

MULTI-METAL & COLD-CONNECTED

A no-torch bracelet with endless variations

PROJECT BY

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Project photo: JIM LAWSON

SKILLS YOU NEED

- sawing
- drilling
- measuring
- assembly



Yes, you can improve your fabrication skills *and* have something new to wear when you're done. A beginner can easily create the circle units in this bracelet – but I warn you, making them becomes highly addictive. When I get fleeting ideas that need testing, geometric shapes help me avoid getting hung up on aesthetics instead of problem solving. Simple, 1" circles or squares have enough of a surface to help you figure something out – and this bracelet grew out of that kind of figuring. For this project, I've made 6 identically constructed units – the seventh closure unit is similar, but not exact. Each circle also has its own look, for which I used a mixture

of gauges of copper, silver, reticulation silver, brass, and bronze from my experiment box in a variety of ways.

As you experiment and fabricate, you'll also be honing your ability to measure, divide, drill, texture, saw pierce, patina – and design! Once you master the construction of the circles, you'll want to vary them and your jewelry further. Cut out a square hole instead of a round one, cut holes in both top and bottom circles to make a wheel, use three circle layers instead of two, cluster tubes in the center and set stones in them, and then connect all your variations not only into bracelets, but also necklaces, earrings, and belts – the only limitation is your imagination.

On the back, be sure to finish the riveted hardware carefully for comfort when worn.

TRY THIS, TOO!



Make a copper and brass bracelet without links or closure

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MATERIALS AND TOOLS YOU NEED

MATERIALS

Scrap sheet of various gauges; textured or plain

3/32" thin-wall tubing; copper and brass

0-80 thread x 1/2" machine screws and nuts – 4 sets per unit; 5 for closure

Rubber O-rings; 1/8" OD, 1/2" ID

TOOLS

Micro nut driver and screwdriver
Jewelers saw frame and 2/0 blades

Blade lubricant

Tube cutting jig

Riveting hammer

Strong, sharp wirecutters

Files

Progressive grades of sandpaper

Polishing cloth or felt wheels and compound

Drill bit size 55

Drill, flex-shaft, or rotary tool; chuck key

Centerpunch

Bench blocks

Fine line Sharpie

Scribe

Large ball peen hammer

Large circle cutter; 1" and 1/2" punches

Rawhide mallet

Tools for applying texture: hammers, punches, stamps, rolling mill, metal corrugator, burs, files, etc.

Patina if desired

Tumbler; stainless shot if desired



{Photo 1} Cut out fourteen 1" circles using mix of textured sheet and different metals. File and sand edges.

{Photo 2} Cut an inner "donut hole" out of seven circles. File and sand edges. Set aside one circle with a hole and one without for closure.

{Photo 3} Using a centerpunch, whack 4 drilling divots into each of 12 circles at 12, 3, 6, and 9 o'clock. I marked mine 4mm in from edge of circle. Use #55 drill bit to drill each hole, keeping drill perpendicular to sheet. Sand or file any burrs.



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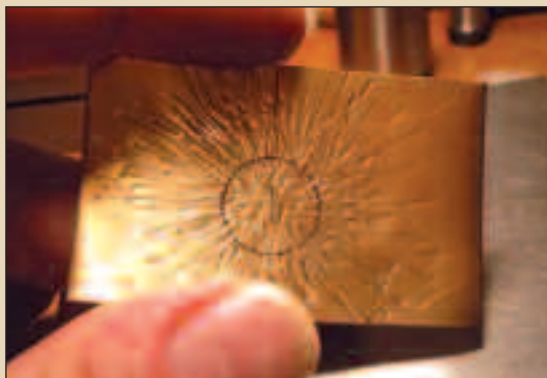
South of the border, artisans work traditional techniques to produce beautiful copper and silver work

MEXICO'S COPPERSMITH VILLAGE

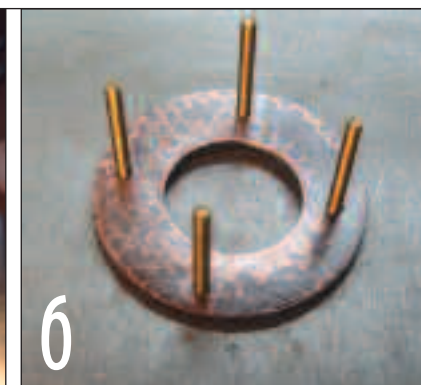
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MATERIALS AND TEXTURE

■ When you test-drive a hammer or punch, save those texture tests in a scrap box – you'll always have pre-textured scraps ready to go. Mark the metal and gauge on the back with a Sharpie. Waste not.



- I used lots of different tools to texture my metal because I have them, but you don't need to – commercially patterned sheet is widely available in silver, copper, and brass.
- Back very thin gauge metal with a plain circle for durability.
- A trip to my hometown hardware store yielded the tubing and rubber O-rings – plus loads of other inspirational materials. Another great source for materials for this project is the HO-scale railroad hobby – I am lucky enough to have two old-fashioned hobby stores in my area that are a fun place to shop for brass and steel microhardware. My 0-80 machine screws were purchased from www.microfasteners.com.
- If you do purchase pre-cut circles and washers, make sure they are not stainless steel, zinc, or some other mystery "hardware" metal – you want solid copper, brass, or sterling, or you won't be able to drill and cut it very easily.



{Photo 4} Bring each of 12 drilled circles to desired finish by sanding and polishing or tumbling. Patina as desired.

{Photo 5} Cut 29 lengths of tubing at 7mm for risers. Lightly file and sand cut edges. Do not remove too much metal. Patina tubing risers if desired. Set 5 aside for closure.

{Photo 6} Insert 4 machine screws into drilled holes of upper circle. With screws in place, flip work and lay on bench.

{Photo 7} Slide a riser on each of the 4 screws, being careful not to damage threads.

{Photo 8} Place an O-ring into position over two opposing screws and risers.

{Photo 9} Place lower circle onto screws, being careful not to damage threads. Ensure textured side is facing desired direction and O-rings are circling correct risers.

TOOL TIME

- A tube-cutting jig makes quick work of the risers. You can set any predetermined length – which in my case was 7mm – and cut, feed, cut, feed, until you're done. It took me less than 10 minutes to cut all 29 risers for this bracelet!
- If you don't have a circle cutter, you can simultaneously expand both your sawing and fabrication skills by hand-cutting them – or not! Just purchase pre-cut circles – several suppliers carry them in a variety of metals. You'll still have to texture them, though, and cut that donut hole out of the center – unless you buy washers, which already have a hole.
- Always disconnect the sawblade, thread the donut of metal onto the saw, reconnect the blade, and saw outward from the center of the circle. After you cut into your middle finger 2 or 3 times, you will remember the wisdom of this.
- If your machine screws are round-headed, put the heads into a mini doming block to preserve their shape when doing the final riveting.





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{Photo 10} Add a hex nut to each screw. Lower nuts a little at a time and work around circle evenly to drive nuts at approximately same rate. Screws will protrude from back of piece, but do not trim yet.

{Photo 11} Verify positions of screws and O-rings. Set aside.

{Photo 12} Continue constructing units, linking them to O-ring of previously constructed unit as they are completed, and adding a new O-ring to join the next one. End with an O-ring at either end of bracelet. Do not add nuts to last link yet. Set aside.

{Photo 13} For closure, mark positions for drilling divots at 12, 3, and 9 o'clock on upper circle. Centerpunch. Drill with #55 drill bit. Also, punch divots at about 5 and 7 o'clock and drill them.

{Photo 14} Mark position of outer edge of cutting channels for upper circle by positioning completed bracelet next to link for closure. The O-Ring should encircle the 5 and 7 o'clock holes. Make a Sharpie line at perimeter of O-ring.

{Photo 15} Mark a parallel line 3mm from first line (slightly wider than gauge of O-ring).

SIZE AND SHAPE TIPS

- I make a "master" circle and use it as a guide for marking and scribing every circle in the piece. The hole placement then remains consistent from unit to unit, and you only have to slavishly measure once – saving lots of time and effort.
- If you use precut shapes, be mindful of edge distortion when you are hammering on them – you might need to do extra cleanup to keep the edges clean.
- I bevel the edges of every circle with a file for comfort and wearability. If you don't want to file, sand, and polish every circle, do a preliminary cleanup and then tumble them with stainless shot and a drop of dish detergent before assembly – they'll be work-hardened after about 20 minutes, too.
- I have a small wrist and big hands, so 6 units and 1 closure fit me, at approximately an 8" bracelet. If your wrist is larger or smaller, you may need to add or subtract a unit.



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{Photo 16} Lay drilled cut circle over lower circle with edges matching, and transfer drilling marks with fine line Sharpie. Divot and drill lower circle. Polish and patina as desired.

{Photo 17} Cut channel for O-ring closure connection by sawing an opening where marked.

{Photo 18} File and sand edges, taking off any sharp corners. Polish and patina as desired.

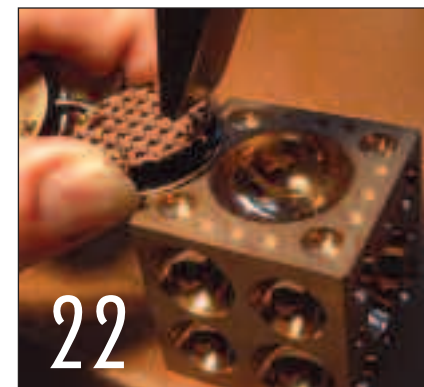
{Photo 19} Assemble by connecting larger section of closure unit to last bracelet link. Position lower circles on both sections. Lower nuts onto last bracelet section and snug them down with nut driver.

{Photo 20} Lower 3 nuts onto closure unit until snug. Attach the smaller section using 2 sets of hardware and risers. Inspect bracelet and test fit of O-ring over smaller section of closure – the O-ring should stretch just enough to go around the 2 risers of smaller section.

When satisfied with layout of units, tighten all nuts on bracelet until tight. Do not force bolts or threads may strip.

{Photo 21} Use heavy wire cutters to clip off excess machine screws, leaving slight stub over bolt. File stub until almost flush with bolt.

{Photo 22} Use riveting hammer to tap down remaining stub and lock in hardware. Lightly file and sand remaining dome of brass until smooth and flush with nut.



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MAKE IT EASIER

- I cut "donut holes" out of the upper circles, but you need not – just face the texture out to the back on the lower circle instead.
- If you don't want to cut out anything, you can buy the circles and washers ready made.
- If you aren't up to making the closure, the rubber O-rings are stretchy enough to make a bangle out of the bracelet instead just by connecting the last link to the first one.

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