Benchtop Spill Plane

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Introduction

These plans are for the benchtop spill plane that Roy Underhill showed in *The Woodwright's Shop* during the 2002 season of the show. Spill planes are used to generate "spills," which are long, tightly curled shavings used before matches to transfer fire from the fireplace to a candle or pipe. This particular spill plane is affixed to your bench and a scrap of wood is run across the top, producing spills out the right side.

Cut List

Qty	Description	T	W	L	Notes
1	Plane body	2	4	14	Groove run across the top, 5/8 inches deep, 7/8 inches wide. Throat cut according to plans.
1	Wedge	2	2	5	Wedge sawn to shape, trimmed to fit.
1	Iron	1/16	1	5	Iron formed from an old saw blade, ground with a 30° bezel.

All dimensions are in inches. The third item is steel, not wood!

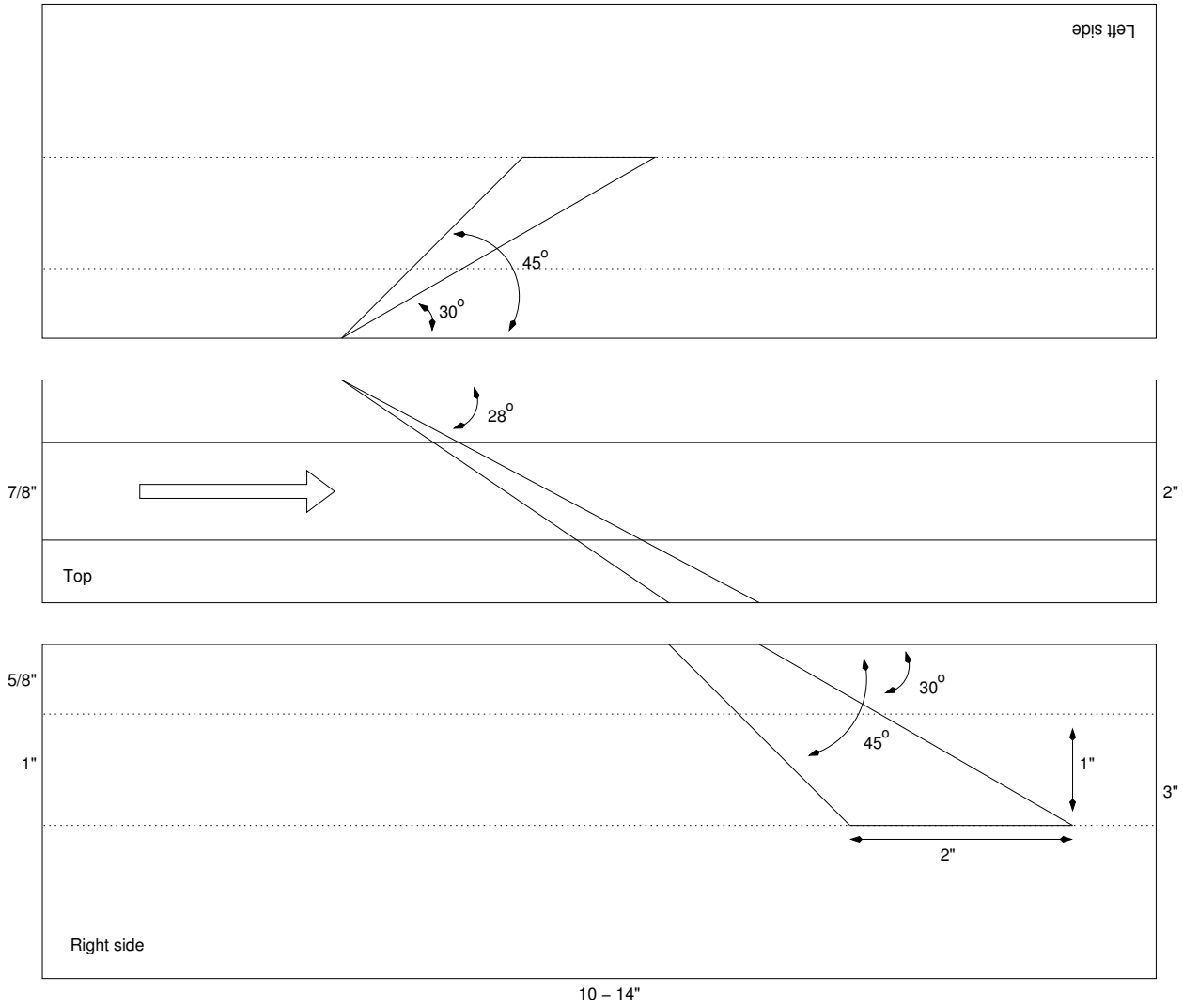
Tools Used

Tool	Uses	Substitutes
Saws		
Atkins, 8 tpi crosscut	· Cutting plane body to size	Crosscut handsaw
H. Peace, 5 1/2 tpi rip	· Cutting plane body to size	Rip handsaw
Disston #4 backsaw	· Making cuts to form the throat	Backsaw, filed crosscut
Handplanes		
Stanley #4	· Smoothing all surfaces	
Stanley #6C	· Truing the blank	
Stanley #45	· Plowing the groove	Backsaw and chisels
Stanley #92	· Flattening bottom of groove	Chisels
Lie-Nielsen #164	· Smoothing end grain	Low angle plane
Lie-Nielsen #60 1/2	· Relieving edges	Block plane
Chisels		
Marples Blue chisels	· Squaring throat walls · Removing waste from throat	Any chisel
Miscellaneous		
Starrett folding rule	· All measurements	Your favorite measuring tool
Veritas wheel gauge	· Layout lines	Another gauge, simple ruler
Stanley bevel gauge	· Measuring all angles	Protractor
Cold chisel	· Scoring saw blade for iron	Hacksaw, file
Hand-cranked grinder	· Squaring, forming bezel on iron	Files, stones

Plans

The plans show the body of the plane from the right, top and left sides. The layout proceeds from the bottom figure (the right side), and the layout lines are transferred from the right side, across the top, and then down the left side of the plane. The left side (the top figure) is upside down in the plans to show how the layout relates to the top.

The iron is not shown in the plans, but it sits with the bezel side up and toward the 30° sloping bed. A wedge cut to fit the opening holds the iron in place. The arrow on the plans indicates the direction wood is run down the groove to produce spills.



Construction Notes

*Start by squaring and flattening a large chunk of a hard wood to the approximate sizes shown in the plans. The only dimensions that are critical are the angles shown, and the relationship between the layout lines on the three sides of the body. My plane is 14 inches long, but anything about 10 inches should work for producing smaller spills.

Once you have the blank square, start by plowing a groove in the top of the blank. I used a Stanley #45 multi-plane to make a groove 1/2 inch in from each side. The resulting groove was 7/8 inches wide and 5/8 inches deep. Use a router plane to insure the bottom is flat and even.

Next comes the layout. Starting from what will be the right side of the plane (from the back), make a line parallel to the top, 1 inch down from the depth of the groove. While your gauge is set to this distance, make another parallel line on the opposite side. On my plane, this was a line across the body that was 1 5/8 inches from the top. I used a wheel gauge to strike this line.

Next, set your bevel gauge to 30 degrees and mark a line from the top down to the line just marked with the gauge. This will form the bed that the iron is against, so make sure you leave enough room behind the line to support the iron. The other side of the throat starts 2 inches to the left from the intersection of the horizontal line and the 30 degree layout line. Set your bevel gauge to 45 degrees, and mark the second line starting from this point.

Now turn the body so you are working from the top. Set the bevel gauge to 28 degrees and mark a line across the top, starting from where the 30 degree line strikes the arris between the right side and the top. Use a ruler to connect the 45 degree layout line on the right side, to the intersection of the first line with the opposite edge of the body. At this point you should have an open triangle on the right side of the plane, and a closed triangle on the top.

Finally, turn the body to the left side. Set the bevel gauge to 30 degrees again and mark a line from the top intersection point down to the horizontal line struck at the beginning of the layout process. Do the same thing with the bevel gauge set to 45 degrees. Make sure that the 30 degree layout line is to the back side of the plane, in the same way it is on the right face.

Use a finely set backsaw to cut along these layout lines, down to the depth of the horizontal lines 1 inch below the depth of the groove you plowed. I found it easier to cut the 45 degree line, so I started with that one before tackling the 30 degree line. The 30 degree line forms the bed for the iron, so try to cut as evenly and cleanly as possible.

Chisel out the waste between these lines, and smooth the bottom and sides of this space.

Next, fashion the iron from a scrap piece of saw blade. The iron should be about 1 inch wide, and long enough that it will extend past the body of the plane slightly. I used a cold chisel to strike a line across the blade, and then was able to snap off a section of the blade while held in a vise. Be sure to wear eye protection, and gloves when doing this because metal fragments can snap off, and most of the edges exposed are very sharp. Use a grinder to straighten the cutting edge of the iron, and then to put a 30 degree bezel on the iron. Sharpen the iron using your favorite sharpening method.

Now comes the hard part – forming the wedge that will fill the space in the throat and hold the iron in place. One way to do this is to cut a 28 degree block off the end of a large scrap of wood, and draw the triangle from the larger opening on the endgrain. The bottom of the scrap will sit on the bottom of the opening, and the top will be parallel to the top of the plane (and to the bottom of the wedge).

Cut off the top of the scrap such that the piece is the thickness of the throat opening (1 inch plus the depth of the groove), and mark the opposite side across the newly cut surface (at 28 degrees, parallel to the first cut).

* Some images appear at `http://www.frontier.iarc.uaf.edu/~cswingle/woodworking/jigs.phtml`

Next, extend the lines from the end grain triangle across the top to the same point where this triangle meets on the top of the plane. On the bottom, do the same thing with the triangle formed by the bottom of the throat. At this point you will have a piece of wood with the triangle from the larger opening (the right side) on the end grain, the triangle from the floor of the throat on the bottom, and the triangle on the top of the plane on the top of the scrap.

Use a saw to cut on the outside of these lines. If you leave some of the wood beyond the part that will become the wedge before cutting the wedge free, you will have some material to clamp into your vise. Try to cut at least $1/16$ of an inch on the outside of the lines so you'll have plenty of extra wedge when it comes time to trim it to fit.

Finally, release the wedge by cutting across the sawmarks. Be sure to leave yourself enough material so that the wedge will extend out both sides of the plane.

Use rasps, files, scrapers and planes to fit the wedge and iron into the opening. When you start getting close, trim the top of the wedge down so that it will rest $1/8$ of an inch below the bottom of the groove. This will allow the shavings to slide off the iron, out the larger opening on the right side of the plane.

Once you've gotten the wedge fitted well enough that you can make spills without the iron moving, you're done with the woodworking. I finished my spill plane with a few liberal coats of boiled linseed oil, wiped on and then off after 30 minutes. Each coat dried for approximately 24 hours. I didn't finish the wedge.

Notes

These plans are not complete. The diagrams are not expected to change, but the **Construction Notes** and **Tools Used** sections will be updated as I work on the project in my shop.

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