

Shopmade Cam Clamps

Inexpensive, easy to make and handy

by Steven Cook



Built from scrap, these clamps are good for light- and medium-duty work.

A while back, I was hired to replace the veneer on a Steinway grand piano that had been damaged in a fire. Veneering the sides required more clamps than I owned or could afford. But I remembered facing just such a situation when I was an apprentice to a pipe-organ builder. Armed with a Swedish-made cam clamp as a prototype, we churned out a batch of 50 clamps before quitting time.

I was working alone, so it took longer to make the clamps I needed. But I used wood from the scrap bin and aluminum from the junkyard, so I spent next to nothing.

I use these clamps for jigs and fixtures, anchoring a workpiece to a bench for routing and laminating wood strips around a form. You just have to keep in mind that they don't exert a lot of clamping pressure.

How the clamps work

These clamps are a variation of a standard screw-bar clamp. One jaw is pinned to the end of the bar, and a sliding jaw moves along the bar to adjust the clamp opening. Rather than using a screw to exert pressure, the clamps use a cam. The sliding jaw is kerfed, as shown in the drawing, allowing the jaw to flex when the cam is rotated. To use the clamp, simply squeeze the clamp jaws together with hand pressure, and rotate the cam.

How to make them

My standard cam clamps are made from scrap blocks of maple, oak or some other dense hardwood about 8 in. long by 1½ in. wide by ¾ in. thick. You can make the jaws longer or shorter to suit your needs.

The weak part of the clamp is the end grain at the tail of the jaws where the pins connect the jaws to the bar. The fixed jaws are pinned into the bar, and the sliding jaw has pins on either side of the bar. As pressure is applied, the pins want to split the end grain of the jaws. To prevent this, make sure the tail end of the jaws extend beyond the bar by at least ¾ in. If they don't, the clamp will fail.

I use ⅛-in. by 1-in. aluminum for the bar, which I get at a scrap dealer or from the local hardware store. To some people, this stock may seem light, but I've never bent one. With the bar only ⅛ in. thick, it's easy to kerf the jaws in the tablesaw with a tenoning jig. Make the kerf wide enough for the sliding jaw to move freely.

If you're going to make a big batch of



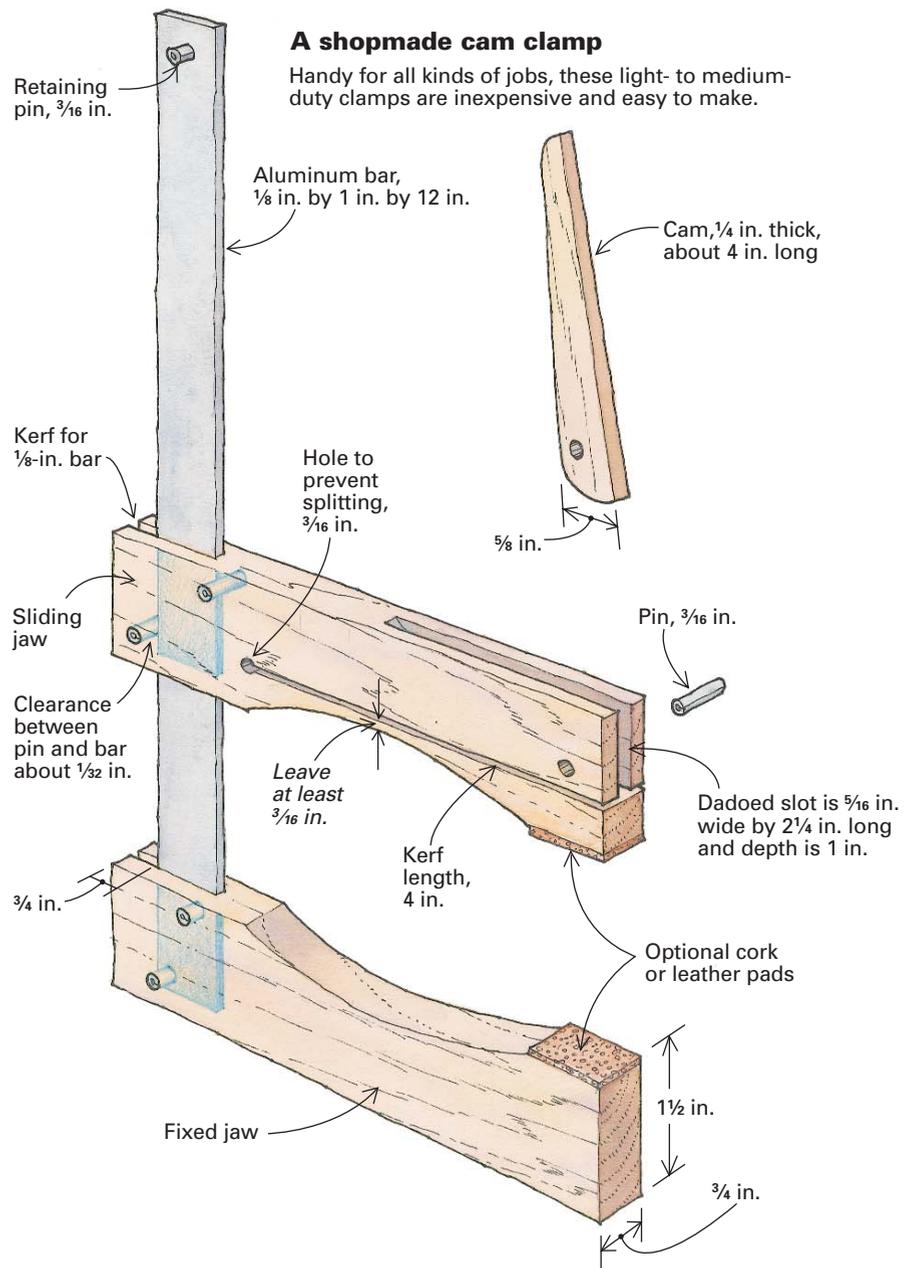
A simple jig makes plunge cutting the bar kerfs fast and safe.



A stopped block clamped above the dado cutter controls the cam-slot length.



A 3/16-in. hole prevents kerf from splitting jaw. The cam pushes the kerf open, forcing the pad against the workpiece.



clamps, you might try something like the simple plunge cutting jig shown in the top photo. With it, I can safely and easily cut the bar kerfs for a pile of clamp jaws in no time. After kerfing the jaws, cut out the curved waste on the bandsaw.

I drill through the fixed jaw and bar in one shot and take care to locate the pins as shown in the drawing. If they are reversed, the clamp won't hold. On earlier batches, I used nails for the pins, but some of them bent under load. Now I buy 3/16-in. by 3/4-in. roll pins in bags of 100 at the hardware store. They are quite a bit stronger than nails and are already cut to length.

Before dadoing the sliding jaws for the cam, I make up the cams, as shown in the drawing. Because they take more abuse than the rest of the clamp, cams should be

made from a strong wood. I use maple. Dado the slots, and then cut the kerf that allows the jaw to flex, as shown in the bottom photo at left.

The correct clearance of the pins on the bar in the sliding jaw is about 1/32 in.—too tight and the jaw won't go on the bar; too loose and the jaw won't slide easily. Make a jig for drilling the holes, and test it before you make up a whole batch.

Drill for the cam-roll pin by holding the cam in the disengaged position (the jaw is not flexed), and drill through them both at once and set the pin. The last step is to install a retaining pin at the end of the bar. Now you're ready to go to work. □

Steven Cook builds furniture and musical instruments in Edmonds, Wash.