Side Escapement Molding Planes

Construction Notes

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A Word on Sources

This document began life as my handwritten notes taken while watching Larry Williams' video "Making Traditional Side Escapement Molding Planes" from Lie-Nielsen. As I dove deeper into this particular rabbit hole, other sources came into the picture and my notes became a combination of these sources as well as some lessons learned as I worked at my own bench. Larry's video remains the main inspiration and should be the first stop for anyone getting in to this work.

Larry Williams, Making Traditional Side Escapement Molding Planes, Lie-Nielsen (video)

Thomas Elliott, *A Guide to the Makers of American Wooden Planes*, (Astragal Press, 2018)

John Whelan, *Making Traditional Wooden Planes*, (Astragal Press, 1996)

William Armour, "Practical Planemaking, Parts I-IV" *Work, The Illustrated Journal for Mechanics* (1898) (republished at: www.handplane.com/32/practical-plane-making-1)

Design Notes

Molding planes had various bed angles for their iron depending on their intended use.

45°- for use in softwood

50° - "York pitch" a compromise between the easier cutting of 45° pitch and the cleaner cut of the higher pitches.

55° - "middle pitch" - recommended by Williams for general hardwood use

60° - "half pitch"

The angle of the wedge is 10.5°

Molding planes standardized around 10" in length. Aesthetic variation lay mostly in the finial on the wedge and the method of terminating the bevels on the upper edges of the plane.

Choosing a Blank

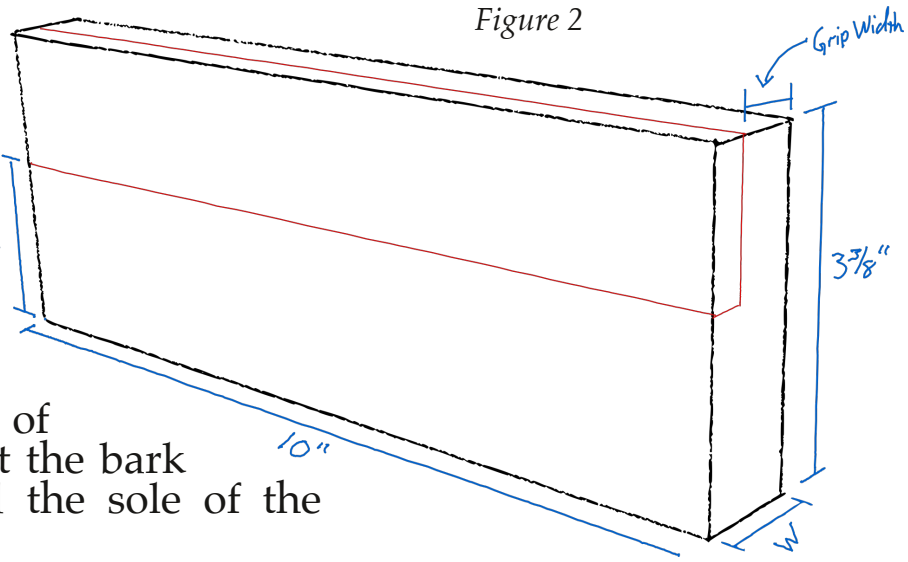


Figure 2

The blank should be as close to perfectly quartersawn as possible for stability. The grain should run very slightly downhill from toe to heal. This prevents having a small section of unsupported shortgrain at the front of the mouth. Lastly, orient the bark side of the tree toward the sole of the plane.

Good woods: Beech, Yellow Birch, Maple, Apple, Pear

Dimensioning

The plane will finish out to 3 ⅜" x 10" in profile. However, leave the blank ~1" overlong at this point. The width is determined based on the size of plane being made and with reference to Table 1 (next page).

Plane the blank true. The blind side of the plane is the best to be the reference face of the blank for subsequent layout because it will not be altered until very late in the process.

Rough the Grip

Lay out and cut out the waste next to the grip according to the dimensions in Figure 2. The offcut can be good wedge stock in larger sized planes.

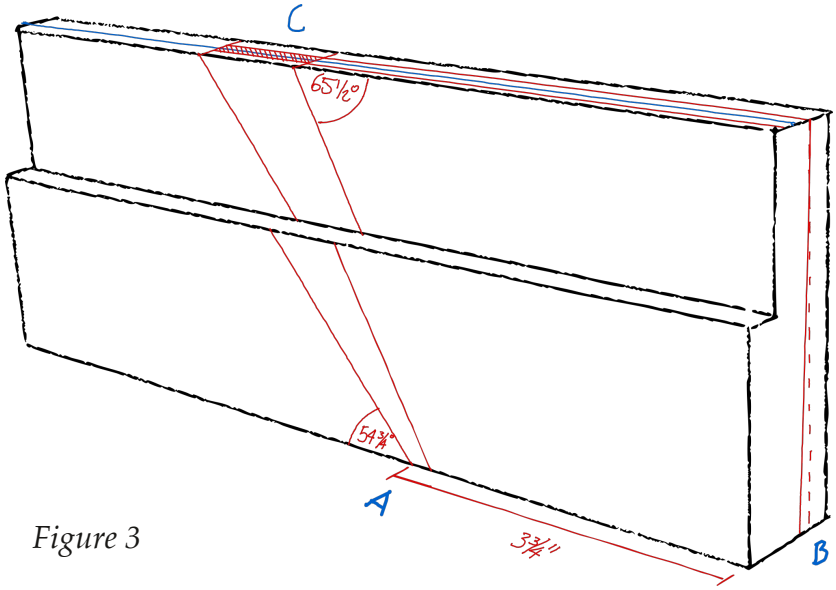


Figure 3

Laying out the mortise

The mouth opening at (A) is laid out directly off of the 1/10" mortise chisel that will be used to clean out the mortise.

The mortise itself is centered in the grip. Lay in a center line (blue). Then define the mortise width from that point based on the wedge thickness in

Hollow & Round Dimensions

#	Width	Grip Width	Wedge Thick.	Iron Width
1	7/16	7/16	1/8	1/16
2	1/2	1/2	1/8 +	1/8
3	1/2	1/2	5/32	3/16
4	9/16	9/16	5/32	1/4
5	19/32	1/2	3/16	5/16
6	21/32	1/2	3/16	3/8
7	23/32	9/16	1/4	7/16
8	25/32	9/16	1/4	1/2
9	7/8	19/32	9/32	9/16
10	15/16	5/8	9/32	5/8
11	31/32	5/8	5/16	11/16
12	1 3/32	23/32	5/16	3/4
13	1 7/32	23/32	3/8	7/8
14	1 11/32	25/32	3/8	1
15	1 15/32	27/32	7/16	1 1/8
16	1 19/32	7/8	7/16	1 1/4
17	1 23/32	15/16	1/2	1 3/8
18	1 29/32	1	1/2	1 1/2

Table 1 — data compiled by Larry Williams

Table 1. Extend the mortise lines all the way along the top of the grip.

At (B) the dotted line is the blind side of the mortise (C) taken straight down the toe. That's not what we want. Move the bottom end of the line ~ 1/8" to center. This creates a "leaning wedge" and strengthens (thickens) the blind side of the mortise. Perhaps obviously, skip this on plane widths too narrow to have a shoulder: #4 and smaller.

Fig. 4 - wedge planing fixture

Take this line along the sole, where it will establish the blind side limit of the saw cut for the mouth.

Making the Wedge

The angle of the wedge is 10.5°. Decide on a finial shape and draw it on the wedge blank, or trace from template or existing wedge. See examples in Figure 3.

Cut the wedge out with a coping saw and birdsmouth, scroll saw, or chevalet (I mean if you've got one, might as well use it...)

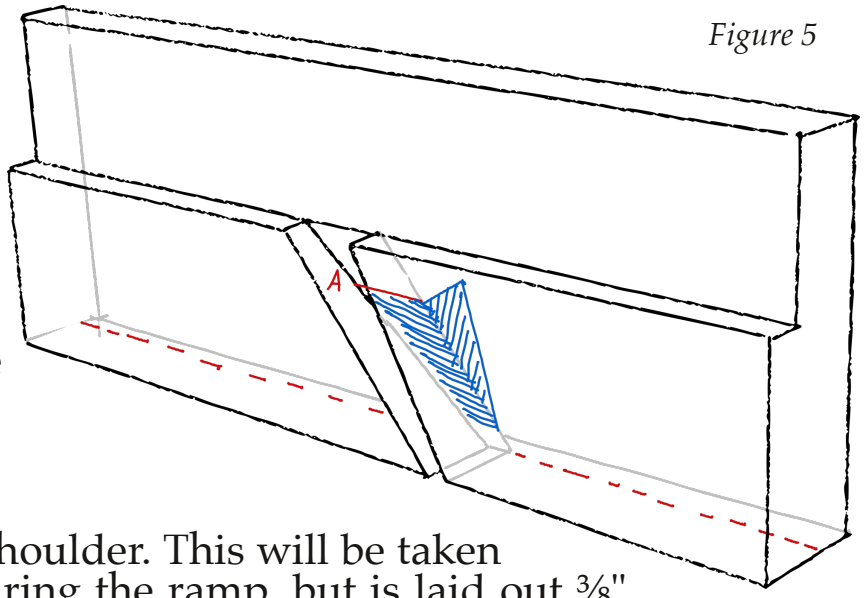
Using a planing fixture (Figure 4) carefully bring the wedge to precise, and even, thickness. Check regularly with dial calipers. Thousands matter here.

Saw the Bed and Breast

Using a gauge block carefully saw the bed and breast, taking care not to saw into the grip or past the layout line on the sole.

Remove the waste between the saw kerfs with a chisel to achieve the form in Figure 5.

Figure 5



Excavate the Mouth Cavity

Lay out (A) ⅜" below the shoulder. This will be taken back to ¼" when finally paring the ramp, but is laid out ⅜" from the shoulder to allow rough work to be done. Chop the bottom of the ramp at (A) with an appropriately sized chisel.

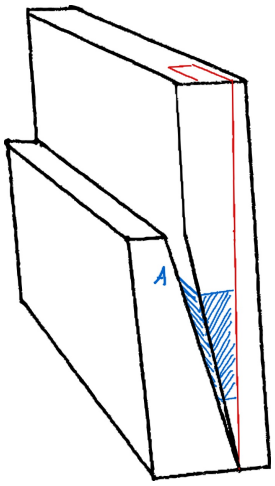


Fig. 6 - cut away

The goal is to remove the blue shaded area in Figures 5 and 6. This is done by alternately chopping across the escapement at (A) and, using the bed and breast as references, chopping down to define the edges of the mouth cavity. When chopping along the bed and breast, tip the chisel back (out of plumb) a little bit to avoid undercutting either face. This slight out of squareness is easily cleaned up later with floats, but undercutting will require altering the layout or geometry of the mouth to remedy. Also, avoid chiseling too close to the mouth or you risk intersecting the yet-to-be cut blind-side bevel.

Drill the Mortise Extents

Excavate the Mortise

Mortise chisel, floats, square the edges.

Fit the wedge.

Bed the Iron

Profile the Sole

Blind Side Bevel first

Carve the Ramp

Turn the wedge backwards to support the lower edge of the ramp. Sever the breast and bed edge of the 1/8" excess that is hanging out first. Then pare it back to 1/4" below the shoulder.

With 3/4" chisel define the edges of where the ramp is going to be, cutting at a bit of an angle to approximate the finished angle of the ramp.

Williams recommends a chisel with ~15° skew to it for paring the final surface of the ramp. Pare it back to get a single plane from top to bottom, crisp, ending flush with the grip at the top and near a knife edge at the bottom.

Figure 7 - the ramp

Adjust the Wedge for Height

Before starting, file off the top corner of the iron blank to protect the ramp.

We want a 2 7/16" reveal on the wedge. Fit the iron and wedge to plane. Then mark current top of the plane body on the wedge. Mark 2 7/16" down from the top of the wedge.

Match the Iron to the Sole

Heat Treat