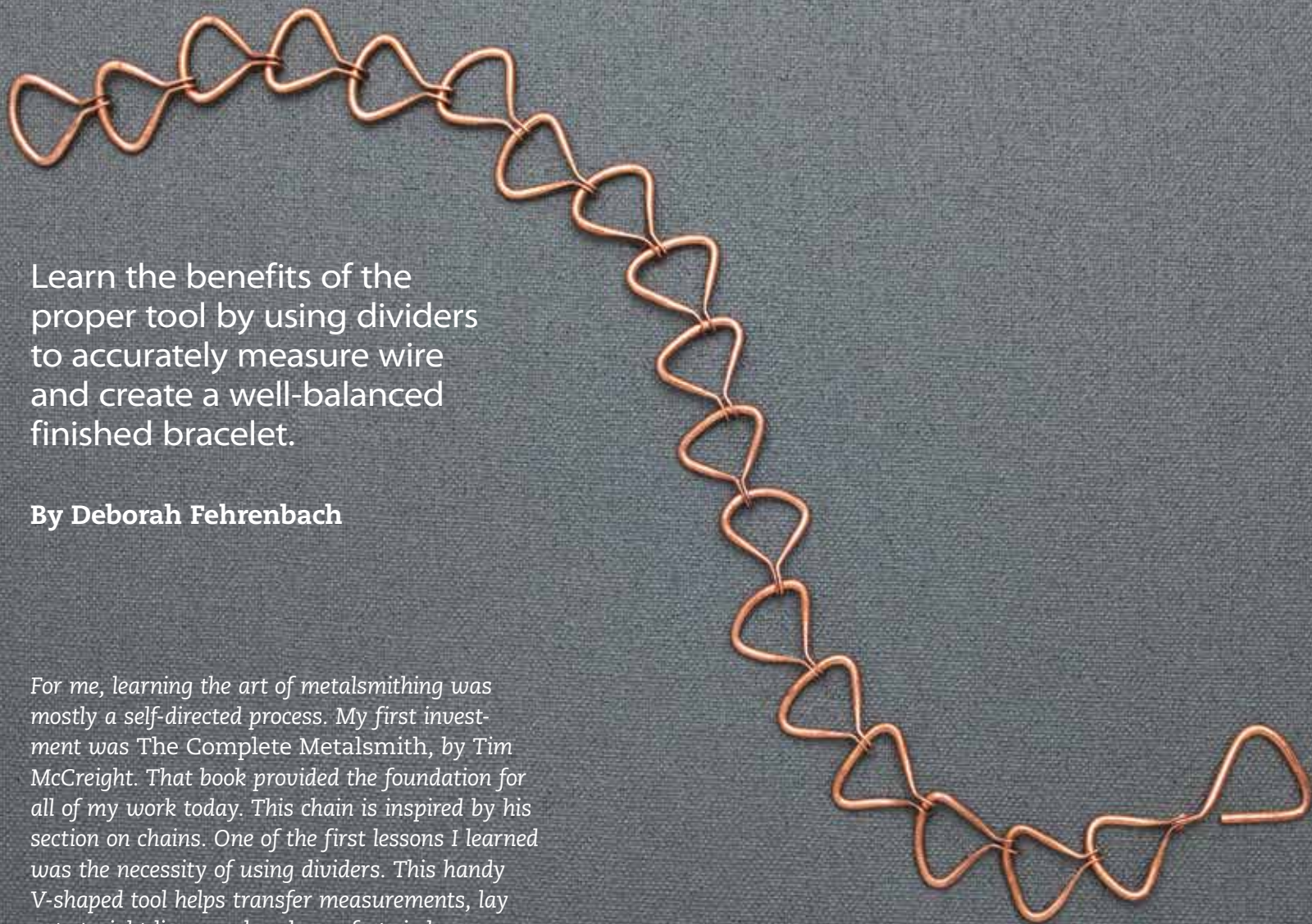


Forged Wire Bracelet



Learn the benefits of the proper tool by using dividers to accurately measure wire and create a well-balanced finished bracelet.

By Deborah Fehrenbach

*For me, learning the art of metalsmithing was mostly a self-directed process. My first investment was *The Complete Metalsmith*, by Tim McCreight. That book provided the foundation for all of my work today. This chain is inspired by his section on chains. One of the first lessons I learned was the necessity of using dividers. This handy V-shaped tool helps transfer measurements, lay out straight lines, and make perfect circles.*



materials

Finished bracelet: 19 cm (7½ in.)

- Copper wire:
 - 16-gauge (1.3 mm), round, 60 cm (23½ in.)
 - 14-gauge (1.6 mm), round, 3 mm (⅛ in.)

tools and supplies

- Metric ruler
- Dividers
- Flush cutters
- Flatnose pliers
- Steel bench block
- Hammers: ball peen, riveting, goldsmith's
- Sanding stick 600-grit
- Center punch
- Flex shaft or rotary tool with #53 (.059 in./1.50 mm) drill bit
- #49 (.073 in./1.85 mm) or larger drill bit
- Bur lubricant or beeswax
- Needle file
- Tumbler with stainless steel shot and burnishing compound or dish soap



Cut the wire for the links. Set your dividers to 30 mm (1⅜ in.) and use them to mark a piece of 16-gauge (1.3 mm) copper wire. Use flush cutters to cut the wire at the mark. Repeat to mark and cut a total of 18 wires.

Bend the wires. Set the dividers to 10 mm (⅜ in.). Scribe marks 10 mm (⅜ in.) in from either end of each wire [1].

Use flatnose pliers to make a 90° upward bend at each scribed mark to form a U shape. Repeat to bend the remaining 17 pieces into matching U shapes.

NOTE: Be consistent with the placement of your pliers when bending the wires. I like to place the pliers' jaws on the inside of the scribed mark, closest to the center of the wire, and bend the shorter

length of wire [2].

Hold a leg of a U-shaped wire component in each hand. Twist one leg 90° towards you [3]. This will give you more room for forging in the next step.

Forge the ends of one wire. Set one end of a wire on a steel bench block and use a ball-peen hammer to forge the end into a 3 mm (⅛-in.) wide paddle [4]. Use a 600-grit sanding stick to round the end of the paddle. Repeat to forge and round the other end.

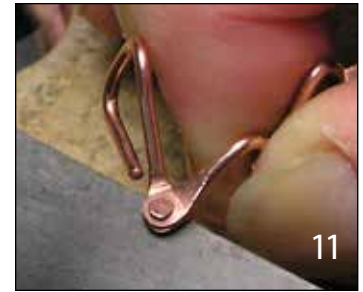
Drill the paddles. Set the dividers to 2 mm (5/64 in.) and scribe a horizontal mark 2 mm (5/64 in.) from the end of a paddle [5]. (To find the center of this line, see

"Find the Center with Dividers," next page).

Use a center punch to make a divot at the center of the horizontal scribed line [6]. Use a #53 (0.059 in./1.50 mm) drill bit in a flex shaft or rotary tool to drill a hole at the divot [7]. Repeat to mark and drill the second paddle. Use a larger drill bit to remove any burrs.

Prepare the additional links. Forge, sand, and drill only one end of each of the remaining 17 U-shaped components. Set these components aside.

Make the first triangle link. Twist the legs of the component with the two forged/drilled ends so that they are parallel and the component lies flat. Slowly bend the legs inward toward the center to form a triangle. Apply even pressure so each leg bends equally. If necessary, use flatnose pliers to adjust the



how to use dividers

Using dividers is the best way to ensure your measurements are accurate. Even a fine-tip marker can throw your measurement off by a millimeter. To use dividers, start with an accurate ruler. Place one tip of the dividers tight against the end of the ruler. Open the dividers until the opposite tip falls on the measurement line you desire. Use the horizontal lines already marked on the ruler as guidelines to ensure the dividers' tips are parallel. Tighten the nut on the dividers to maintain the space between the tips, then use the set distance to mark your metal. Set one end of the dividers tight against the end of the metal and use the other tip to scribe a line.



legs until they are centered.

Use the dividers to scribe a mark 4 mm ($\frac{5}{32}$ in.) from the end of one paddle. Using the scribed mark as a guide, grasp the wire in flatnose pliers and bend the arm 30°. Repeat to mark and bend the other side to form a Y shape. The paddles should be parallel and the holes should be aligned [8].

Connect the remaining links. Thread the unforaged end of one of the remaining 17 components through the holes in the first triangle link.

Hold the newly added link so the straight wire end lies flat on the steel bench block, and forge the end into a paddle [9]. Sand and drill the paddle. Twist the legs so the link lies flat, bend it into the triangle, and then form it to a Y shape as you did with the first component.

Repeat to add the remaining 16 links.

Make the clasp. Mark, measure, and cut a 35 mm ($1\frac{3}{8}$ -in.) piece of 16-gauge (1.3 mm) wire. Use the dividers to scribe one mark 10 mm ($\frac{3}{8}$ in.) from one end of the wire,

and another 15 mm ($\frac{1}{2}$ in.) from the other end. Use flatnose pliers to bend the wire 90° at each mark.

Forge, sand, and drill the 15 mm ($\frac{1}{2}$ in.) end as you did with the components.

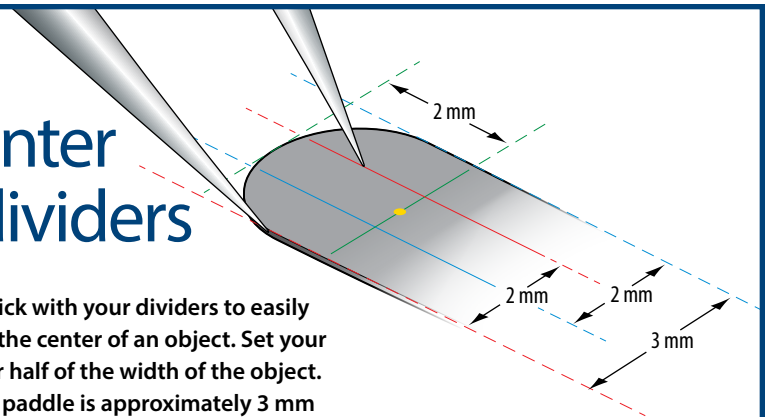
Use a needle file to round the end of the wire near the 10 mm ($\frac{3}{8}$ -in.) mark. Bend the legs of the component to form a triangle. With your flatnose pliers, bend the long end to form a Y [10].

Sandwich the drilled end of your clasp between the drilled ends of the last link. Thread a short length of 14-gauge (1.6 mm) wire through all three holes. Flush-cut the wire so only 1 mm (approximately $\frac{1}{16}$ in.) extends beyond the components on both sides. Rivet the wire in place [11].

Tumble-polish the chain.

find the center with dividers

Try this simple trick with your dividers to easily and quickly find the center of an object. Set your dividers just over half of the width of the object. For example this paddle is approximately 3 mm ($\frac{1}{8}$ in.) wide, so the divider is set to 2 mm ($\frac{5}{64}$ in.). Use the dividers to scribe a mark from each side. Find the center between the two scribed lines.



Deborah Fehrenbach's goal as a designer is to create jewelry forms that produce energy and excitement for the wearer. Predominantly self-taught, she works in her Michigan studio, and will often mix traditional techniques with the unconventional. Her work has been featured in multiple publications, and various Lark Books publications. Her award-winning designs are exhibited internationally and throughout the USA.



take it further: make matching earrings

Cut three 30 mm (1 $\frac{3}{16}$ -in.) pieces of 16-gauge (1.3 mm) wire. Follow the same steps as for the chain to make a two-link section.

Forge the third link's paddles so that they are in the same plane as the triangle, instead of perpendicular to the triangle as in the chain.

Forge one paddle, thread the unforged end through the two-link section, and then forge, sand, and drill the second paddle.

Bend the arms of the third paddle toward the center to make a triangle. Align the holes, and add an ear wire.

Repeat to make a second earring, then tumble-polish both earrings.

