

The Art of Marquetry

Learn the double-bevel technique from a master of the medium

BY CRAIG VANDALL STEVENS



Years ago, when I had the good fortune to study under James Krenov, the decorative art of marquetry caught my imagination. Marquetry linked my longstanding interests in drawing and art with the woodworking skills I was learning. Through trial and error, I developed a way of working that blended the traditional double-bevel marquetry method with the thick hand-sawn veneers that we learned to make at The Krenov School. I've enjoyed adding marquetry to my woodworking ever since.

Defining the double-bevel technique

Simply put, double-bevel marquetry involves taping together two pieces of veneer—the background veneer and the insert veneer—

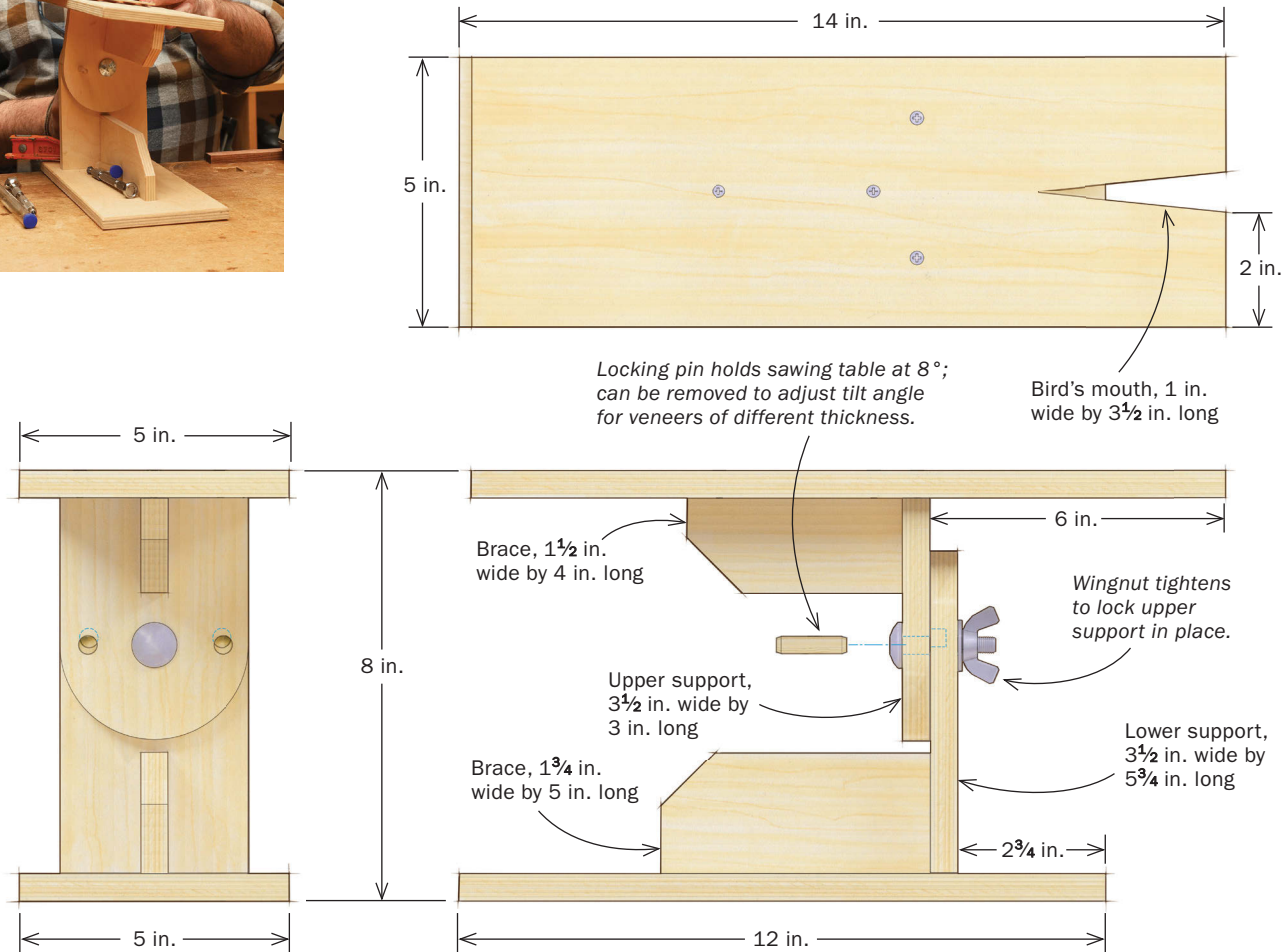
and cutting both at once so that the opening you create in the background veneer and the piece you'll insert into it are identical in size and shape. That's the double part of the technique. As for the bevel part, the background veneer is on top as you saw, and the insert piece from the bottom veneer replaces the piece directly above it, bringing a new color or grain pattern to the image. Because you make the cuts with the saw table tilted, both the background and insert pieces are beveled on their edges. With just the right bevel angle, the sawkerf is completely eliminated and the fit of the marquetry pieces is perfect.

The double-bevel technique is ideal for creating a single precisely fitting marquetry design. Because the work is cut at an angle,

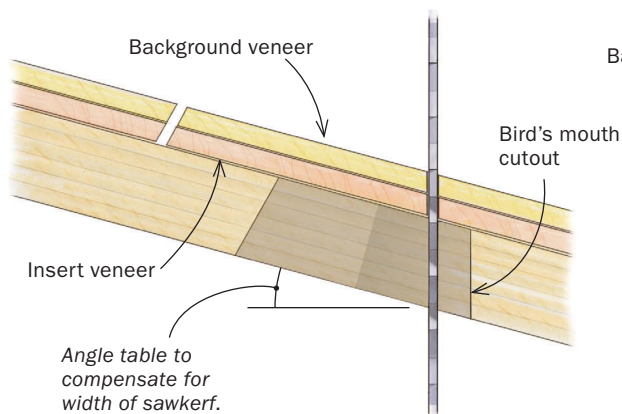


SHOPMADE SAWING SURFACE

Build a sawing donkey to hold the work as you cut with the fretsaw. The swiveling top of the donkey creates the bevel angle. For $\frac{1}{16}$ -in.-thick shopsawn veneers, the bevel angle is 8° . The cutting takes place within the bird's mouth. Be sure the fretsaw blade's travel is vertical both as seen from the side and the front. Move the work with one hand and the saw with the other. All parts are $\frac{1}{2}$ -in. Baltic-birch plywood.



HOW THE DOUBLE-BEVEL PROCESS WORKS



1. SAW THROUGH BOTH LAYERS OF VENEER



2. INSTALL INSERT VENEER FROM BELOW



3. BEVELED CUT CREATES GAP-FREE FIT





PAINTING WITH WOOD

When selecting wood species for marquetry, Stevens avoids high contrast. Subtle variations in color are effective at producing the illusion of depth in an image. Choosing for grain and texture is also important. A curve in the wood grain can fool the eye into seeing a curve in the image, while a straight-grained piece in the same place could leave it looking flat.

SOURCES OF SUPPLY

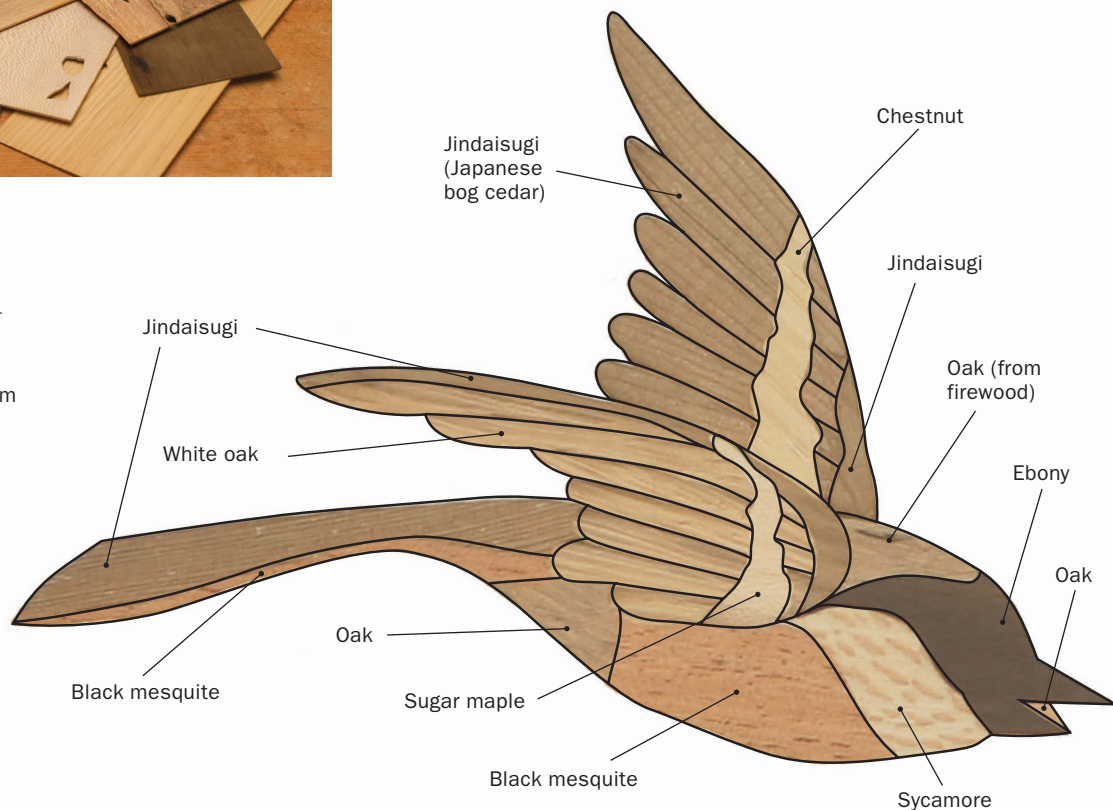
ECLIPSE FRETSAW
highlandhardwareco.com

OTTO FREI SWISS JEWELER'S BLADES
SIZE 2/0
ottofrei.com

#69 DRILL BITS
McMaster.com

PIN VISE
amazon.com or elsewhere

STYLUS
michaels.com



Develop the drawing in stages. Stevens works on paper through multiple iterations to develop his design. He often uses tracing paper to copy the parts of a drawing he likes, then redraws the rest. With the finished drawing laid over a sheet of graphite paper, Stevens traces each line with a stylus to transfer the design to the background veneer.

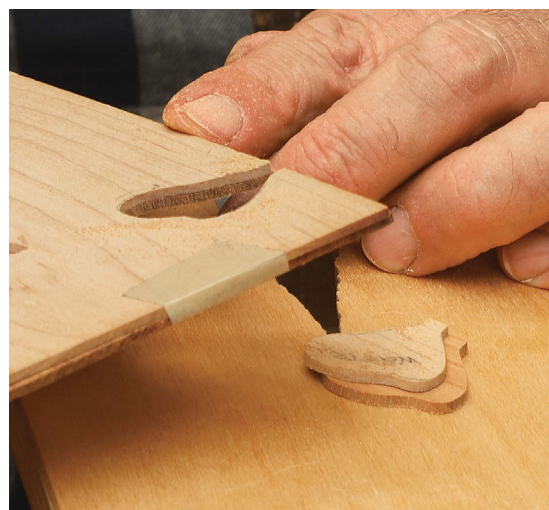


Start with a practice pattern



SET UP

Adjust the donkey. When cutting thick shopsawn veneers, set the swiveling table at 8°. For thinner veneer, the angle will be greater, perhaps 13° to 18°. To create the necessary tension on the blade in the saw, insert the near end at the handle, then press the saw forward to flex the frame and insert the far end. Release the frame and the blade tightens.



SAWING

If you tilt the sawing table so it is lower on your left, all the cuts must travel clockwise around the part you're sawing out. At the end of a cut, be sure the pieces you're removing are resting on the table, not over the bird's mouth, or they can drop through and disappear on the floor. Push the insert veneer into the background from behind. It should be a tight fit all around (below).

only one insert piece can be made at a time. Other marquetry techniques permit you to stack veneers and cut multiples of the same shape at once, but they won't fit seamlessly like pieces cut with the double-bevel technique.

What veneers are best for marquetry?

I slice my own veneers for marquetry from solid stock, sawing the sheets just over $\frac{1}{16}$ in. thick on the bandsaw. I like working with thick veneer because the often small marquetry pieces are less delicate when you are sawing, handling, and gluing them, and there is plenty of thickness for scraping and sanding when the pattern is complete. Sawing your own veneers also lets you use scrapwood that might otherwise go to waste. In addition, when you add marquetry to furniture, you can saw the veneers for the marquetry from the same solid stock you use for the piece itself, producing perfect grain and color matches.

All that said, double-bevel marquetry also works well with thinner veneers. You just need to use a different bevel angle when you saw them. For $\frac{1}{16}$ -in.-thick veneers, I tilt the sawing surface



Inlay one piece at a time



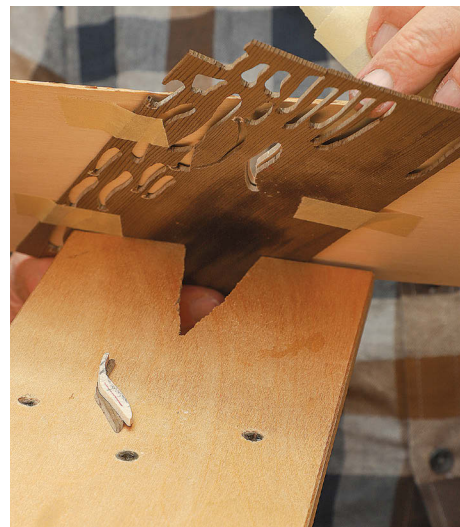
Tape on the feather veneer. To saw out the first feather for his bird, Stevens tapes a piece of insert veneer to the underside of the background veneer. He orients the insert veneer so the feather's grain will be parallel along its length.



A pinhole for starters. For cuts in the center of the panel, drill a hole and insert the blade to start sawing. Tighten the bit in a pin vise, and rotate it with your fingers. A few twists are enough to make the hole.



Thread the blade. With the fretsaw pressed between your chest and the donkey, thread the loose end of the blade through the pin hole in the veneers. Pull the veneers along the blade toward the handle and tighten the far end of the blade in the frame.



Saw and steer separately. While one hand operates the saw in a vertical sewing-machine action, the other hand guides the veneers, steering the cut. When the cut is finished, press from above to release both sawn pieces. The one on top, cut from the background veneer, will be discarded. The insert piece, pushed in from behind, should present a gapless fit.

8° off horizontal. For thin commercial veneers, the tilt usually increases to between 13° and 18°.

Two saws can make marquetry

You can get excellent results in double-bevel marquetry using either a hand-powered fretsaw or a motorized scrollsaw. The fretsaw has numerous advantages: It's inexpensive; it gives you complete control over the speed and nuance of the cut; and after you get the hang of it, it's a simple, quiet pleasure to use.

The action of a fretsaw should be a bit like a sewing machine: Its blade should be perfectly vertical as it rises and falls. You operate the saw with one hand and guide the workpiece with the other. It takes a little practice to get comfortable, but before long it feels quite natural. The fretsaw offers an approachable way to get started in the craft, and I still do most of my marquetry with one.

The scrollsaw has its own advantages: Most prominently, its throat is far deeper than that of the fretsaw, allowing you to



Shade and glue as you go



Darken one edge of the inlay. Just as shading can make a drawing look more realistic, it can create the illusion of depth in a marquetry image. Stevens dips the insert piece for just 15 or 20 seconds in aquarium sand heated in a cast-iron pan on a hot plate. Creating humps in the sand makes it easier to restrict the shading to one edge of the feather.

create marquetry patterns in larger background veneers; with its motorized blade and foot-pedal control it frees both your hands to guide the veneers as you saw; and of course there's no learned skill required to make the blade travel vertically. Threading the blade through the tiny hole in the marquetry to start a cut is a bit fussier with the scrollsaw because the angle of insertion makes the hole harder to see. I typically countersink the hole (with a carving burr spun by hand in a pin vise) on the underside to make threading the blade easier.

Working step by step

Even the most sophisticated double-bevel marquetry images are completed one piece at a time. If you are trying the technique for the first time, I recommend you start by making a small sample piece or two. The steps for making a simple test piece can then be applied to pieces in all shapes and sizes as you create a complex image. Here are the fundamental steps. I'll describe using a fretsaw, but nearly all the information applies just as well to the scrollsaw.

Draw a coin-sized shape on your background veneer, then place a sheet of contrasting veneer (the insert veneer) underneath and tape the two veneers together at the edges. Angle the top of your donkey (see drawing, p. 67) or the table of your scrollsaw to the appropriate bevel angle. In order to start the cut you'll need to drill a hole. With a #69 drill bit in a pin vise, drill a hole canted at the bevel angle. Then, with one end of the fretsaw blade fastened in the handle, thread the 2/0 jeweler's blade through the hole. Flex



Forget your gallon bottle of glue.

An accordion applicator with a needle-thin tip delivers a precise ribbon of yellow glue to the edge of the insert piece. With the background veneer face down on the donkey (or another flat surface) press the inlay piece in place and then tap it in tight with a small hammer.

the frame so you can tighten the other end of the blade in the saw.

Move the workpiece and saw together into position on the donkey with the blade in the bird's mouth. The saw teeth should face away from you and the blade should be on the downhill side of the shape to be cut. Position the saw vertically.

Begin sawing clockwise around the shape, paying close attention to keeping the fretsaw frame plumb. If it relaxes away from vertical, the cutting angle changes and the fit won't be accurate. Keep the sawing within the bird's mouth and follow your pencil line. It's a lot to keep in mind but gets much easier with practice.

Guide the workpiece through the cut with your left hand and as the blade comes back around to the drill hole, carefully approach the kerf where you started sawing so the shape doesn't jog and draw attention to itself. For greater control, lengthen and slow the up and down action of the saw and reduce the feed rate of the workpiece. When you've completed the cut, unclamp the fretsaw blade and gingerly remove it from the workpiece.

STRATEGIES FOR SUCCESS

Judging by the finished image, you'd think each piece was made and inserted at exact size. But for various reasons most pieces are glued in oversize and then sawn through for the later ones.

OVERLAP AS YOU GO

For clean joints, saw right through the prior piece. Stevens made the first feather intentionally overwide, then redrew the second feather's outline and sawed along it. He makes the second feather overwide as well, and repeats the process.



ADDING AN ACCENT

With all the feathers finished on one wing, Stevens saws for the band of color that crosses them. He switches from dark to light veneer for the insert piece.



SKINNY LINES START OUT THICK

The curving thin line along the lower edge of the bird's tail would be too fragile to saw out separately. So Stevens makes and glues in a far wider piece, then saws away all but a sliver of it as he cuts out for the tail feather.



Completing the panel

Finish at the front. To emphasize the illusion of depth in a marquetry image, inlay the parts farthest from your eye first, and overlap the parts as you go. On this bird, Stevens started the topmost feather on the far wing, and ended, here, with the accent band on the bird's near wing.



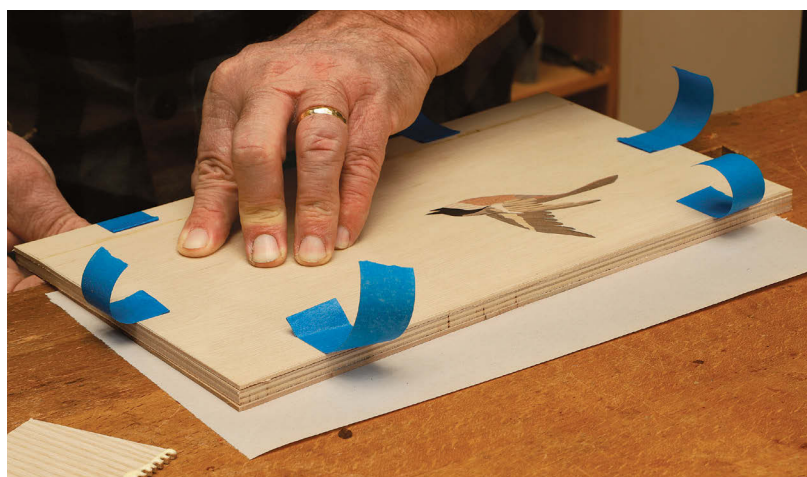
Scrape and sand. Stevens uses a card scraper to remove residual glue and scrape all the inserted pieces flat. He works both faces of the marquetry with the scraper, then follows with fine sandpaper.



Turn the veneers over and release the two shapes you've cut with the press of a finger. Do this over the saw table or your workbench so you don't lose the small parts. Then remove the tape and press the insert piece into the opening in the background veneer. If the cut was clockwise, the saw was held vertically throughout the cut, the bevel angle was accurate, and the planets were in alignment, the insert piece from below will fit into the background veneer exactly. Glue it in place, tapping it home with a hammer, and you can immediately begin cutting the next piece.

Repeat the steps again and again and you'll have a nicely fitted marquetry project. Friends and family will be mightily impressed. □

Craig Vandall Stevens is director of the Philadelphia Furniture Workshops and the author of five books on woodworking, including *The Fine Art of Marquetry* (Schiffer, 2010).



Glue the bird to a backing board. After spreading glue on a plywood substrate, Stevens tapes the marquetry on top. With the blue tape keeping the marquetry from shifting, Stevens uses MDF cauls to spread the pressure evenly as he clamps the panel.

