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CHEVROLET



BUILDING SWEET MEMORIES

Remember those chalky-tart-sweet lollipop candies? Kinda UFO shaped, in pastels, on a hollow plastic stick? Lollies—I loved the name, the taste and the sugar. I overindulged on them for one week every summer—the week in July my parents rented a cabin at the Crow's Nest resort on Long Lake in northern Wisconsin. The main lodge served up Lollies, a nickel apiece.

My dad booked the same cabin every year. I swatted mosquitoes on the same knotty-pine bedroom wall. Ate fresh-caught walleye at the same Formica-topped table. Played foosball with the same friends in the lodge, jukebox blaring. And I experienced my first kiss at 13—a singular moment—and I'm not saying any more 'bout that.

Loads of Lollies. Millions of mosquitoes. Sand sticking to my sunscreen. And that one moment. The memories are as clear as

Long Lake, as bright as a July Thunder Moon.

Can we build such memories? Yes, by constructing a place where memorable things will occur. That's our Getaway project—a "cabin" for today. That's what we're building for our September issue.

Do-it-yourselfers build memory-makers all the time. Build a new kitchen island and share birthday cake around it. Update your backyard space and laugh into the night with neighbors. Make a

raised bed garden and berate the neighborhood bunnies for eating all your beans. (They can't all be fond memories.)

We're going all out to build an experiential dream getaway. It will be an amazing memory-maker. In our 70 years of publishing, this is our most ambitious DIY project. And the how-to stories will fill the September issue. The planning and progress stories, meanwhile, fill our staff meetings. You'll get more details soon, and you won't have to wait for the issue to arrive in the mail. Check our website and social media for previews of our Getaway project.

Until next time, grab a hammer, some wood and a few Lollies and make sweet memories.

GLENN HANSEN
DEPUTY EDITOR

JEREMY LIN
PRO BASKETBALL PLAYER



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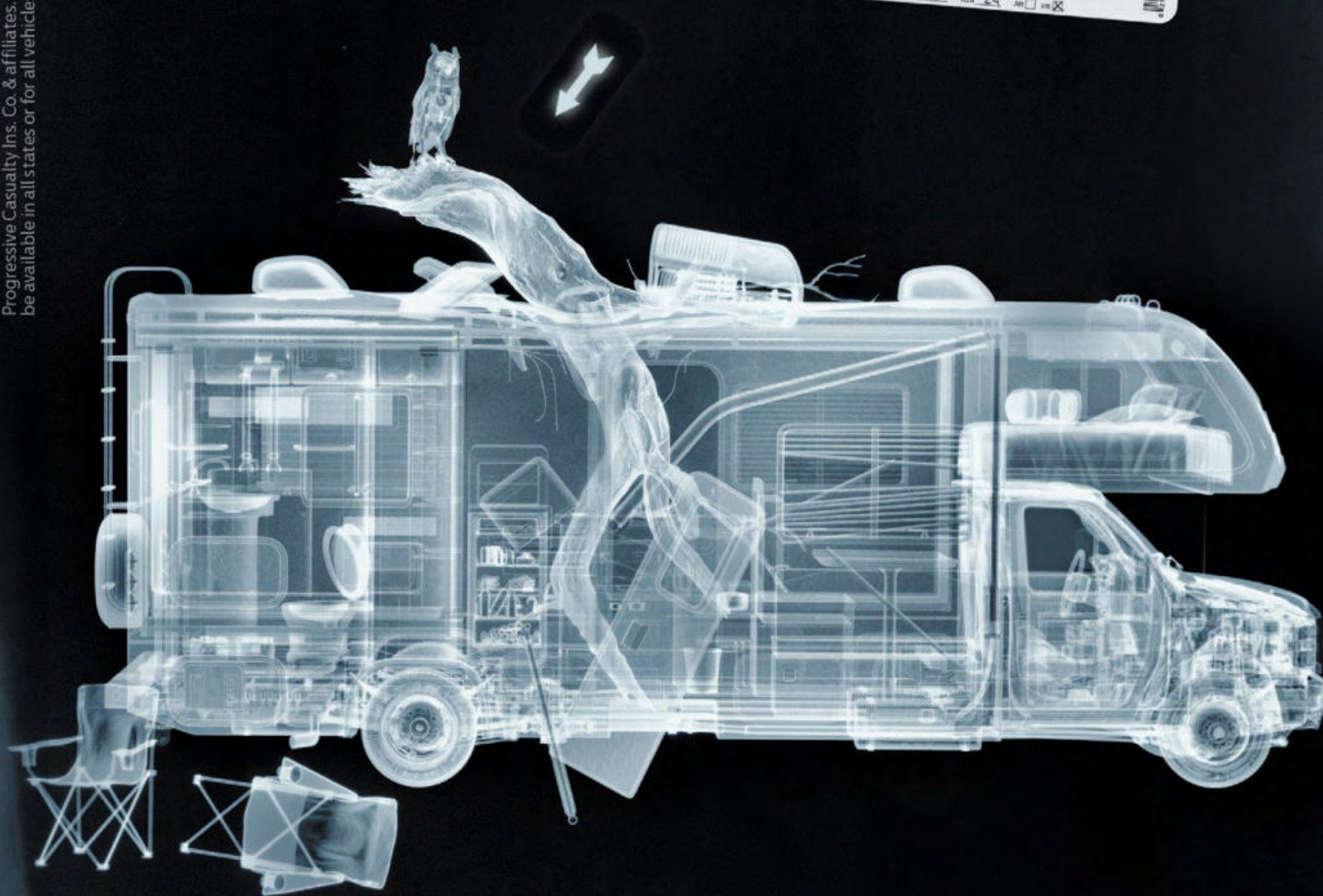
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FEATURES

28

Workbench to Lighted Bar Top

This butcher block design delivers durability and drama.

34

Cocktail Elevator

A pop-up bar offers speedy refreshment at the push of a button.

40

Swing-Out Countertop

Short on work space? This extra countertop shows up on demand.

46

Light Up Your Garage

A mix of task and indirect lighting suits work and play.

52

Fully Charged

Keep your tools organized and powered up in this handy station.

58

Ultra-Organized Garage Cabinets

We'll show you how to modify a pair of cabinets for maximum storage.

DEPARTMENTS

10 Stuff We Love

17 Handy Hints®

22 homeLAB

66 Home Care

78 Reader Info

80 Great Goofs®



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THE ART OF THE PROCESS

At *Family Handyman*, we're used to keeping a tight focus on the how-to steps that lead you to a finished product. In each article, we print a half dozen or more how-to photos accompanied by step-by-step instructions. It's a formula to show the best way to build something. However, this does not leave room for art, for experimentation, for the passion of the craft.

Here are a few photos of the creative, often gritty, side of DIY. Visual artist (and staff photographer) Tom Fenenga captures the deeper side of how-to in early images from our Getaway project, which will be featured in our September issue. See more of Tom's work at familyhandyman.com/thegetaway.



87%

SO? DID YOU?

Last spring, 87% of you said you would "start a new project because you have more time at home." So? Did you? Let us know what you started and finished! Email us at editors@thefamilyhandyman.com.



You Read and Said

Tom from New Jersey read our May issue, emailed us and said, "Install a storm door in 30 minutes? Probably after installing the same door over and over and over again, you can set up for a 30-minute install." But for a beginner to "unpack, read instructions (hopefully), assemble door, measure, drill latch holes, chisel out for latch and lock" **Tom's not wrong. Thanks, Tom.**

Important Facts about IMBRUVICA® (im-BRU-vih-kuh) tablets and capsules

The risk information provided here is not comprehensive. To learn more, talk about IMBRUVICA® with your healthcare provider or pharmacist. For more information, call 1-877-877-3536 or go to www.imbruvica.com.

What is IMBRUVICA®?

IMBRUVICA® is a prescription medicine used to treat adults with:

- Mantle cell lymphoma (MCL) who have received at least one prior treatment
- Chronic lymphocytic leukemia (CLL)/Small lymphocytic lymphoma (SLL)
- Chronic lymphocytic leukemia (CLL)/Small lymphocytic lymphoma (SLL) with 17p deletion
- Waldenström's macroglobulinemia (WM)
- Marginal zone lymphoma (MZL) who require a medicine by mouth or injection (systemic therapy) and have received a certain type of prior treatment
- Chronic graft versus host disease (cGVHD) after failure of 1 or more lines of systemic therapy

It is not known if IMBRUVICA® is safe and effective in children.

What should I tell my doctor before taking IMBRUVICA®?

Before taking IMBRUVICA®, tell your healthcare provider about all of your medical conditions, including if you:

- have had recent surgery or plan to have surgery. Your healthcare provider may stop IMBRUVICA® for any planned medical, surgical, or dental procedure.
- have bleeding problems
- have or had heart rhythm problems, smoke, or have a medical condition that increases your risk of heart disease, such as high blood pressure, high cholesterol, or diabetes
- have an infection
- have liver problems
- are pregnant or plan to become pregnant. IMBRUVICA® can harm your unborn baby. If you are able to become pregnant, your healthcare provider will do a pregnancy test before starting treatment with IMBRUVICA®. Tell your healthcare provider if you are pregnant or think you may be pregnant during treatment with IMBRUVICA®.
 - **Females** who are able to become pregnant should use effective birth control (contraception) during treatment with IMBRUVICA® and for 1 month after the last dose.
 - **Males** with female partners who are able to become pregnant should use effective birth control, such as condoms, during treatment with IMBRUVICA® and for 1 month after the last dose.
- are breastfeeding or plan to breastfeed. Do not breastfeed during treatment with IMBRUVICA® and for 1 week after the last dose.

Tell your healthcare provider about all the medicines you take, including prescription and over-the-counter medicines, vitamins, and herbal supplements. Taking IMBRUVICA® with certain other medicines may affect how IMBRUVICA® works and can cause side effects.

What should I avoid while taking IMBRUVICA®?

Do not drink grapefruit juice, eat grapefruit, or eat Seville oranges (often used in marmalades) during treatment with IMBRUVICA®. These products may increase the amount of IMBRUVICA® in your blood.

What are the possible side effects of IMBRUVICA®?

IMBRUVICA® may cause serious side effects, including:

- **Bleeding problems (hemorrhage) are common** during treatment with IMBRUVICA®, and can also be serious and may lead to death. Your risk of bleeding may increase if you are also taking a blood thinner medicine. Tell your healthcare provider if you have any signs of bleeding, including:
 - blood in your stools or black stools (looks like tar)
 - pink or brown urine
 - unexpected bleeding, or bleeding that is severe or that you cannot control
 - vomit blood or vomit looks like coffee grounds
 - cough up blood or blood clots
 - increased bruising
 - dizziness
 - weakness
 - confusion
 - change in your speech
 - headache that lasts a long time or severe headache
- **Infections** can happen during treatment with IMBRUVICA®. These infections can be serious and may lead to death. Tell your healthcare provider right away if you have fever, chills, weakness, confusion, or other signs or symptoms of an infection during treatment with IMBRUVICA®.

- **Decrease in blood cell counts.** Decreased blood counts (white blood cells, platelets, and red blood cells) are common with IMBRUVICA®, but can also be severe. Your healthcare provider should do monthly blood tests to check your blood counts.
- **Heart problems.** Serious heart rhythm problems (ventricular arrhythmias, atrial fibrillation and atrial flutter), heart failure and death have happened in people treated with IMBRUVICA®, especially in people who have an increased risk for heart disease, have an infection, or who have had heart rhythm problems in the past. Tell your healthcare provider if you get any symptoms of heart problems, such as feeling as if your heart is beating fast and irregular, lightheadedness, dizziness, shortness of breath, swelling of the feet, ankles or legs, chest discomfort, or you faint. If you develop any of these symptoms, your healthcare provider may do a test to check your heart (ECG) and may change your IMBRUVICA® dose.
- **High blood pressure (hypertension).** New or worsening high blood pressure has happened in people treated with IMBRUVICA®. Your healthcare provider may start you on blood pressure medicine or change current medicines to treat your blood pressure.
- **Second primary cancers.** New cancers have happened during treatment with IMBRUVICA®, including cancers of the skin or other organs.
- **Tumor lysis syndrome (TLS).** TLS is caused by the fast breakdown of cancer cells. TLS can cause kidney failure and the need for dialysis treatment, abnormal heart rhythm, seizure, and sometimes death. Your healthcare provider may do blood tests to check you for TLS.

The most common side effects of IMBRUVICA® in adults with B-cell malignancies (MCL, CLL/SLL, WM and MZL) include:

- diarrhea
- tiredness
- muscle and bone pain
- rash
- bruising

The most common side effects of IMBRUVICA® in adults with cGVHD include:

- tiredness
- mouth sores (stomatitis)
- pneumonia
- bruising
- muscle spasms
- diarrhea
- nausea

Diarrhea is a common side effect in people who take IMBRUVICA®. Drink plenty of fluids during treatment with IMBRUVICA® to help reduce your risk of losing too much fluid (dehydration) due to diarrhea. Tell your healthcare provider if you have diarrhea that does not go away.

These are not all the possible side effects of IMBRUVICA®.

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

What are the ingredients in IMBRUVICA®?

Active ingredient: ibrutinib

Inactive ingredients:

IMBRUVICA® capsules: croscarmellose sodium, magnesium stearate, microcrystalline cellulose, and sodium lauryl sulfate. The 70 mg capsule shell contains gelatin, titanium dioxide, yellow iron oxide, and black ink. The 140 mg capsule shell contains gelatin, titanium dioxide, and black ink.

IMBRUVICA® tablets: colloidal silicon dioxide, croscarmellose sodium, lactose monohydrate, magnesium stearate, microcrystalline cellulose, povidone, and sodium lauryl sulfate. The film coating for each tablet contains ferrousferic oxide (140 mg, 280 mg, and 420 mg tablets), polyvinyl alcohol, polyethylene glycol, red iron oxide (280 mg and 560 mg tablets), talc, titanium dioxide, and yellow iron oxide (140 mg, 420 mg, and 560 mg tablets).

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For more information, go to www.imbruvica.com or call 1-877-877-3536.



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Stuff We Love

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Air to Spare

My bicycle pump has been gathering dust since I got this Makita cordless inflator. I can throw one of my tool system batteries in it and take it to almost any deflated situation. I just dial in the right psi limit on the inflator and let it do all the pumping.

The inflator tips store onboard, so you have to try hard to lose them. It makes quick work of filling small-volume items like bicycle tires and basketballs. It's not so speedy with car tires and air mattresses, but it can get the job done. Most major tool manufacturers offer inflators now. I have the Makita DMP180ZX, which costs \$100 as a bare tool; you'll pay about the same for a DeWalt. The Ryobi version costs \$30 and Milwaukee's is about \$80. You can find them online and at most home centers.

BILL BERGMANN, ASSOCIATE EDITOR

Adjustable
psi limit

Driving in Tight Spaces

The body of a drill driver often won't allow for the optimal placement of a fastener. Flex drive bits are available, but they aren't designed for the heavy torque of an impact driver. This DeWalt MaxFit Pivot Holder is impact-driver ready, and its 20-degree pivot allows firm seat on the head of a fastener. Milwaukee offers its impact-ready Shockwave Knuckle Bit (\$14), which has a 30-degree pivot. Both bits lock for easy use as a non-pivoting driver. The 11-piece Milwaukee driver and bit set is \$26. The DeWalt MaxFit Pivot bit holder is \$10. It's also part of a 14-piece set (\$16).

JOSH RISBERG, LEAD CARPENTER

WHAT'S IN YOUR TANK?

When you're in the middle of a torching task or cooking camp-side, there's nothing worse than running out of propane. It's hard to know how much fuel is left in a tank. That is, it used to be, before I got a Bernzomatic Digital Fuel Gauge. It works with my 14-oz. torch bottles and the 16-oz. canisters I use for my camp stove.

The LED display shows how much is left in the tank, so I can be sure I have enough fuel for the task at hand. If you're packing for an outdoor adventure or planning to do torch tasks around the house, grab this pocket-size scale. Find it for \$12 online and in outdoors and discount stores.

NICK GRZECHOWIAK
CHIEF CONTENT OFFICER



DUAL-CLAW CAT'S PAW

Pulling nails is an inevitable part of building and remodeling. A traditional single-claw cat's paw works OK, but a Japanese-style puller like this Dead On Tools Exhumer is a far more effective tool. With two claws—one parallel, the other perpendicular to the 10-5/8-in. shaft—it gives you several ways to yank a nail.

Strike the small face on the back side of the perpendicular head to drive the claw to encircle the nail head, even if it's below the surface. I'll often drive the claw on the straight end of the shaft to burrow under a nail head at a flatter angle and then use the opposite end for the leverage to pull the nail. If the nail is still stubborn, you can strike

the small face to drive the nail out by its head. Built-in bonuses include a circular saw wrench and a bottle opener so you can change your saw blade and pop a frosty beverage. The Exhumer Classic version I have costs \$18, and the new Exhumer 9 is \$24. Both are online and in home centers.

MIKE BERNER
ASSOCIATE EDITOR

EASY-WRENCHING RATCHET

When I started wrenching on engines as a teen, my first ratcheting socket tool seemed heaven sent. My experience with this Milwaukee M12 Ratchet has been no different; this thing is beyond awesome. It works fast, requires minimal effort and is nearly perfect for those tight places where you can't swing a wrench. It might not loosen big, old rusty nuts, but it's surprisingly powerful in many situations. Most major tool manufacturers are making these now. This Milwaukee kit with charger and case goes for \$180 online and at home centers.

BRAD HOLDEN, SENIOR EDITOR



VENT COVERS WITH STYLE

I love the look of large decorative vent covers in old homes. But the trend in new homes is minimalist and plain. To my delight, I've seen an increasing number of decorative choices at home centers lately. And the most pleasing to my eyes are Stellar Air vent covers. They're available in common sizes for wall or ceiling vents in many different designs. I hope options for floor registers are coming soon. Costs vary widely depending on the size, style and finishing options. A small vent cover starts at about \$30. Find them at stellarairdecorativeventcovers.com.

GLENN HANSEN, DEPUTY EDITOR



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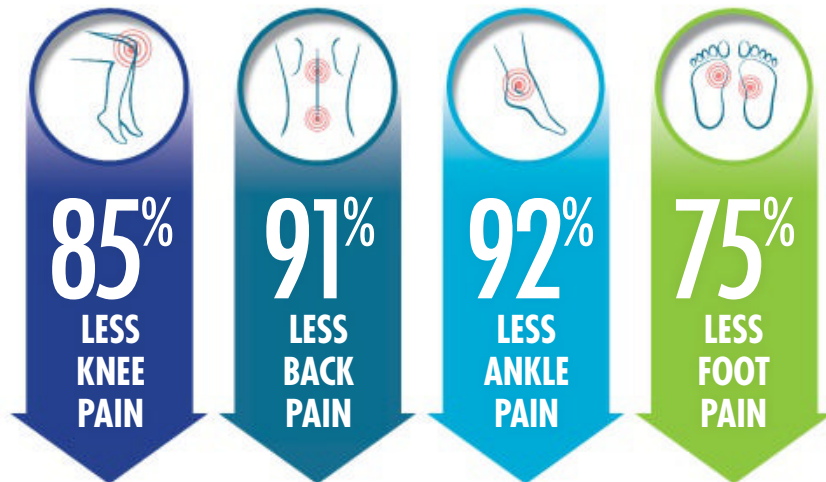


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SPRINKLER ON THE MOVE

Before in-ground sprinkler systems, traveling sprinklers were a high-tech way to keep your grass green. Nelson's new take on the classic cast iron sprinkler offers three speeds so you can control the level of saturation. I just lay my hose out in loops across my lawn and set this sprinkler to work. The water runs into the sprinkler and drives a turbine gear to propel the back wheels while the hose guides the front wheel. You can water your lawn without continually repositioning the sprinkler. It's so pleasing to watch this sprinkler quietly at work, powered only by water pressure. You can find the Nelson Rain Train Traveling Sprinkler online and at home centers for about \$75.

BILL BERGMANN, ASSOCIATE EDITOR



CURE FOR GAS HANDS

Whether you're filling up at the pump, topping off the mower or working under the hood, that nasty gasoline smell can stay on your hands for hours. This convenient pack of wipes from Briggs & Stratton is a sure cure for that stench. Nontoxic and safe for most surfaces, these Gas Off wipes don't just mask the odor; they remove it. The resealable pack of 15 wipes costs \$5 and is a perfect fit for your glove box or toolbox.

MIKE BERNER
ASSOCIATE EDITOR



Magnetic Way to Mind Small Parts

I wish I had a buck for every minute I've spent looking for that one nut, bolt, washer or screw that dropped. While assembling a new grill recently, I used this magnetic parts bowl. I was so impressed with myself when I finished because there were no missing parts! With its magnetic base, you can stick it on any metal surface, anywhere, anyhow. It's available in a variety of sizes. The 5-1/2-in.-diameter Husky bowl shown here costs \$10.

JAY CORK, ASSOCIATE EDITOR

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(see details)



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It's not often you happen upon a blade smith who has gem cutting skills. In fact, you stand a better chance finding a needle in a haystack. But finding needles in haystacks is what we do best, so when we saw this master craftsman's handiwork, we made certain to procure some of these Southwestern masterpieces to complete our collection.

The stainless steel blade, bolster and pommel are exquisitely etched and would have looked great with a less ambitious handle. But the results of overachieving are stunning here. The turquoise-blue colored handle is ablaze with assorted stones like jasper, marble, sunstone, and coral that have been hand cut and inlaid in a Southwestern motif that conjures images of intricately beaded belts and moccasins.

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Dishwasher double duty

It can take forever to wash greasy dust off switch plates, light fixture covers, stovetop drip pans and other household items. Why not just wash them in the dishwasher? This works great with plastic, aluminum and steel, especially for items like grilles with gaps and detailing. Put them on the top rack and send them through a normal cycle. Don't do this with items that are enameled, painted, plated or made of brass or wood.

JEFF ROBINSON

Top rack



Quick-draw measuring tape

The clip on my measuring tape used to fray the pockets of my jeans. To prevent more damage, I unscrewed the clip and screwed a pot magnet in its place. I hook the clip onto my pocket. Now it's easy to grab the tape and put it back when I'm done.

BOB DOWNEY



CLEAN SWEEP

To make sweeping up a breeze, I modified a dustpan to fit my shop vacuum's floor fitting. I attached the fitting to the dustpan with a hose clamp.

ROBERT GILLETTE



MIX YOUR OWN WINDOW CLEANER

Most professional window washers don't buy window cleaner. They make their own by mixing a teaspoon of dishwashing liquid with a few gallons of water. That's it. You can just pour it into a spray bottle for indoor work. For outside windows, get yourself a combination sponge/squeegee and dip it right in the bucket.

CHRIS COSTELLO

BOTTOM RIGHT: **MIKE KRIVIT**



FUR FILTER FOR DOG BATHING

I used to pay to have my dog bathed because I'd end up with a clogged drain if I washed him in my bathtub or shower. Not anymore. To keep fur out of the drain, use a mesh-type scrub pad. In a shower, clip the pad to the drain plate with a bobby pin. In a bathtub, wedge two pads under the stopper from two sides. The pads catch fur but let water flow through.

ELLEN MATHESON



SOLO DRYWALL HANGING

Hanging that top course of drywall is challenging to do by yourself. Make the job easier by creating a bracket consisting of a couple of 16d nails installed between 1 and 2 ft. from each end of the sheet. Just sink them about 1 in. deep into the studs 48-1/2 in. down from the ceiling. Hoist the sheet and rest the bottom edge on the nails. Push the sheet up against the ceiling with one hand and tack it into place with the other with a few prestarted drywall nails or screws.

MITCH BOOTH

STREAK-FREE CAR

Your car will look like it rolled out of a professional car wash if you dry it with your leaf blower after you wash it. Rinse your car, blow away the bulk of the water with the leaf blower and then finish up with a quick towel swipe. You'll get a streak-free finish without a pile of wet towels, and you won't have to wait around to start waxing.

GREG BRENNFLECK





TRASH-CAN VACUUM BREAKER

Nature abhors a vacuum. And so do you when you try to pull a full plastic bag out of a trash can. The bag forms an airtight seal inside the container, creating a vacuum as you try to lift out the bag. Break the vacuum and save your back by drilling a 1/2-in. hole in the can. Drill through the side, near the bottom. If you drill through the bottom, disgusting garbage liquids can leak out.

DAN LUND

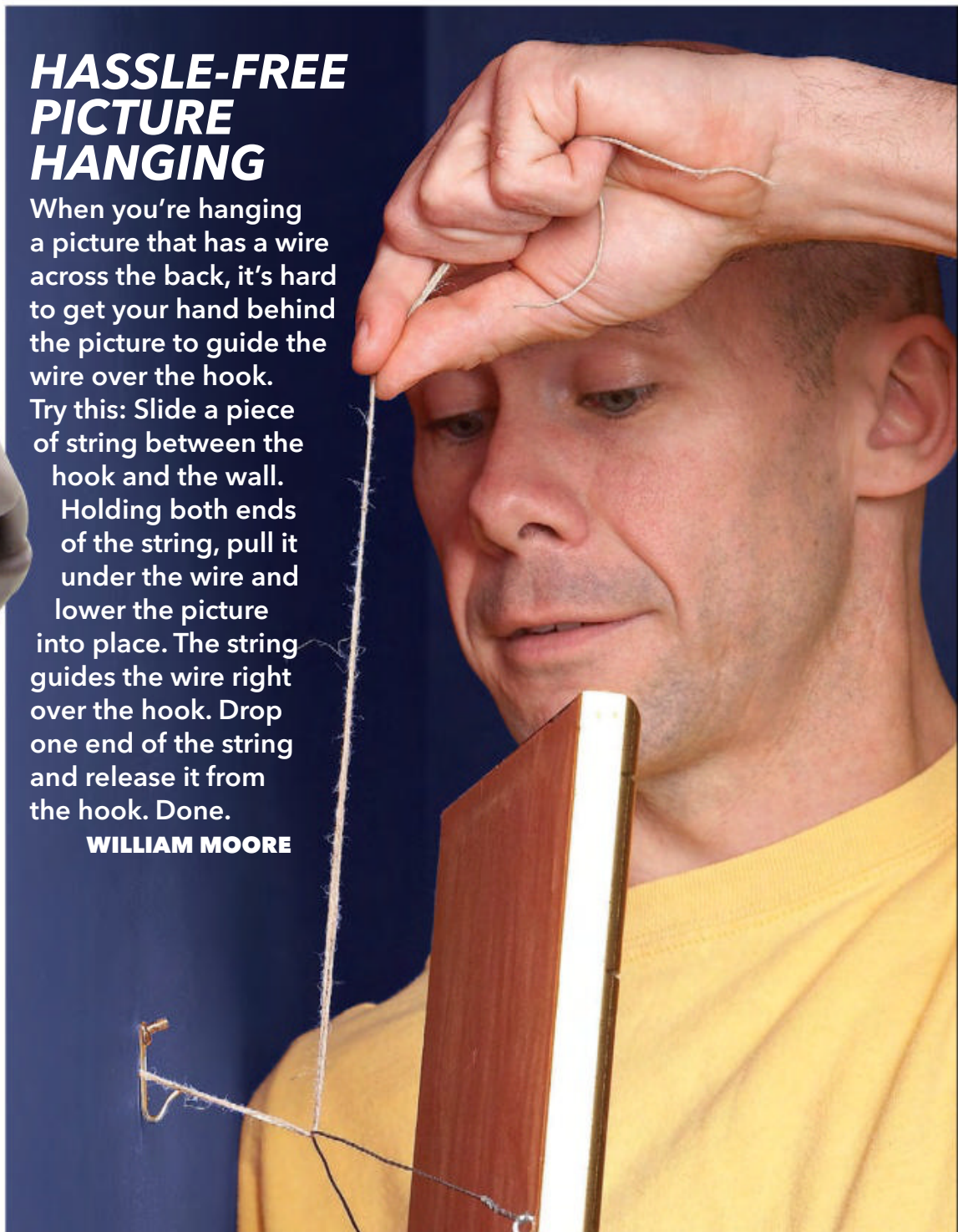
HASSLE-FREE PICTURE HANGING

When you're hanging a picture that has a wire across the back, it's hard to get your hand behind the picture to guide the wire over the hook.

Try this: Slide a piece of string between the hook and the wall.

Holding both ends of the string, pull it under the wire and lower the picture into place. The string guides the wire right over the hook. Drop one end of the string and release it from the hook. Done.

WILLIAM MOORE



SMOOTHER VARNISHING

I've been building and refinishing furniture for a long time, and here's a tip I use to get a super-smooth finish. Open the can of varnish and put it in a few inches of warm water. Let it sit for about 10 minutes, giving it a stir every few minutes. Stir it again right before you apply it. It will flow more easily, penetrate more thoroughly and set up better. This also works for tung and other penetrating oils.

ANNE TENNIS

GAME CHANGERS 2021

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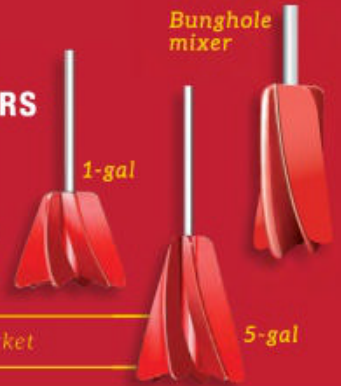


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IDEAS & INNOVATIONS FOR HOME

MY YEAR WITH "ROBO"



BY BILL BERGMANN

Cleaning isn't my favorite activity, so I stepped into the future and got a Roborock S5 Max vacuum cleaner. One year later, "Robo" and I have a strong relationship and here's why.

SETUP/PROGRAMMING:

Most robot vacs use a charging dock they can access easily when it's time to recharge. I found an inconspicuous spot my Robo could reach anytime.

Downloading the phone app and connecting to Wi-Fi was straightforward; I just had to be sure to connect with 2.4 GHz signal, not the regular 5 GHz system. You can also connect to the vac through Alexa or Google Home.

I was impressed with the app's capability. I mapped all the rooms in my house to include no-go and

no-mop zones, and I customized Robo's vacuum and mop settings for certain areas. Robo sends useful alerts to my phone; I know if it's stuck (it happens but rarely), or if I need to fill the mop reservoir or empty the dust bin. And Robo pings me when it's finished. I love that!

WHAT ROBO CAN DO:

At slightly under 3 in. tall, Robo scoots below furniture and cleans the unseen. Its little spinning brush collects the dust and pet hair that cling to furniture feet.

Robo does a light damp mop that brings a new level of clean to my floors. I now do only occasional spot cleaning and fewer manual mop sessions.

I'm amazed that Robo senses carpets and rugs, switching to stronger suction to clean a rug.

WHAT ROBO CAN'T DO:

I need to do a little prep before putting Robo to work. I move any lamp or cord that might obstruct Robo or get sucked into its rotating brush. If it does jam, Robo sends an SOS to my phone. The brush is easy to remove and clean.

Robo senses stairwells and I have yet to see it fall. But it won't clean the stairs; I grab my stick vac for that. My floors have a tall transition to the bathroom; Robo can't handle that. And it gets stuck at the low toe-kick near the dishwasher.

MAINTENANCE: The app lets me know when Robo's sensors need cleaning. I cleaned them twice this past year. The mop cloths can be cycled through the laundry.

The dust bin is small but adequate for my

600-sq.-ft. first floor. I usually empty it between floors. I'm always impressed by how much that bin can hold. The HEPA filter on the bin needs to be cleaned periodically.

COST: The cost-to-performance factor for robot vacs improves by the day. You can find a capable Wi-Fi version for less than \$200 and a simple set-and-go model for less than \$100, but with those you probably won't get mopping or super programmable features. On average, Robo spends an hour or less vacuuming and mopping each week. My Robo cost about \$600, so I figure that's \$12 an hour for the year. And I think Robo has a few more years of cleaning ahead. That's a good deal.

3-IN-1 SHEATHING FOR NEW HOMES

Created in 2008 by Huber Engineered Hardwoods, ZIP System sheathing is now a building industry standard for residential and commercial construction. The 4 x 8-ft. panels are oriented strand board (OSB) structural sheathing coated with water-resistant polymer. After the panels are attached to the framing, the seams are taped, giving a continuous air barrier. Its water vapor permeability, or "perm rating," falls within the ideal range of 12 to 16, allowing a house to breathe while preventing moisture from being trapped in a wall cavity. In short, ZIP sheathing is a labor saver; sheathing and house wrap are accomplished in one step.

ZIP panels are now available with adhered rigid foam insulation. Thicknesses range from 1 to 2-1/2 in., offering insulation values of R-3 to R-12. Insulated ZIP sheathing meets structural wall bracing requirements, boosts R-values and provides a moisture and wind barrier. It also prevents thermal bridging, which causes energy loss through



solid structural components (studs).

The average cost of R-6 ZIP is about \$60 a sheet, while 1/2-in. OSB plus house wrap and 1-in. rigid insulation ends up at about \$45. But

with ZIP you're ditching the labor cost of foam insulation and house wrap and gaining the energy savings of a well-insulated home.

BILL BERGMANN, ASSOCIATE EDITOR

A SHIRT THAT CARES

Work shirts are often stiff, bulky and uncomfortable. And I'm not sure they actually do any work. The Truewerk Cloud Shirt is different. This lightweight polyester long-sleeve shirt is comfy and does the work of protecting me from sun exposure. With built-in 50+ UPF protection, the shirt claims to block 98% of UV rays. I don't have to reapply lotion throughout the day. Plus the light fabric stretches a bit, and it breathes and dries quickly.

I like the shirt's plastic snaps; they're easier to manage than buttons if I'm wearing gloves. I also like a work shirt with a collar, and this one adds even more sun protection on my neck. The chest pockets have pencil holders and securable flaps.

The Cloud Shirt, about \$60 online, is my new go-to shirt for gardening and lawn work—and hiking and kayaking too.

GLENN HANSEN, DEPUTY EDITOR

SWITCH IT UP

Lighting hasn't been this cool and this fun since the lava lamp. Add in the convenience of light-switch-anywhere technology, and this GE product mashup sends that lava lamp straight to your garage-sale pile.

I tested a few items in the C by GE product line, starting with the Smart Switch. This wire-free switch mounts anywhere, is battery-powered and can control GE's Smart Bulbs and items plugged into GE's Smart Plug. Plus, it handles dimming and color control for bulbs that are so equipped.

It took me some time to grasp the wireless functionality. Powered by a common button battery, this switch attaches to any wall with screws or removable tape. The included wall plate cover hides the fasteners for a clean look. You can mount it in a standard box and use wall plates matching others in your house. I use it like a remote control; it sits on my bedside table. I love that I can easily change the light color or dim the bulb for late-night reading when my wife is asleep.

Of course, the switch needs a GE Smart family member to communicate with. Easiest and most versatile is the Smart Plug, which makes anything plugged in a smart thing. Control a lamp, turn a radio on or off, fire up a fan—the smart plug can handle any regular plugged appliance.

Now add a Smart Bulb to any lamp or light fixture and turn up the fun. I tried both the Full Color Smart Bulb and the Tunable White Smart Bulb. Both bulbs use Bluetooth technology to connect with the Smart Switch for easy-to-control lighting. I can also control the bulbs from the C by GE app installed on my phone, and that's free to use. If you use Alexa or Google Home in a smart home setting, you get even more connectivity options.

I had big fun with the color array of the Full Color bulb. My Smart Switch turns the light on and off, dims to my desire and controls color settings. I haven't yet created any "scenes," but I can do so with the smart bulb and save settings using the app. And with the Tunable White bulb, I get to select cool daylight tones for early morning and warmer tones for nighttime. I can also set schedules for on and off, and I can control the bulbs from anywhere, with or without my remote Smart Switch.

GLENN HANSEN, DEPUTY EDITOR

Install it on the wall



Or use it as a remote



SWITCH VS. REMOTE

I prefer using the wireless wall switch as a remote control, but it can also be mounted on the wall with included screws or removable tape. You can install the switch under a standard wall plate too.



Wall plate cover



Wall plate bracket



Wire-free switch

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COCKTAIL ELEVATOR

Whatever beverage refreshes you after a few hours of wrenching or sawing, just push the magic button and your reward comes into view—thanks to this pop-up bar. Cheers.

IN-CABINET CHARGING

We are all charged up about these purpose-built cabinets. They stow power tools, batteries and chargers. No more dead batteries as an excuse.

EPOXY & LED COUNTER

This countertop does double duty: It's a base for woodworking, carburetor cleaning and more. When we put away the tools and switch on the inlaid lights, it becomes a mixology station.

DESTINATION GARAGE



SHOWROOM LIGHTING

This is a showroom atmosphere that really works. That means a combination of functional task lighting, custom ceiling fixtures and special accent lights that switch the space from work to play.

STORAGE ORGANIZER

Don't let your garage cabinets turn into junk drawers. We made ours to be clean and efficient. And if we do let things slide, we can always close the doors to hide the mess!

SWING-OUT COUNTER

Space is at a premium in the garage. Build this hideaway countertop that appears only when needed. Our swing-out countertop pivots from under the main counter, magically expanding the work space.

WORKBENCH TO BAR TOP

Add LEDs set in epoxy for
a unique, high-tech look

BY MIKE BERNER

Butcher block countertops are tough as nails and the perfect choice for a garage workbench. But that doesn't mean they have to be ordinary. I made this design by routing out a hexagon pattern, laying LED strips in between and covering them with epoxy. Flipping that light switch at the end of the day signals that it's time to put away the tools, sip—and relax.



MEET THE BUILDER

Mike Berner was a school-teacher until his summer job building homes turned into a year-round career. Now he's an editor at *Family Handyman*.



1 START THE HEXAGON TILES

To cut the 15 hexagon tiles, you'll need a jig. I started with a 2-ft. x 2-ft. melamine sled. I set my table saw fence to 12 in. and made a partial cut into the sled. I attached a fence at a 120-degree angle with a few screws then fastened a pair of toggle clamps to the fence. Then, I cut 8-1/4-in.-wide strips of 3/4-in. plywood into 10-in. pieces until I had 16 parallelograms.

2 FINISH THE HEXAGON TILES

For the rest of the cuts, clamp a stop block with a 30-degree angle at one end against the fence 4-5/8 in. away from the saw kerf. Clamp the plywood parallelograms into the jig, cut one side, then rotate and repeat until you've got a pile of hexagon tiles.

WHAT IT TAKES

TIME	COST	SKILL LEVEL
3 days	\$1,200	Advanced

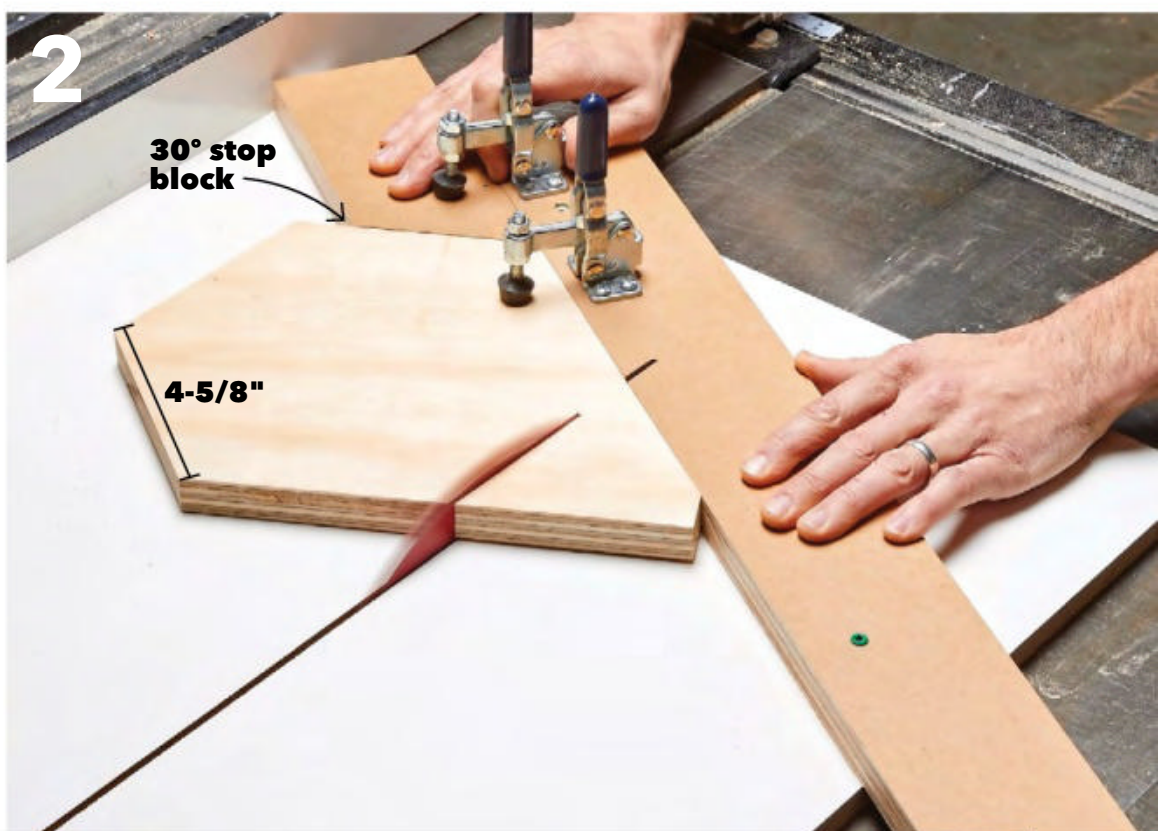
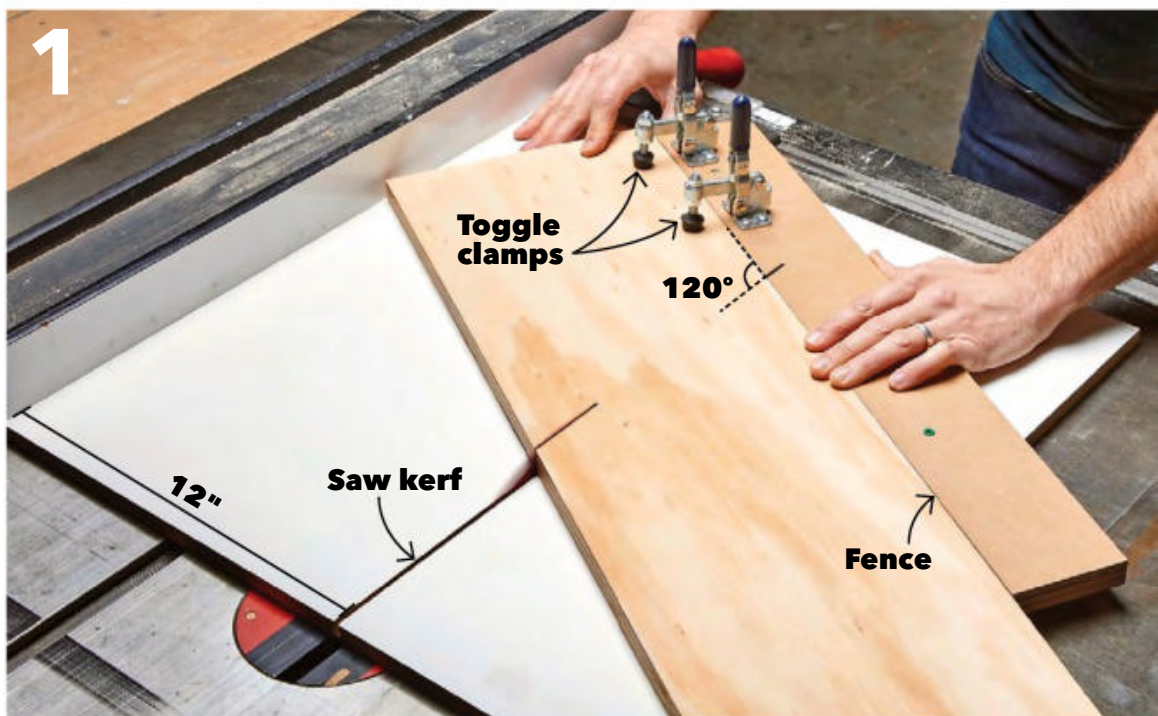
TOOLS

Table saw, drill, 18-gauge brad nailer, router, chisel, caulk gun, hot glue gun, belt sander, orbital sander

Materials List

ITEM

Butcher block countertop
3/4" plywood
Hot glue
18-gauge brads
Two-part deep-pour epoxy
Mixol concentrated tint
1-qt. measuring container
Metallic powder highlight
Acrylic plexiglass
1/2 x 2' x 2' plywood (melamine)
LED strip lights
22-gauge five-lead cable
LED strip connectors
Silicone
Shellac
Toggle clamps





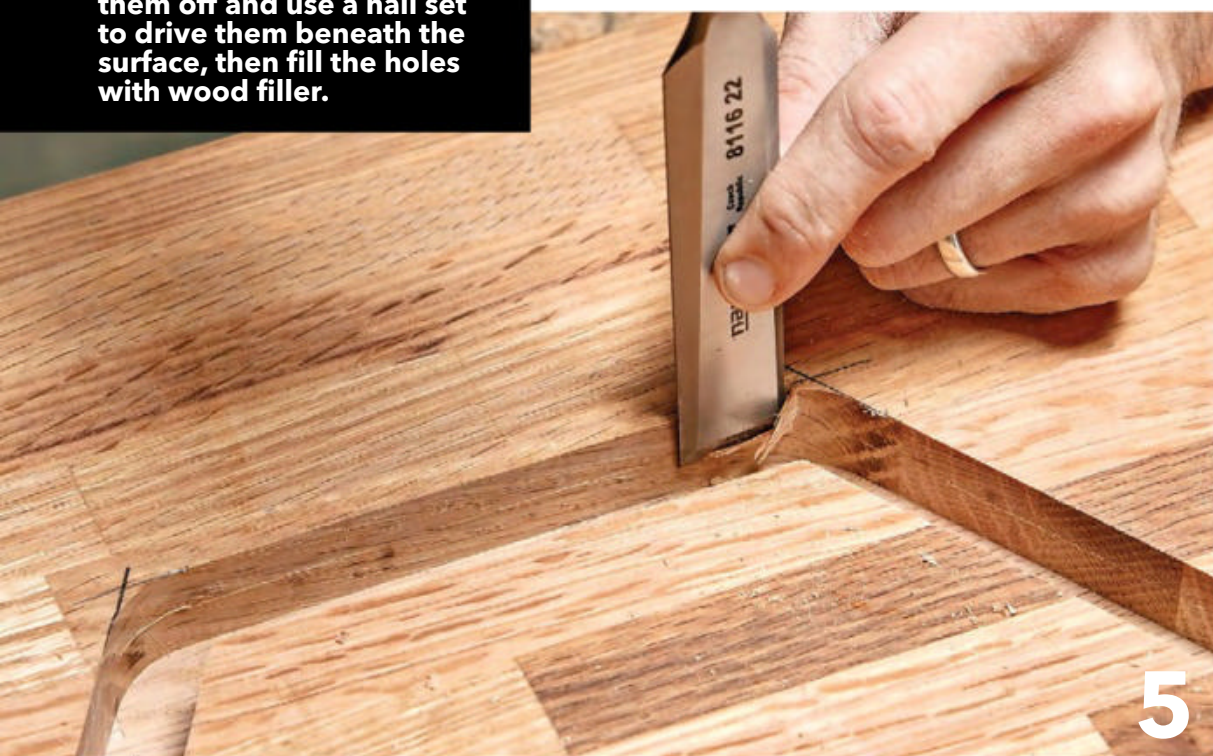
3



4

REMOVE THE TILES

When you finish the routing, remove the tiles with a pry bar and pull the nails. If the nails won't pull out, cut them off and use a nail set to drive them beneath the surface, then fill the holes with wood filler.



5

3 CREATE THE PATTERN

Lay out the tiles on the butcher block top, using spacers just like you would if you were tiling a floor. To make the spacers, I ripped 3/4-in.-wide hardwood strips. (The edge of nominal 1-by material is too narrow to use as a spacer for my 3/4-in. router bearing.) Then I cut the strips into 3-in. lengths. I secured the tiles with dabs of hot glue and brad nails.

4 ROUT THE PATTERN

To create the channels, I routed around the tiles counterclockwise (against the rotation of the bit). I did this in several 1/8-in.-deep passes until I reached a depth of 3/4 in. This is the most difficult part of this project; go slow. After each pass, I stopped to vacuum out all the chips and let the bit cool.



3/4" pattern bit

5 CHISEL THE CORNERS

The router leaves rounded corners at every outside turn. Using a straight-edge, mark a sharp corner, then chisel to the line. You'll fill the channel with epoxy, so don't worry about making a perfect cut all the way to the bottom of the channel.



6

6 SEAL THE CHANNELS

When poured right over wood, especially an open-grained species like red oak, the epoxy will seep into the pores. This wastes epoxy and produces lots of air bubbles. Prevent this by sealing the wood with shellac first. Because shellac dries quickly, you won't have to wait long before pouring epoxy.

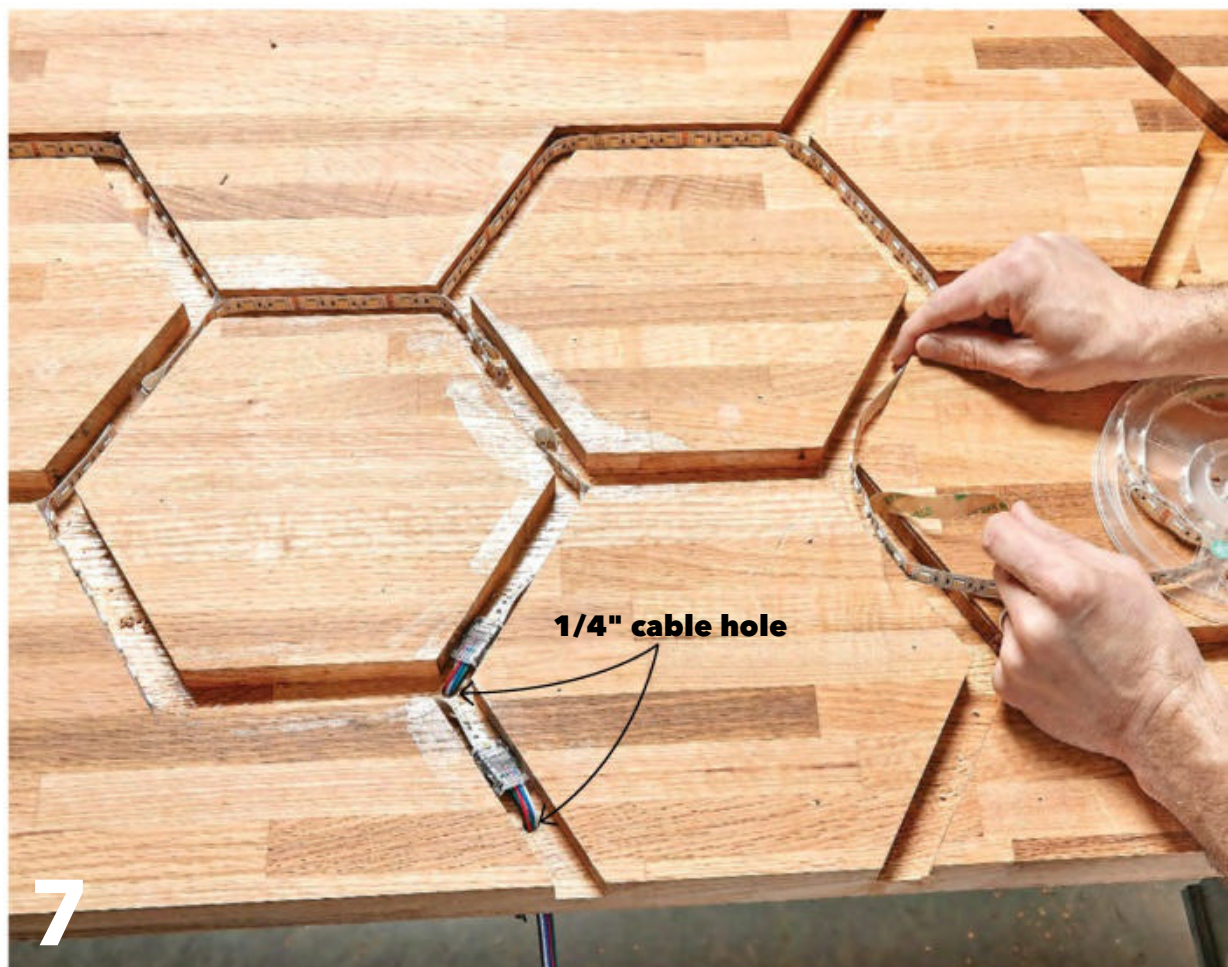
7 SET THE LIGHTS

Getting the LED light strips through the channels is a bit of a puzzle. I needed multiple runs to get lights in each channel, including a couple strips that covered just a single side of a hexagon. At the ends of the runs, connect the strips to a five-wire cable, then guide the cable into the cabinet space through a 1/4-in. hole. Here are a few things I learned:

- Draw a map of the runs before cutting any lights.
- Lay the cut strips in the channels before removing the adhesive backing.
- Use hot glue to hold corners of the strips that don't stick very well.
- Test your lights before covering them with epoxy.

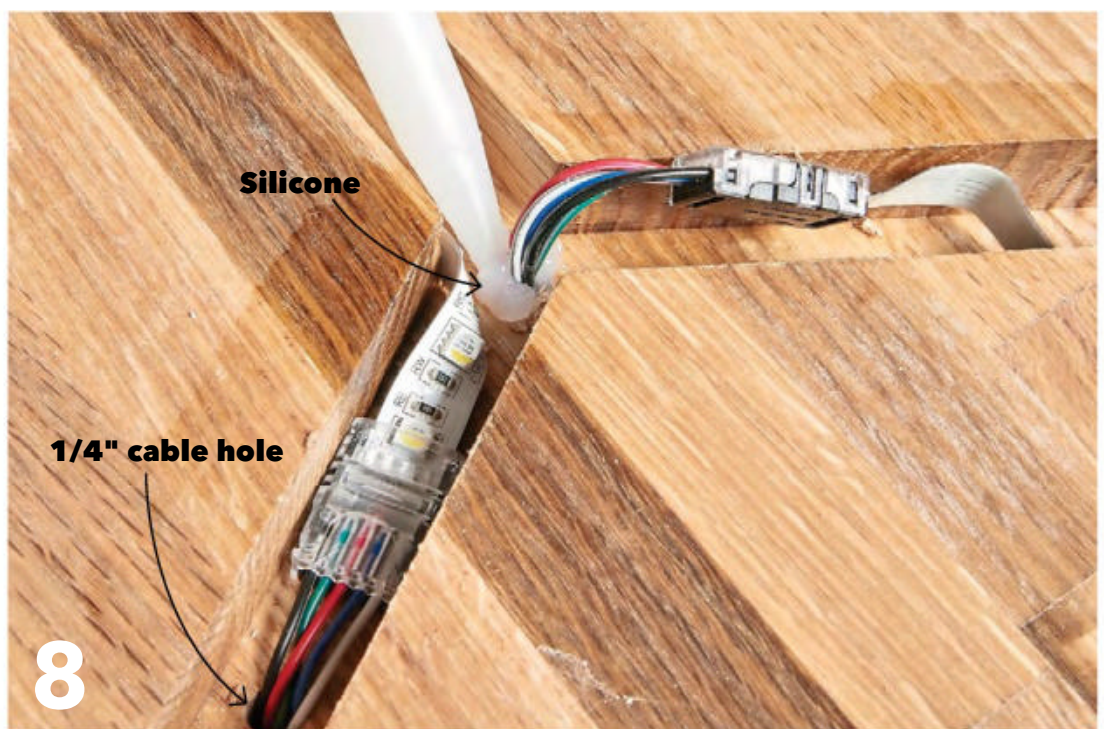
8 PLUG EVERY VOID

Even a tiny leak in the form could cause the epoxy to drip out and make a huge mess. Where each cable passes through the top, lift the cable a bit and fill the hole with silicone. Slowly push the cable back through, filling the hole with silicone as you push the wires down.



7

1/4" cable hole



8

Silicone

1/4" cable hole



9 DAM THE EDGES

The easiest way to dam the epoxy in the channels is with 1/8-in. acrylic and hot glue. I cut 2-in.-wide acrylic strips into 3-in.-long pieces. Then I laid a thick U-shape bead of hot glue around each channel's opening; I extended this glue to the top of the countertop on both sides of the channel to keep the epoxy in. Apply silicone around the outside of each dam for extra leak protection.

10 MIX AND TINT THE EPOXY

I used MAS Epoxies Deep Pour Epoxy Resin System to fill the channels. Each epoxy is different; follow the mixing guidelines on the kit and mix only what you can pour right away. I stirred in a few drops of white concentrated tint, plus white metallic powder to add a cool shimmer effect.



11 POUR THE EPOXY

When you're ready to pour, work your way around all the channels. Don't worry about dripping or slightly overpouring; you'll sand everything afterward. I used three batches of epoxy, overfilling the channels slightly. Look for leaks as you go, using duct tape to seal them. This deep-pour epoxy has a low viscosity and takes about two days to fully cure.





12

12 REMOVE THE FORMS

After the epoxy has fully cured, carefully pull off the acrylic dams. They should pry right off with a flat bar or chisel. Then scrape off the dried glue.



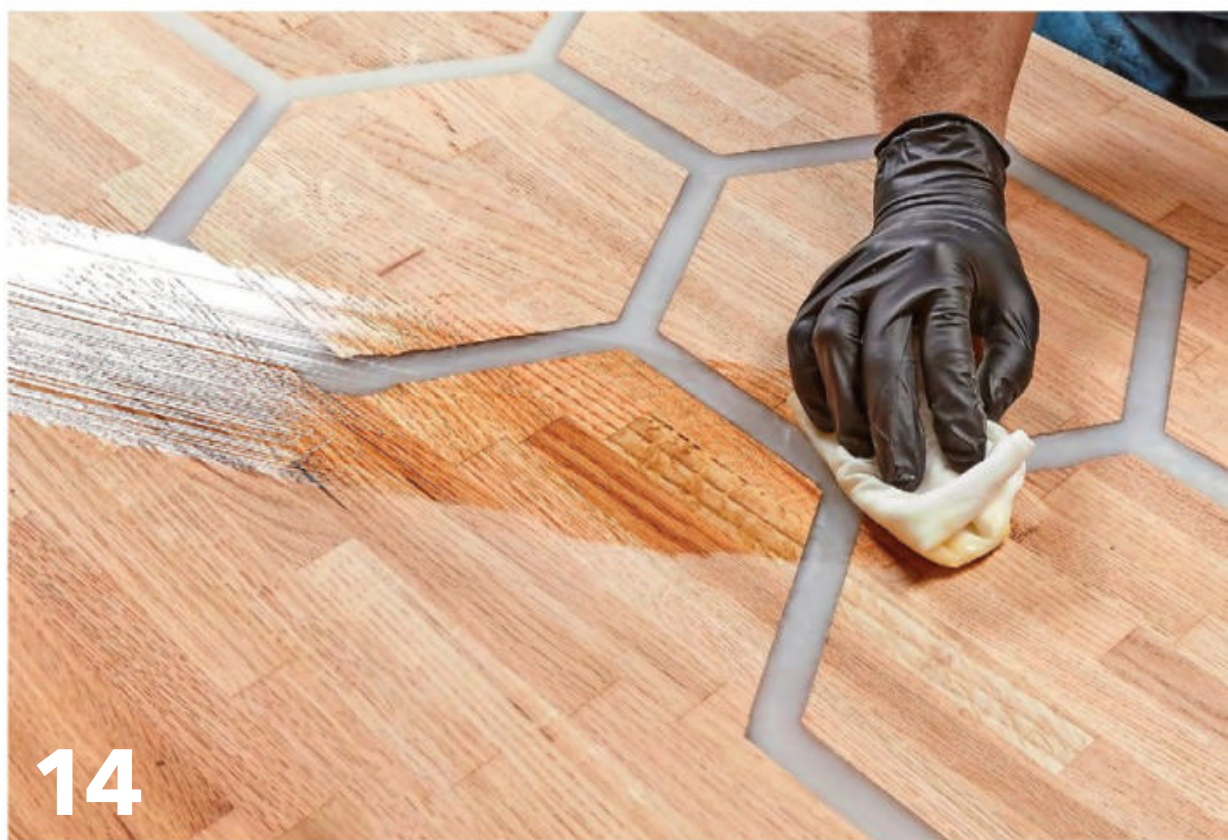
13

13 SAND THE TOP

With a belt sander and 40-grit sandpaper, I attacked the cured epoxy that pooled above the surface. Once the counter was flat, I switched to an orbital sander with 80-grit sandpaper, working my way up to 220-grit and sanding the whole top.

14 WIPE ON THE FINISH

At this point, the epoxy looks dull, but that's temporary. Vacuum the dust and clean the top with denatured alcohol. Then using a clean rag, wipe on a coat of polyurethane to protect the top and reveal the epoxy's swirl and shimmer.



14

15 WIRE THE LIGHTS

After you place the counter on the cabinets, all that's left is to connect the lights to a power source. Match the color-coded wires to the correct terminals of your power supply and turn it on. For more on wiring the lights, check out the show-room lights project on p. 46.



15

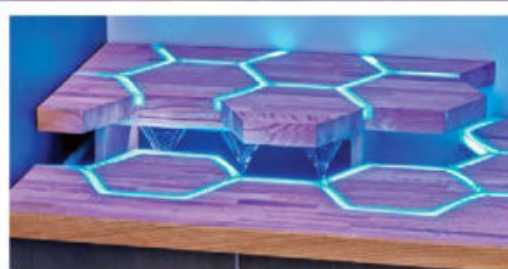
COCKTAIL ELEVATOR

Done for the day? Press a button
to order up your favorite refreshment



BY JAY CORK

With its inlaid lighting, this counter-top made the perfect setting for a truly luxurious touch—a hidden cocktail bar. I took a simple cabinet box, stirred in a motorized TV lift and added a splash of creative wiring to give this garage an entertaining twist.



**HOVER YOUR
CAMERA HERE**

See a video of
how Jay built this
unique hidden
cocktail bar.



1 MAKE THE BASE

I fashioned a base for my cocktail bar by tracing the section of countertop that editor Mike Berner made in “Workbench to Bar Top” on p. 28. I used the same butcher block material and cut out the shape with a jigsaw.

2 ASSEMBLE THE CABINET BOX

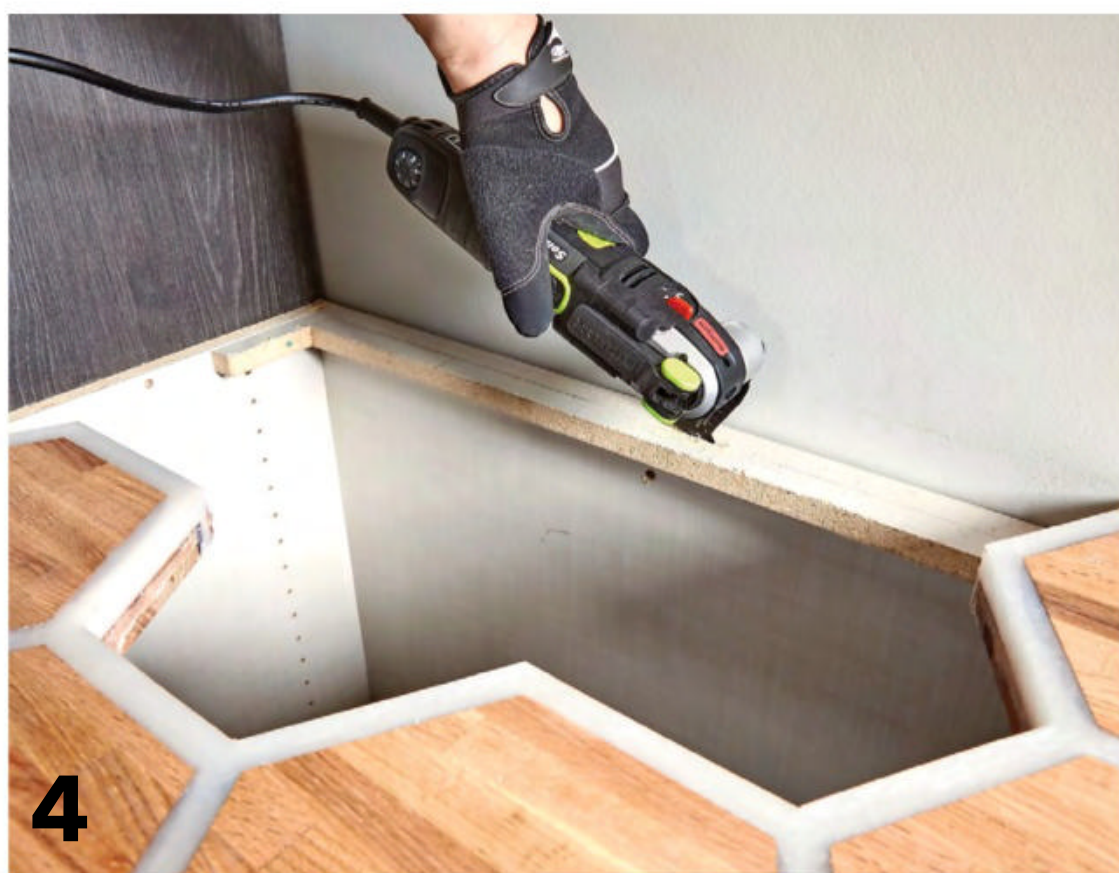
I used pocket hole joinery just in case I needed to disassemble the whole thing. I’m glad I did. I miscalculated and had to remove the box and cut it down by a few inches. If I had used a different joinery method, that would have been far more difficult.

3 INSTALL THE LED LIGHTS

The next step is to feed the power cable through a small notch in the back of the cabinet. Stick the LED light strip to the inside top of the cabinet, snug to the back. I hid the strip with a piece of oak quarter-round, directing light down, not out.

4 PREPARE THE CABINET

To retrofit a TV lift into the cabinet, cut away the cabinet’s top stretcher. A jigsaw didn’t let me get close enough, so I finished with an oscillating multi-tool.



WHAT IT TAKES

TIME	COST	SKILL LEVEL
2 days	\$675	Intermediate

TOOLS

Table saw, jigsaw, router, orbital sander, drill, oscillating multi-tool, pocket hole jig, basic carpentry tools

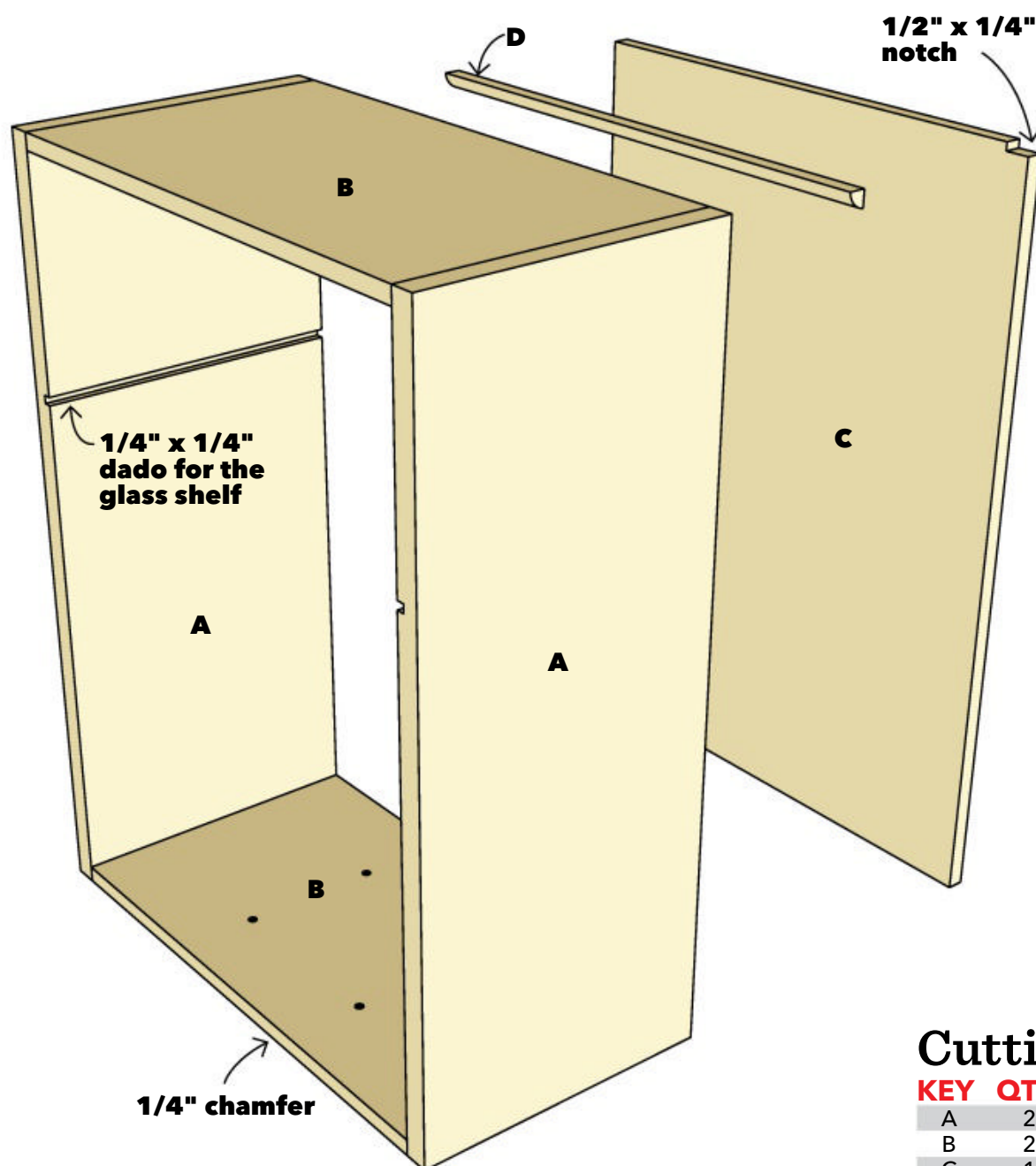
THE LIFT

The TV lift I used is available for \$560 at tvliftcabinet.com. There were a variety of sizes to choose from, and the staff was very helpful. If you can use a screwdriver, you can install one of these.



Figure A Cocktail Bar Cabinet

OVERALL DIMENSIONS: 22" H x 18" W x 9-1/4" D



5 LEVEL THE LIFT

With the lift fully extended, use a scrap piece of countertop to position the lift level with the rest of the work surface.

6 ATTACH THE LIFT TO THE CABINET

Secure the lift to the back of the cabinet with 1-in. screws. A magnetic torpedo level helped me keep everything plumb.



MEET THE BUILDER

An editor for *Family Handyman*, Jay Cork loves tinkering in his garage as much as he likes relaxing after.

Materials List

ITEM	QTY.
1x10 x 4' oak boards	2
1/4" tempered glass	1
1/2" oak quarter-round	4'
27" TV lift	1
Momentary switch	1
Limit switch	1
18-gauge wire	12'
1" pocket hole screws	Box
1-1/4" trim screws	8

Cutting List

KEY	QTY.	DIMENSIONS	PART
A	2	9-1/4" x 22" x 3/4"	Sides
B	2	9-1/4" x 16-1/2" x 3/4"	Top and bottom
C	1	16-1/2" x 20-1/2" x 1/2"	Back
D	1	1/2" x 1/2" x 16-1/2"	Quarter-round



7

7 INSTALL A HIDDEN SWITCH

The lift came with a remote, but here's an alternative way to operate it. I wired a round momentary switch (\$12 online) to the control box, concealing it under the lip of the countertop. I routed a small channel on the underside of the countertop for the wires and drilled a hole for the switch. Now the switch is perfectly concealed yet always within reach.

8 MOUNT THE POWER SUPPLY

Mount the power supply near the front of the cabinet so the cables won't impede the travel of the cocktail bar. Bundling the cables with hook-and-loop wire wraps keeps them clear of moving parts.

9 WIRE THE LIGHT SWITCH

For a little extra pop, I installed a limit switch (\$7 online) to automatically turn on the LED lights as the cocktail bar rises and turn them off again as it descends. The power runs to the LED strip through the black wire, so I spliced that to the switch. When the bar goes up, the circuit closes and power flows to the lights.



8

Bundle these loose cables with wire wraps



9

Limit switch actuator arm

Black power wire

PRO TIP

Before you install the limit switch, test the setup with a scrap piece of LED light and the switch hooked up to the power supply to make sure everything is wired properly.



10

10 POSITION THE BASE

With the lift fully extended, set the base onto the lift cradle and attach it using 1-in. screws. I used playing cards to help maintain an even gap.

11 ATTACH THE BOX TO THE BASE

To prevent the oak from splitting, drill 1/8-in. pilot holes in the top and bottom. Attach the box to the base with 1-1/4-in. trim screws.

12 POSITION THE "LID"

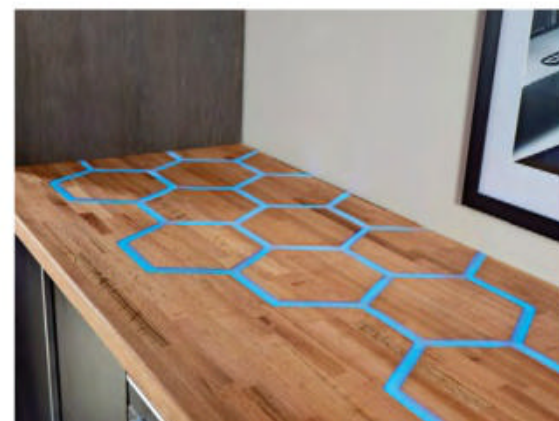
With the lift in the lowered position, use double-sided tape to help position the lid. Set the countertop lid onto the box and attach it with trim screws.



11



12



FINAL FITTING

The final installation was a little difficult because the cocktail bar was heavier and deeper than a skinny flat screen TV, exerting more leverage on this lift. But with a little shimming and trimming, I was able to get both the base and the lid to sit perfectly flush with the countertop.

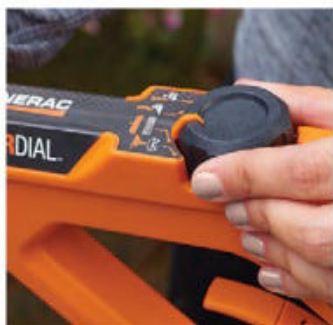
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SWING-OUT COUNTERTOP

**There
when you
need it,
gone when
you don't**

BY BRAD HOLDEN

Most workshops just don't have enough horizontal work space. Sometimes the fix is as simple as adding another bench or table, but in a garage, cars take up all the floor space.

This swing-out butcher block counter is a great solution. It pivots from under your current countertop, giving you more space when you need it. You'll have to modify cabinets, which is easy if you're installing new cabinets. For existing cabinets, you'll have to remove them first.



SECRET CABINET

This hidden door hides a small storage space that you access with a magnetic latch.

1 CUT DOWN THE CABINETS

Pull out the cabinets and shorten them to accommodate the thickness of the work surface (A) plus 1/4 in. If you're working with an existing bank of cabinets, you'll also need to modify the width to create about a 6-in. gap. The gap allows space for the swing-out to rotate and for the narrow leg cabinet that supports the end of the work surface.



2 REINSTALL THE CABINET TOPS

After you've cut down the cabinets, reinstall the tops to make the cabinets rigid again. The partial tops of these cabinets came out easily, so I was able to reuse them. If your cabinet tops cover the entire opening and you have to cut them out, you'll need to make new ones.



3 CUT DOWN DOORS AND DRAWERS

Once your cabinets are reassembled, you'll need to tackle the doors or drawers. My cabinets had only drawers, so I just made the top drawers shallower, cut down the drawer fronts and reattached them. On a table saw, it's easy to trim down drawers. Just set the fence for the height you need and push the drawer through, cutting one side at a time. If you need to resize doors, you might have to relocate a hinge.



4 MAKE A TEMPLATE

From a piece of plywood or other inexpensive sheet stock, cut a template (see **Figure A**). Make it as wide as your cabinets are deep and as long as the space between your full-height end cabinets, minus 1/4 in.

Drive a screw into the pivot point. Loop a length of string around the screw and wrap the other end around a pencil, making the string long enough so the pencil just touches the end of the template at its front edge. Using the string-guided pencil like a compass, mark this distance at the back edge of the template. Make a straight line connecting the front corner with the mark at the back edge, and then make the angled cut. Cut a 2-in. radius on the pivot corner. Use this template to lay out the work surface and the leg cabinet.



Figure A

Swing-Out Countertop Template

OVERALL DIMENSIONS: 32-7/8" H x 57-3/4" W x 23-1/4" D

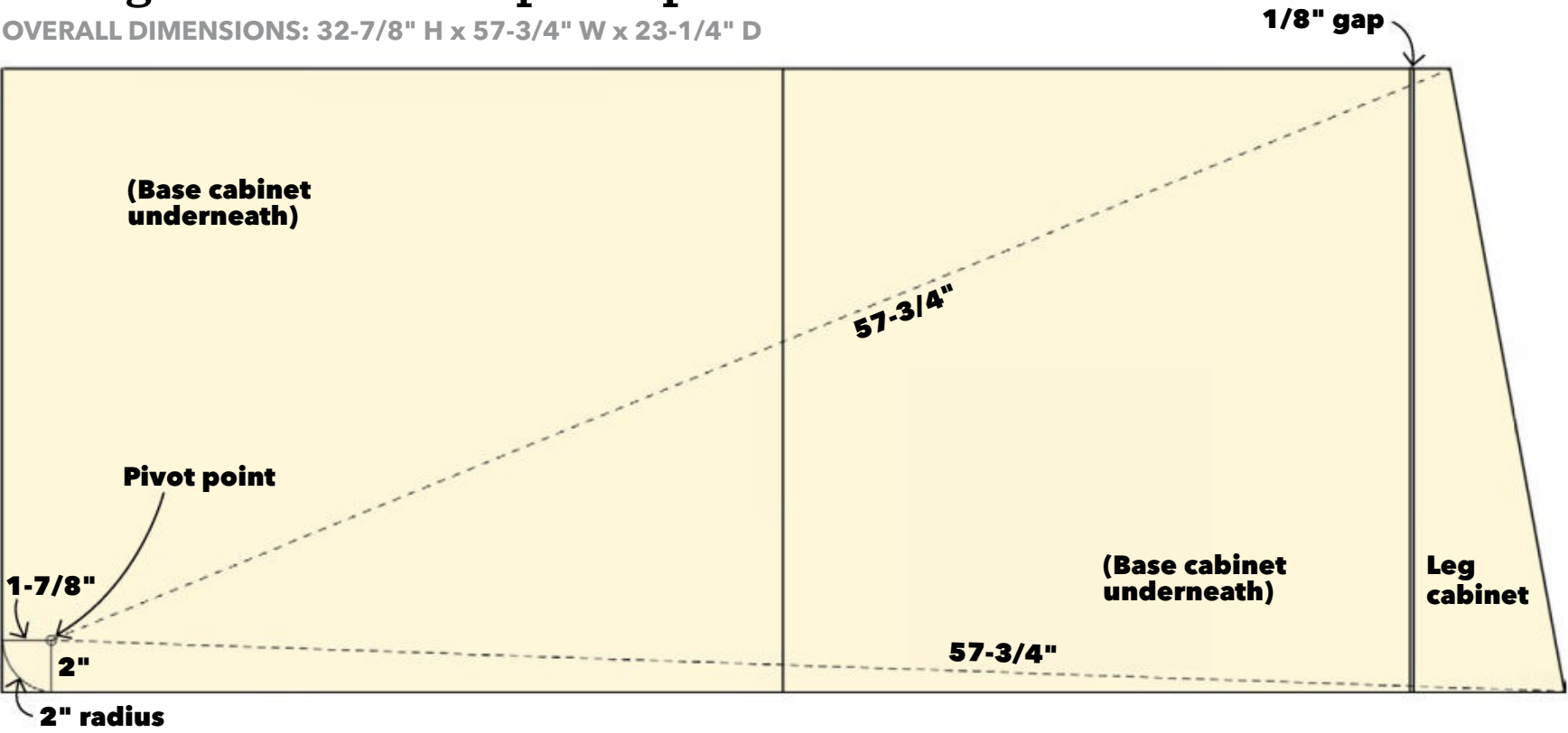
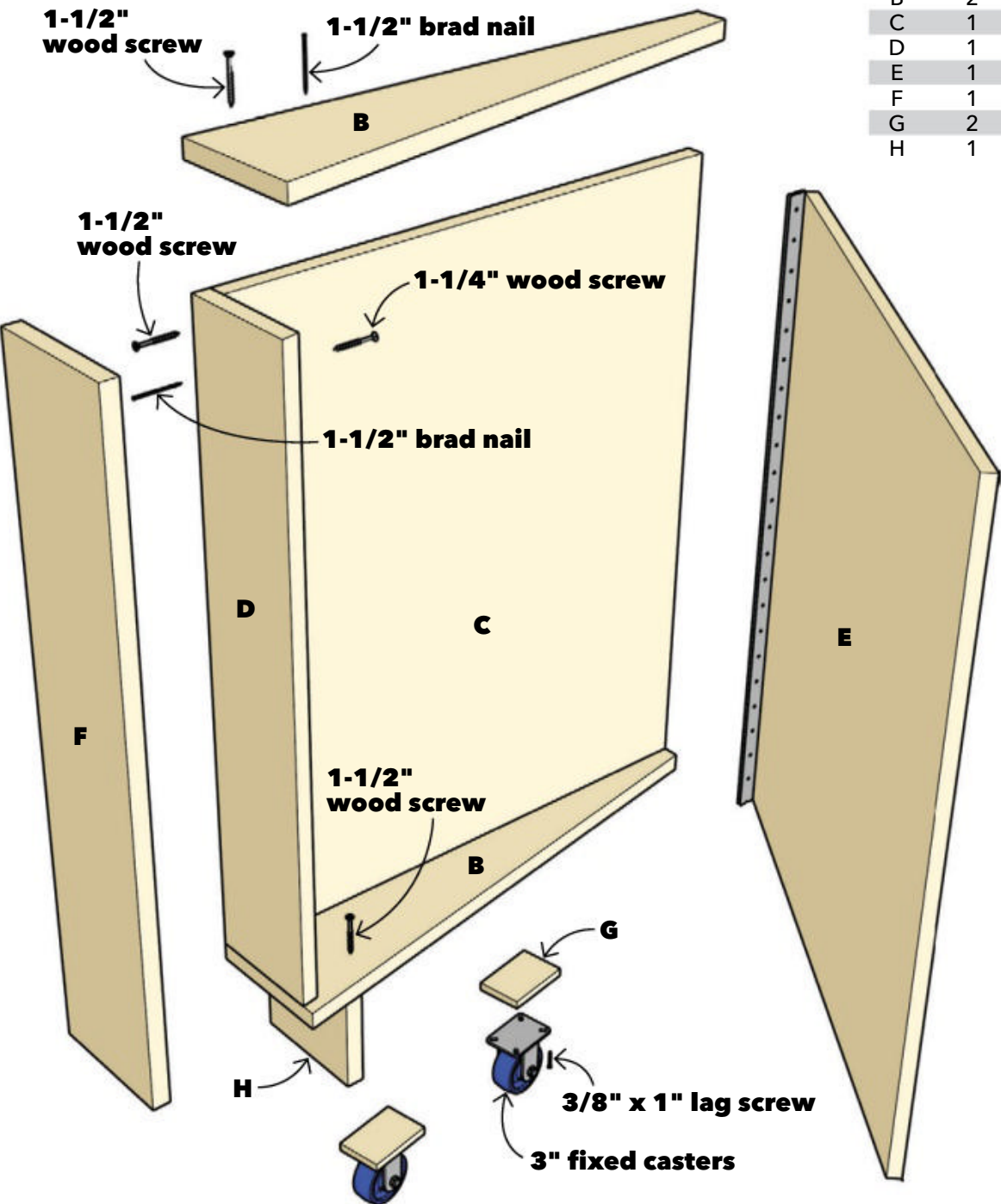


Figure B

Secret Swing-Out Cabinet



Cutting List

KEY	QTY.	DIMENSIONS	PART
A	1	Work surface	1-1/2" x 24" x 59-3/4"
B	2	Top and bottom	3/4" x 5-5/8" x 23-1/4"
C	1	Back	3/4" x 22-3/8" x 27-1/8"
D	1	Side	3/4" x 5-1/16" x 27-1/8"
E	1	Door	1/2" x 23-7/16" x 27"
F	1	Cover panel	3/4" x 5-5/8" x 28-5/8"
G	2	Caster risers	Cut to suit
H	1	Toe-kick	Cut to suit

Materials List

ITEM	QTY.
3/4" x 4' x 4' MDO plywood	1
1/2" x 2' x 4' MDO plywood	1
1-1/2" x 24" x 60" oak butcher block	1
Piano hinge	1
3" fixed casters	2
5/16" x 1" lag screws	
Cabinet lock	
Door handle	
1-1/2" brad nails	
1-1/2" wood screws	
3/8" x 3" hex-head bolt	
3/8" washers	
3/8" threaded insert	
Wood glue	
Polyurethane	
Paint	

WHAT IT TAKES

TIME	COST	SKILL LEVEL
2 days	\$500	Intermediate

TOOLS

Table saw, circular saw, drill/driver, finish nailer



MEET THE BUILDER
Brad Holden is a senior editor at *Family Handyman*, and he has built custom cabinets and furniture for 30 years.

5 CUT THE WORK SURFACE

Trace your template onto the work surface blank, then cut the angle and the radius. My butcher block had a 1/4-in. round-over on the front edge, so I used a router to give all the other edges the same profile after cutting the finished size and shape.

6 CUT CABINET PARTS

Cut all the cabinet parts (see Figure B and the Cutting List). Your cabinet's height may differ, depending on your casters and the toe-kick height. You can cut the triangular top and bottom (B) with a circular saw, but this table saw method guarantees accuracy. Draw the top and bottom on a blank, and then tack a straight guide board on the line, overhanging the edge of the blank. Set your fence so you'll cut on the line with the guide board against the fence. Be sure to cut on the correct side of the line! With the first piece cut, your offcut also has an angled side, so you can cut the other part with a straight rip.

7 ASSEMBLE THE CABINET

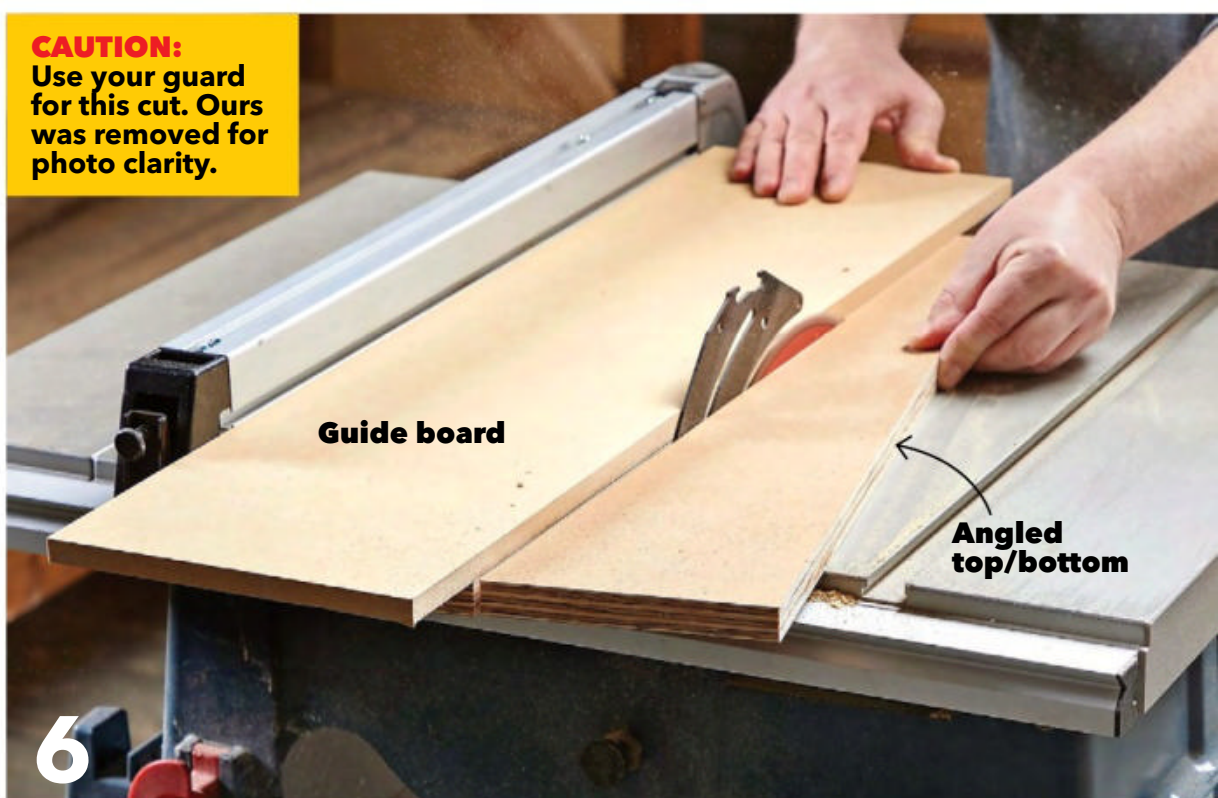
Tack all the parts together using glue and 1-1/2-in. brad nails. Add 1-1/2-in. wood screws for strength. Fill the nail and screw holes as needed, as well as any voids in the MDO edges. When the filler is dry, sand the cabinet and door up to 150-grit. Prime and paint.

8 ATTACH THE CASTERS

Mount casters on the bottom of the cabinet—parallel to the cabinet's angled side—using lag screws or through-bolts. To get the casters to match the height of the cabinet's toe space, I added 3/8-in.-thick riser blocks. I used fixed casters; swivel casters would give a very narrow base of support, particularly with the front caster mounted behind the toe-kick.



CAUTION:
Use your guard for this cut. Ours was removed for photo clarity.





9 FASTEN THE CABINET TO THE WORK SURFACE

With the work surface upside-down on a bench, set the cabinet in place. Predrill countersunk clearance holes through the cabinet top, and pilot holes into the work surface. Attach the cabinet with 2-in. wood screws.

10 DRILL A HOLE FOR THE THREADED INSERT

Slide the swing-out assembly into position, flushing its front edge with the cabinet faces and allowing a 1/8-in. space at each end. Mark the pivot location on the underside of the cabinet top, and then drill a pilot hole through the cabinet top and the work surface, continuing until your bit marks the bottom of the countertop. Pull the assembly out and enlarge the hole in the work surface to 3/8 in. Enlarge the hole in the cabinet top to 1/2 in., and continue that 1/2-in. hole 1 in. into the underside of the countertop.



11 INSTALL THE INSERT

Hold the threaded insert in place with your fingers or needle-nose pliers, stick a screwdriver through the cabinet hole, and then drive the threaded insert into the countertop until it's flush with the bottom surface. A drop of dish soap on the threads makes the insert easier to drive. If you torque on it too much, you could damage the insert's interior threads.



12 FASTEN THE SWING-OUT TO THE COUNTER

Slide the swing-out assembly into place. Slip a fender washer on the through-bolt, then insert it into the pivot hole, slipping washers between the cabinet and the work surface and the work surface and the counter. It's a bit tricky to position the washers. Move them as needed using a putty knife. With the washers in place, drive the bolt into the threaded insert.

13 INSTALL PANEL HARDWARE

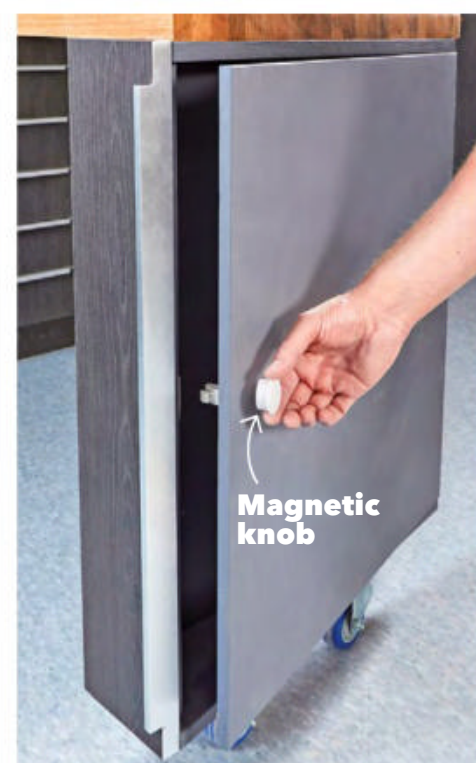
Cut the cabinet cover panel (F) to size and attach your hardware. We used extruded aluminum handles on these doors. I had to shorten the handle to make it fit this cover panel. Carbide-tipped blades cut aluminum easily. It's noisy, but it doesn't hurt the carbide teeth.

14 ATTACH THE PANEL

Predrill countersunk pilot holes through the cabinet and then drive screws in just far enough so their points protrude about 1/8 in. Push the swing-out into place again, position the cover panel so it lines up with the adjacent doors or drawer fronts, then give it a couple thumps with your fist so the screw points mark their location on the back of the panel. Pull out the swing-out assembly, locate the panel on the screw point indents and drive the screws from inside the cabinet to attach the panel.

15 INSTALL THE LOCK

The cabinet door's handle needs to be a flush mount, because anything protruding would prevent the assembly from rotating into its space. I took it a step beyond flush mount and installed a simple toddler-safety magnetic catch. There's no visible hardware on the exterior. Once the catch is installed, hold the magnetic knob (included) over the catch to release it and open the door. The lock isn't strong enough to keep out serious thieves, however, only the mildly curious.



SECRET DOOR
Hold the knob over the latch to unlock the door. Stash the knob in a secret location.

LIGHT UP YOUR GARAGE

A combination of showroom and task lighting does it best

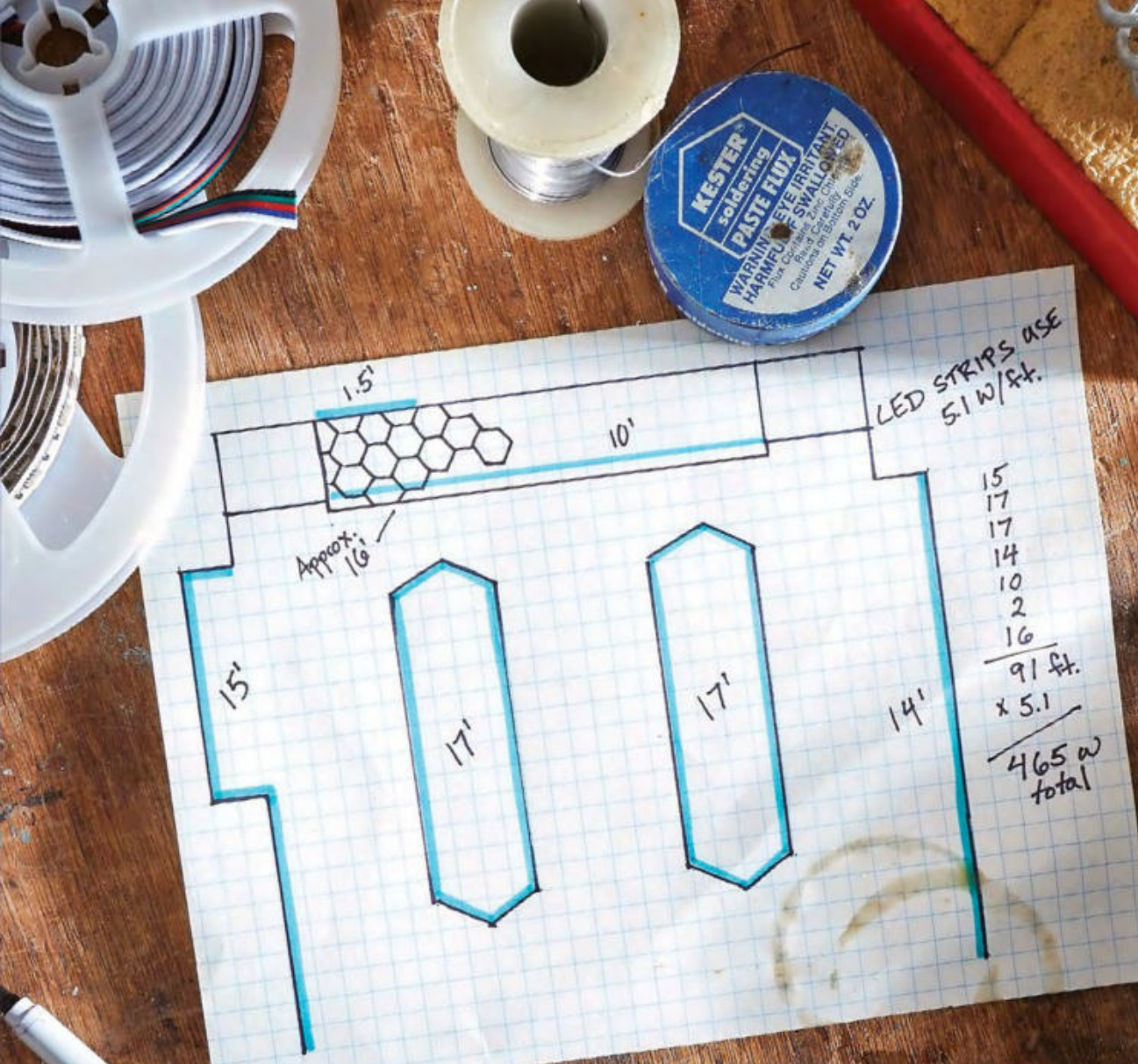
BY JAY CORK

Let's face it; most garages are poorly lit, often by just a single bulb or fluorescent fixture. To give this garage plenty of light for project work, I installed a task light above the work surface and designed two ceiling islands to provide even more direct light. To add some showroom flair, the islands include indirect lighting that complements the illuminated countertop and the accent lighting along our garage walls.



MEET THE BUILDER

Jay Cork, an associate editor at *Family Handyman*, is an inventor at heart.



LIGHTING DESIGN

■ MAKE A DRAWING

A sketch is my most important tool for designing a lighting project. It helps me conceptualize the design and gets me to the next step—the math.

■ DO THE MATH

To figure the power draw, I multiplied the total length (91 ft.) by the wattage per foot (5.1). The result: 464 watts. I chose to double up; two 400-watt, 24-volt power supplies means I'll have plenty of power now, and when I add more lights down the road.

■ BUY YOUR POWER CABLE

A lighting project like this requires running power cable. Always order extra; if I think I need 100 ft., I'll order 140.

MAKE THE CEILING ISLANDS

1 ASSEMBLE THE FRAMES

Each ceiling island uses 1/2-in. MDF for the face and 3/4-in. pine for the sides. After assembling them with pocket hole joinery and construction adhesive, chamfer the edge of the face with a router bit. I sanded the islands lightly and painted them to match the ceiling.



2 DRILL HOLES FOR THE SPOTLIGHTS

Using a hole saw, drill 3-in. holes for the spotlights. Because these ceiling islands were 8 ft. long, it was easy to evenly space the five lights at 16-in. on center.

3 ADD THE ACCENT LIGHTS

Line the inside of each island with an LED strip using a wood block as a guide to keep the strip centered on the sides. The controller for the LED strips sits inside the islands and is connected to the power supplies with low-voltage cable fished through the ceiling and the walls.



WHAT IT TAKES

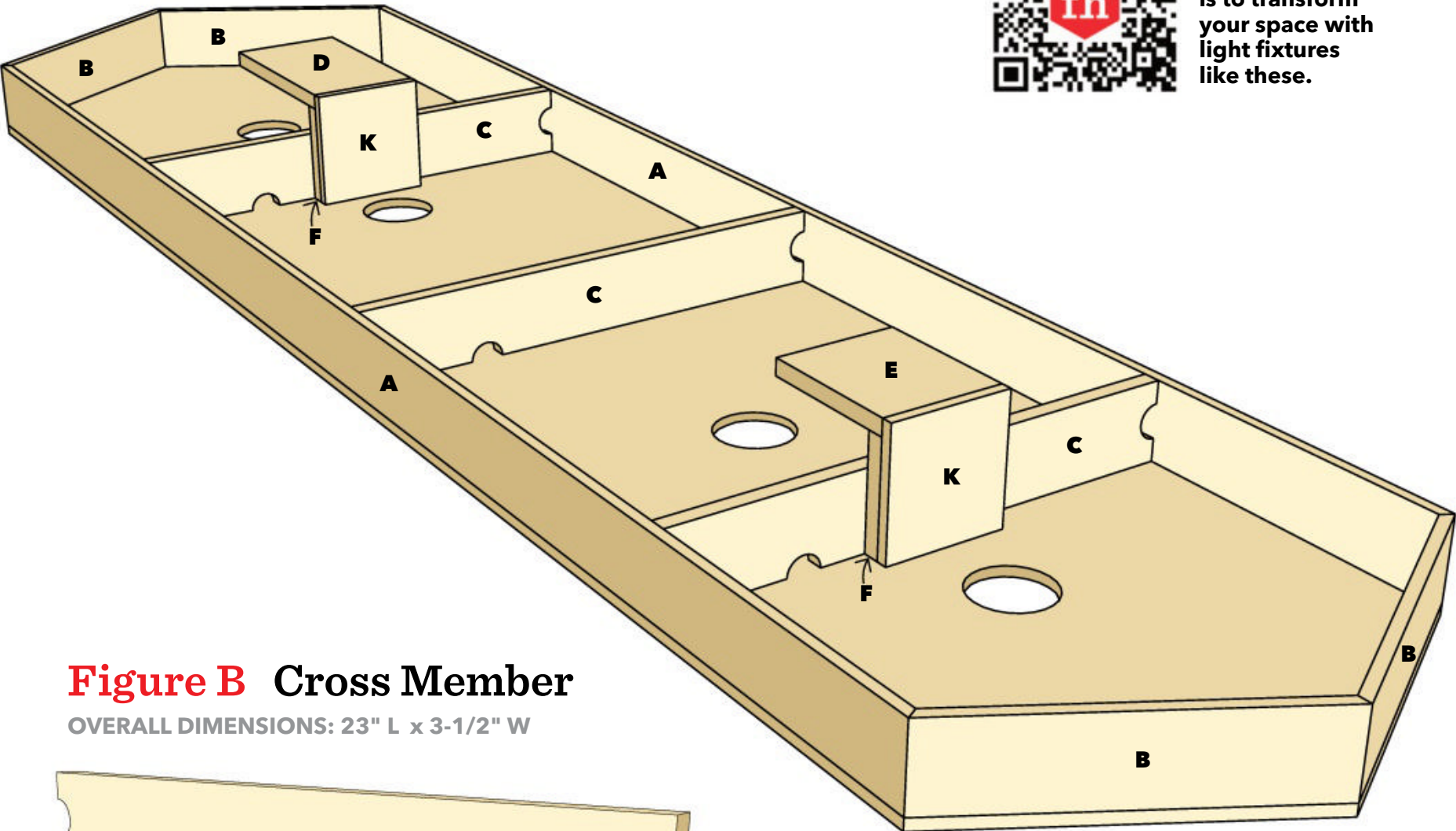
TIME	COST	SKILL LEVEL
2 to 3 days	\$1,300	Intermediate

TOOLS

Table saw, sander, drill, pocket hole jig, router, basic carpentry tools, basic electrical tools, soldering iron

Figure A Ceiling Island

OVERALL DIMENSIONS: 8' L x 2' W x 4" H



HOVER YOUR CAMERA HERE
See how easy it is to transform your space with light fixtures like these.

Figure B Cross Member

OVERALL DIMENSIONS: 23" L x 3-1/2" W

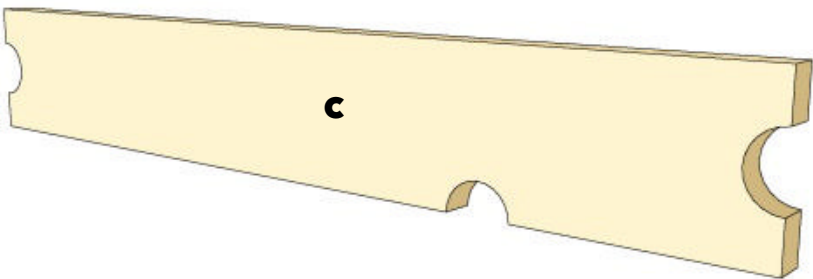


Figure C Hanger

OVERALL DIMENSIONS: 9-3/8" L x 5-1/2" W x 3-3/4" H

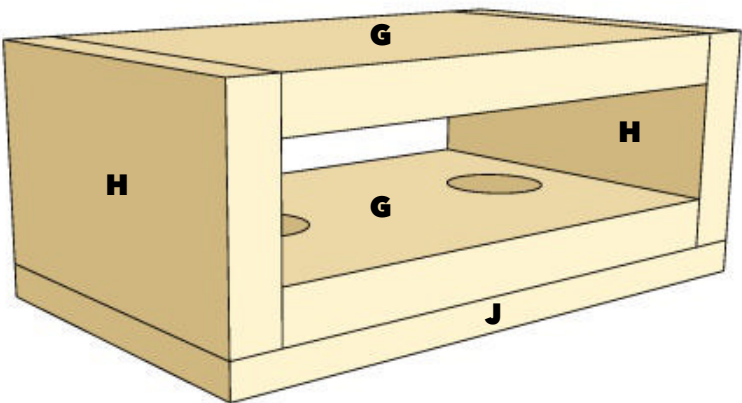


Figure D Cutting Diagram

OVERALL DIMENSIONS: 8' L x 4' W



Inspired by Mike Berner's countertop lighting design (p. 28), I echoed that shape in the ceiling islands. Each island has five spotlights (\$60 for six online) that connect to 110v service. Hidden inside are LED strips for indirect accent lighting.

Materials List

ITEM	QTY.
1/2" x 4' x 8' MDF sheet	1
1x4 x 8' select pine	4
1x6 x 8' select pine	2
16' LED strips	6
LED light controllers	7
24v power supplies	2
Remote control	1
Spotlights	10
1" pocket hole screws	Box
No. 8 1-1/4" wood screws	Box
No. 8 2" wood screws	12
4" lag bolts	8

Cutting List

KEY	QTY.	DIMENSIONS	PART
A	4	3/4" x 3-1/2" x 82-1/8"	Sides-long
B	8	3/4" x 3-1/2" x 13-7/8"	Sides-short
C	6	3/4" x 3-1/2" x 23"	Cross members
D	2	3/4" x 5-1/2" x 9-1/2"	Cantilever arms-long
E	2	3/4" x 5-1/2" x 6-1/2"	Cantilever arms-short
F	4	3/4" x 5-1/2" x 5"	Cantilever posts
G	8	3/4" x 5-1/2" x 7-7/8"	Hanger box tops/bottoms
H	8	3/4" x 5-1/2" x 3-1/4"	Hanger box sides
J	4	1/2" x 5-1/2" x 9-3/8"	Hanger box backers
K	4	1/2" x 5-1/2" x 5-3/4"	Cantilever post backers
L	2	1/2" x 24" x 96"	Island faces



4 WIRE THE SPOTLIGHTS

After you mount and wire the individual transformers for the spotlights inside the island, the lights easily mount through the holes on the face. The spring clips on the lights still allowed a little movement, so I used hot glue to help them stay put.

5 MAKE THE HANGERS

Here's a super-simple method to hang the ceiling islands. First, bolt two open-ended boxes (see Photo 7) to the ceiling joists. Attach L-shaped brackets to the island's cross members then slide the "L" into the boxes.

6 CREATE A SPECIAL EFFECT

A crinkled layer of aluminum foil inside creates random reflections on the ceiling, diffusing the light.

7 HANG THE ISLANDS

After connecting all the wiring, grab a friend to help you hang the islands. The front bracket is longer, so slide it in first. This allows you to easily see where the rear bracket needs to go.

PRO TIP

You can find LED systems at home centers, but I found a much more robust selection of LEDs, power supplies, controllers and wiring at superbrightleds.com.





INSTALL ACCENT LIGHTING

To power all the LED strips, I used two separate power supplies that feed seven individual channel controllers. This gives me control over the color and brightness of each individual run of LED strips including those for the countertop (p. 28) and the hidden cocktail bar (p. 34). Too much? Not at all. Remember what I said about showroom flair?



1 HIDE AN LED STRIP ALONG THE WALLS

A piece of trim applied to the bottom of the slat board provides a perfect space for an LED strip. I stuck one strip along each wall.



2 HIDE THE CABLES

For some LED strips, I had to get creative on running the power cables. A piece of scrap wood helped me tuck the power cables out of sight. I gave it a gentle push so I wouldn't damage the cable.

PROGRAM THE REMOTE

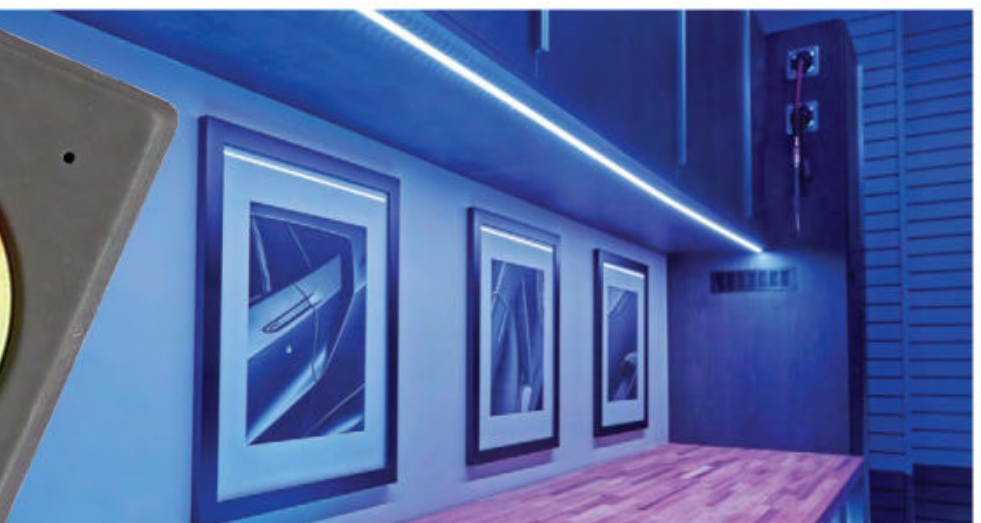
Before installing all the LED controllers and tucking them away, I paired them to the remote and tested all the connections.



WORK SPACE TASK LIGHT

Most of the LEDs I installed are for accent lighting, but I also wanted direct light on the main work surface. I attached an aluminum U-channel (\$40) to the underside of the upper cabinets with double-sided tape. I snapped a frosted lens into the channel to diffuse the light.

I learned something important in this step: The aluminum channel absorbed the heat of the LED lights, causing the double-sided tape to partially fail. Lock your lights into place with a bead of hot glue on the back of the channel. That fixed it for me.





HOOK UP THE ELECTRONICS

1 TIN THE LEADS WITH SOLDER

When you connect braided copper wire to screw-type terminals, tin the leads with solder. This provides a better connection and keeps the strands of the braid from fraying.

2 CONNECT THE CABLE

I used a two-conductor 18-gauge braided copper cable to connect the power supplies to the LED controllers. With screw-type terminals, always give wires a little tug after tightening the screw to make sure they are secure.

3 SKIP THE QUICK CONNECTORS

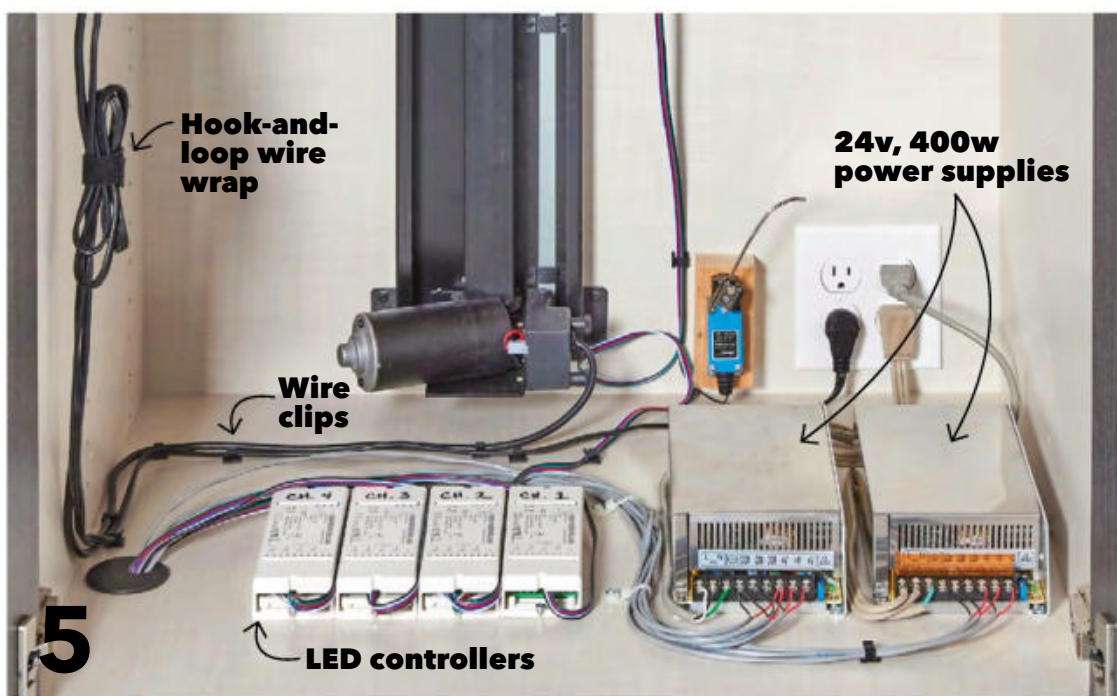
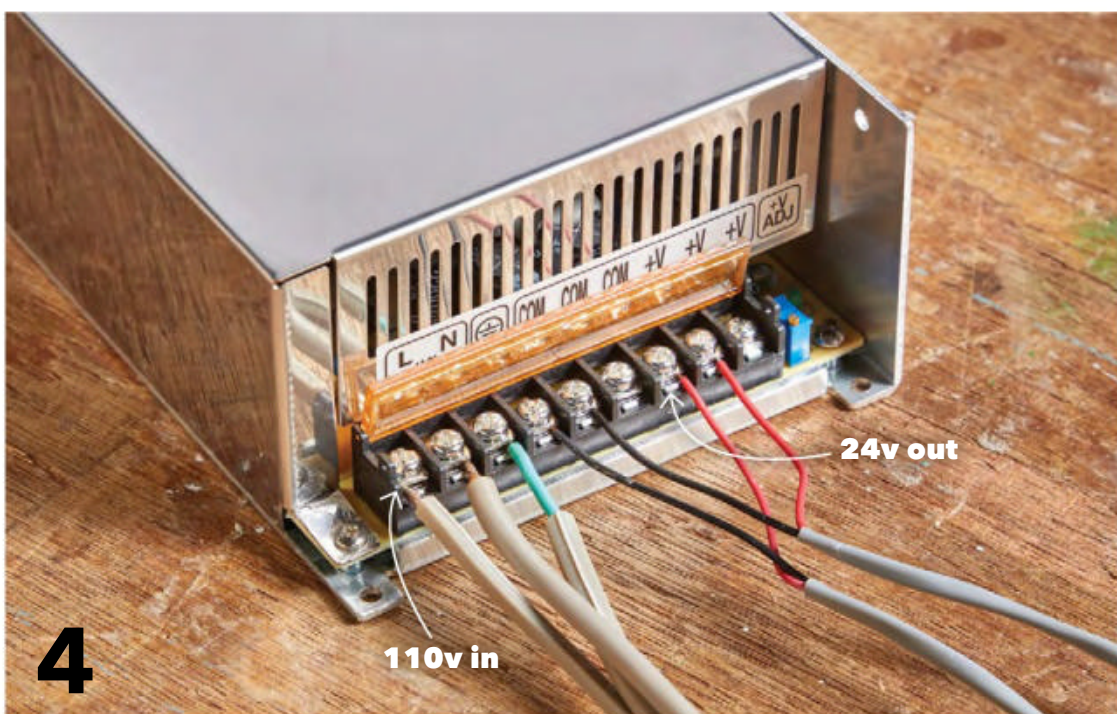
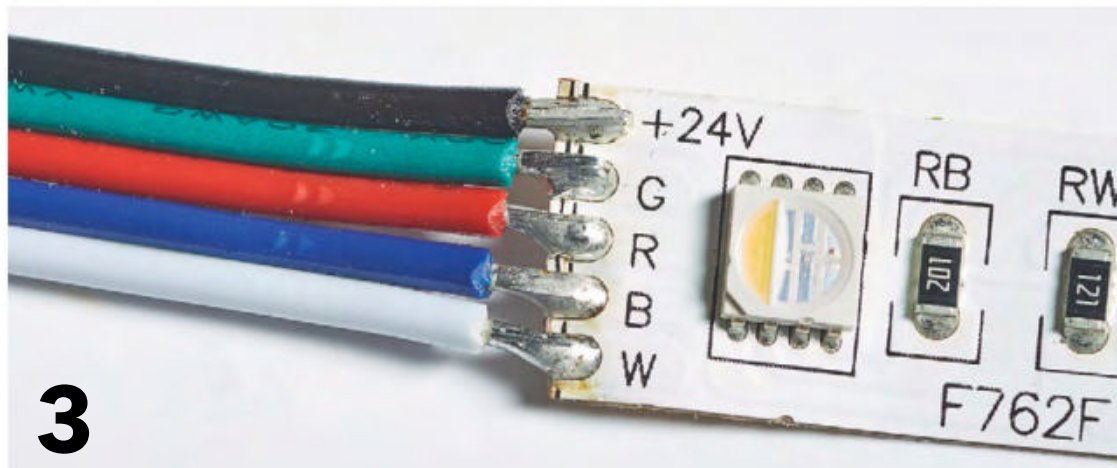
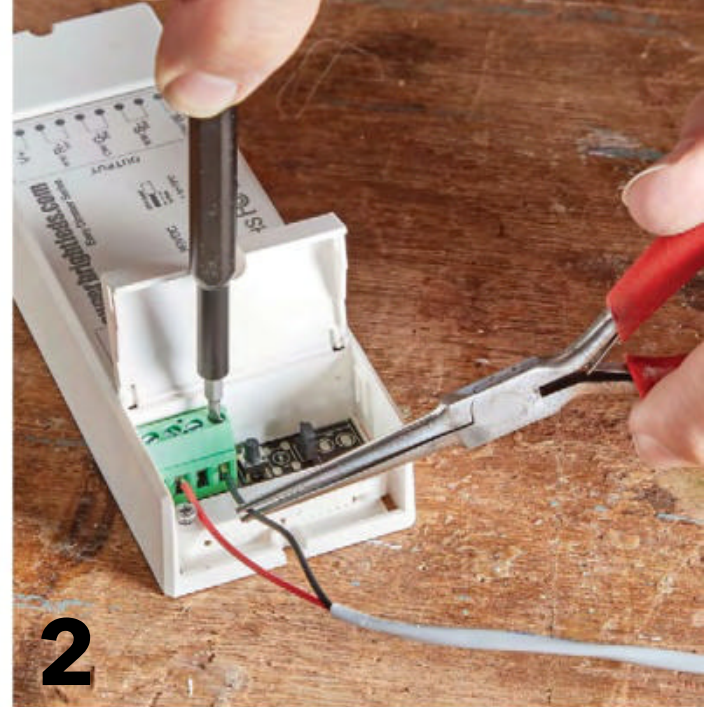
The LED strips connect to the controllers using a five-conductor cable. There are solderless quick connectors available, but they can be difficult to use and unreliable. Instead, I solder the wire leads directly to the LED strips.

4 CONNECT THE POWER SUPPLIES

Once you've run all the cables into the cabinet, it's time to connect the controllers to the power supplies. The power supplies should not be plugged into an outlet while you do this. Plug them in only after all the controllers have been connected.

5 KEEP THINGS NEAT

Keep multiple wires and cables neat and organized with cable clips, zip ties and even hook-and-loop fasteners. Troubleshooting and adding or removing components will be much easier.



FULLY CHARGED

This sliding station keeps your tools ready to go

BY MIKE BERNER

How many times have you picked up a battery-powered tool, only to find that it was put away with a dead battery? I came up with this sliding panel and drawer charging station built into a tall garage cabinet that lets me store everything in one place. With tools organized and easy to access, a bin for charged batteries, and a charger at the ready, you won't be stuck waiting for a charge.

WHAT IT TAKES

TIME	COST	SKILL LEVEL
1 day	\$250	Beginner

TOOLS

Table saw or circular saw, miter saw, jigsaw, drill, 18-gauge nailer, basic carpentry tools



1 FRAME AROUND SLAT WALL PANELS

Cut the slat wall to size and attach a frame around it. The poplar frame stiffens the panel and hides the raw edges. I glued and nailed the frame parts to the edge of the panel, flush with the face, starting with the top and bottom. I cut the sides to fit and fastened them the same way.

PRO TIP

The slats in the panels I bought ran the long way, so I had to put two pieces together to make the panels tall enough. The frame held the edges together, and I added an extra batten on the back to support the seam.

2 BATTEN THE BACK

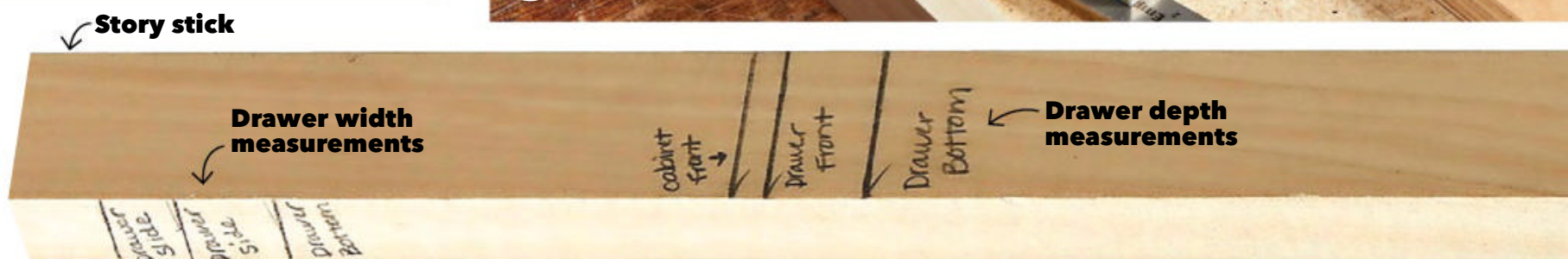
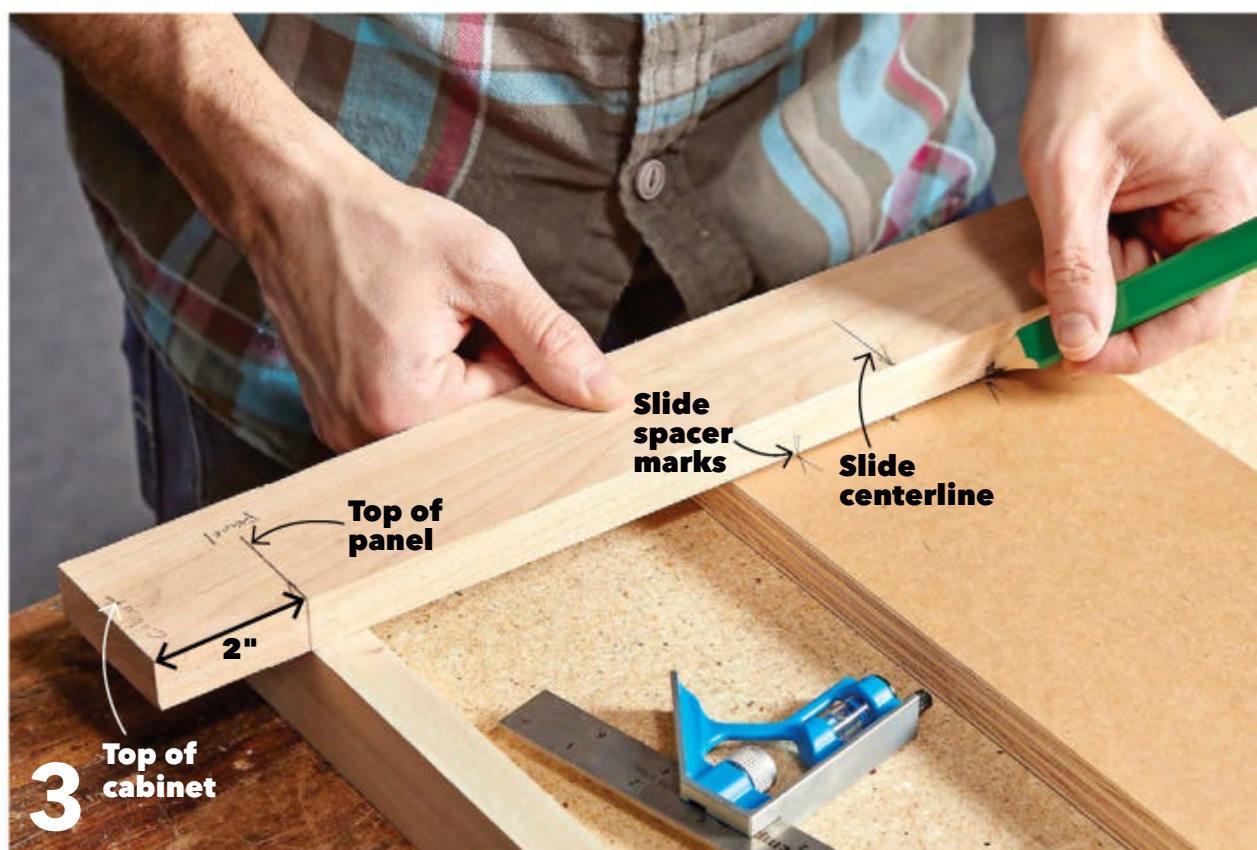
Glue and nail battens about 6 in. from the top and bottom of the panels. Both the frame and the battens stiffen the panels; the battens also give you something to screw drawer slides to.

3 MARK YOUR STORY STICK

I made a mark 2 in. from the top of the story stick and lined it up with the top of my panel. I made a mark for the centerline of the slides on the spacers and the story stick, then rotated the stick and marked the locations for the cabinet spacers.

MAKE A STORY STICK TO PLACE THE SLIDES

The locations of the spacers and slides are arbitrary, but they do need to line up. For this I make a story stick; it's a custom ruler marked with all my important measurements. I marked one side of the stick for spacers, a second side for slide locations, and the other sides for the drawer width and depth.





4 SHIM SLIDES WITH SPACERS

I used the story stick to locate the 3-in.-wide slide spacers in the cabinet. These spacers allow the slides to clear the door hinges.

5 TRANSFER SLIDE MARKS TO SPACERS

To mark the slide locations on the spacers, hold the story stick to the top of the cabinet and transfer the drawer slide centerline marks from the story stick to the spacers. Mark both ends of the spacers, then connect the marks to make the slide centerline.

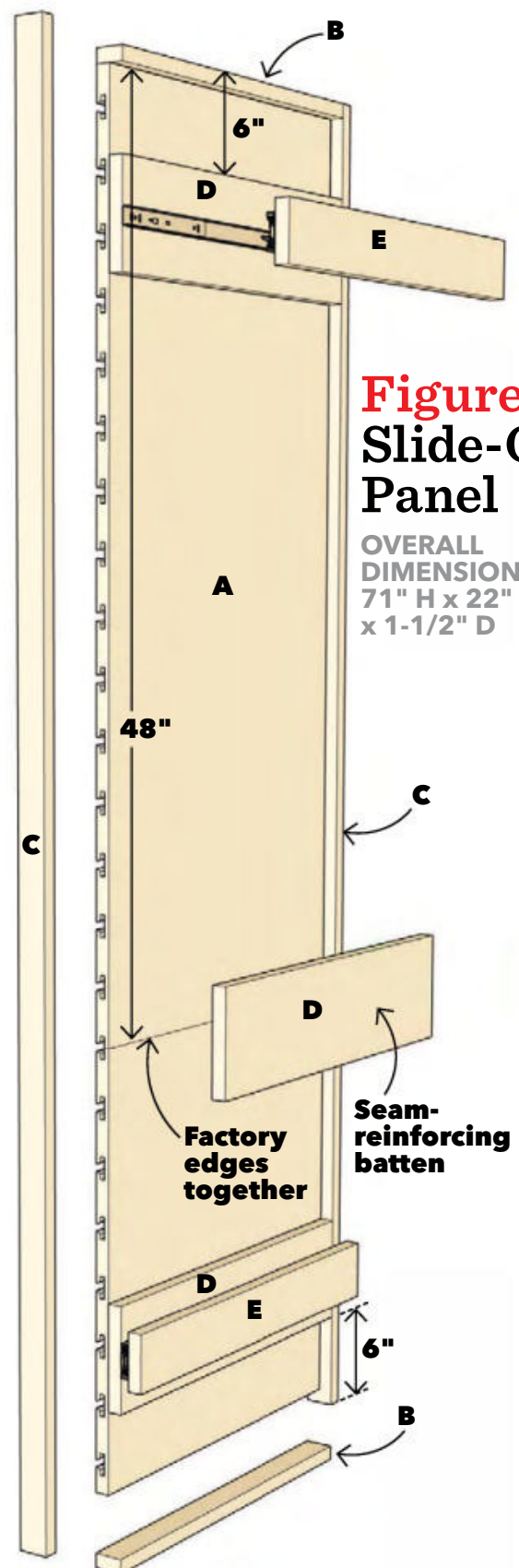
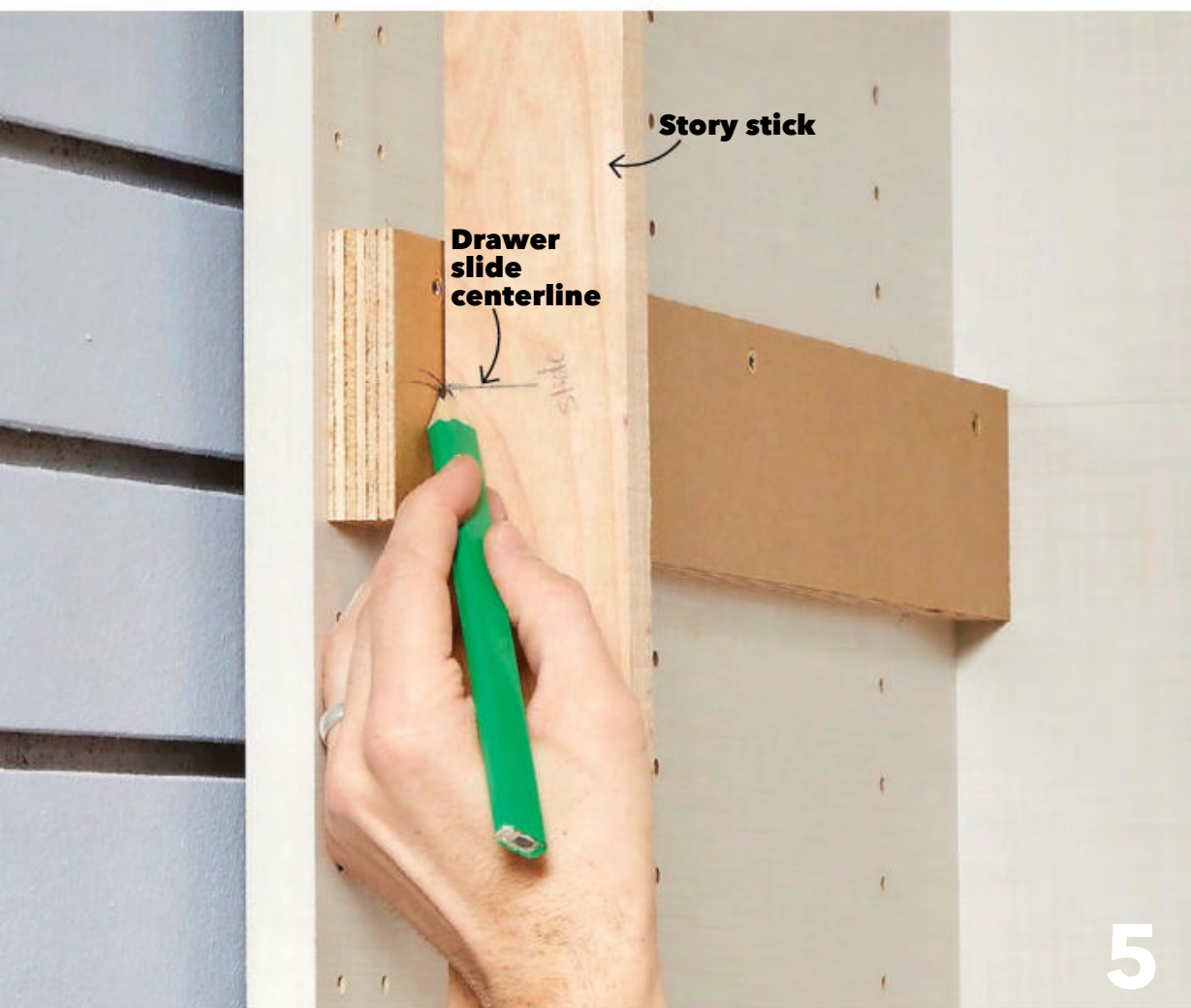


Figure A
Slide-Out Panel

OVERALL DIMENSIONS:
71" H x 22" W
x 1-1/2" D

Cutting List

KEY	QTY.	DIMENSIONS	PART
A	2	3/4" x 20-1/2" x 69-1/2"	Slat wall panels
B	4	3/4" x 1-1/2" x 20-1/2"	Frame tops/bottoms
C	4	3/4" x 1-1/2" x 71"	Frame sides
D	6	3/4" x 5-1/2" x 20-1/2"	Battens
E	6	3/4" x 3" x 21-1/4"	Slide spacers
F	1	3/4" x 21-1/4" x 24-1/2"	Drawer bottom
G	2	3/4" x 10-3/4" x 21-1/4"	Drawer sides
H	2	3/4" x 10-3/4" x 24-1/2"	Drawer back/divider
J	1	3/4" x 3-1/2" x 26"	Drawer front
K	2	3/4" x 3/4" x 6"	Charger cleats
L	1	1/4" x 12-1/4" x 80"	Door-joining panel (Photo 12)

6 ATTACH THE DRAWER SLIDES

Place the slides so their screw holes fall right on the slide centerline and the fronts of the slides are flush with the front of the panel and drawer. Drill a pilot hole and drive in the screw right on the centerline. Use this same technique for attaching each part of the slide: the cabinet member and the drawer member.

7 ASSEMBLE THE DRAWER

Drill pocket holes in the drawer bottom and back. Glue and clamp the parts together. Then flip the drawer upside-down and drive the pocket screws. The clamps keep the drawer parts from shifting while you drive the screws.

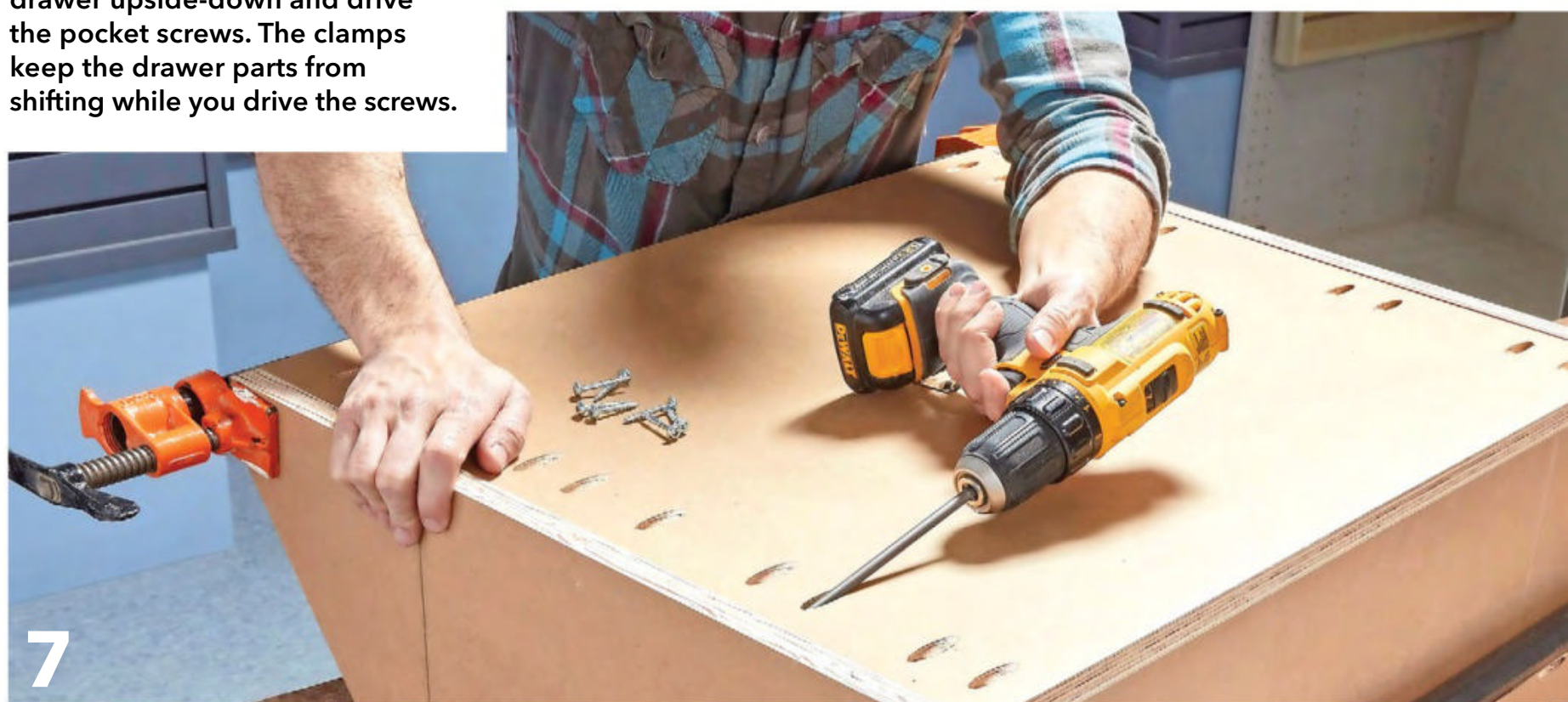
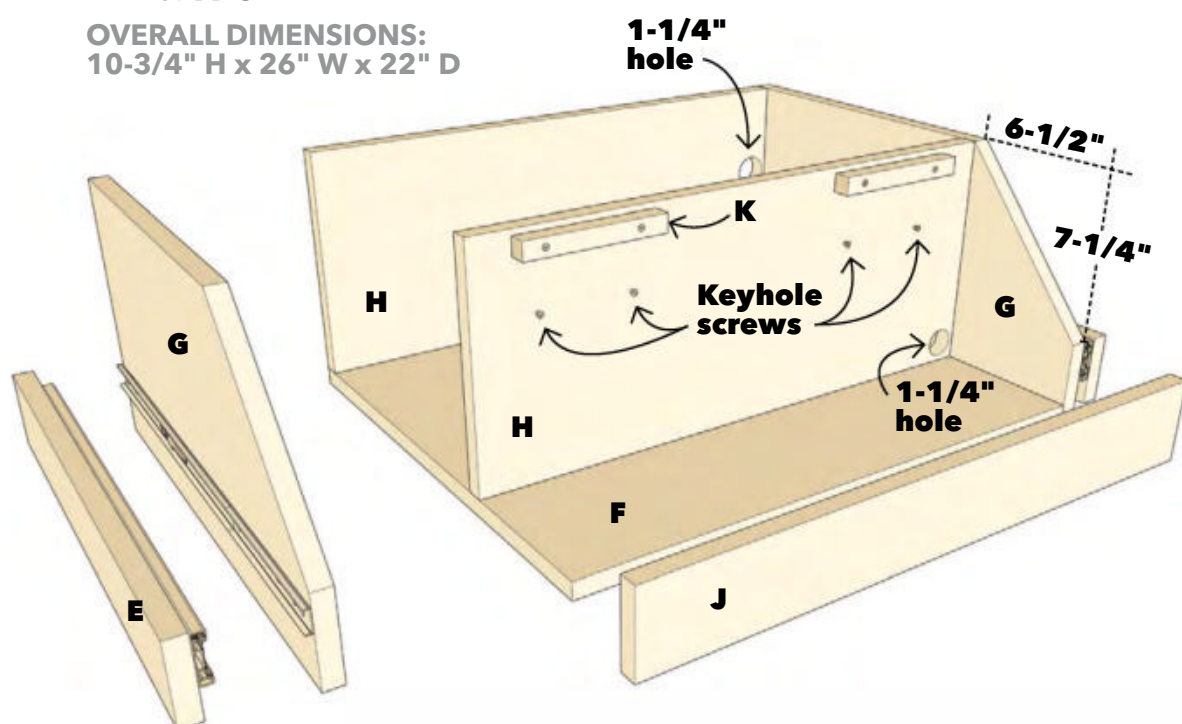


Figure B Drawer

OVERALL DIMENSIONS:
10-3/4" H x 26" W x 22" D



MEET THE BUILDER

Mike Berner is an associate editor at *Family Handyman*. He enjoys spending time relaxing in his yard, not waiting for batteries to charge.

Materials List

ITEM	QTY.
3/4" x 4' x 8' MDO sheet	1
4' x 8' slat wall sheet	1
1/4" x 4' x 8' hardboard sheet	1
1x2 x 8' poplar	4
No. 6 1-1/4" wood screws	
No. 8 2-1/2" pan head screw	4
No. 8 3/4" wood screws	
1-1/4" pocket hole screws	
No. 10 1" bushing	4
Cabinet vent	2
Wood glue	
Small cooling fan	
Slat wall accessories	



8

8 SECURE THE CHARGERS

Most chargers have keyhole slots for mounting. That can be a problem when you're pulling a battery off the charger, as the movement can lift the charger right off its keyhole screws. To hold them in place, I screwed cleats above the chargers. The cleats are removable, so you can take your charger with you if necessary.



9

9 COOL CHARGERS WITH A FAN

To help prevent heat buildup inside the drawer, I mounted a fan between the chargers. I slid 1-in. bushings over 2-1/2-in. screws to keep the fan away from the divider for better air circulation.

10 INSTALL THE PANELS AND DRAWER

I removed the chargers and fan, primed and painted the panels and drawer, and then slid the panels and drawers into place. That's when I realized I'd built the drawer too narrow and the slides wouldn't catch. To fix it, I backed out the screws in the spacer, slipped in a couple shims behind it and then tightened it back up.



10

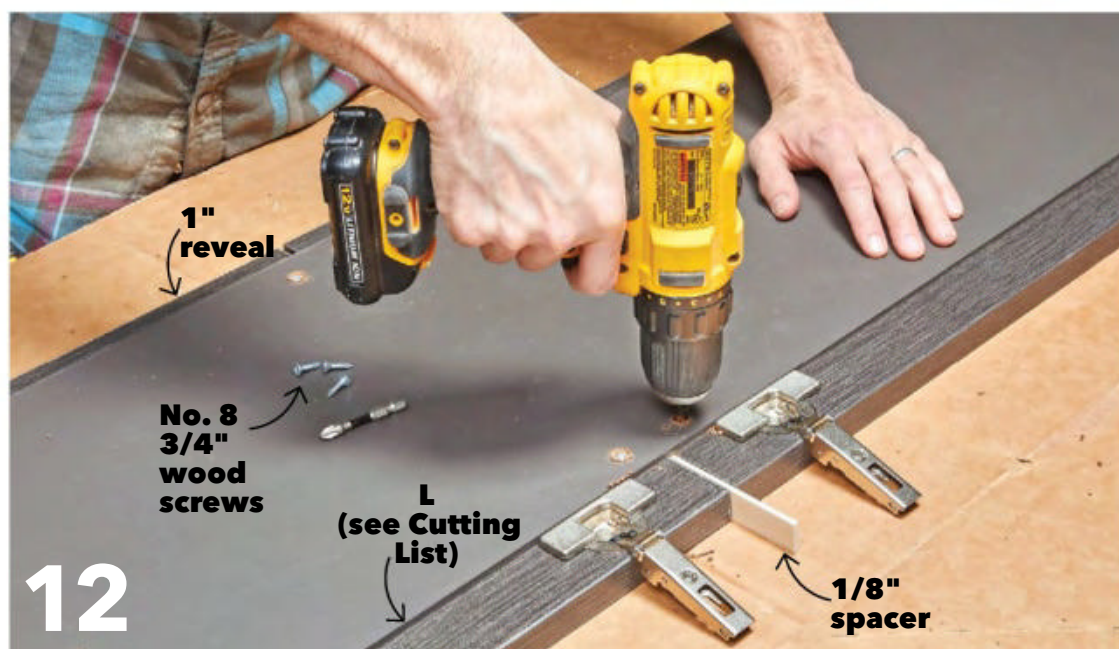


11 VENT THE CABINET

I added vents to the door bottoms so warm air could escape. I wrapped the area with painter's tape to minimize chipping the laminate as I cut, then I marked the opening for the vent. I drilled 3/8-in. starter holes in the corners and cut the opening with a jigsaw.

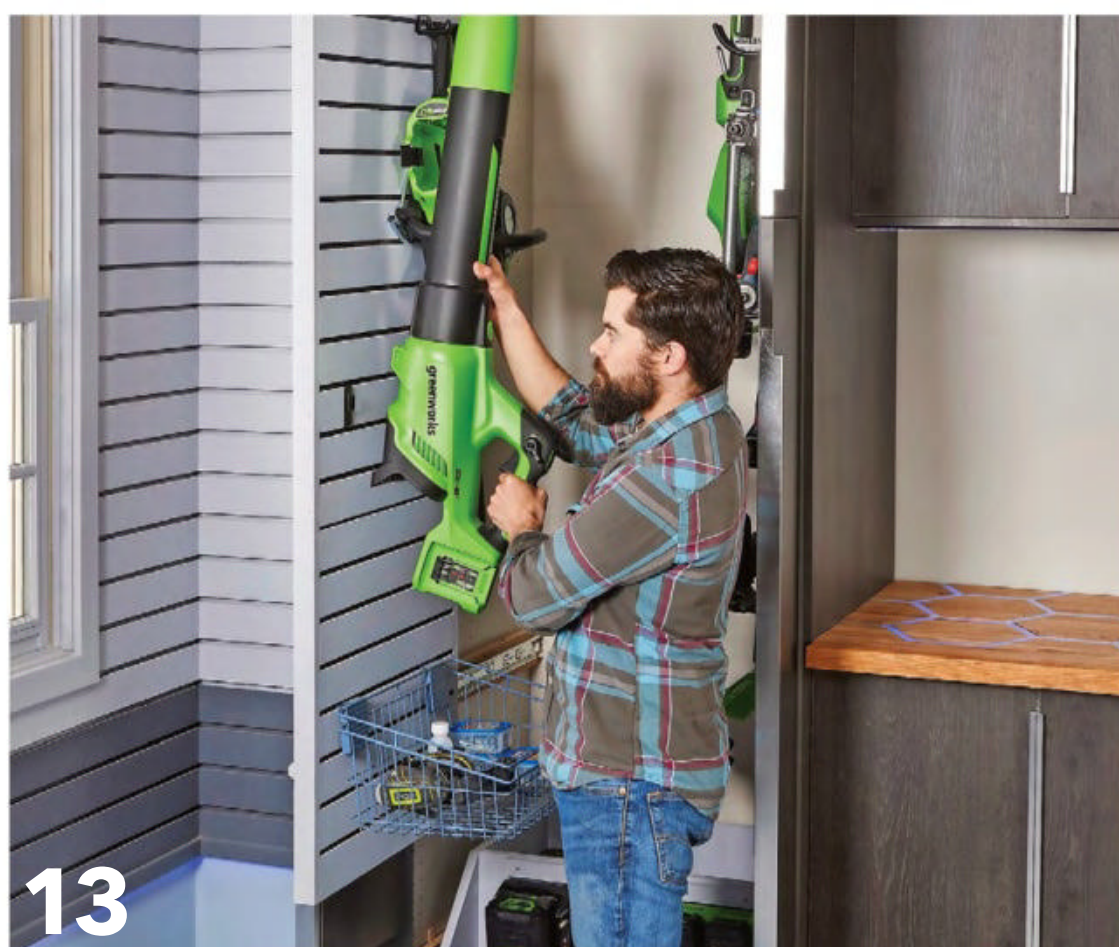
12 JOIN THE DOORS

Our cabinet has four doors: a pair for the top portion and a pair for the bottom. I didn't want to open two doors on each side to access the panel or drawer. So I joined the top and bottom door pairs using a piece of painted 1/4-in. hardboard cut to fit inside the hinges and with a 1-in. reveal around the other edges. With the door pairs on a flat table and a 1/8-in. spacer between them, I screwed the hardboard to the doors. Leave the shims between the doors until the doors are installed.



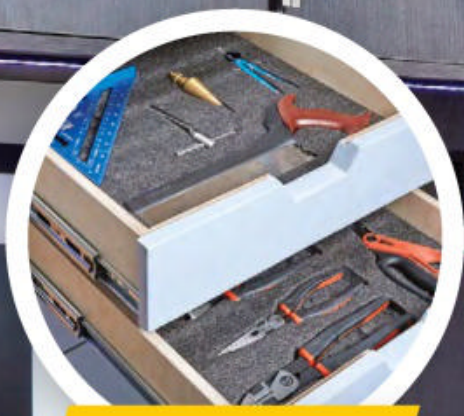
13 ARRANGE ACCESSORIES

Slat wall accessories include a variety of hook types and sizes as well as baskets and shelves. I was able to hang a lot of lawn and yard tools on the panels. The best part of this slat wall system for storing battery-powered tools is how easy it is to rearrange them as needed.





GRAB & GO POWER & AIR



CUSTOM CUTOUTS



HIDDEN STORAGE

WHAT IT TAKES

TIME

2 to 3 days

COST

\$800

SKILL LEVEL

Intermediate

TOOLS

Table saw, combination square, framing square, box cutter, 1/4" crown stapler, 18-gauge nail gun, pocket hole jig, long-nose pattern marker, miter saw, hacksaw, drill/driver, 4" hole saw, caulk gun

ULTRA-ORGANIZED GARAGE CABINETS

Modify your cabinets for greater storage and convenience

BY BILL BERGMANN

Our garages are multitaskers. Vehicle storage, workshop, tool organizer and hangout space for friends and family. For this garage to serve all those purposes, it must be highly organized. I customized two typical kitchen cabinets for maximum storage. Think Swiss Army Knife caliber organization and convenience.

TALL CABINET

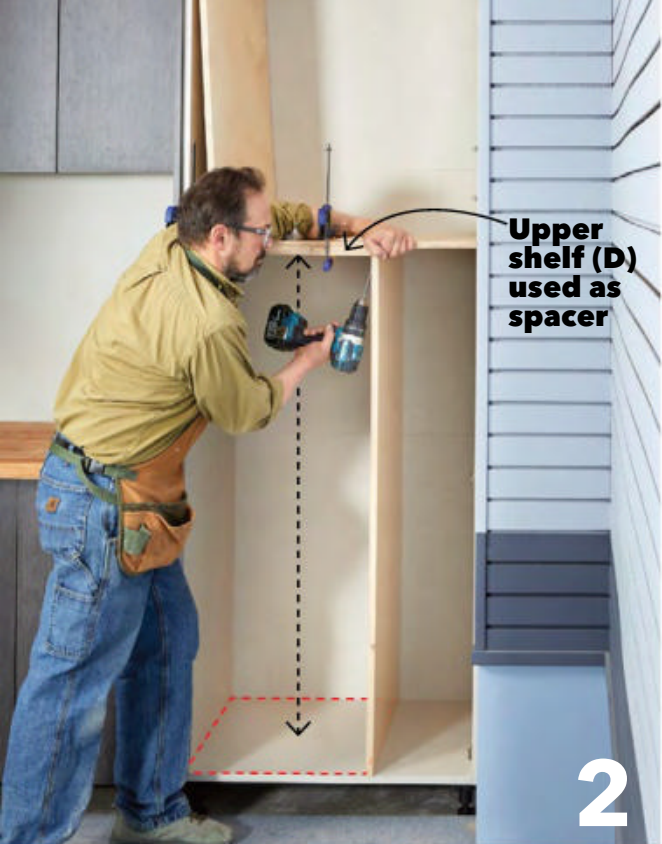
1 INSTALL SHELVES

Use a clamp to temporarily support the middle shelf (C) in its approximate location, and use the lower divider panel (B) as a support and spacer. Attach the shelf with pocket screws. After attaching one side of the shelf, slide the divider to the other side, remove the clamp and attach that side. You'll repeat this process for the upper shelf (D) once the upper divider panel (A) is in place.



MEET THE BUILDER
Bill Bergmann spends too much time in his garage building projects, rehearsing "garage bands" and hosting man cave happy hours. This project shows his skill at modifying cabinets.





Upper shelf (D) used as spacer

2



Vertical staples

Horizontal staples

3



4

2 INSTALL THE DIVIDER PANELS

Using the upper shelf (D) as a spacer, attach the top and bottom of the lower panel. Repeat the process for the upper divider panel (A), then install the upper shelf. Use pocket screws for all these connections.

3 ASSEMBLE DRAWER BOXES

After completing the Cutting List, assemble the drawer boxes (N - W) using crown staples and wood glue. Do this on a flat table to ensure the parts stay flush on the bottom.

PRO TIP

Staple horizontally to attach the sides, fronts and backs to the base. Staple vertically to connect the sides to the front and back. Keep the staples slightly away from the outer edge to avoid splintering the plywood's veneer.

4 BUILD PEGBOARD PANELS

Make a pullout pegboard panel sandwich (J and K) using nails for the mitered corners of the frame (E - H), crown staples and construction adhesive for the panels.

5 INSTALL THE PULLOUT PANELS

Attach the drawer slide inner rails to the panels and the slides to the supports (L). Install the supports and the guide cleats (M) with adhesive and brad nails, centering each panel in its space.



Drawer slide support

Guide cleats

5



6 LAY OUT AND INSTALL DRAWER SLIDES

Rip a scrap of plywood to make a story stick, and mark the drawer spacing on it. Stand the stick in the cabinet and transfer those marks to the cabinet side and the lower divider. Install the first pair of slides on the bottom of the cabinet. Set the slides back the thickness of the drawer face plus 3/16 in.

PRO TIP

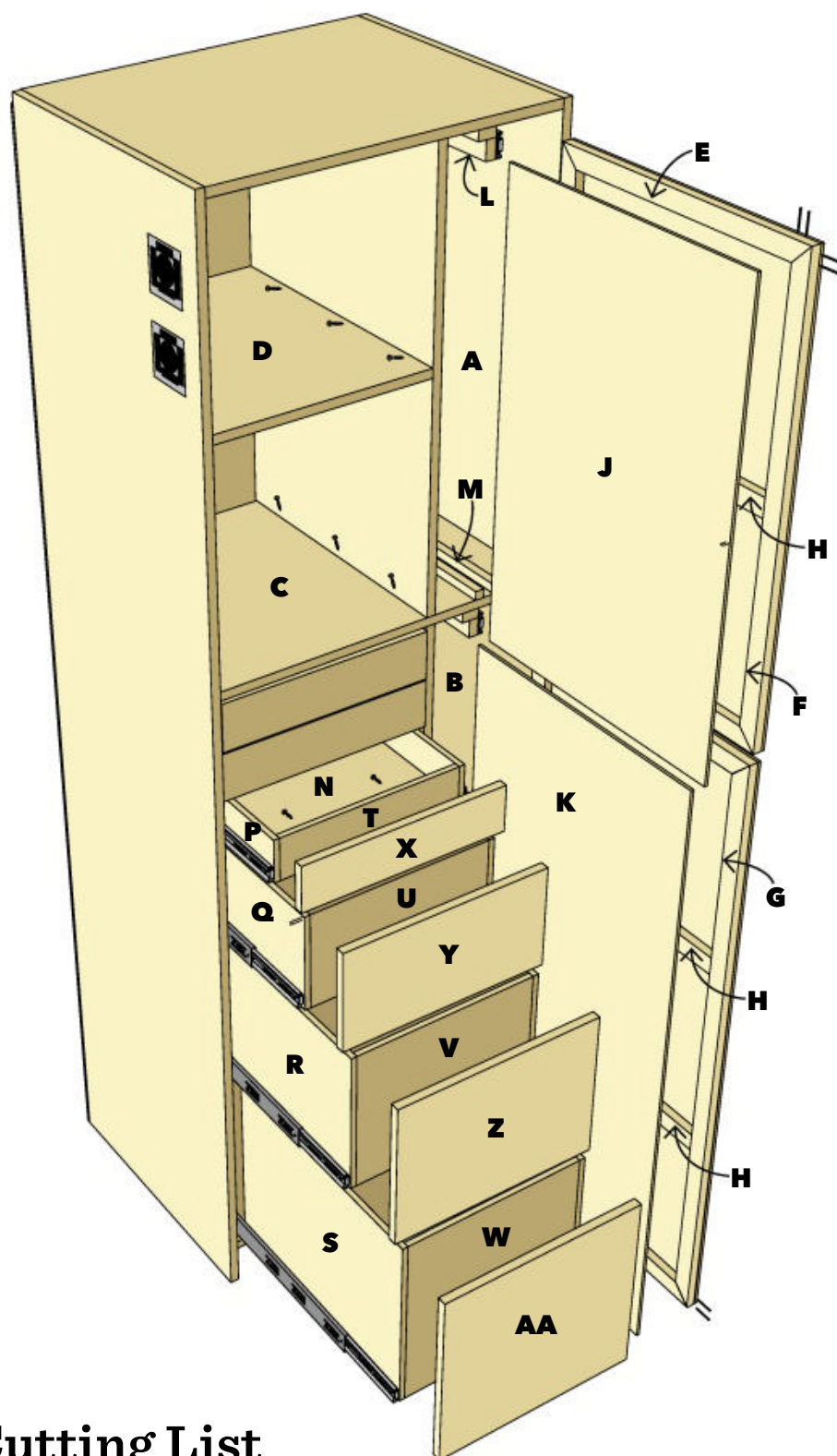
Cut a scrap of plywood the same size as the distance between the bottom slide and the next slide up. Use that plywood to position the second set of slides. As you work your way up with the drawer slides, cut the plywood to match the layout and support each set of slides for installation.

Materials List

ITEM	QTY.
3/4" x 4' x 8' fir-core birch plywood	2
1/2" x 5' x 5' Baltic birch plywood	2
1x4 x 4' clear pine	1
3/4" x 16" x 4' S4S laminated spruce panel board	2
1/4" x 2' x 4' pegboard	4
1/4" x 4' x 8' hardboard	1
22" heavy-duty over-travel drawer slides	1 pair
22" soft-close drawer slides	8 pairs
3/4" x 2' piano hinge	2
Biometric cabinet lock	1
1/4" crown staples: 1" and 1/2"	
1-1/2" 18-gauge nails	
1-1/4" pocket screws	
1-1/2" trim screws	
1" cabinet screws	
3" corner braces	4
Construction adhesive	
Wood glue	
Heavy-duty double-sided tape	
Polyurethane finish	
Latex enamel	
50' cord reel	1
50' hose reel	1
4" hose ports	2
1-1/8" x 2' x 4' Kaizen foam	1
Heavy-duty 30-mm cup hinges	5

Figure A Tall Cabinet

OVERALL DIMENSIONS: 30" W x 94" H x 24" D



Cutting List

KEY	QTY.	DIMENSIONS	PART
A	1	3/4" x 23" x 36"	Upper divider panel
B	1	3/4" x 23" x 51-3/4"	Lower divider panel
C	1	3/4" x 23" x 28-1/2"	Middle shelf
D	1	3/4" x 23" x 18"	Upper shelf
E	4	3/4" x 1-1/2" x 22"	Pegboard frame rails
F	2	3/4" x 1-1/2" x 36"	Upper pegboard frame stiles
G	2	3/4" x 1-1/2" x 50-3/4"	Lower pegboard frame stiles
H	3	3/4" x 1-1/2" x 19"	Panel crosspieces
J	2	22" x 36"	Upper pegboard panels
K	2	22" x 50-3/4"	Lower pegboard panels
L	4	3/4" x 3/4" x 1-1/2" x 22"	Slide support top and vertical
M	4	3/4" x 3/4" x 22"	Pullout guide cleats
N	6	3/4" x 16" x 20-1/2"	Drawer box bases
P	6	1/2" x 3-3/4" x 21-1/2"	Small drawer box sides
Q	2	1/2" x 8-1/2" x 21-1/2"	Medium drawer box sides
R	2	1/2" x 12-1/2" x 21-1/2"	Large drawer box sides
S	2	1/2" x 16" x 21-1/2"	X-large drawer box sides
T	6	1/2" x 3-3/4" x 16"	Small drawer box fronts and backs
U	2	1/2" x 8-1/2" x 16"	Medium drawer box front and back
V	2	1/2" x 12-1/2" x 16"	Large drawer box front and back
W	2	1/2" x 16" x 16"	X-large drawer box front and back
X	3	3/4" x 4-1/8" x 17-7/8"	Small drawer faces
Y	1	3/4" x 8-7/8" x 17-7/8"	Medium drawer face
Z	1	3/4" x 12-7/8" x 17-7/8"	Large drawer face
AA	1	3/4" x 6-3/8" x 17-7/8"	X-large drawer face



7 POSITION AND INSTALL DRAWER FRONTS

Using heavy-duty double-sided tape and shims, position the drawer faces (X - AA), keeping about a 1/8-in. gap around the perimeter. Attach each face from the inside of the drawer box using cabinet screws. The cabinet doors leave little space for drawer pulls. Drill 1-1/2-in. holes for finger pulls or make a hand-pull cutout like I did.

8 INSTALL THE CORD/HOSE PORTS

Drill two 4-in. holes through the side of the cabinet, then attach the ports to the outside of the cabinet with pan head screws.

PRO TIP

Start the hole-saw cut from the inside. Once the guide bit comes through the outer cabinet, finish the cut from the outside to avoid any tear-out or splintering. The port covers will help hide sloppy cuts, but better to avoid them in the first place.



9 ATTACH CABINET DOORS TO TALL CABINET

I joined the four doors of this cabinet with 1/4-in. hardboard, using an approach similar to editor Mike Berner's in the charging center project (p. 57). I upgraded to heavy-duty cup hinges for this larger, heavier door.

10 MAKE FOAM TOOL INSERTS

Use a box cutter and a straightedge to cut the foam drawer inserts. Place your tools on the foam where you want them, and trace them with a long-nose marker. Set the depth of a box cutter blade to match each tool and score the outlines. Kaizen foam is a stack of foam layers, so you can remove layers to the approximate depth of your cut.





BASE CABINET

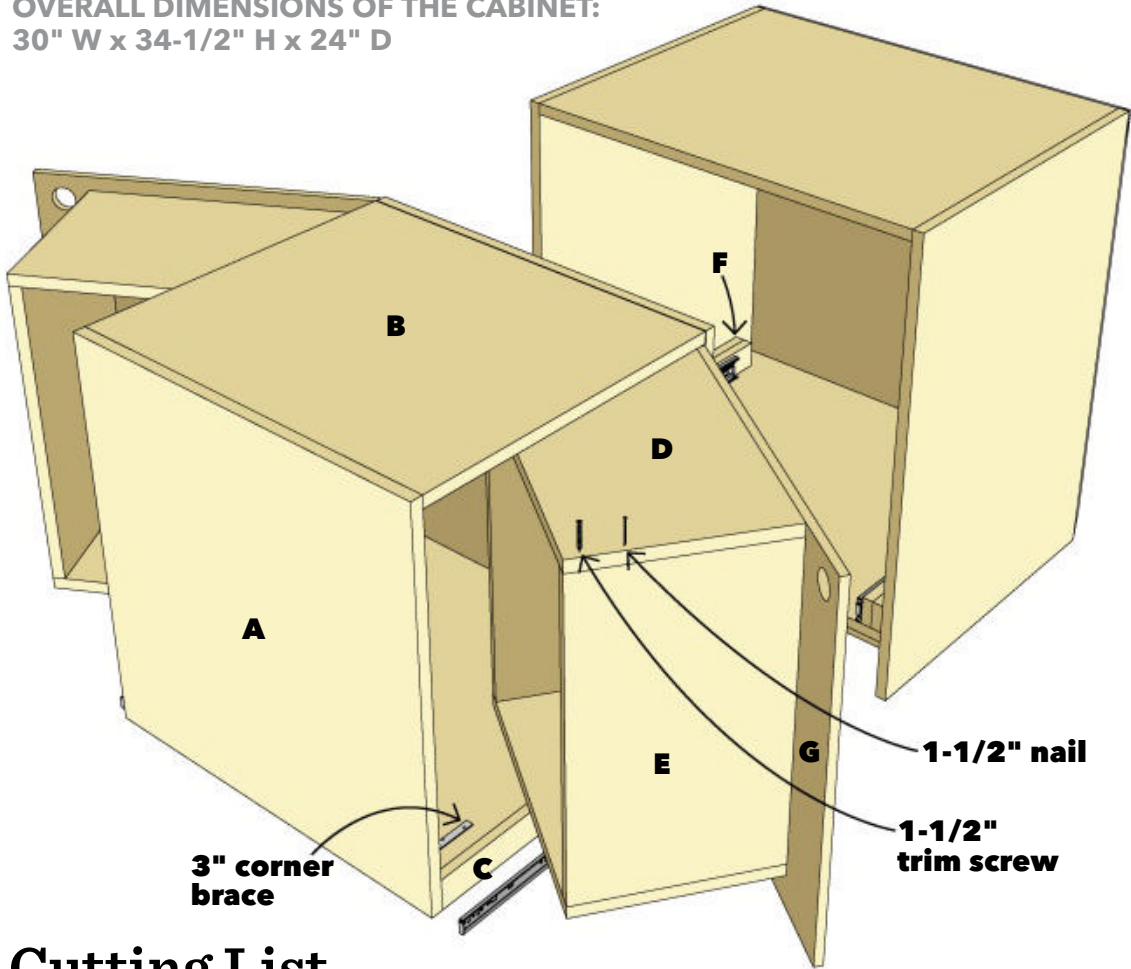
1 ATTACH DRAWER SLIDES TO LARGE PULLOUT

With the parts for the lower pullout (A - C) and storage boxes (D and E) assembled, use 1/2-in. spacers to attach the inner rail of the drawer slides to the base buildup (C) on the pullout box. Set the insert back about 3/16 in. from the front of the box. Attach the corner braces (E)—two on the top and two on the bottom—to square and stiffen the box.



Figure B Base Cabinet Pullout

OVERALL DIMENSIONS OF THE CABINET:
30" W x 34-1/2" H x 24" D



Cutting List

KEY	QTY.	DIMENSIONS	PART
A	2	3/4" x 24-1/2" x 25"	Lower cabinet pullout front and back
B	2	3/4" x 24-1/2" x 20-1/2"	Lower cabinet pullout top and bottom
C	2	3/4" x 2" x 20-1/2"	Buildup
D	4	3/4" x 11" x 16-3/4"	Inner storage box for lower pullout, top and bottom
E	4	3/4" x 11" x 19-1/4"	Inner storage box for lower pullout, side
F	4	3/4" x 2" x 23"	Slide supports for lower pullout
G	2	1/2" x 21-1/8" x 23"	Backs for inner storage boxes



Self-centering drill bit



Edges of storage box marked for nail placement



Electrical tape

2 HANG STORAGE BOXES ON LOWER PULLOUT

Cut the piano hinge to length. Install one side on the inner box, then attach the other to the lower pullout. A No. 4 self-centering bit gives quick and accurate screw placement for the hinges.

3 INSTALL STORAGE BOX BACKS

Mark the edges of the storage boxes on the backs (G) and fasten them using glue and brad nails. Using a 1-1/2-in. hole saw, cut a finger pull hole in the upper front corner of each back.

4 INSTALL LOWER PULLOUT DOORS

With the drawer slides installed on their supports (F), slide the lower pullout into place. I recommend drawer slides rated for at least 250 lbs. Loaded with tools and fasteners, this pullout pushed the limits of the 150-lb. slides I used. Place the original doors using double-sided tape, maintaining a consistent gap against the adjoining cabinets. Attach them from inside the pullout with wood screws.

Finishing touches

To safeguard valuable and heirloom tools in the tall cabinet, I installed a biometric lock. Installation was easy: I drilled a 3/4-in. hole in the door, mounted the lock and a strike plate, and then did a few simple steps to add my fingerprint. Other final touches included adding peel-and-stick edge banding for the visible plywood edges, 1-1/2-in. nosing on the pegboard pullouts, magnetic catches on the lower storage boxes and edging trim on the top of the lower pullout. I sealed the interior cabinet components with two coats of water-based polyurethane and painted others with a latex enamel.

PRO TIP

Use black electrical tape to black out the light plywood and create a shadow line in the gap between the two doors.



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A close-up photograph of a person's hands using a blue and black handheld angle grinder with a white grinding wheel to grind a tile on a floor. The person is wearing a tan work boot. The background is a dark, wood-grained floor.

Home Care

HEALTH | MAINTENANCE & REPAIR | STORAGE & ORGANIZATION

REPLACE A BROKEN TILE

There's an option between living with a cracked floor tile and replacing the whole floor. If you have leftover tile or can find new tile to match your old, you can make your floor look as good as new in a couple days.

1 CUT THE GROUT

Using an angle grinder with a masonry wheel, cut through the grout down to the subfloor all around the tile. Cutting the grout avoids chisel and hammer work that could crack adjoining grout lines.

2 REMOVE THE OLD TILE

Poke a screwdriver tip into the crack and pry up the damaged tile. Don't pry against a good tile; you risk damaging it, too. Chip out any remaining pieces of tile and mortar. A cheap wood chisel is perfect for this. I also use one to trim out any remaining grout up to the edges of the good tile.

3 SET THE NEW TILE

Mix up a small batch of mortar and spread it in the tile area with a notched trowel of the correct size. For this large-format tile, I used a 1/4-in. x 3/8-in. notch. Set the new tile in place, pressing it into the mortar so it's level with the surrounding tiles. Allow the mortar to set for 24 hours.

4 GROUT THE NEW TILE

After the mortar has set, grout the joints with a grout float. If you're lucky enough to know the exact grout used originally, you'll get a close match. But even then, it may not be quite the same color as the surrounding grout that's had foot traffic since the original installation.

5 CLEAN UP THE EXCESS

Using a damp sponge, wipe off any excess grout. Wring out the sponge in clean water frequently. Wipe down the grout lines, applying enough pressure to make them the same level as the surrounding grout lines. Let the grout set for 24 hours before walking on it.

BRAD HOLDEN, SENIOR EDITOR





FIX A SQUEAKY FAUCET

Outdoor frost-proof faucets eventually develop a squeal that you hear when you turn the handle. The brass stem threads are rubbing against the brass threads in the housing. If your faucet is squeaky, you don't have to just live with it. There's an easy fix using a bit of plumber's grease. Start by turning off the water supply. If there's a shutoff valve for the faucet, close it. Otherwise, shut off the main valve.

1 PULL THE STEM

Remove the handle. Then loosen the packing nut. Reinsert the plastic handle and unscrew the entire stem.

2 GREASE LIKE THERE'S NO TOMORROW

Apply a generous amount of plumber's grease to the threads. Then insert the stem and turn the handle. If there's no more squealing, reassemble the packing nut and install the handle. If the faucet still squeals, it could be time to buy a new one.

IS SYNTHETIC OIL THE BETTER CHOICE?

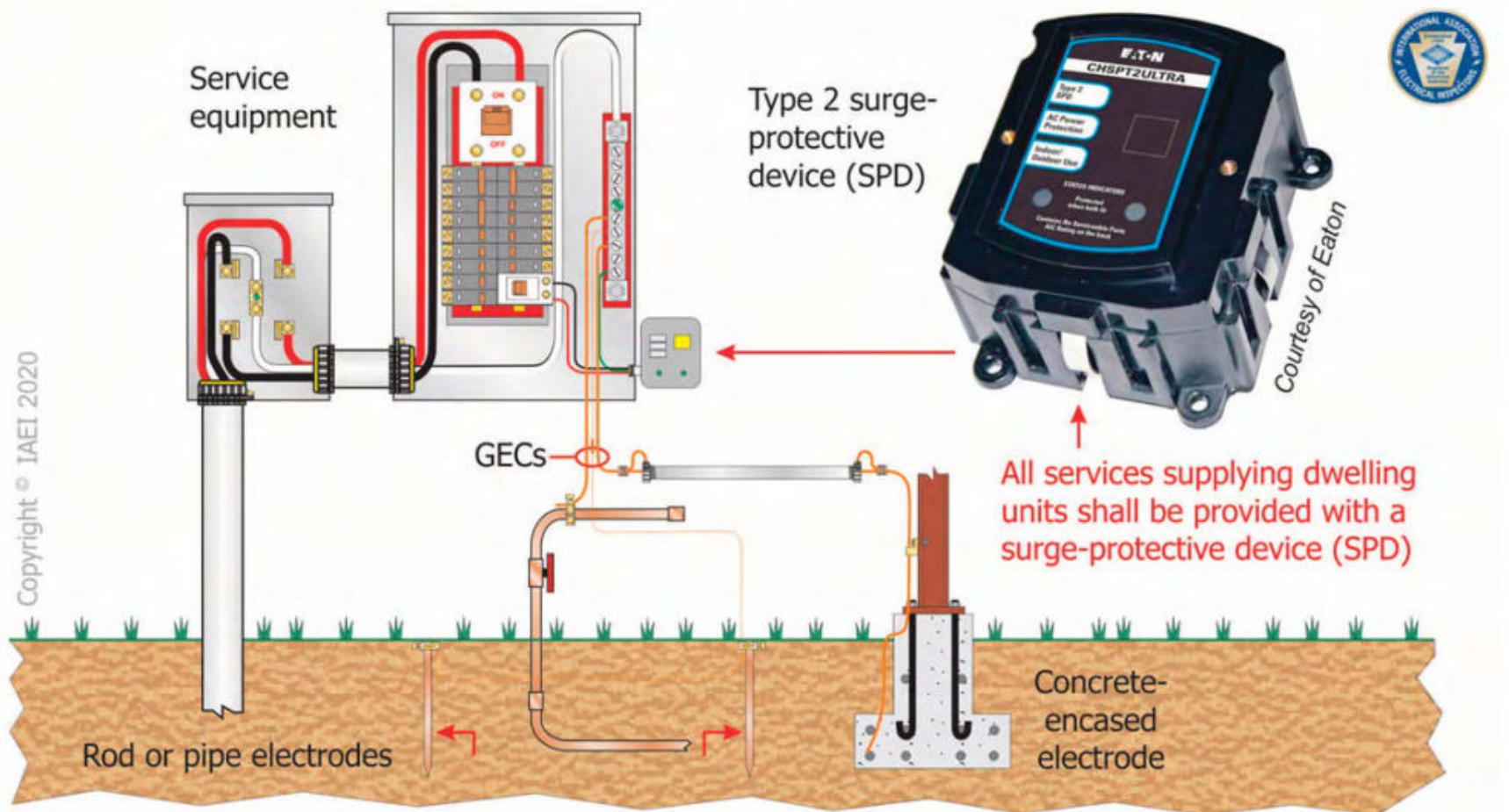
There's no question: Synthetic oil is a better engine lubricant than conventional oil. Many new vehicles require synthetic oil; failure to use it can void your warranty. But if your older vehicle doesn't require it, and you stay on top of your oil change schedule, you can save money by using conventional oil. It will still protect your engine's moving parts. Check your owner's manual to see what oil type and viscosity are recommended.



Test your tester

When you're testing an outlet or circuit you suspect is dead, first use your tester on a circuit you know is live, to verify that the tester is working. Then, after testing the suspect circuit, recheck the tester on the good circuit. This ensures your tester is working before you check a suspect circuit, and that it's still working afterward. It only takes a few seconds and could save your life.

PAUL HELGESON



Whole-house surge protection now required

According to the 2020 update of the National Electrical Code, a surge protective device (SPD) is required at the service panel on new construction and service panel replacements. This regulation came about because of all the surge-sensitive technology we're using in our homes. Having surge protection at the service panel eliminates the need for a power strip with surge protection.



MEET THE EXPERT
John Williamson is the
State of Minnesota
Electrical Operations
Supervisor.

SELL AT THE RIGHT TIME TO GET THE BEST PRICE

Real estate data may suggest an ideal time of year to sell your home, but the optimal time may not be the same in every place and for every person.

There are other circumstances to consider:

- DO YOU NEED A QUICK TURNAROUND?
- ARE YOU LOOKING TO HIT THE MARKET WHILE IT'S HOTTEST?
- IS THE "IDEAL TIME" CONVENIENT FOR FAMILY AND WORK?



SPRING IS THE OVERALL WINNER FOR SELLING. In most places, homes sell the fastest and for the highest price in the first two weeks of May. The months of April and June are typically strong as well. Warmer weather and more hours of daylight give buyers more opportunity to house hunt. Blooming flowers and lawns turning green maximize curb appeal.



HERE'S WHAT MAKES SELLING IN THE SUMMER EASIER. Longer daylight and flexible schedules make shopping easier, but buyers feel the pressure of time. Those with kids want to move in before school starts. Sellers benefit from this sense of urgency since it can drive prices up.



FALL IS AN IFFY TIME FOR HOME SALES. Not every area of the country has pleasant fall weather, and people seem to turn their attention toward making necessary repairs before winter instead of selling. This reduces inventory as well as the number of potential buyers. That said, fall buyers are often serious, but picky. They may have looked all spring and summer without finding the perfect home.



WINTER IS BEST IN AREAS like California, Florida, Arizona and ski resort towns. In other areas, curb appeal is low: Branches are bare, grass is brown and there are mounds of snow. It's also harder to schedule showings since days are shorter and people are busy with holidays. But winter buyers can be much more serious. They're often pressed for time, wanting to buy before the end of the year or relocating for a job.



MEET THE EXPERT
Polly Watts is the VP of Sales for Sundae, a leading off-market home buyer.

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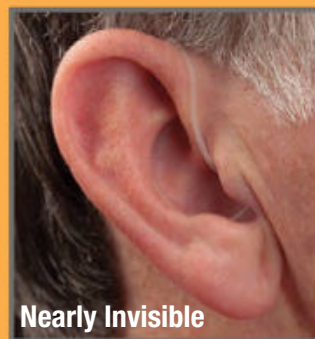
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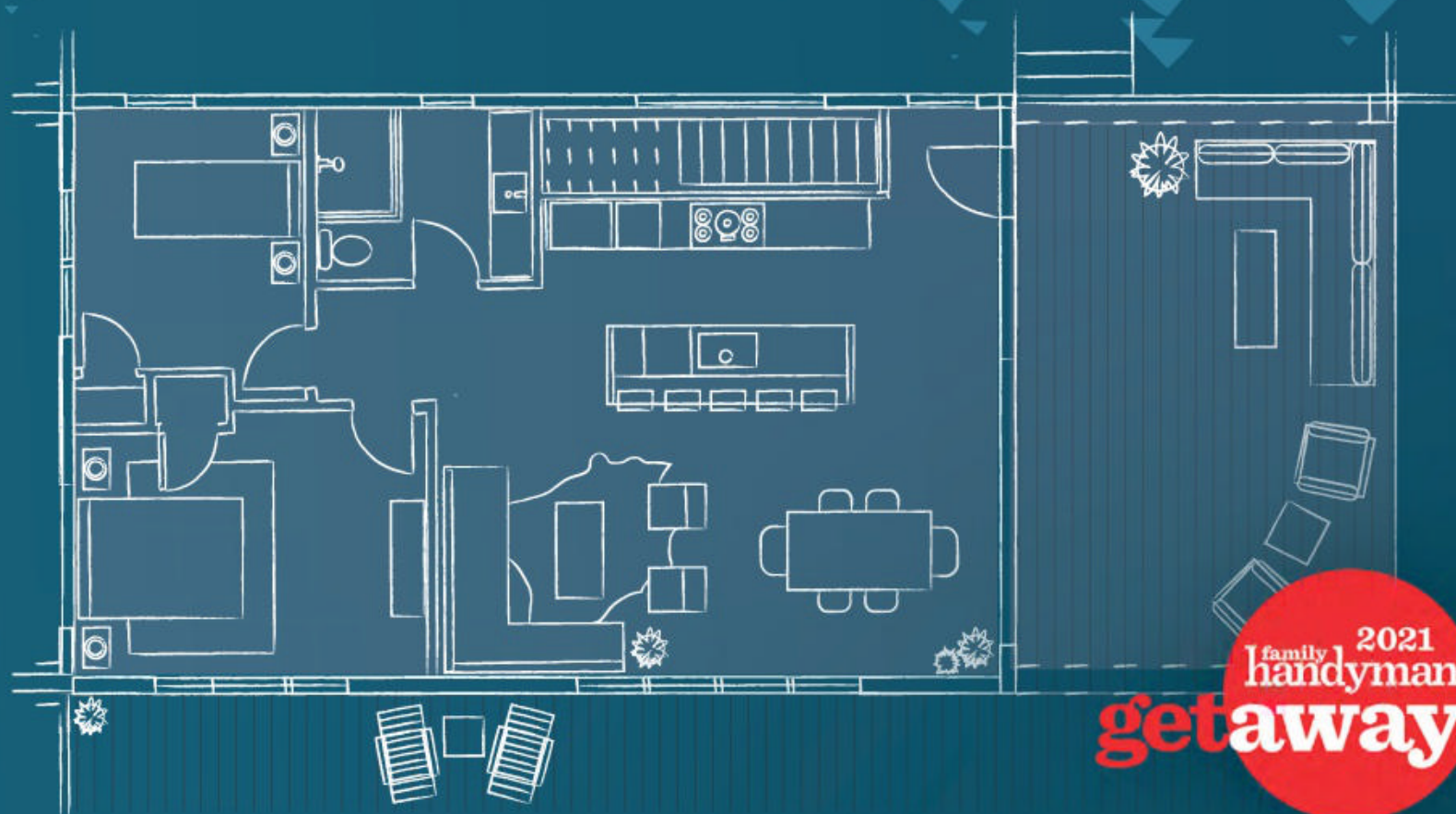
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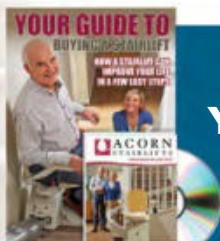
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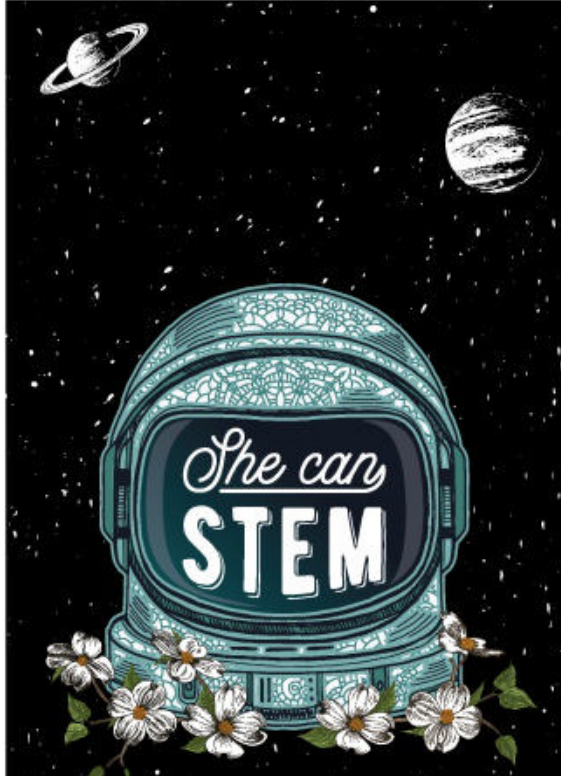


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Clogged, Backed—up Septic System...Can anything Restore It?

DEAR DARRYL: My home is about 10 years old, and so is my septic system. I have always taken pride in keeping my home and property in top shape. In fact, my neighbors and I are always kidding each other about who keeps their home and yard nicest. Lately, however, I have had a horrible smell in my yard, and also in one of my bathrooms, coming from the shower drain. My grass is muddy and all the drains in my home are very slow.



Dear
Darryl

My wife is on my back to make the bathroom stop smelling and as you can imagine, my neighbors are having a field day, kidding me about the mud pit and sewage stench in my yard. It's humiliating. I called a plumber buddy of mine, who recommended pumping (and maybe even replacing) my septic system. But at the potential cost of thousands of dollars, I hate to explore that option.

I tried the store bought, so called, Septic treatments out there, and they did Nothing to clear up my problem. Is there anything on the market I can pour or flush into my system that will restore it to normal, and keep it maintained?

Clogged and Smelly – Greensboro, NC

DEAR CLOGGED AND SMELLY: As a reader of my column, I am sure you are aware that I have a great deal of experience in this particular field. You will be glad to know that there IS a septic solution that will solve your back-up and effectively restore your entire system from interior piping throughout the septic system and even unclog the drain field as well. **SeptiCleanse® Shock and Maintenance Programs** deliver your system the fast active bacteria and enzymes needed to liquefy solid waste and free the clogs causing your back-up.

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Laughs and lessons from our readers

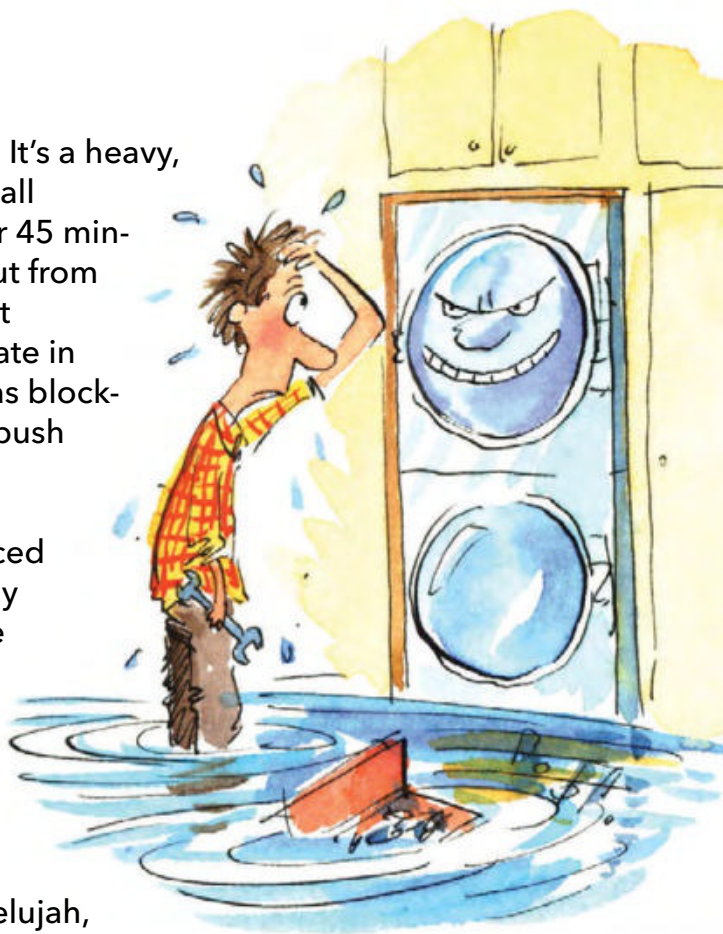
FOURTH TIME'S THE CHARM

Our washing machine was on the fritz. It's a heavy, stacked unit (dryer on top) in a tight wall recess, so it's tough to maneuver. After 45 minutes of pulling and straining, I got it out from the wall and spotted the problem right away—a broken clutch. But it was too late in the day to get the part and the unit was blocking the hall to the kitchen, so I had to push the whole thing back against the wall.

The next day I did the backbreaking 45-minute thing over again and replaced the clutch. Then I reattached the supply hoses, pushed the unit back into place and started it. Oh, man—water began coming out from underneath the washer! I'd forgotten to reattach the drain hose! Once again, I pulled the whole thing out from the wall. Then I reattached the drain hose, pushed the unit back yet again, started it and hallelujah, it seemed to work fine—no leaks.

The next day my wife discovered hot water coming out during the cold cycle. I'd switched the hot and cold hoses when I reattached them! Which meant I had to...

JOHN KLUBE



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A few years ago, my dad decided to replace the vinyl floor tile in the basement. The tiles came up easily, but he couldn't scrape the adhesive residue off the concrete, so he ran to the home center and bought a slick new razor scraper. But even with the new scraper it was slow going, and I could hear him complaining all morning about how the "@#%\$ scraper" didn't work. By lunchtime he was fed up. He told me to get in the car, and as we drove to the store to return the scraper, he told me to watch carefully and I'd "learn a lesson about how to deal with this kind of situation."

My dad stomped over to the service desk, yelled at the poor teenage girl standing there and handed her the piece of junk. She took one look at the blade, clicked the built-in release, turned the blade around to expose the actual razor edge, which had been covered for safety, and cheerfully handed it back. My dad said nothing, but I sure learned a lesson—just not the one he'd intended.

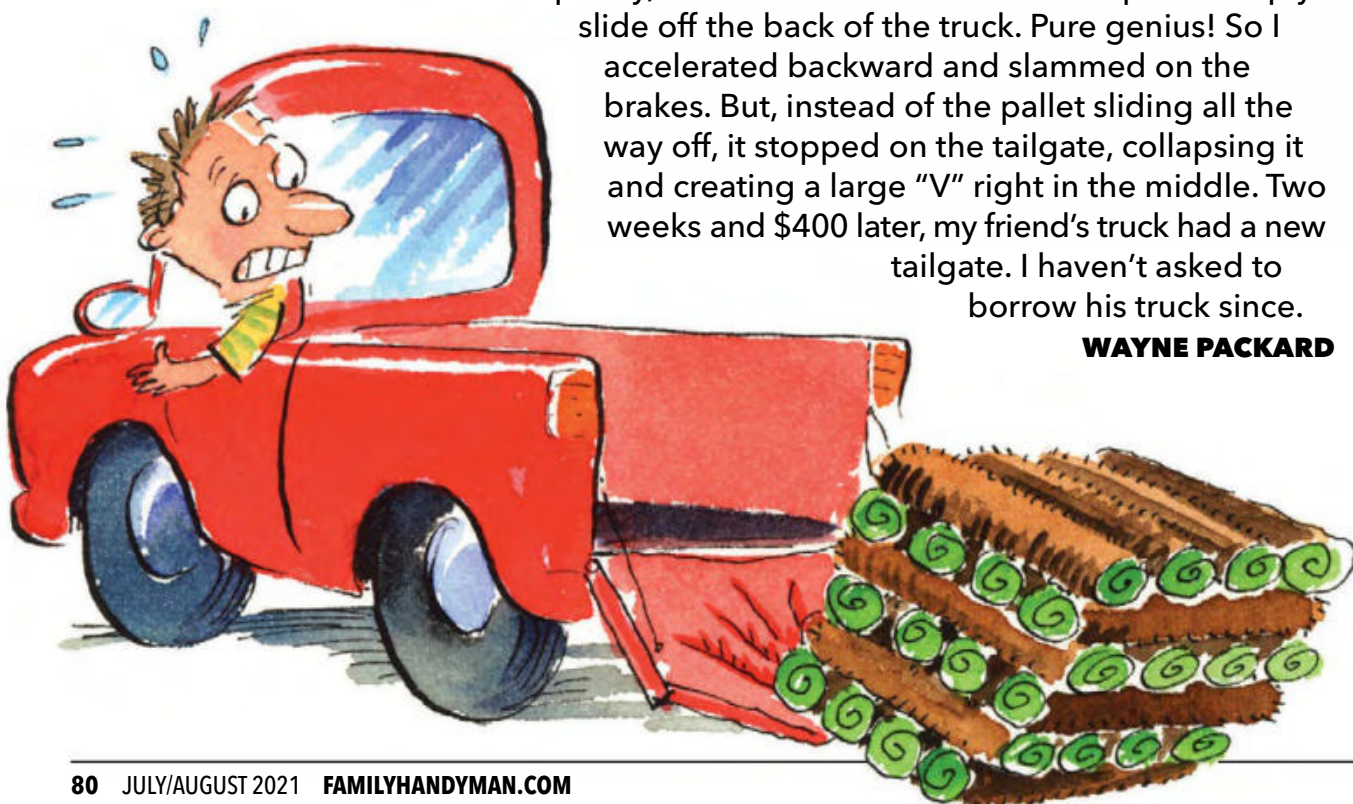
DAVID KAISER

SPEEDY BUT NOT SMART

A couple of years ago, I borrowed a friend's pickup to save a \$40 delivery charge for a pallet of sod. The nursery loaded the sod with a forklift, and I drove home congratulating myself on my money-saving brilliance. And then another great idea suddenly struck me—the easy way to unload all that heavy sod would be to back up

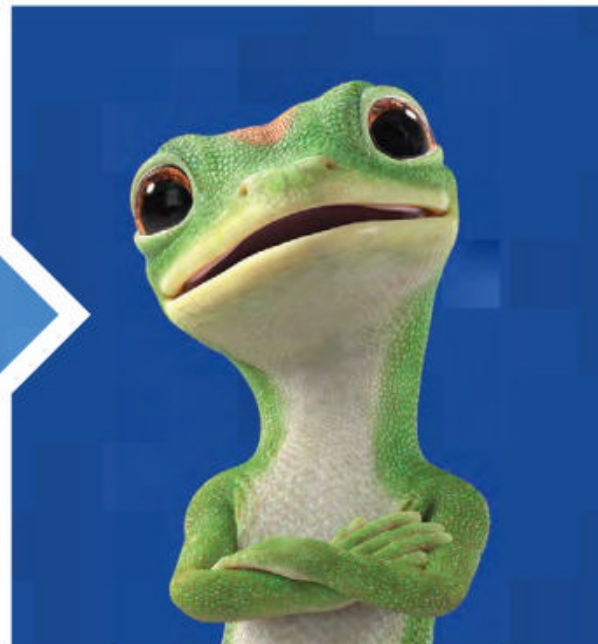
quickly, slam on the brakes and let the pallet simply slide off the back of the truck. Pure genius! So I accelerated backward and slammed on the brakes. But, instead of the pallet sliding all the way off, it stopped on the tailgate, collapsing it and creating a large "V" right in the middle. Two weeks and \$400 later, my friend's truck had a new tailgate. I haven't asked to borrow his truck since.

WAYNE PACKARD



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