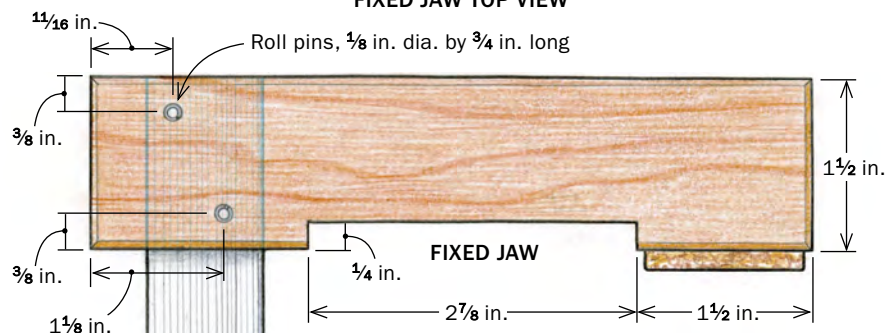




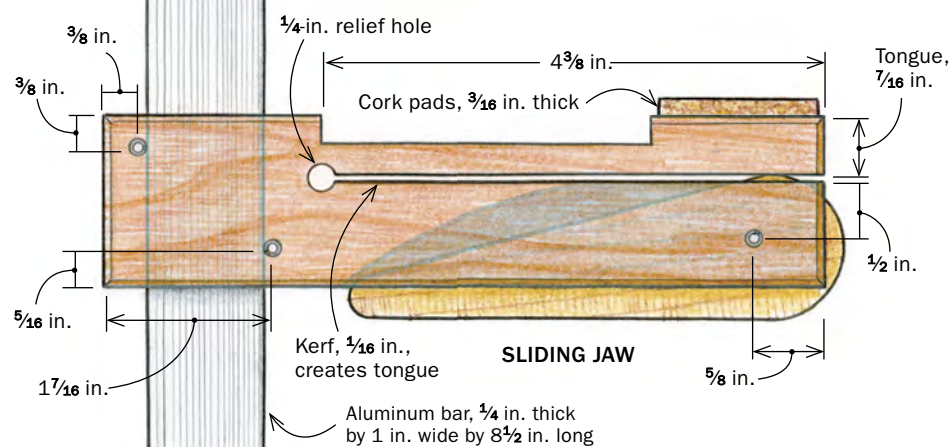
FIXED JAW TOP VIEW



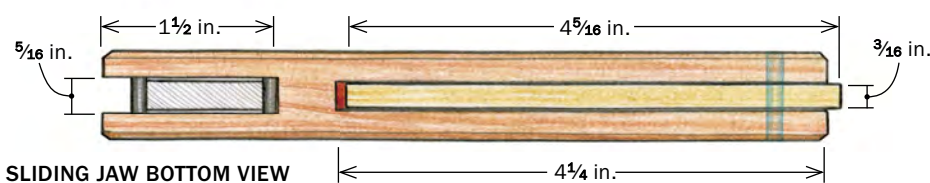
FIXED JAW

Shopmade Cam Clamps

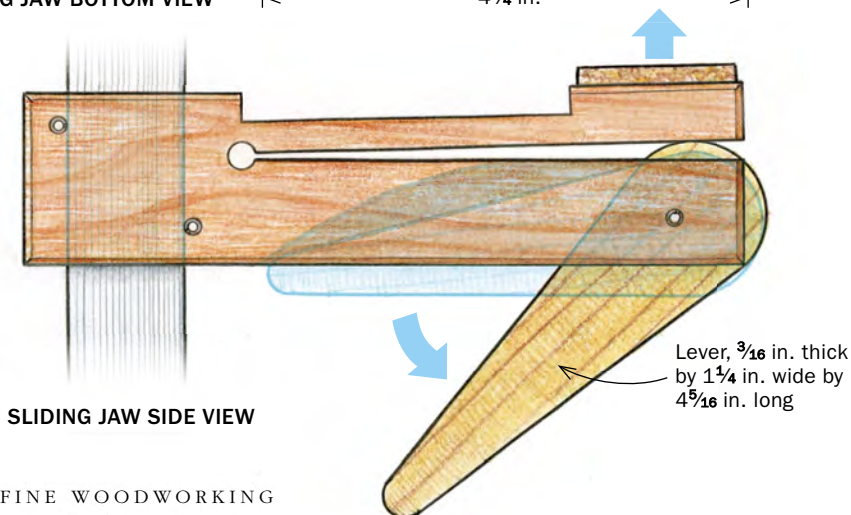
Handy, light-duty clamps are quick to make



SLIDING JAW



SLIDING JAW BOTTOM VIEW



SLIDING JAW SIDE VIEW

As a luthier, I always need a lot of clamps that apply light, firm pressure, and these little cam clamps are the perfect tool for the job. They come in handy with furniture, too, any time you need to hold a couple of small parts together.

The clamp's mechanism is simple. The lever applies pressure on the tongue, which tightens on the workpiece. The lever's pivot pin is off center, creating a cam action, so the lever exerts more pressure the farther you pull it. Two pins then lock against the metal bar to keep the sliding

BY NATHAN MURPHY

jaw from moving. The clamps don't apply huge pressure, but it's enough that you don't want to clamp your fingers in them (I know from experience). Cam clamps can cost close to \$20 apiece; I make them myself for about a tenth of that.

A stack of blanks

I begin crosscutting the jaw blanks to length at the chopsaw. The sliding and fixed jaws are the same length, so you have to measure only once. Cut the aluminum bar stock to length at the chopsaw now too. I get this stock from Online Metals (onlinemetals.com).

You can use almost any wood for these cam clamps. I've had success with oak and cherry. Whatever you use, try to look for straight-grained pieces and mill it so the grain runs vertically on the ends. Knots, grain runout, and horizontal grain can weaken the jaw. Grain direction is less critical for the lever.

I generally like to cut more blanks than I plan to use, because some of them will end up as test pieces for setting up to drill the pins.

Next, make the recess in the middle of the blanks to leave space for the jaws to



ALL JAWS



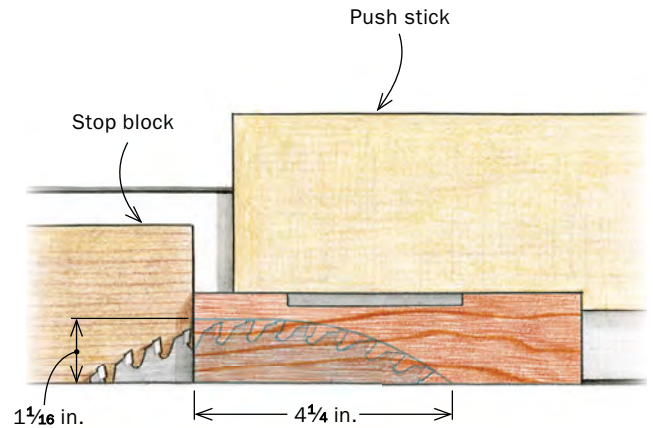
Time for recess. Nibble out a recess on the tablesaw using a crosscut sled, sliding the workpiece back and forth between stop blocks.



Slot for the bar. Use a tenoning jig to cut the bar slot. Rotate the workpiece after the first cut and take a second pass to center the slot. Aim for a $\frac{1}{32}$ -in. gap.

SLIDING JAWS

Cut a slot for the lever. This is a stop cut with small parts, so work carefully. Use a featherboard, push stick, and zero-clearance insert, and shut off the saw after each cut before removing the workpiece.



Create the tongue. At the bandsaw, make a stopped cut, locating the kerf at the top of the lever slot (right). A 1/4-in. relief hole drilled at the end of the kerf (far right) helps prevent splitting when you tighten the clamp.



Drill for the pins. Because this jaw will slide, drill these holes outside of where the bar will lie. For repeatability, Murphy uses a spacer block for one hole, then removes it and flips the jaw over to drill the second hole.



grip while tightening. I nibble out the waste on a tablesaw with a crosscut sled.

When cutting the slots at the back end of the jaws for the aluminum bar, raise the tablesaw blade to 1 1/2 in. Even though the bar is only 1 in. wide, the slot should be deeper to leave room for the roll pins you'll install later. Also, make the slot 1/32 in. wider than the thickness of the bar to let the movable jaw slide. Afterward, chamfer the edges of the jaw.

Separate the blanks into two piles, one for the fixed jaws and the other for the sliding ones. From now on you'll work on them separately.

Sliding jaws have bite

The sliding jaws require two more cuts: a slot for the lever and a bandsaw kerf that creates the flexible tongue. I first cut the slot for the lever. Using a 1/4-in. dado blade, set up a stop block and featherboard to make the stopped cut. Then turn off the saw, wait for the blade to stop, and back the jaw out of the cut.



Cut and shape the levers. Aim for a teardrop shape that's flat along its sides. Rough out the levers on the bandsaw (far left) before refining them on a belt sander. Avoid flat spots along the curve.

Cut the kerf for the tongue at the bandsaw, aligning your entry with the top of the lever slot. Don't cut so far back you run into the bar slot, or the clamp will be prone to splitting. Drill a hole at the end of the kerf to relieve the tension on the jaw.

For the levers, I first make a master, aiming for a teardrop shape that's flat along its sides. Once done, this lever becomes the template for the others.

If you want to sand your clamps, now is the best time.

Add the pins

I get the 1/8-in.-dia. metal roll pins, sometimes called slotted spring pins, from Fastenal in 3/4-in. lengths. These get hammered into each jaw. The sliding jaw gets three, two at the back and one through the lever. The rear two should be spaced so the jaw can slide



Pivot point. A roll pin acts as the axle for the lever. Hold the lever in place while you drill these holes.



Put a pin in it. Hammer the roll pins in carefully, especially at the slot for the aluminum bar (far left). Have the lever in place when you pound in its pin (left).

FIXED JAWS

Cut the bar to length. Murphy uses a standard miter saw and blade to cut the aluminum bar, but a hacksaw would handle the job as well. File the ends smooth afterward.



along the aluminum bar but still lock at 90° to it when clamping. The third pin allows the lever to rotate, so drill for it with the lever blank in its slot.

The fixed jaw gets only two roll pins. These fix the jaw to the aluminum bar, so drill through the jaw and bar together.

Finishing touches

With the pins in, the clamps are functionally finished. Still, I add cork to the jaws to improve the grip and to help prevent marring a workpiece. Another option is to install a rivet at the end of the bar to keep the movable jaw from sliding off. I don't do this, however, because if I'm trying to clamp inside a hole or some other awkward spot, it helps to be able to take the clamp apart and put it back together. □

Nathan Murphy is a luthier in Madison, Ind.

Bore for the bar. You want to lock the aluminum bar into the fixed jaw, so drill through both wood and bar simultaneously. Again, a fence and spacer help speed up the process (right). Pound the two pins into place (below) to keep the bar fixed to the jaw.



Cork cushions. Murphy glues small pieces of cork to the jaws to keep them from damaging his workpieces. To clamp the cork in place, simply close the jaws on themselves.