# SHOP NOTES: Making a Finger Plane

**1** It's a remarkably simple tool with just a few parts of wood and metal.

- The ***plane iron*** is a small piece of tool steel, 3/32" to 1/8" thick.
- The wooden parts include the ***frog***, which supports the plane iron, the ***wedge*** which secures it in the plane, and the ***finger rest,*** which is used to push the plane. Together, the frog and the finger rest make the bottom or ***sole*** of the plane, and the gap between them is the ***throat***. These parts should be made from a very hard, dense wood, such as wenge or rosewood. I've used cocobolo.
- The ***sides*** are 1/8"-thick brass. The ***wedge pin,*** which provides a fulcrum for the wedge, is a 1/8"-diameter brass rod. There are also four 1/16"-diameter brass pins that serve as ***rivets*** to hold the metal sides to the wooden frog and finger rest. You can purchase the brass at a hardware store or a hobby shop.

**2** Cut the wood and brass parts on a band saw, using a 1/8" blade with standard teeth. Don't use a skip-tooth or a hook-tooth blade; these are for wood only. A standard-tooth blade will serve well for cutting both wood and non-ferrous metals such as brass.

**3** You'll find that many of these parts are too small to be easily (or safely!) manipulated on the band saw. Instead, mount them on a large scrap of wood with double-sided carpet tape and cut both the part and the scrap at the same time. To keep the tiny parts from dropping down into the bowels of your band saw, cut a kerf in a thin scrap of plywood and position it so the kerf straddles the blade. This serves as a "zero-clearance" table top – there's very little clearance on either side of the blade and no room for the parts to fall through.

**4** Cut the brass pins to length edge with a file – I used a microfile. If you have one, you can also use a small hand-held grinder with an abrasive cut-off wheel.

**5** Drill 1/8"-diameter holes in the sides for the wedge pin. Stack the sides face to face, insert the wedge pin through the holes to keep them from shifting, and clamp them together with a locking pliers. File or grind the top, front, and bottom edges so both sides

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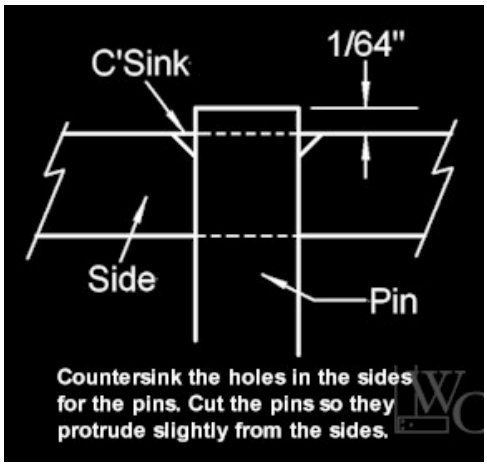
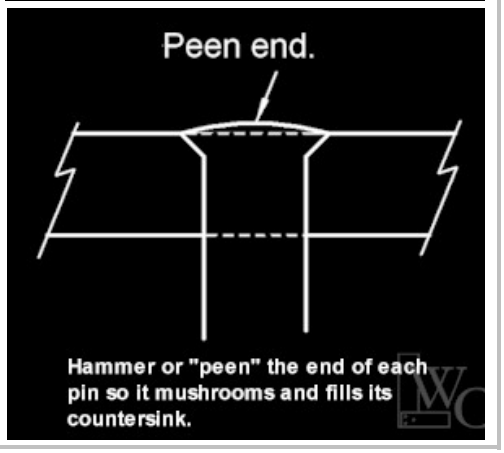
| | have exactly the same profile. |
| **6** | Cut the plane iron to size using a grinder or abrasive saw. I made this plane iron from a machinist's "cut-off" tool. You can buy these from suppliers of metalworking tools. Or you can use an old jointer knife or an old chisel. Just make sure that the metal you use is high-carbon tool steel and that it will hold a sharp edge. After cutting it to size, square the ends on a grinder or sander, then grind a rough bevel on one end. The cutting bevel of the plane iron must be 3º to 5º less than the angle of the frog so you have a clearance angle when you plane. |
| **7** | Round over or "relieve" the inside top edges of the side with a file or drum sander, then polish the relieved edges with very fine abrasives. This will make the plane more comfortable to use; there will be no sharp corners biting into your finger. |
| **8** | Sand the supporting surface (the edge that supports the plane iron) of the frog, making it perfectly flat. Also create a depression or "divot" for your finger in the finger rest. You can make this divot by carving it, drilling the stock with a fluting bit for a router, or grinding it with a 1/2" drum sander. |
| **9** | Mark and drill the holes for the rivets in one side. Assemble the frog, finger rest, and sides with cyanoacrylate (CA) glue, using the wedge pin to keep the sides aligned. There should be a 3/16" to 1/14" gap between the back edge of the finger rest and the front point of the frog. This will form the throat through which the plane iron protrudes. (The precise size of the throat will depend on the thickness of the plane iron.) |
| **10** | After the glue cures, drill the rivet holes through the finger rest, frog, and remaining side. Measure and cut the rivets to length, then lightly file or sand the ends to flatten them. Using a hand countersink, cut tiny countersinks around the outside diameters of the rivet holes and the wedge pin holes. Insert the rivets, rest the plane assembly on its side on an anvil, and lightly tap the upper end of each rivet with a small hammer. As you tap, both ends of the rivets will swell and mushroom, filling the countersinks and wedging themselves in the sides. Install the wedge pin in the sides in the same way. |
| **11** | Sand or grind the sides so the rivets are flush with the brass surfaces. Also sand the front edge of the finger rest and the back edges of the frog and the sides so that both the nose and the rear of the plane are rounded. |
| **12** | Rough-fit the plane iron and the wedge in the plane. The cutting edge of the plane iron must be perfectly parallel to the sole of the plane. If not, you may have to regrind the bevel. Sand an angle in the wedge stock so when the wedge is inserted under the wedge pin with the iron in place, (1) the lower |



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| | (narrow) end stops about 1/32" from the cutting edge of the iron and (2) the upper surface of the wedge makes contact all along the length of the pin. | |
| **13** | Sharpen the plane iron and polish the metal surfaces of the plane. If you've made the wooden parts from a wood species that requires a finish, apply one. The cocobolo shown here is so oily that I saw no reason to mess with a finish. | |
| **14** | Rest the plane flat on a wooden surface. Insert the plane iron in the plane so the cutting edge rest against the wood. Lightly press the wedge in place, then back the plane iron out about 1/16". Press the wedge down again, making it as tight as possible and locking the plane iron in place. Using a small mallet, tap the upper end of the plane iron until the cutting edge protrudes every so slightly from the sole of the plane. While you doing this, make test cuts on a board. When the plane is shaving paper-thin curls, the iron is right where you want it. | |