

Four Planes That Earn Their Keep

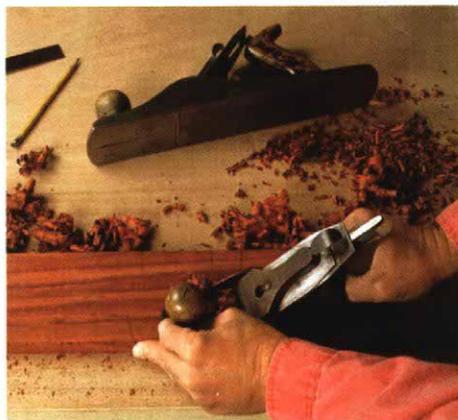
These quiet hand tools belong in any power workshop

by Sven Hanson



After 20 years of mechanizing and jigifying my woodshop, I have to admit that the four planes shown in the photo above are still my most cost-effective tools. Not all by themselves, mind you. But they work as part of a complementary system that capitalizes on the efficiency of machinery and power tools to do the bulk work quickly and on the versatility of hand tools, especially planes, to do fine detail work. The four planes that I use regularly—smooth plane, jack plane, low-angle block plane and bullnose plane—also happen to be my favorite tools to use, period.

The Stanley Co. refined the designs of their cast-iron planes back in the late 1800s. Stanley-style planes, which are now made by a number of manufacturers, still deliver the goods in 1995. Sure, they take some time to master, but so do power tools. You have to set up planes properly and maintain them (see the story on pp. 42-43), but investing a little time here will raise your work to a higher level. Even better, planes are quiet and don't make any



Handplanes complement power tools.

Clockwise from left: a No. 4 for smoothing and flattening, a No. 5 for truing edges, a bullnose chisel plane for cleaning up rabbets and joinery, and a low-angle block plane for chamfering and trimming.

Two versatile workhorses. *The author uses a No. 4 smooth plane to flatten and smooth boards. With its sole waxed and skewed to the work, the plane easily removes millmarks from a piece of padauk. To joint edges, he uses the No. 5 jack plane in the background.*

dust. The joy of using finely Crafted handplanes, woodworkers' mainstays since Roman times, just puts the frosting on the cake.

Integrating planes into everyday shop work

For serious stock preparation, I use a tablesaw, a bandsaw, a planer, a jointer and several routers. Then I turn to my arsenal of planes. I'm not talking about antique, wooden planes here. These are

modern, metal planes, carefully tuned to have flat soles with sharp, well-bedded blades set at the right depth of cut.

The Stanley Co. assigned numbers to their various planes, Bench planes started with a No. 1 (the smallest and least common) and ended with a No. 8 jointer plane, which is the largest. Numbers higher than eight just identify the type of plane and do not indicate size. In everyday shop work, I use a No. 4 smooth plane to level and smooth surfaces, a No. 5 jack plane to joint edges for glue-up and a No. 90 bull-nose plane to clean up rabbets and bevel inside corners.

I also use a low-angle block plane (Stanley No. 60½) as a utility player. It's great for one-handed jobs, like planing end grain, chamfering and truing. And it's great for getting into tight places. I like it for smoothing certain difficult woods, too. Here's the way I use each of the four planes in my normal work:

Use two smooth planes: one for flattening, one for smoothing—I once tried to save six cents per board foot by buying unsurfaced boards and planing them to the right thickness with a scrub plane. After my arms turned to rubber and I was soaked in sweat, I decided to skip the scrub plane. It's much easier to buy surfaced lumber that's already fairly flat and smooth and consistent in dimension, color and grain pattern.

I still use a plane to do a little hogging, though. Once in a while, I use my No. 4 Bailey (a high grade of Stanley) smooth plane fitted with a thick, spare blade that has its edge rounded, like the tip of an adze. (See the box at right to learn more about thicker irons.) I grind and hone this plane iron at the usual 25° to 30° bevel, and by moving the frog and the iron, I adjust the throat (the opening formed by the edge of the blade in the mouth of the sole) so that it's fairly wide.

For general planing, however, I use two planes: a "roughing" smooth plane, which has the throat ⅛ in. open and the cap iron set back ⅓ in. from the edge of the blade, and a "finishing" smooth plane, which has a ⅓ in. or smaller throat and the cap iron set ¼ in. or less back from the blade edge.

When making heavy cuts, like flattening a board, I skew the roughing plane to the grain to make a slicing cut. Because I slightly crown the edge of the blade in this plane, there's less contact with the wood. This, combined with the skew, makes for relatively easy work and minimal tearout.

I find smooth planes especially handy in two common situations. The first is where two pieces of wood intersect—as they do in a door frame. I plane the adjoining surfaces one at a time until they are flush. The other is when I'm taking down high spots to get an even surface. For both of these jobs, I use the finishing smooth plane, fitted with a blade set for a light cut. Because the frog is adjusted for a small throat, it supports the blade edge. Tak-

Buy a thick blade to stop chatter

More than one authority on hand-planes has said that the route to clean planing is paved by a thicker blade. After trying several of them, I have to agree. Even if a thick iron is poorly seated to the frog, the iron's greater thickness reduces vibration and, hence, the stuttering that you often get with a thin blade as it skips across the wood.

Thick blades used to be the norm. Some of the earliest ones were tapered in thickness over their length. Luckily, you can still get thick antique blades, which offer the advantage of laminated construction. Old blade forgers put a layer of very hard but brittle steel on the top of the blade over cheaper, softer and more flexible steel. This yields a heavy blade that holds its edge for a long time.

Hock Handmade Knives offers new, thick replacement blades in a variety of sizes (available from Garrett Wade, 161 Avenue of the Americas, New York, NY. 10013; 800-221-2942 or Frog Tool Co., 700 W. Jackson Blvd., Chicago, Ill. 60661; 800-648-1270). You can find thick antique blades at auctions, tool swaps and flea markets.

But antique blades usually need work, such as removing rust pits, flattening the backs and sharpening. Also, you may have to narrow the iron to fit a new plane body or extend the cap-iron screw slot. But boy, can these irons cut and last. —S.H.

ing the time to make these adjustments makes the plane easy to push and produces a smooth finish. The drawing on p. 42 shows what happens when the plane is adjusted correctly.

With the finishing smooth plane, I leave the cutting edge straight, but I round just the corners of the iron so they don't dig in. I skew the plane slightly and use shallow strokes in overlapping passes, which reduces tearout when I have to plane across or against the grain. I use slight pressure at the front of the sole during the start of a cut and shift pressure to the back as I finish. I do this to prevent rounding over the ends of the work. I'm actually lifting the heel and then the toe. To picture this, visualize the board from the side, and work as if you were planing a hollow in the middle by easing up on each end of the cut.

Regardless of which type of smooth plane I'm using, I hold the plane firmly without strangling it by the handles. Your hands can't feel what's happening if you use a death grip. Use a lighter grip, and let your fingers help guide the plane. To plane the edge of a board, wrap your fingers part way around the plane, and touch the sides of the wood. Use your fingers as a fence (see the bottom photo on the facing page). To plane wide surfaces, rest your thumb on one side of the plane and fingers on the other. You can point your forefinger in the direction you're planing. If you aren't getting a good shaving, then expose less blade or sharpen it.

A jack plane with a crowned blade is great for edge-jointing—The jack plane, slightly longer than a smooth plane, probably got its name from either jack-of-all-trades or a mule. From either origin, you get the idea that this tool is a hard worker.

Most furnituremakers take a No. 7 or No. 8 plane to joint edges because they are long (over 20 in.) and heavy. I prefer a No. 5, 14-in.-long jack plane for this task. It takes more trial fitting of the boards, but the jack is easier to handle. You could even substitute a smooth plane for jointing, but it is a bit short. In any case, you'll need a blade profile suited to jointing, not smoothing.

The blade for jointing should be crowned so that the middle of the edge is about .01 in. higher than the corners. I've tried other shapes and found that an iron without a crown wanders like a car without a steering wheel.

There's another reason to crown the blade. To correct the edge of a board that's out of square with a straightedge blade, you have to choose between angling the blade to the sole or tilting the plane to cut down the high side of the edge.

It's hard to tilt the tool freehand such a small amount. Likewise, it's not easy to angle the blade in the plane accurately (I angle it the wrong way half the time). But if you use a crowned blade, you can correct a beveled edge by planing with one side of the iron on the high side of the board. With practice, you can straighten a twisted edge in a pass or two. Once you learn the right body English, you'll

Five steps to tune your plane

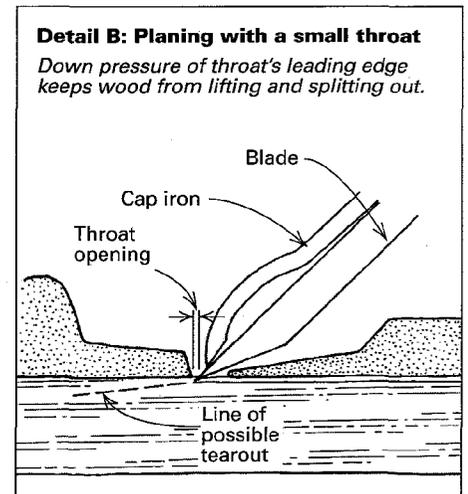
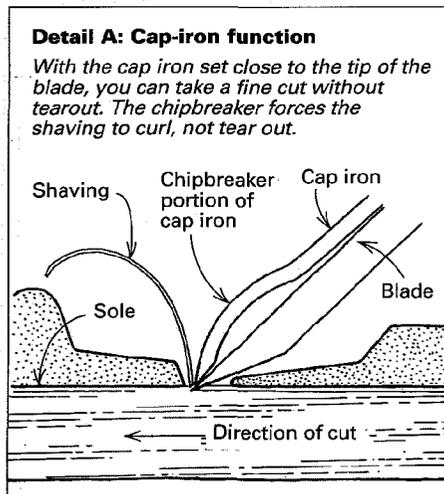
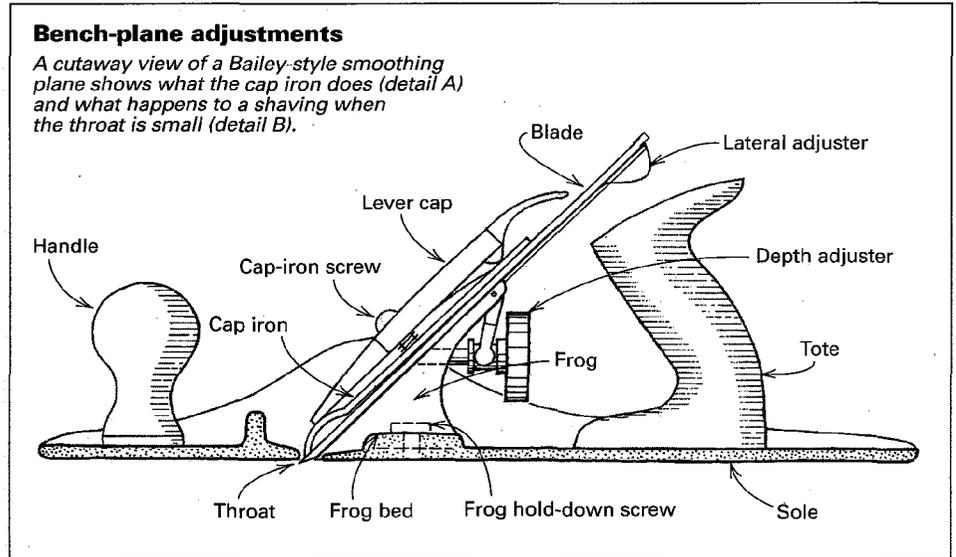
A tune-up will improve any plane's performance. Sadly, many new planes need this more than old ones. Manufacturers often machine the sole before the casting is fully cured, which can leave the sole twisted or cupped. Most new planes don't have sharp blades either. Before using a plane, I correct these problems by following an easy, five-step tune-up procedure.

1) Flatten the sole: To check the sole for flatness, I install the blade $\frac{1}{64}$ in. short of the sole and tension the lever cap as if I'm about to plane. Then, with a strong light shining from behind, I drag a straightedge along the sole diagonally while looking along the bottom. Where light is peeking through, I draw lines across the sole with a permanent marker. Then I hold the sole to the platen of my 6x48 stationary belt sander. I use a worn 120- or 150-grit belt. If you don't have a stationary sander, you can make a fixture for a portable belt sander (see the photo at left on the facing page).

After less than a minute of steady pressure, I check my progress. The disappearing lines tell me how I'm doing. I make sure that, at the least, the area just in front of the throat is flat. By installing an ultra-fine belt, you can polish the sole.

2) Sharpen the blade: To sharpen my irons, I mount an old 150- or 180-grit aluminum oxide belt to my sander. Using a protractor, I check the blade's existing bevel for its proximity to 25°, so I know whether to adjust the angle when sanding. Don't worry about being exact. Sharpness is far more important than a bevel at exactly 25°. I darken the bevel with a marker and draw cross lines using a square on the blade's back, behind the edge. Now I can see where I'm working and which way to tilt the blade. While I'm set up, I bring out all my plane irons and sharpen them too.

After flattening the back of the iron and



dressing the bevel, I grind both surfaces on a soft Arkansas stone that's lubricated with Neatsfoot or glove oil, which I get at a local Kmart or sporting-goods store. I can go directly to this step if I haven't let the blade get too dull.

To find the proper angle (see the center photo on the facing page), I touch the thick part of the bevel and then tilt the blade for-

ward until oil squishes out from under the tip. I usually tilt up a bit more (about 5°) to create a microbevel. You'll hear a slightly higher pitch as you reach the tip. Following the Arkansas stone, I use a black oilstone. Alternating between the back and the bevel on the last strokes eliminates any wire edge.

An optional last step is honing. I rig up a fixture to hold my electric drill (see the

be getting joints that close as tightly as the doors to Scrooge's vault.

Other than having a crowned blade for jointing and a relatively open throat, I set the rest of my jack plane just like a finishing smooth plane. That is, the blade has a razor edge, the sole is flat and the frog is seated firmly in the sole. It's also important that the leading edge of the cap iron mate tightly to the flat side of the blade (see the story above).

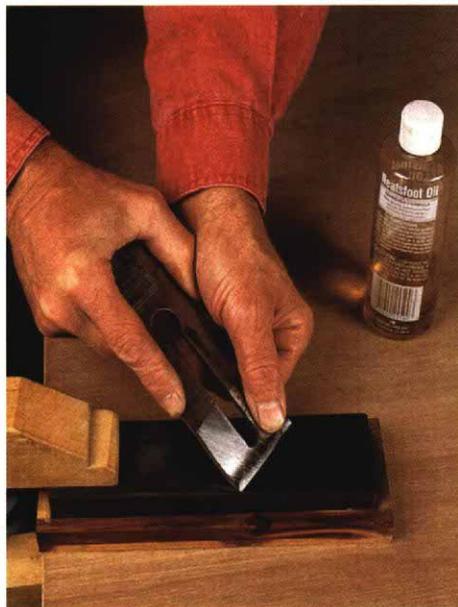
To joint a pair of boards for glue-up, I first run the mating edges over the power jointer. This usually leaves a bit of snipe on the end. Next I clamp one board into the bench vise and balance the second on top to see how the two butt. I look for areas of no contact and mark high spots on the sides. Lifting the top board off, I draw pencil lines across the edge of the bottom board every inch

or so. The idea isn't to plane off the pencil lines, but to use them as indicators. I plane the high areas and leave the low ones. The disappearing marks let me know where and how deeply I'm cutting and whether the blade is sitting level.

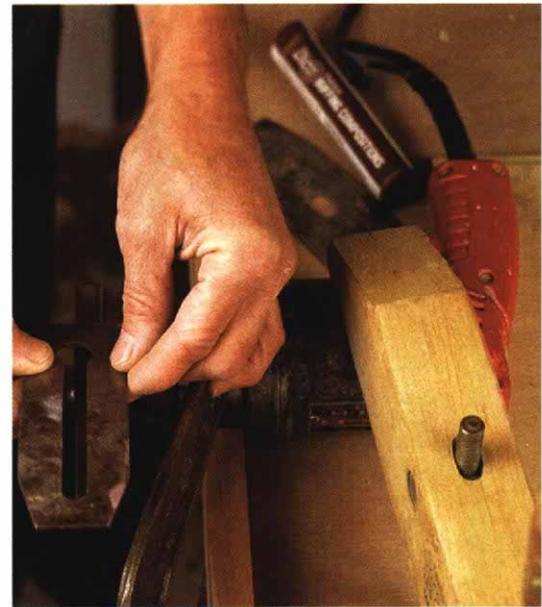
A block plane is a great multipurpose tool—Block planes are little gems. If I were stranded on a desert island and could only own one plane, I'd have a block plane. They've been around a long time but were dormant in many tool chests for years—until British Arts-and-Crafts woodworkers reintroduced exposed joinery in furniture at the turn of the 20th century. Block planes are ideal for trimming the end grain of through-tenons and dovetails. A block plane's absence of a cap iron and its easy-to-remove lever



Belt sander dresses plane parts. A simple fixture allows Hanson to clamp his belt sander on its side with the trigger on. He trues up the leading edge of a cap iron, so it mates tightly to the blade, preventing shavings from clogging the tool.



To touch up blade edges quickly, Hanson uses oilstones lubricated with Neatsfoot oil. Without losing much planing time, he can dress an edge before it gets dull. He uses a soft Arkansas stone and then a black oilstone for a surgical edge.



Power drill makes a portable honer— By clamping his electric drill to a worktable and chucking in a polishing wheel, Hanson creates a makeshift honing station. Used like a buffing wheel, the setup works well in the shop or at a job site.

photo at right). Holding the bevel of the blade to a polishing wheel, I make sure I'm at the correct angle. While honing, I apply buffing compound to the wheel occasionally and cool the blade with water from a spray bottle.

3) Seat the blade: Plane chatter usually is caused by poorly machined areas in the frog bed or gunk between the bed and the blade. On better planes, I unscrew and lift out the adjustable frog. If cleaning the bed doesn't seat the blade, then I grind the bed flat, like the sole. Other styles of planes are trickier. I have to reach inside with a bastard file and flatten the whole bed without rounding it at the back of the throat.

With the first three tune-up steps done, a plane can cut smoothly with the grain. But because I'm planing against the grain half the time, I usually take the tune-up two steps further to reduce tearout.

4) Dress the cap iron: A cap iron has a sinuous-looking chipbreaker that acts like a speed bump to prevent shavings from shooting up the ramp as the blade is shearing off wood. The leading edge of the cap iron should contact the flat side of the blade tightly to prevent shavings from getting clogged between the two. To dress the cap-iron edge (I undercut it a bit), I use a file and my belt sander (see the photo at left). I polish the chipbreaker, so the shavings will glide over it. And I ease the front of the lever cap with a file, so there's not an abrupt junction between it and the top of the cap iron.

5) Adjust the throat: On a bench plane, the front of the throat holds the shaving down and forces it around a sharp bend. The smaller the throat opening, the tighter the turn and the better the resistance to tearout. With a small throat, about the worst you will get is shallow, misdemeanor

damage instead of felony tearout.

On a block plane with an adjustable throat plate, I decrease the throat to the smallest opening that won't choke on chips. For bench planes, I experiment with moving the frog and setting the blade depth. The blade isn't supported as well when you move it away from the back of the throat. Because of this, thin blades often chatter. I fix that by using a thick blade. I can usually guess the right combination of adjustments to get a small throat. However, because I've reduced the depth of cut, I've incurred a multi-stroke penalty, meaning that the job will take longer to finish. That's why I set up a second smoothing plane with a larger throat for rougher work.

To reduce plane-to-wood friction, I wax the sole with a candle. When you're prepping wood for glue-up or finishing, though, clean off the wax with mineral spirits before you make the last few passes. —S.H.

cap make it the fastest plane to sharpen and put back into service. That makes it a good choice any time you think you might nick the blade on an embedded nail or gum up the blade with old paint.

A block plane's blade sits upside down in the plane—at a 20° slope in a standard block plane or a 12½° angle in a low-angle block plane. With the blade inverted, there's no place to fit a cap iron. To control tearout, you need to adjust the cutter depth and throat opening carefully and recheck it often. The better models have adjustable throats. Changing the direction of your strokes and the amount that you skew the tool also improves the cut.

Block planes work well as one-handed tools. When a workpiece needs a quick swipe and I can steady it with one hand and plane with the other, I use a block plane (see the top photo on p. 44). I

like the low-angle variety best because it cuts plywood, fiberboard, plastics and laminates cleaner than other planes. Freshly sharpened, a block plane can trim projecting plugs and tenons without fracturing the wood fibers below the surface. Block planes also can chamfer crisply (see the center photo on p. 44).

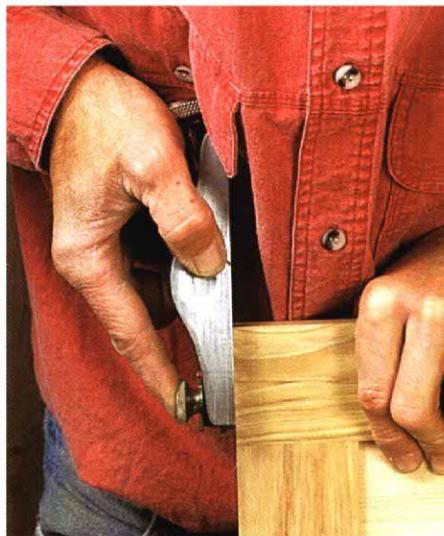
A bullnose plane refines joinery and gets into corners— Once you're hooked on the first three planes, you'll soon add a bullnose plane, which is actually a shoulder plane with a short, stout nose. Because the body of this plane is square, it does a great job on tenon shoulders and cheeks, and in dados and rabbets (see the bottom photo on p. 44).

I prefer Stanley and Record models because they are a combi-

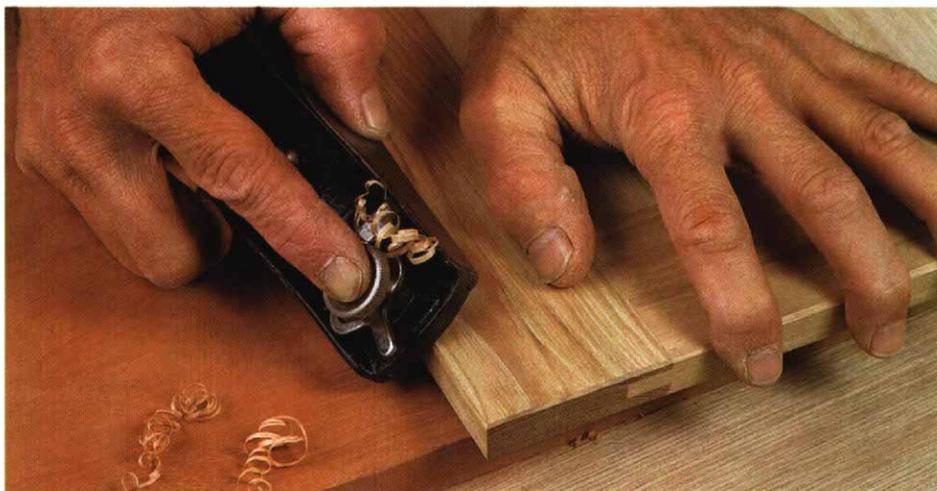
nation shoulder and chisel plane. You can buy other bullnose planes for around \$20, but they lack a removable front piece to make it easier to work in tight quarters, and they don't have a screw for adjusting blade depth for making ultra-fine cuts.

Like a block plane, a bullnose plane has its blade bevel-side up. But unlike a block plane, a bullnose plane is very demanding to set right. More than any other plane I own, the bullnose has to be adjusted carefully to coax out its peak performance. I hone the straight bevel of the blade razor sharp with perfectly square corners. The cutting edge and the sides of the blade must align with (or be just a hair over) the bottom and sides of the plane. Other-

A block plane is a handy trimming tool. Conveniently held in one hand, a block plane can pare the endgrain of a stile in a frame and true up hard-to-get-at places.



Chamfer adds a finished look to pieces (below). With a block plane, you can relieve edges and corners to make them easier on the hands and on the eyes. Here, the author chamfers a cypress door frame.



A bullnose chisel plane cuts into a corner (right). After routing rabbets in a padauk mirror frame, the author uses a Record bullnose plane to clean up the rabbets inside the mitered corners. With the nose removed, it works just like a chisel.



wise, you'll get stepped cuts that will slowly drive you out of a corner and out of square. I grind about a 10° bevel on each side of the blade.

Bullnose planes are great for several things: truing up the rabbets in a carcass to receive the back of the cabinet, beveling an edge near an adjacent surface, trimming corners in mitered frames or shaving down fat tenons. Further, you can widen a rabbet or dado by extending the blade past the side of the body to scrape the sidewall lightly. Last, but not least, with the front shoe removed, you can plane right up to a corner or joint. It's like using a chisel in a steadying jig. This is helpful for things like cleaning up the rabbet for the glass in a mirror frame (see the bottom photo).

Other handplanes worth honorable mention

Besides the four planes mentioned, I have another standby plane in my trusty collection: a Stanley Multiplane. Though I use it less often, it's handy for shaping moldings that router bits can't duplicate and getting into places that bits can't reach. Because a Multiplane (a No. 45 or the less-common No. 55) has a fence and rides on rails instead of a continuous sole, it is more involved to use than other planes.

It's also worth mentioning rabbet and dado planes, which do what their names suggest. Rabbet planes can have one or both sides of the blade flush to its sides, and, like a Multiplane, a rabbet plane comes with a fence and a depth gauge. By making their own paths, dado planes can work below a surface to plow a groove or dado. Good rabbet and dado planes are expensive. But because they do their jobs so well, it's worth hunting around for them at flea markets. □

Sven Hanson is a woodworker and professional carpenter in Albuquerque, N.M.

Further reading

The Antique Tool Collector's Guide to Value, Ronald S. Barlow, Windmill Publishing, El Cajon, CA 92020

Plane Basics, Sam Allen, Sterling Publishing Co., 387 Park Avenue S., New York, NY 10016-8810

FWW#14, #65 and #99 (tuning bench planes)

FWW#35, #98 and #99 (choosing and using bench planes)

FWW#39, #54 and #105 (block planes)

FWW#67 and #76 (shoulder and rabbet planes)

FWW#29, #61 and #81 (sharpening blades)