Make Your Own Hardware



ears ago, I needed angled hinges for a cabinet and decided to make them myself. That experience got me hooked on metalwork and blossomed into a side business, Sanderson Hardware. Now, hardware making is a part of my work as a furniture maker, a place where I can further express myself as a craftsman.

Designing and making pulls gives you the freedom to do exactly what the piece calls for, and it is exciting to know that your piece of furniture is custom built from start to finish.

Brass, an alloy of copper and zinc, is a good metal to use for pulls because it is relatively inexpensive, can be cut with woodworking machines, and is easy to bend. It also is readily available in many forms: bar, rod, and sheet stock. Commercial hinges are often

These two custom pulls are easier than you think

BY ROBERT SANDERSON



made of brass as well, so the overall look of the piece will be consistent.

You don't need exotic, expensive tools or machines to make your own brass pulls. Most woodworking shops already have the necessary equipment. To work the relatively small pieces of brass safely, you will have to make a few simple jigs to hold the workpieces. You can make them from scraps of MDF (mediumdensity fiberboard) or plywood, and once you have them you're set for the future.

Here, I'll show you how to make a ring pull and a drop pull. Once you've learned to build and install them, you'll have a launching point for future work.

Robert Sanderson owns Sanderson Hardware in Fort Bragg, Calif.

Take your furniture to another level





The tips and techniques in this article will get you started on the basics of metalworking. From there, you can mix and match the methods and apply them to an endless variety of designs. Here are a few different takes on the ring pull and drop pull.



Stick with brass

Most of the tools and techniques used for cutting wood can be applied to brass. A standard woodworking blade will work fine on the bandsaw, but you'll want a metal-cutting blade for your tablesaw. Also, brass is widely available in a variety of sizes, and it can be treated to give it different textures and colors.



A sled for small stock. For safety, there should always be two teeth in a cut, so use a sled to add to the thickness. The sled also guides the stock safely. Leave enough length to square up the ends with a file or disk sander. A benefit of the bandsaw is that it can cut curves. A hassle is that brass shavings get embedded in the rubber tires and need to be cleaned.

TABLESAW

Rip to width. Work with about 12 in. of bar stock, ripping equal amounts from each side. If you take the full amount off one side, the natural tension in the bar might cause it to bend. Use a good zero-clearance throat plate, push sticks, and a featherboard.



Cut to length. Use a cutoff box and hold-down block for consistent, accurate parts. A dado in the hold-down block holds the brass (above). Butt the hold-down block against a stop block. The blade should be high enough to cut through the brass, not the whole block (right).

P Start by cleaning out sawdust in the cabinet and turn off dust collection. It's rare, but metal shavings can be hot and could start a fire.

Brass-work survival kit

The projects in this article require only a small investment in new tools and materials.

TOOLS

Freud New Diablo Steel Demon Cone-shaped ¼-in. shank rotary file, MSC Industrial Supply (mscdirect .com), No. 00439117

Pillar file, #4, MSC No. 60210143

Drill-press vise, MSC No. 00267161

6/32 standard tap, MSC No. 04436325 6/32 bottoming tap, MSC No. 04436333

Reamers:

Loose fit, MSC No. 02318525 Press fit, MSC No. 72006208

T-handle tap wrench, MSC No. 00208348

#53 screw machine drill bit MSC No. 01378538 (12-pack)*

#65 Jobber drill, MSC No. 01188655 (12-pack)*

Center drill and countersink #2, MSC No. 01031020

Layout fluid, MSC No. 00264176

MATERIALS FOR RING PULL

¹∕₁₆-in. by ³⁄₄-in. rectangular bar stock, MSC No. 32001786 ¹∕₈-in. rod stock, MSC No. 78203981 Standard brass cotter pin, available at most hardware stores Brass escutcheon pins: 5% in., #16 gauge for attachment

1/2 in., #20 gauge for the divider, Atco products (atcoproducts.com) by the pound*

MATERIALS FOR DROP PULL

⁵/16-in.-square bar stock, MSC No. 32001661

¹/₂-in. by ³/₁₆-in. rectangular bar stock, MSC No. 32001901

4⁄16-in. by 5⁄16-in. alloy steel dowel pin stock, MSC No. 0602 0028 in bulk*

*Smaller quantities available at Sanderson Hardware (sandersonhardware.com)

Photos, except where noted: Anissa Kapsales (action): Kelly J. Dunton (products)

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Make a ring pull

Ring pulls are a great beginner project. They require

little machining, and they can be made in any size to accommodate your piece.



¹/16-in. by ³/4-in.rectangular bar stock for the escutcheon plate

⅓-in. rod stock for the ring

START WITH THE PLATE

Beyond just being decorative, the escutcheon plate locks the cotter pin in place and lifts the ring off the surface of the wood.



Locate and drill holes. Mark for the cotter-pin post as well as the holes for the attachment pins, and start them with a center punch. To provide space for the drill bit, place the escutcheon plate in a vise, raised up on parallel bars taped inside the jaws (left). With a cone-shaped ½-in.-shank rotary file held in a pin vise, break the edges of the holes (right) to remove any burrs and to provide clearance under the head of the pin. Sand the plate with P400-grit paper to create a consistent finish. Last, slightly chamfer the edges with a Pillar file for a more interesting look.









Make a coil and cut rings apart. First, sand the rod to P400-grit to clean it and give it a consistent finish. Bend it around any ½-in. cylinder, holding one end with a vise grip to create a coil (left). Bring each layer tight to the next. Then cut through the whole coil with a handsaw (above).

Flatten them. Hold one side of the ring in a vise and twist the other with a pair of channel locks. To prevent scratching, line the vise jaws and channel locks with dense cardboard. Because the brass ring will spring back, overbend it.





Run a single-cut bastard mill file (¾2 in. thick) through the ends to make them vertical and parallel to each other. This will affect the way the ring hangs on the cotter pin.

Cleanup trick.

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3 COTTER PIN HOLDS IT TOGETHER

The tiny escutcheon pin will keep the ring centered so that the split will not be visible.



1/2-in., #20 gauge escutcheon pin



Add an escutcheon pin divider. Place the cotter pin horizontally in the vise, and mark the "eye" with a center drill. Switch to a No. 65 drill bit and drill all the way through both halves of the eye.



Push the pin through and peen the divider. Cut off the extra length with a pair of dykes, leaving a small amount sticking out. A small hammer flares out the end of the divider and locks it in place. Sand with P400-grit paper.



Open the ring. Place one half of the ring in the vise so that the split is outside the vise jaw. Place a tool handle through the ring to lever it open just enough to load the cotter pin onto it.

Wooden

wedge

Install the plate. Use double-

sided tape to hold it in place

while drilling pilot holes. Ham-

mer in the pins, preferably using

a hammer with a plastic head to

prevent damage to the pins.



Heat sets it. Pinch the ring in the vise, using only enough pressure to bring the ends of the ring in contact with the divider pin. Then heat the ring with a small propane torch to allow the brass to relax. Now it will stay closed.

FINISHING BRASS

Plain brass is beautiful and oxidizes naturally. There also are antiquing solutions available. For texture or colors, the brass can be packed in sawdust dampened with any of these chemical solutions. The Coloring, Bronzing and Patination of Metals by Richard Hughes and Michael Rove (1991, Watson-Guptill Publications) is an excellent source for recipes.





Add the ring pull. Drill for the cotter pin, wiggling the drill in the back of the hole to accommodate the wedging action to come. Now push the pin through and mark its length, plus ½ in. Holding the pin in a vise, cut it to length with a saw and clean up the ends with a file.

Insert the wedge. To lock the pull on the escutcheon plate and drawer or door, hammer a wood wedge between the ends of the cotter pin. Spread the ends with a screwdriver to get started, and trim the wedge with a saw and chisel.

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Drop pull

Drop pulls have a refined look and feel wonderful to the touch. The mechanics are similar to a butt hinge, except the knuckle has only one



DRILL AND TAP THE POST

One thread at a time.

Mark the center of the post with a center punch and place the post in the vise. Use a #36 bit to drill a hole. Now use a #6/32 standard hand tap in a tap wrench, chucked in a drill press. Turn the tap gently by hand, cutting one thread at a time and then backing it out a half-turn to break off the chip. After the standard tap, which has a tapered end to start the cut, come back with a bottoming tap to finish cutting the threads to the bottom of the hole.



2 CUT THE KNUCKLE JOINT

ONE SLED FOR THE POST





Post gets shoulders. On the router table, cut the first shoulder, flip the part in the sled 180°, and cut the opposite shoulder. The shallow tenon on the opposite end is cut the same way, using a pair of similar sleds.

FILE TO FINALIZE THE FIT



ANOTHER FOR THE PULL



Center the slot on the pull.



Pull needs a slot. While still on the router table, cut the slot in the pull that will accept the tenon on the post.



To fit the post to the pull, use a Pillar file on the post with the safe edge against the shoulder and make light cuts, testing the fit until the post goes all the way home in the pull and does not stick.

3 DRILL FOR THE DOWEL PIN





L-shaped stop holds work. The stop, made with two stopped cuts on the tablesaw, enables the pinhole to be drilled from both sides, reducing error from wander if you were to drill through from one side.



Drill halfway and flip. Clamp the pull to the post (the face of the pull must be slightly proud of the post for clamping pressure to hold them together) and lay out the pinhole location at the center. Start the hole with a center drill (left) and switch to a #53 bit to drill about halfway through the assembly (right). Flip the pull and complete the hole.

SHAPE THE PULL AND ADD THE PIN

Create a taper. Apply layout fluid, scribe a 2° taper on each side, and file to the final shape. Then sand the front and back of the pull to thin it out and bring the front of the pull in line with the front end of the post. Using P180-grit sandpaper stuck to a flat surface, move the pull back and forth with your fingers, trying to keep the pressure even and the surfaces flat.

Reamer for pull, .0620 in.

Reamer for post, .0635 in.





Round off the knuckle. File to create clearance for the pull to swing. With a drill bit aligning the parts, file the front end of the post and the corner of the pull. Flip the pull and round off the other corner in the same way. Round over the bottom front end of the post with the pull removed.



Create a press fit. Ream out the assembly so that the pull has a press fit (left) and the post a loose one (right). Using a drill, hold the parts in your hand while you ream them out. Be careful not to run a reamer in reverse; it will change the reamer's size.



Press the pin in place. File or sand the pin to size, deburring and rounding it with a file. Start the pin in the pull with a small hammer, then hold the post in place and press the pin in gently with a vise.



1/16-in. by 5/16-in. alloy

steel dowel pin

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