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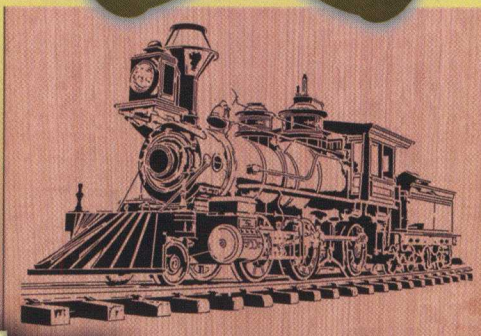
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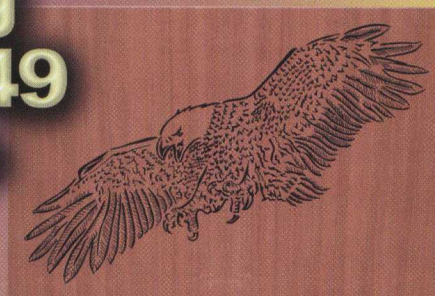
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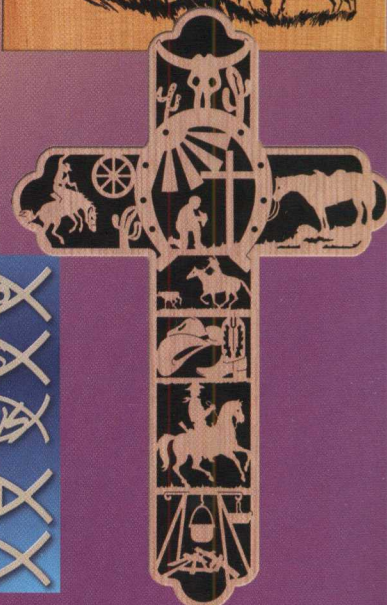
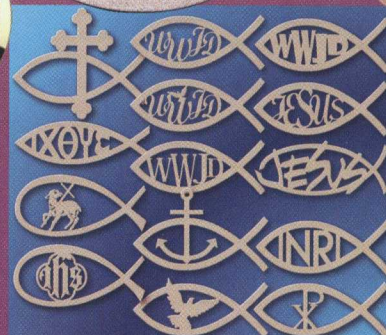
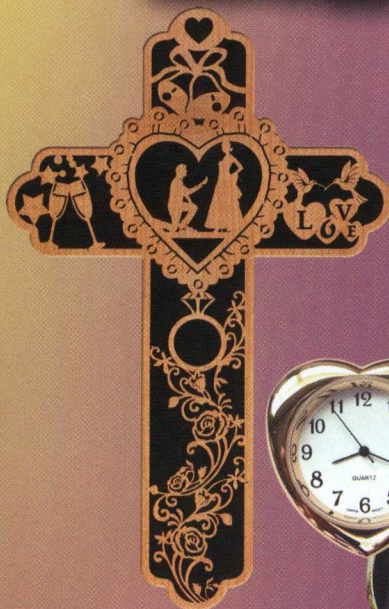
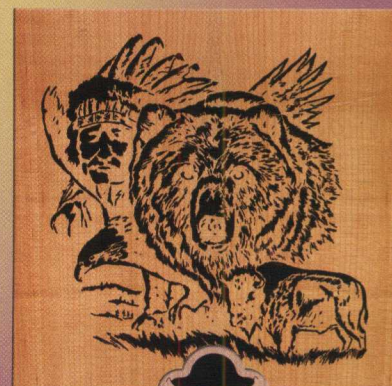
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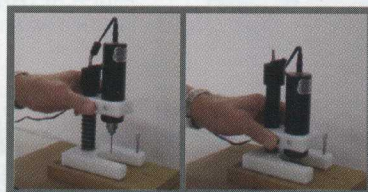
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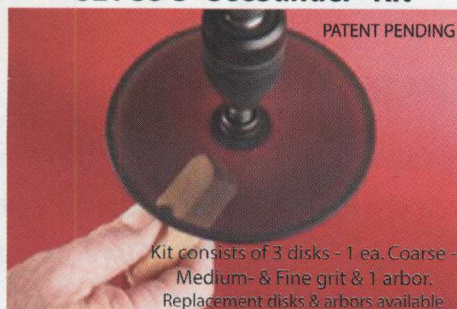
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40 Bring this majestic portrait to life with richly colored wood.

FEATURES



16 *Scroll Saw Therapy*

By Kathleen Ryan

Richard Frano uses woodworking to battle multiple sclerosis



22 *The Puzzles of William Waite*

By Mindy Kinsey

Artist and designer is passionate about creating brainteaser puzzles



28 *Crafting a Daisy Photo Frame*

By Kathy Wise

Beautiful intarsia flowers add a touch of spring to this simple frame



60 *Building a Working Wooden Gear Clock*

By Clayton Boyer

Genesis clock is specifically designed for first-time builders

DEPARTMENTS

4 *Editor's Column*

6 *Letters to the Editor*

8 *Bragging Pages*

10 *Product Review*

12 *Info Exchange*

14 *Scroll Saw Basics*

78 *Coming Features*

78 *Ad Directory and Classifieds*

80 *Sawdust*



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METHODS



24 **Creating a Turtle Teaser Puzzle**

By William Waite
Perplexing brainteaser puzzle is easy to make



32 **Making Stylish Gifts with Wooden Hinges**

By Gary MacKay
Folding mirror and business card holder feature all-wooden hinges



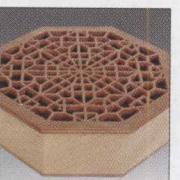
40 **Creating an Intarsia Fox**

By Janette Square
Realistic design uses shaping and risers to add dimension



44 **Building a Portable Herb Planter**

By Fred and Julie Byrne
Personalize this functional design with interchangeable name plates



48 **Making a Geometric Box**

By Sue Mey
Intricate fretwork lid highlights this easy-to-make box



52 **Making a Celestial Mobile**

By Daniel and Ruth Johnson
Use fabric dye to add vibrant color to this easy-to-cut project

PATTERNS



19 **Filigree Fretwork Hearts**

By Alison Tanner
Delicate designs make great Valentine's Day decorations



26 **Cutting a Whimsical Heart Puzzle**

By Rosalie and Tom Cross
Fun design makes a great Valentine's Day gift



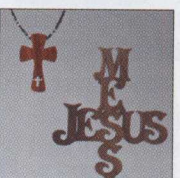
38 **Waiting**

By Kerry Hallam
Beautiful portrait highlights your scrolling abilities



73 **Spring Songbirds**

By Alison Tanner
Coordinated set of fretwork designs makes a striking display



76 **Simply Elegant Cross Designs**

By Gene M. Reilly and Robert Riggs
Express your faith with easy-to-make projects

TECHNIQUES



56 **Cutting Intarsia with a Single Pattern**

By Carol and Homer Bishop
Practice this new technique with a simple apple blossom design



70 **Making Custom Jigsaw Puzzles**

By Charles Ross
Cut puzzles freehand with this quick and easy technique

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➔ **Bonus Photo Gallery**

Scroll Saw Therapy, pg. 16
Additional photos of Richard Frano's projects.

➔ **Exclusive Web-Only Patterns**

Making Custom Jigsaw Puzzles, pg. 70
FREE jigsaw puzzle patterns plus dozens of designs to create shaped puzzle pieces.
Cutting a Whimsical Heart Puzzle, pg. 26
Two bonus patterns for alternate designs.

➔ **Online Video**

Building a Working Wooden Gear Clock, pg. 60
See the amazing Genesis clock in action.

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My Favorite Cover

In our holiday issue, we invited readers to share their favorite project from past issues of the magazine. Check out www.scrollsawer.com to find out who won the coveted scroll saw library.

As our 10th anniversary celebration winds to a close, we are offering readers one more chance to win a Fox Chapel scroll saw library worth more than \$1,000. Simply log on to our website and enter a vote for your favorite *Scroll Saw Woodworking & Crafts* magazine cover. If you don't have Internet access, you can mail your selection to SSW&C Covers, 1970 Broad Street, East Petersburg, Pa. 17520.

While I would be hard-pressed to choose a favorite project from past issues, selecting my favorite cover is easy. Our design team has created some fantastic covers over the years—featuring everything from whimsical painted projects to elaborate fretwork designs. But my favorite cover is Holiday 2004 (Issue 17). The *Birds and Berries Winter Wreath* on the cover is a gorgeous project, but this is my favorite cover because it was my first issue.

I joined Fox Chapel in 1999, but it wasn't until 2004 that I became actively involved in the magazine. During my early days in the customer service department, I never thought I would end up being the editor of *Scroll Saw Woodworking & Crafts*. It's a position that has brought me much joy.

I still talk with customers I met during my early days, and I'll always be thankful for how those relationships helped me grow personally and professionally. But the most rewarding part of my job is the relationships I have built with readers and contributors. I love knowing I can turn to our readers to get honest feedback on articles and projects. When I check my e-mail and find a page-by-page critique of the latest issue, it brightens my day and boosts my enthusiasm for the next issue.

I'm always excited to see what creative new ideas contributors are developing. I can't wait to share new techniques with readers. And when a new contributor sees their project in print for the first time, I share in their joy.

So, while I enjoy working on every issue of *Scroll Saw Woodworking & Crafts*, issue 17 will always have special meaning for me. That issue was the start of a wonderful journey—a journey that has resulted in countless new friendships I cherish every day.

Shannon Flowers

Shannon Flowers

Shannon@FoxChapelPublishing.com



The Holiday 2004 cover is my favorite because it marks the start of my involvement with the magazine.

SCROLLSAW

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To promote scrolling as an artform and an enjoyable pastime—for all ages and all skill levels.

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PATTERNS

Finding tools in the United Kingdom

I recently discovered your excellent magazine and have taken out a subscription. The articles are brilliant and the layout is great.

As I live over the pond in England, I get frustrated at the access scrollers in the United States have to various tools and different woods. In the United Kingdom, to purchase the various woods needed to do some of the projects justice, I would have to re-mortgage my house. As for access to tools, a couple of manufacturers in the States make electric files, but none of these companies export them to Europe.

I am confused by the way you refer to scroll saw blades by numbers. You refer to a #3 blade or a #7 blade, but over here, the packages only list the pitch of the teeth and the width and thickness of the blades. Is there a reference sheet or guide to help me purchase the right blade?

John O'Connor
via e-mail

Number	Blade thickness	Blade width
#2/0	0.007 to 0.009 (0.18mm to 0.23mm)	0.022 to 0.026 (0.56mm to 0.66mm)
#1 to #2	0.009 to 0.012 (0.24mm to 0.30mm)	0.026 to 0.031 (0.67mm to 0.79mm)
#3 to #4	0.012 to 0.015 (0.30mm to 0.38mm)	0.032 to 0.035 (0.81mm to 0.89mm)
#5	0.013 to 0.016 (0.33mm to 0.41mm)	0.036 to 0.044 (0.91mm to 1.1mm)
#7	0.015 to 0.017 (0.38mm to 0.43mm)	0.044 to 0.050 (1.1mm to 1.27mm)
#9	0.016 to 0.019 (0.41mm to 0.48mm)	0.053 to 0.060 (1.3mm to 1.5mm)

Dimensions listed in inches (metric)

Most manufacturers use a standard system for the size of blades. However, there can be small differences between same-sized blades from manufacturer to manufacturer.

Many retailers have charts on their websites that cross-reference the size of the blades with the numbers. There is some overlap in the sizes. What one retailer considers a #4 blade, another retailer may consider a #7 blade. In general, the size of the blade gets smaller as the number of the blade decreases.

The blades noted in the materials list are suggestions. The most important factor when choosing a blade is your comfort using the blade for that project.

The chart at right lists some general conversions.

Scrolling to Relieve Stress



My mom passed away the day after I had eye surgery. I had to immediately travel to Florida to help my dad. My eye turned for the worst and there I was taking care of things in Florida and not seeing very well. I had another surgery and was still taking care of dad. My life felt upside down.

I was looking through *Scroll Saw Woodworking & Crafts* Summer 2009 (Issue 35) when I saw the beautiful boat. I said to myself, "I'm going to make that."

Phyllis Eckenrode created a wooden boat to keep herself focused while recovering from eye surgery.

When I step into my shop, everything else seems to go away. I am so happy watching the wood turn into something special. When I was making the sails, the happiness inside me was overwhelming. To hold the sail and know that a few hours ago, it was just a piece of wood; I could hardly stand it.

Now, here I am, I can hardly see, my mom is gone, and I am my dad's caregiver. I will be moving, leaving a woodworking club, friends, and my shop behind.

I'll have to set up a new shop, because when I visit my shop, everything else is left at the door. I have a sailboat sitting in my window and I made it. What can be better than that?

Phyllis Eckenrode
Bridgeport, N.Y.



Fox Hunt

It seems that pesky little fox went on vacation and didn't tell anyone!

We neglected to hide the fox in *SSWC* holiday 2010 (Issue 41). A number of circumstances contributed to the unfortunate incident, but it really boils down to good old-fashioned human error. Please accept our sincere apologies. We promise he is hiding in the pages of this issue.

We randomly selected two subscribers from our database to receive gift certificates. Frank Raab of Naples, Fla., and Robert Lackmar of Erwin, Tenn. are the lucky winners.

Find the fox in this issue, contact us, and tell us the page number and location. Two readers randomly selected from all correct replies will receive a \$25 Fox Chapel Publishing gift certificate. Entries must be received by February 25, 2011 to be eligible. *NOTE: The contest fox is an outline drawing that would face left if his feet were on the "ground" (other foxes appearing in SSW&C don't count).*

Send your entry to *Scroll Saw Woodworking & Crafts*, Attn: Find the Fox, 1970 Broad St., East Petersburg, Pa., 17520, or enter online at www.ScrollSawer.com.



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- Smitty

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Carved Fretwork Goose ▶

Ronald Mostel of Naples, Fla., created this goose fretwork using Dave Snyder's relief-cutting technique, which was featured in *Scroll Saw Woodworking & Crafts* Holiday 2008 (Issue 33). Ronald cut the outline of the goose first, and then cut the fretwork before using a sanding mop and a router to shape the goose.



◀ Seascape Intarsia

Cindy Lutian of Merritt Island, Fla., created this seascape scene based on a Judy Gale Roberts pattern. Cindy made the design her own by using plugs of different colored wood to represent the sandy bottom of the sea. Cindy also extended the picture to fit into a round frame and added turquoise stained glass as a backing.

3-D Bookends ▶

Kenneth Janice of Carpentersville, Ill, created these bookends based on a project by Fred and Julie Byrne, which was featured in *Scroll Saw Woodworking & Crafts* Spring 2009 (Issue 34). The bookends were Kenneth's first compound-cut project. Kenneth used walnut and poplar to make the bookends.



Horse-Drawn Wagon ►

Paul Regeness of Avon, Conn., created six of these horse-drawn wagons based on an article by Paul Meisel, which appeared in *Scroll Saw Woodworking & Crafts* Holiday 2009 (Issue 37). Paul used walnut for the seats and moldings to add contrast.



The Spotlight's On You!

Creating beautiful scroll saw projects is your passion. Here's your chance to share your work with the scrolling community.

Please send crisp clear images of your scroll saw pieces, along with 100 words about yourself and what inspired you to create the project. Remember to include your hometown, the number of years you've been scrolling, the title of the piece, the name of the pattern maker (if not yourself), and a list of materials, such as the wood or woods used to complete the project.

Send your submissions to: *Scroll Saw Woodworking & Crafts*, Attn: Bragging Pages, 1970 Broad Street, East Petersburg, Pa. 17520, or e-mail your photos and text to Duncan@FoxChapelPublishing.com.

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By Bob Duncan

Convenient Finishing Station

K&M of Virginia has combined standard painter's pyramids with a lazy Susan-style turntable to create a complete finishing station for small- and medium-sized projects.

The Finishing Turntable features pyramid-shaped work supports that slide on rails attached to the top of the turntable. The shape of the pyramids allows air to flow under the project for a faster drying time while providing the necessary support. The pyramids slide in toward the center to support projects as small as 4" across. The 16"-diameter turntable can accommodate larger projects.

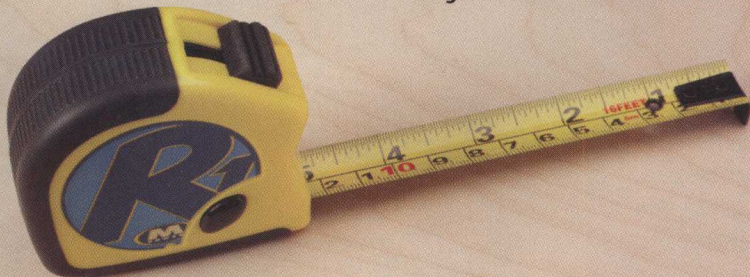
The turntable speeds up your finishing process because you can spin the project around to access it from every angle. The plastic turntable is impervious to most finishes and is easy to clean. The turntable supports up to 100 pounds, making it suitable for delicate fretwork or heavy intarsia projects.

The manufacturer's suggested retail price for the Finishing Turntable is \$39.95. The turntable is available from several woodworking sources. For a complete list of suppliers, visit the manufacturer's Website at www.finishingturntable.com.

The Finishing Turntable's adjustable pyramids accommodate projects of various sizes.



The new R1 tape measure is designed to be user-friendly for right-handed woodworkers.



Tape Measure for Right-Handed Users

M Power's new R1 tape measure is designed for right-handed people. With ordinary tape measures, you must choose between reading the numbers upside down or holding the body of the tape measure with your dominate right hand while making the marks with your left hand. The R1 tape measure eliminates that choice. While holding the body of the tape measure with your left hand, you can read the numbers easily and make the marks with your right hand.

The R1 tape measure is a simple solution that makes measuring and marking user-friendly for right-handed woodworkers. The tape measure is available for \$13.95. Visit M Power's Website at www.m-powertools.com for a list of retailers.

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Preventing Clogged Spray-Can Nozzles



Spray-finish nozzles that refuse to spray, spray sideways, or spit and sputter cause frustration and can ruin a project.

To prevent this, I always remove the spray nozzle from the can and place it in a jar of appropriate thinner—usually lacquer thinner or paint thinner. When you need the nozzle, take it out of the thinner and it's perfectly clean. If you have a clogged nozzle, soak the nozzle in thinner. You may need to use a sewing needle to pick out the softened finish. It's not possible to save every nozzle, so when a can of finish is empty; I keep the nozzle as a backup. This works with spray-adhesive nozzles as well.

Mike Mickelson
Hamilton, Mont.



Store spray-can nozzles in a jar of thinner for a supply of clean nozzles that are ready to apply a perfect finish.

Glue Squeeze-out

It can be difficult to clean up glue squeeze-out, especially where glued joints meet at grooves or angles. I push a ¼"-diameter plastic drinking straw along the glue line to scoop up squeezed-out wet glue. When the glue is collected, it may be used in other areas or simply discarded. Just snip off the straw above the glue residue and the straw is ready for the next cleanup job.

Garry Shilliday
Via E-mail

Removing Patterns

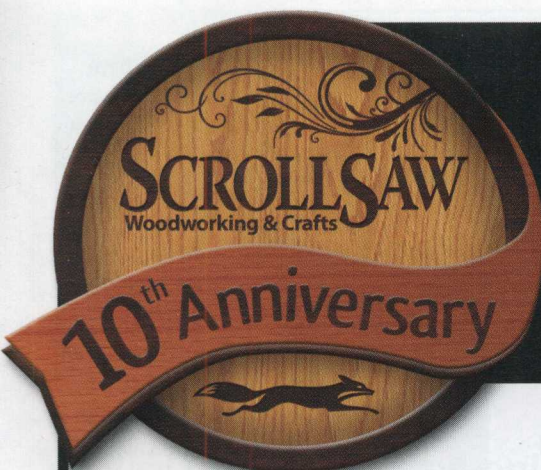
Removing patterns attached to a blank with spray adhesive can be tedious. I don't like to use strong-smelling solvents, but a heat gun is slow and may damage the stock.

For small- and medium-sized blanks, place the wood with the pattern attached into the microwave for 25 to 30 seconds. The pattern will pull off easily without leaving a residue.

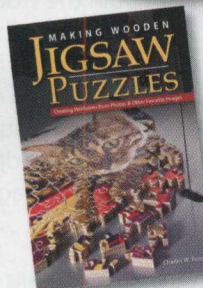
Robert O'Brien
Mascoutah, Ill.



TOP TIP in our summer issue wins a \$100 gift certificate from Dale's Puzzles, www.DalesPuzzles.com. Send your tips or techniques to Bob Duncan, 1970 Broad Street, East Petersburg, PA 17520, or Duncan@FoxChapelPublishing.com



Keep Your Saw Busy with These Great Projects



Making Wooden Jigsaw Puzzles

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By Charles Ross

Adding a new twist to puzzle making with tricks and tips to create personalized and challenging puzzles from photos and digital images. See the author's strip cutting technique on page 70.

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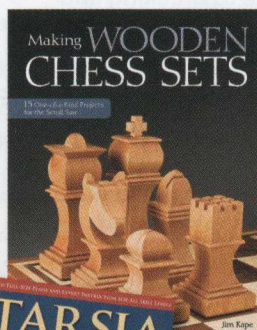
Making Wooden Chess Sets

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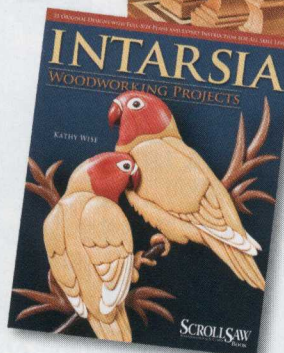
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Intarsia

Woodworking Projects

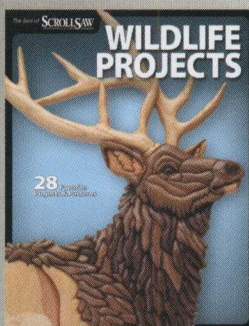
21 Original Designs with Full-Size Plans and Expert Instruction for All Skill Levels

By Kathy Wise

Find out how to make the author's Daisy Picture Frame on page 28.

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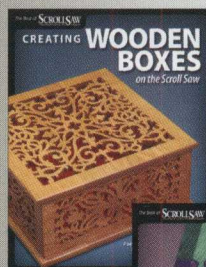
Wildlife Projects

28 Favorite Projects and Patterns

By Editors of Scroll Saw Woodworking & Crafts

Join your favorite authors, including Kathy Wise, Gary Browning, Charles Dearing, and Lora Irish, as they scroll handsome projects from the animal kingdom.

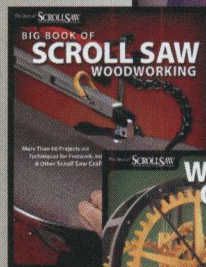
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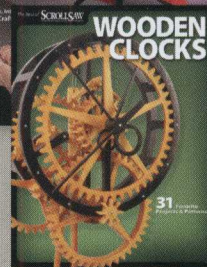


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Be sure to check out our latest 10th Anniversary contest as well as a special offer on page 18!

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Attaching Patterns

Temporary-bond spray adhesive is the most common method used to attach patterns to stock. Photocopy the pattern. Spray the adhesive on the back of the pattern, wait a few seconds, and press the pattern down onto the blank. Rubber cement or glue sticks work similarly.



You can also use graphite or carbon transfer paper. Place the pattern on your blank and slip a sheet of transfer paper in between the pattern and the blank. Use a few pieces of painter's tape to hold the pattern and transfer paper in place. Trace around the pattern with a red pen (so you know where you have traced). Choose a light-colored transfer paper for darker woods. Carbon paper costs less than graphite paper, but must be sanded off before finishing.

Removing Patterns

Dampen the paper pattern with mineral spirits to aid in removal. Commercial adhesive removers work as well. A quick wipe of mineral spirits will remove most adhesives left behind on the wood.

Blade-entry Holes

Some patterns have blade-entry holes marked. If the pattern doesn't, place the holes near a line to be cut to prolong your blade life, but don't place



the hole on a curving line or inside corner (if possible). Drill the hole perpendicular to the blank. Use a drill press if you have one; otherwise the holes may interfere with delicate fretwork. Drill through your blank into scrap wood to prevent tear out on the back side of the blank.

If you have the space, use a larger bit—it will make it easier to thread your blades through. For thin veining cuts, use the smallest bit your blade will fit through.

Blade Tension

Before inserting a blade, the tension should be completely removed. Clamp both ends of the blade into the blade holders and adjust the tension. Push on the blade with your finger. It should flex no more than $\frac{1}{8}$ " forward, backward, or side to side.

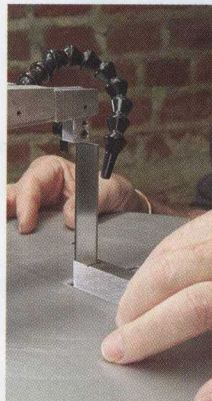
A blade that does not have enough tension will wander. It will also flex from side to side, making for irregular or angled cuts. If you press too hard on a loose blade, it will usually snap.

A blade that has too much tension is more susceptible to breaking and tends to pull out of the blade holders. In general, it is better to make the blade too tight rather than too loose.

Squaring Your Table

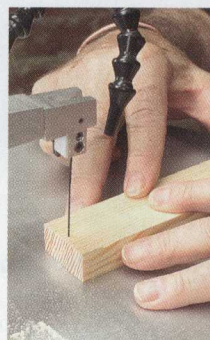
Most scroll saws have an adjustable table that allow you to make cuts at different angles. There are times when you want your saw set at an angle, but most cutting is done with the blade perpendicular to the table. If the table is even slightly off-square, your cuts will be angled. This interferes with puzzle pieces, intarsia, segmentation, and many other scrolling projects.

The most common method for squaring your table is the small square method. Set the square flat on the saw table against a blade that has been inserted and tensioned. Adjust the table to form a 90° -angle to the blade.



The cutting-through method is also popular. Saw through a piece of scrap wood at least $\frac{3}{4}$ "-thick and check the angle of the cut using a square. Adjust the table until you get a perfectly square cut.

To provide more projects per issue, we have consolidated basic scrolling information here. Because our articles will no longer cover these basics, we will publish this page in each issue to assist novice scrollers.

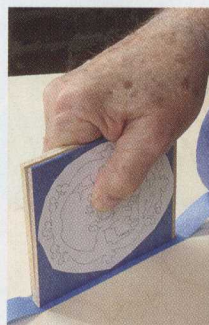


You can also use the kerf-test method. Take a $1\frac{3}{4}$ "-thick piece of scrap and cut about $\frac{1}{16}$ " into it. Stop the saw, and spin the wood around to the back of the blade. If the blade slips

easily into the kerf, the table is square. If it doesn't slide into the kerf, adjust the table and perform the test again until the blade slips in easily.

Stack Cutting

Stack cutting lets you cut several pieces of a project—or even several projects—at one time. Essentially, you attach several blanks together, and cut them as one unit.



One way to attach blanks is with tape. Line all the layers up and wrap a layer of tape around the outside edge. You can also wrap the whole stack in tape for extra stability. Scrollers

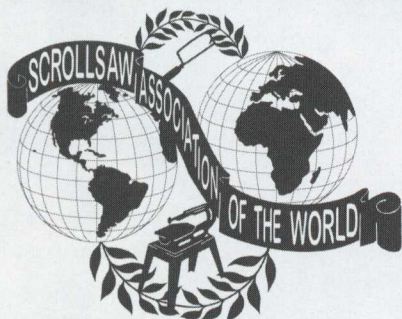
can use either masking tape, painter's tape, or clear packaging tape.

Another method uses hot-melt glue. Glue the blanks together with a dot of hot-melt glue on each side.

You can also join pieces for stack cutting by driving brads or small nails into as many waste areas as you can. Be sure to cut off any overhanging nails as close to the surface as you can; then sand them flush to avoid scratching or catching on the table.



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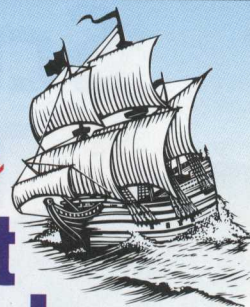
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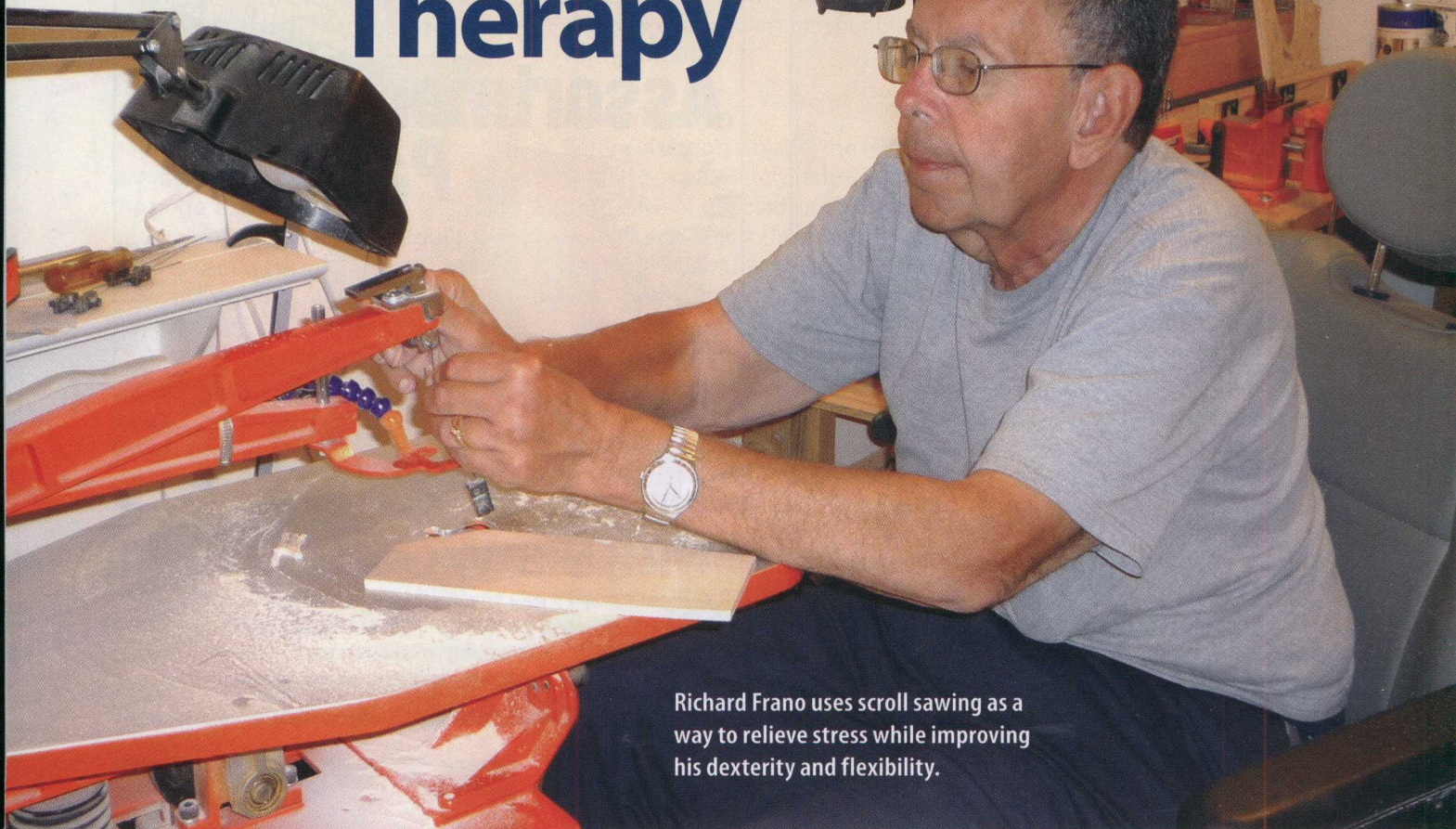
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Scroll Saw Therapy



Richard Frano uses scroll sawing as a way to relieve stress while improving his dexterity and flexibility.

Richard Frano uses woodworking to battle multiple sclerosis

By Kathleen Ryan

For the past 45 years, Richard Frano, a disabled veteran from Southington, Conn., has been waging a private war against the ravages of multiple sclerosis (MS). MS is an incurable autoimmune disease that attacks the central nervous system. One of the unlikely weapons in Richard's arsenal to fight the disease is a scroll saw.

"MS is an insidious disease that steals from your body a little more each day," said Richard. "Having had the disease for so long, I consider myself fortunate not to be worse off than I am."

Now wheelchair-bound, Richard estimates he has lost the use of nearly half of his body functions due to the progression of the disease. Dealing with the effects of MS on a daily basis causes him a great deal of tension, stress, and anxiety. Richard, who is 70 years old, finds that working in his woodshop is a way of relieving stress and escaping from his problems.

"The creative aspect of woodworking helps improve the dexterity and flexibility of both my mind and my limbs. It's one of the most enjoyable outlets I have. I can escape into places that are absent of the effects of this disease," Richard explained.

Richard credits his craft with improving his self-esteem. "When the disease started taking more and more away from me physically, I began to lose my self-worth," Richard confessed. "But when I heard people talk about my work in glowing terms, it made me realize that woodworking has added value back into my life by allowing me to do something worthwhile that people can appreciate."

Richard became interested in woodworking about ten years ago when his wife, Jolanta, asked him to build some cedar flower boxes for their deck. "Because I had little else to do, I decided to give it a try. I found that I really enjoyed it. It was very satisfying," Richard said.

Realizing that he could make better flower boxes if he had the right power tools, Richard purchased a table saw, drill press, chop saw, band saw, sanding belt, and basic scroll saw. He literally set up shop. "I never did make new flower boxes, though, because I got distracted by the scroll saw and ended up making a table clock instead," the scroller said with a chuckle.

Since then, Richard has created more than 125 clocks, decorative wall hangings, and jewelry boxes to give as gifts or donations for auctions and fundraisers to help others battling MS. His donations have helped to raise thousands of dollars, with some pieces bringing more than \$1,500.

Despite his fund-raising success, Richard's focus is on the work itself. "The most rewarding and enjoyable part of woodworking for me is the creation process. The ability to take a raw piece of wood and make something of beauty is truly gratifying," the woodworker said.

Richard's customized workshop consists of two rooms: one containing the table saw and other high-powered equipment, and the other for his professional scroll saw, drill press, workbench, and hand tools.

"The rooms are laid out so I have an open center for turning and maneuvering my wheelchair," Richard explained. "The scroll saw, which is mounted on its own legs, had to be modified by cutting the legs so the saw is at sitting level instead of standing level. All of the other tools and benches are at wheelchair level as well."

Richard works every day on some aspect of his projects. "I'm always either planing the wood, cutting the patterns, sanding, gluing, or staining and finishing the pieces," he said.

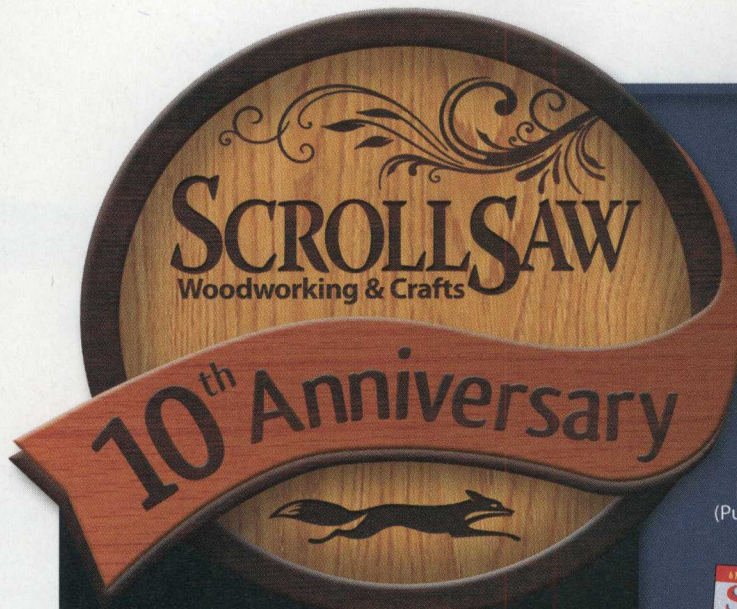
"When I wake up each morning, I tell myself that I will make this day the best it can be for me and those I come into contact with. Then, I make it a point to experience the best in everyone and in all I set out to do," Richard said. "I am very gratified to know I can accomplish such intricate work even with the compromised abilities MS has caused. I look forward to accomplishing even more in the future because I'm going to keep on working until I can't work anymore."

Richard's personal mantra—and his advice to others who suffer from a debilitating disease—comes from the acronym PITEOS. "It stands for 'Persistence Is The Essence Of Success,'" Richard explained. "That's my advice. Be positive and persistent in whatever you try to do and you will succeed!"

**"Be positive
and persistent
in whatever
you try to do
and you will
succeed!"**

Richard has created dozens of clocks, most of which are donated to fund-raising auctions.





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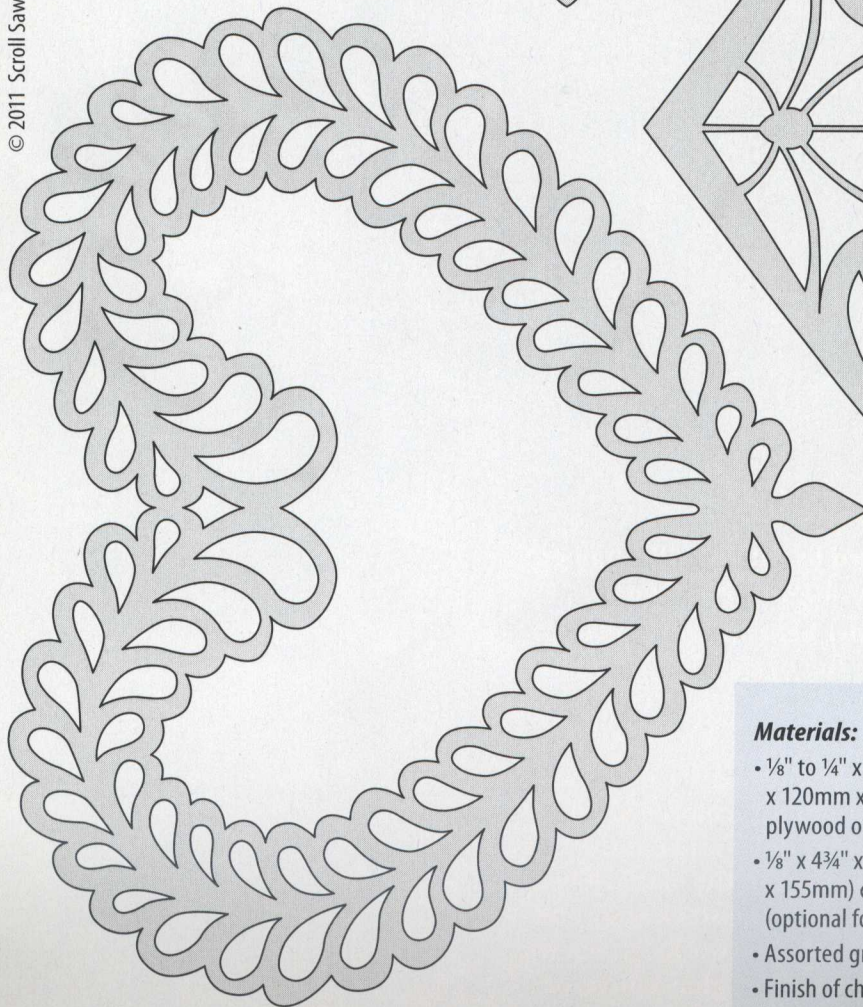
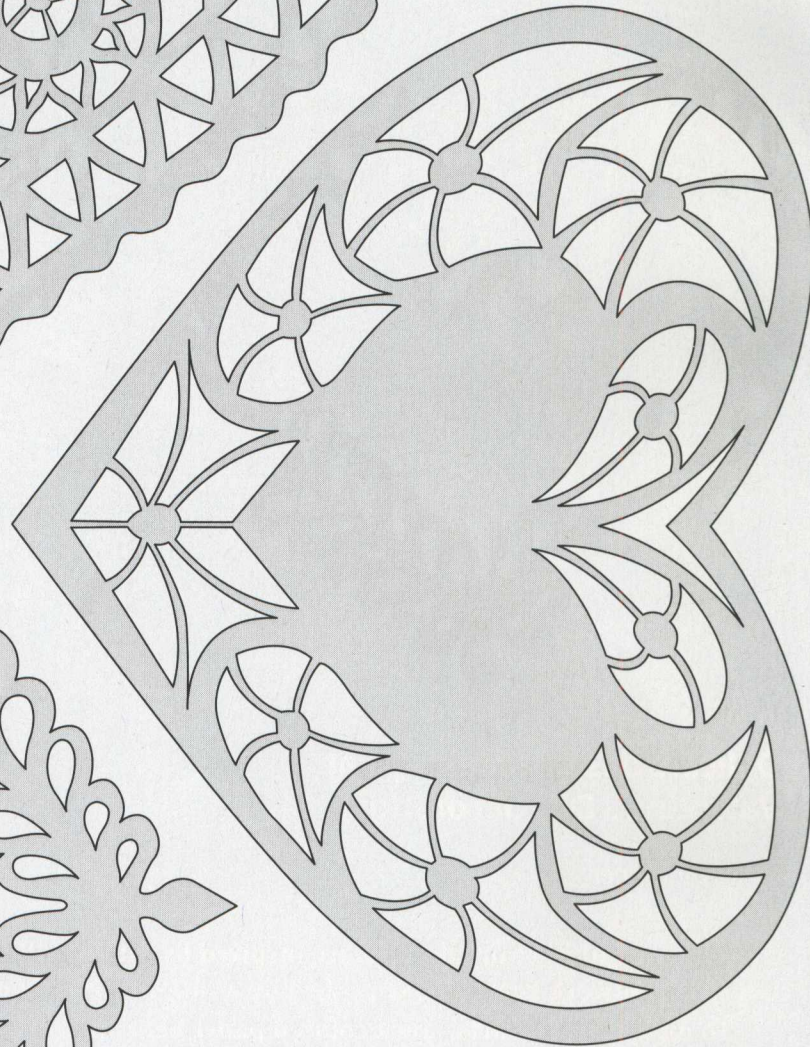
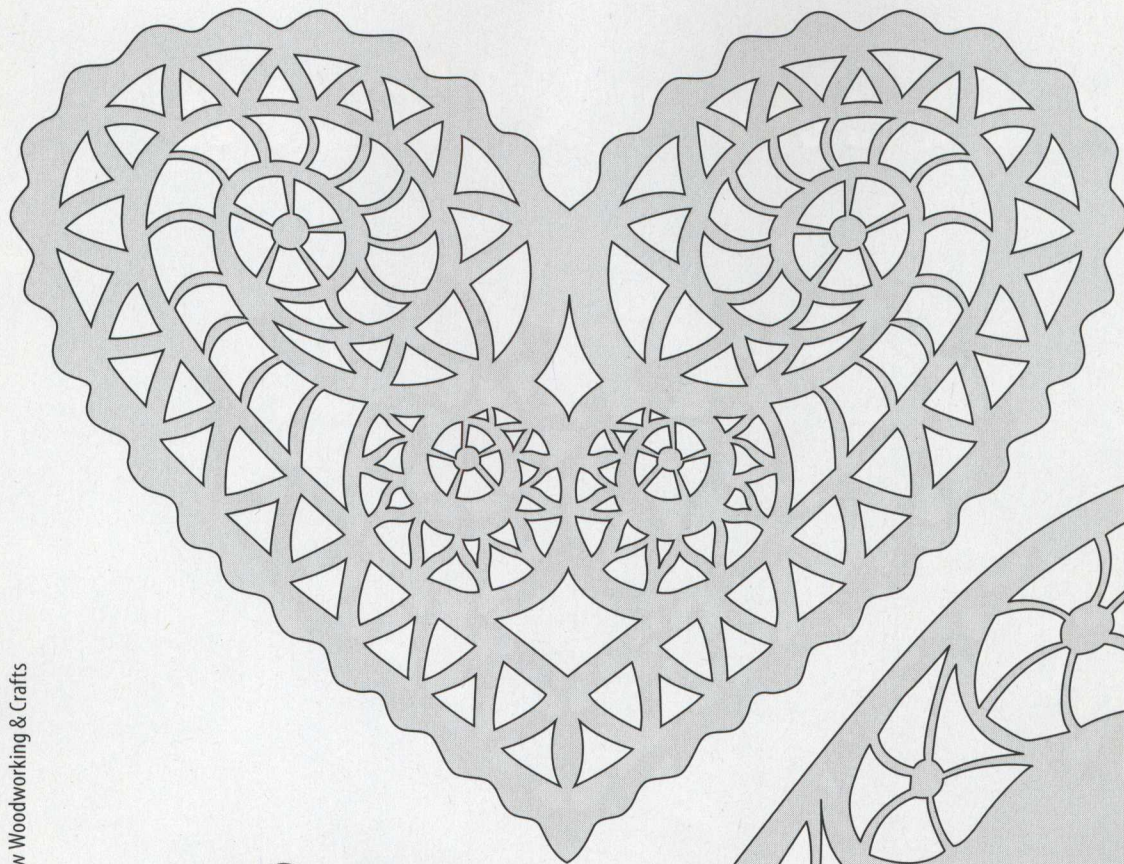
By Alison Tanner

These beautiful fretwork designs are inspired by intricate Battenberg lace. The fretwork hearts make perfect decorations for Valentine's Day.

To make paper hearts, stack colored paper between two pieces of scrap plywood and attach the pattern to the top of the plywood. Cut the designs and use the paper cuttings as overlays to create custom greeting cards.

Cut the hearts from Baltic birch plywood for attractive ornaments or make beautiful suncatchers with the addition of a colored acrylic backer. To create a suncatcher, drill blade-entry holes and cut the frets. Use masking tape to attach the acrylic to the back of the blank. Then, cut around the perimeter of the pattern. Separate the stack and sand off any fuzzies. Apply your finish of choice to the fretwork. Attach the colored acrylic to the wood using cyanoacrylate (CA) glue, epoxy, or silicone adhesive.

Filigree fretwork heart patterns



© 2011 Scroll Saw Woodworking & Crafts

Materials:

- $\frac{1}{8}$ " to $\frac{1}{4}$ " x $4\frac{3}{4}$ " x 6" (3mm to 6mm x 120mm x 155mm) Baltic birch plywood or wood of choice
- $\frac{1}{8}$ " x $4\frac{3}{4}$ " x 6" (3mm x 120mm x 155mm) colored acrylic (optional for suncatcher)
- Assorted grits of sandpaper
- Finish of choice

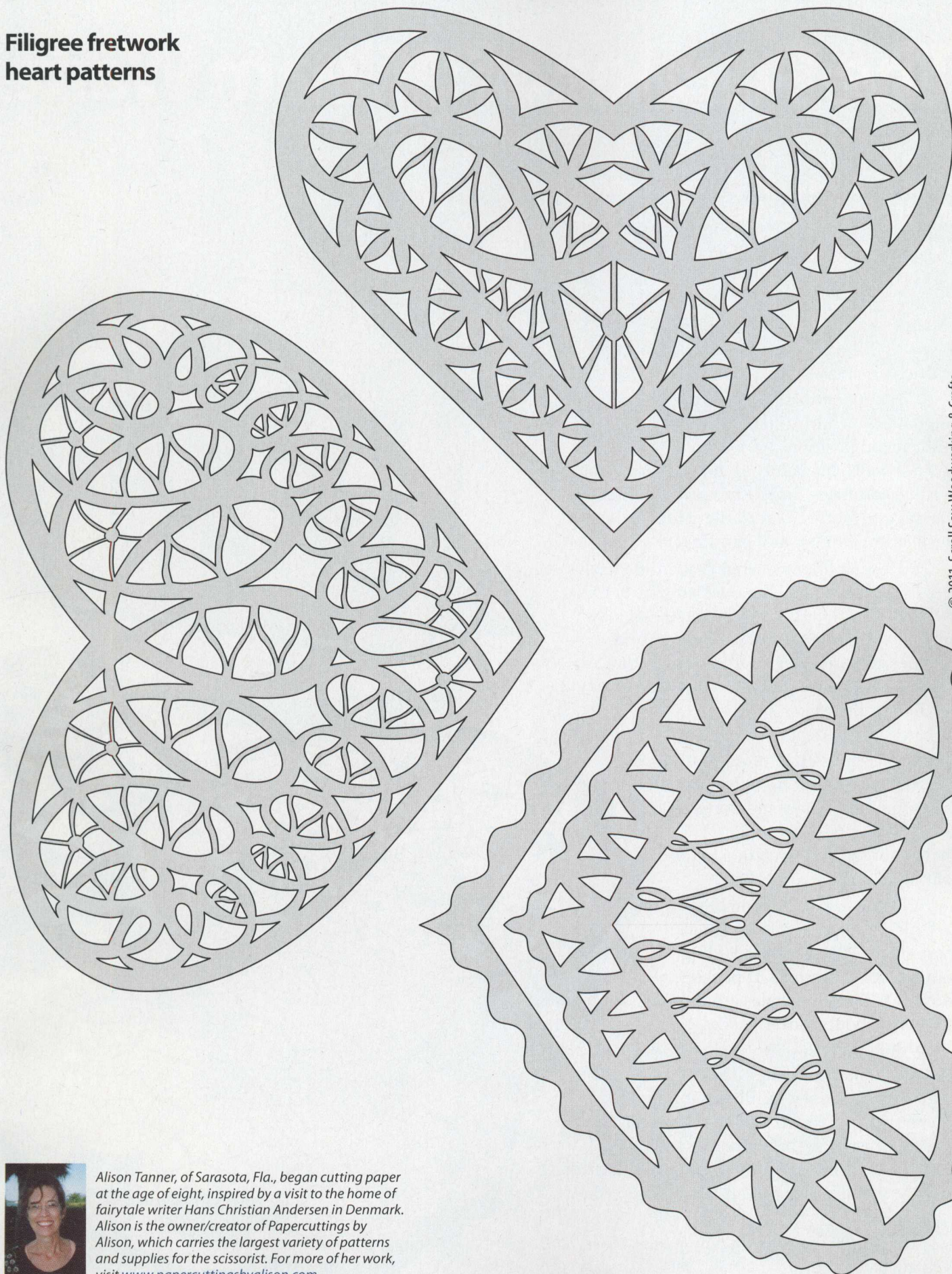
Materials & Tools

- Cyanoacrylate (CA) glue, epoxy, or silicon adhesive (optional)

Tools:

- #1 reverse-tooth blades or blades of choice
- Drill with $\frac{1}{16}$ " (3mm)-diameter drill bit

Filigree fretwork heart patterns



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Alison Tanner, of Sarasota, Fla., began cutting paper at the age of eight, inspired by a visit to the home of fairytale writer Hans Christian Andersen in Denmark. Alison is the owner/creator of *Papercuttings by Alison*, which carries the largest variety of patterns and supplies for the scissorist. For more of her work, visit www.papercuttingsbyalison.com.

The Puzzles of William Waite

Artist and designer is passionate about creating brainteaser puzzles

By Mindy Kinsey

An artist, musician, and puzzle designer, William Waite considers himself something of a Renaissance man.

William holds advanced degrees in music and has been trained in painting. William's musical compositions have been performed professionally, his paintings have been exhibited in three countries, and he has given university courses and lectures about the structural correlation of music and painting.

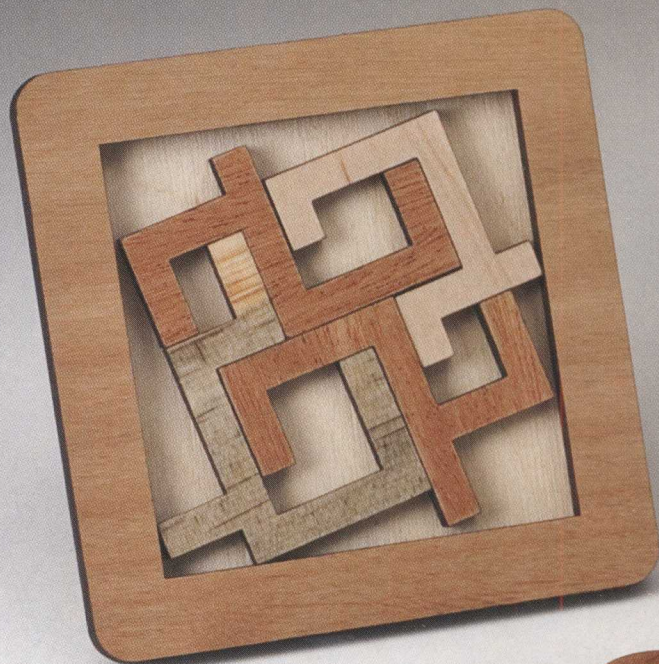
In 1998, William started designing puzzles to fit within the small boxes he collected. Using the shape, materials, or design on the box as inspiration and materials including wood, polymer clay, matches, wire, and thumbtacks, William eventually finished more than eighty Puzzles-In-Boxes.

William's passion, however, is brainteaser puzzles. "Although these brainteasers usually have few pieces, they often have many solutions—and yet it can be extremely challenging to find even one of the solutions," William explained.

William resides in Prairie du Chien, Wis., and has designed more than 300 puzzles, including some award-winning 3-D puzzles. Most of William's puzzles are the tray type with about a dozen pieces.

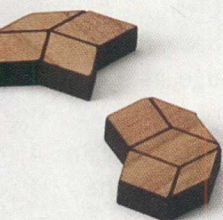
William began selling his puzzles in 2003 when he was living in New York. A bit desperate for money, William set up a table on the sidewalk to sell his puzzles. It was successful enough that he decided to make puzzles his business. William now sells puzzles directly to the public through his website, eBay, and art fairs.

"I enjoy a modest living doing what I love," William said.





William Waite finishes his puzzles assembly-line style.
Visit his website at www.puzzlemist.com.



Creating a Turtle Teaser Puzzle



Perplexing brainteaser puzzle is easy to make

By William Waite

The Turtle Teaser has only eight pieces, but twenty-two different ways you can fit them into the tray.

Some puzzle solutions require you to turn pieces upside down. To keep from spoiling the illusion of the segmented shell, burn or carve the detail lines on both sides of each puzzle piece.

Create the puzzle from two separate layers of wood. The base layer is the turtle shape and the top layer forms the turtle's shell, which contains the puzzle pieces. The geometric puzzle pieces are made up of a combination of flattened pentagons. Each puzzle piece contains three or four pentagons connected together.

Cut the perimeter of both layers. Drill blade-entry holes and cut out the turtle's eyes. Then, drill a small

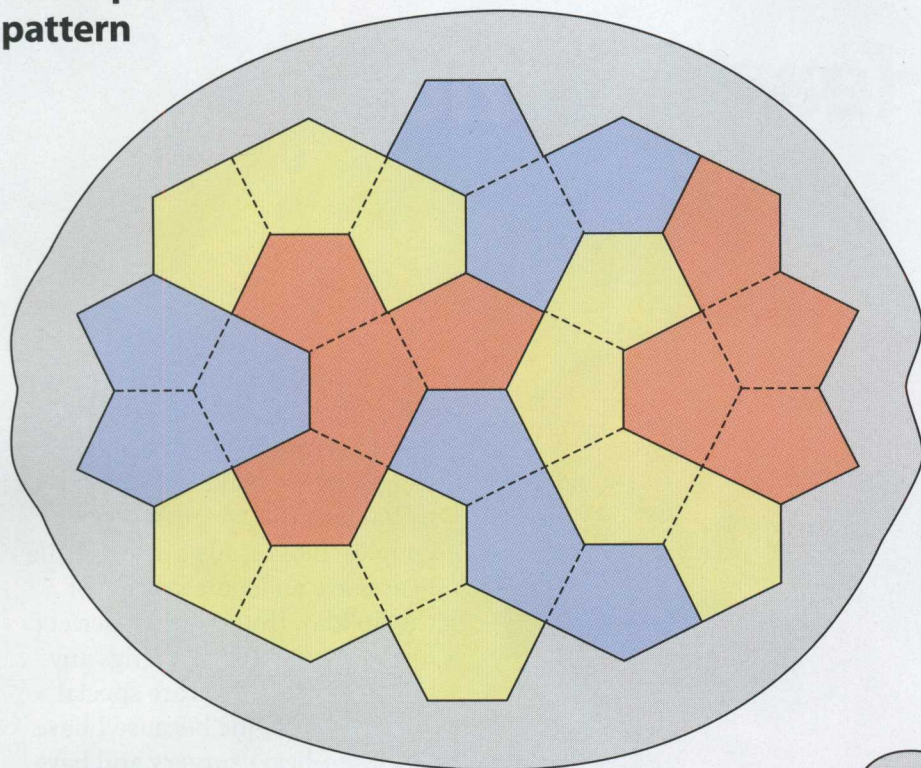
blade-entry hole in one of the corners and cut the puzzle pieces, striving for accuracy. Sand the edges if necessary to make the pieces interchangeable.

Engrave, woodburn, or draw the detail lines on both sides of the puzzle pieces. For a more difficult puzzle, paint the puzzle pieces to eliminate any clues from the wood grain. Use a small torch or woodburner to darken the edges of the pieces for contrast.

Glue the ring of the shell layer to the base. Be sure not to spread the glue all the way to the edge, as the top layer juts out over the bottom layer.

Although it seems very friendly, this is actually an incredibly difficult puzzle to solve without using the wood grain as a clue.

Turtle puzzle pattern



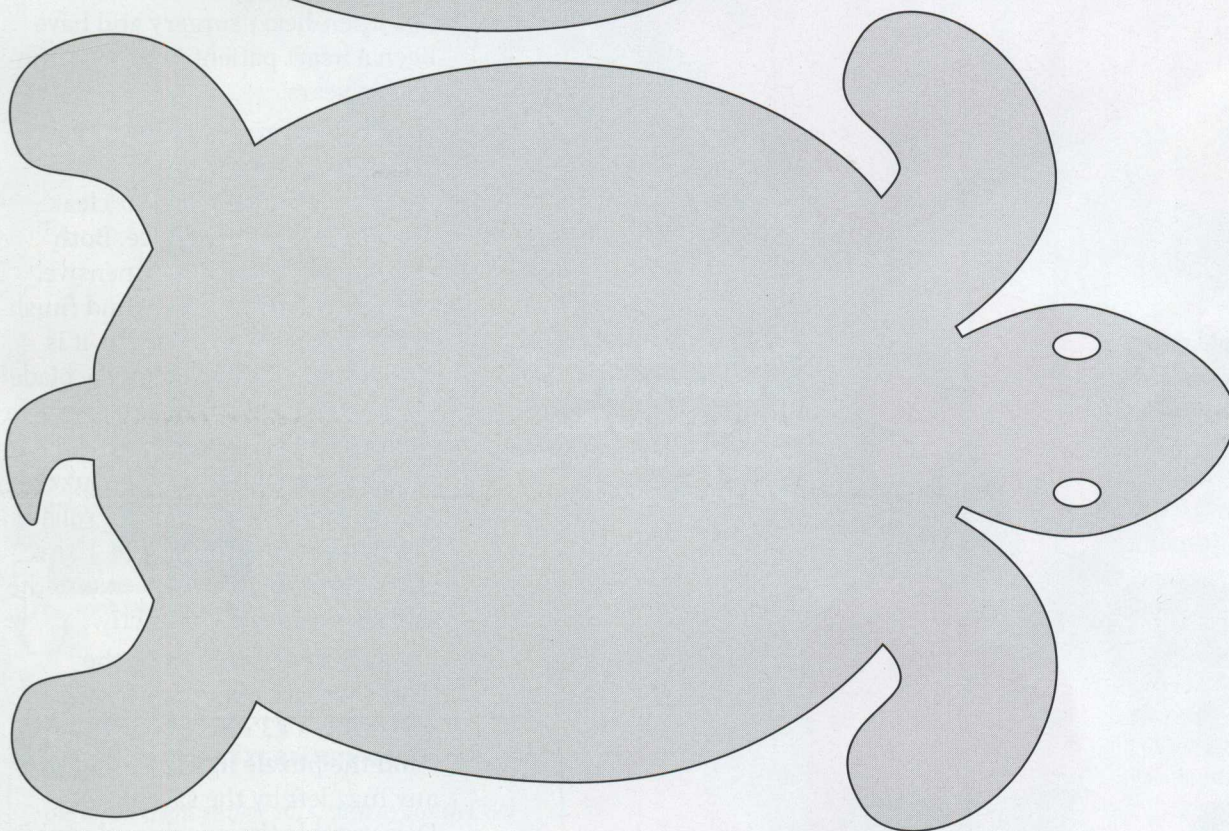
Materials & Tools

Materials:

- $\frac{1}{8}$ " x $4\frac{1}{2}$ " x $6\frac{3}{4}$ " (3mm x 115mm x 170mm) walnut or wood of choice (base)
- $\frac{1}{8}$ " x $4\frac{1}{4}$ " x 5" (3mm x 110mm x 130mm) Baltic birch plywood or wood of choice (shell and puzzle pieces)
- Wood glue
- Assorted grits of sandpaper
- Finish of choice
- Fine-tip permanent marker (optional)

Tools:

- #1 reverse-tooth blades or blades of choice
- Woodburner or rotary-power carver (optional)
- Small propane torch (optional)
- Drill with $\frac{1}{16}$ " (2mm)-diameter drill bit
- Clamps



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About the Artist

William Waite of Prairie du Chien, Wis., has designed hundreds of puzzles and brainteasers. For more of William's work visit his Website at www.puzzlemist.com.

Cutting a Whimsical Heart Puzzle

Fun design makes a great Valentine's Day gift

By Rosalie and Tom Cross



These quick and easy puzzles can be painted with acrylic paints or dyed. See Daniel Johnson's technique for using fabric dye on page 52.

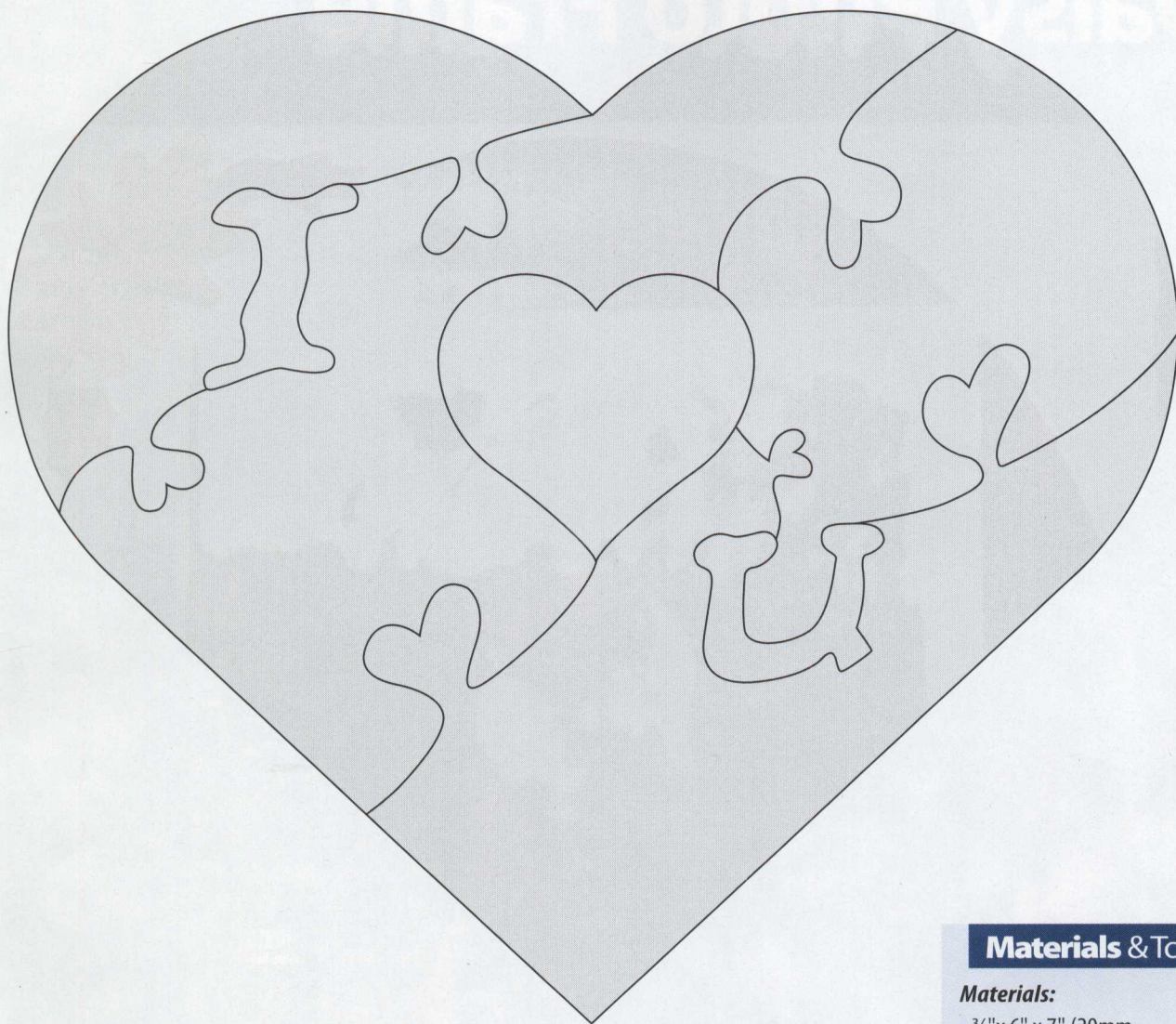
This simple project is easy to cut and makes a thoughtful gift. The idea originated when Rosalie suggested we make wooden hearts as Valentine's Day gifts for our couples' Bible study group. While hearts are an iconic symbol of the holiday, this puzzle is perfect for expressing your feelings any time of year. Hearts are special to Rosalie and me because I have had open-heart surgery and have been a heart patient for more than twelve years.

As I began cutting out hearts, I decided to turn them into puzzles. I used poplar, but clear pine is also a good choice. Both woods are relatively inexpensive, widely available, and cut and finish well. When cutting puzzles, it is very important that your saw blade be square to the table. I was using a square to align my table and blade and had trouble fitting the puzzle pieces. I later found out the square I was using was inaccurate. Use a small drafting square to ensure the table is positioned correctly.

Attach the pattern to the blank and cut along the pattern lines with a #3 reverse-tooth blade. Sand the puzzle lightly to remove any fuzz left by the saw blade. Disassemble the puzzle and apply a coat of white primer paint. Sand the primer lightly and apply your chosen finish color. The puzzle pieces can also be dyed or stained.



Heart puzzle patterns



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ONLINE BONUS

Download alternate heart puzzle designs.

www.scrollsawer.com



TIPS EASY PATTERN REMOVAL

Use an inexpensive glue stick, such as Scotch Clear Glue Stick, to adhere the pattern to the wood.

Make sure there is a film of glue behind any line in the pattern. When finished cutting, just spray the blank with water. The pattern slides right off. Wipe the wood lightly with a damp rag to remove any remaining adhesive residue.

Materials & Tools

Materials:

- $\frac{3}{4}$ " x 6" x 7" (20mm x 155mm x 180mm) poplar or wood of choice
- Assorted grits of sandpaper
- White primer and paint or finish of choice

Tools:

- #3 reverse-tooth blades or blades of choice
- Paintbrushes



Rosalie and Tom Cross live in Houston, Tex., and have enjoyed working together on projects of all kinds for more than fifty years. Rosalie is the planner, designer, and decorator. Tom translates, executes, and builds Rosalie's designs. The couple have two grown children and five grandchildren.

Crafting a Daisy Photo Frame



Beautiful intarsia flowers add a touch of spring to this simple frame

By Kathy Wise

Picture frames make great gifts. This intarsia frame is easy to make and allows you to show off your scrolling skills while displaying your favorite photograph.

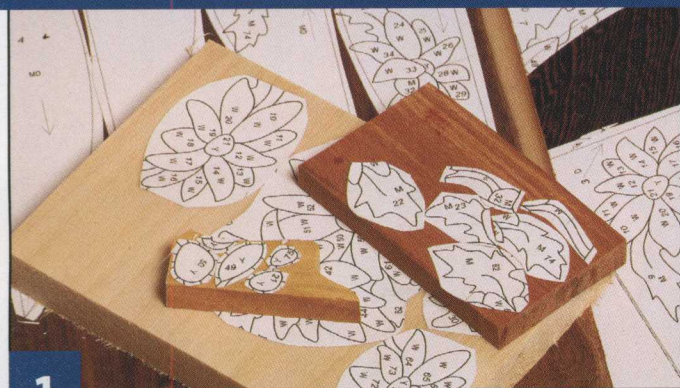
Make the intarsia flowers as daisies with yellow centers surrounded by white petals or as black-eyed Susans with black centers surrounded by yellow petals. The intarsia flowers can be used as stand-alone decorations or embellishments on other projects, such as boxes, serving trays, and napkin holders.

I use black walnut and wenge for the frame. For an easier pattern, make the frame from a single piece of

wood. I use yellowheart for the flower center, poplar for the white petals, and beech for the leaves.

Make five copies of the pattern and keep a master copy for later use. Cut and group the pattern pieces together by color. Apply spray adhesive to the back of the pattern pieces and attach them to the shiny side of a piece of clear contact paper. Cut the paper pattern pieces apart. Attach a full-size pattern to a piece of thin plywood or hardboard to use as a backing board and assembly board.

FRAME: CUT THE PIECES



1 Prepare the blanks. Plane any wood that is not flat before you attach the patterns. Peel and stick the pattern pieces onto the wood. Align the grain direction with the arrows on the patterns. Cut the large pieces into smaller manageable pieces.



2 Cut the flower pieces. Use a #3 reverse-tooth blade or your blade of choice. Use a small square to check a cut piece to make sure your blade is square to the table. Cut each individual petal from the larger section. This method gives you a larger piece of wood to hold as you cut.



3 Cut the frame pieces. These pieces can be cut from a single piece of wood or cut from two complementary colors. Number the bottom of the cut pieces with a pencil and lay them out on the assembly board. Make sure you like the fit, flow, and color of the pieces. Now is the time to make a change if needed.

FRAME: SHAPE THE PIECES



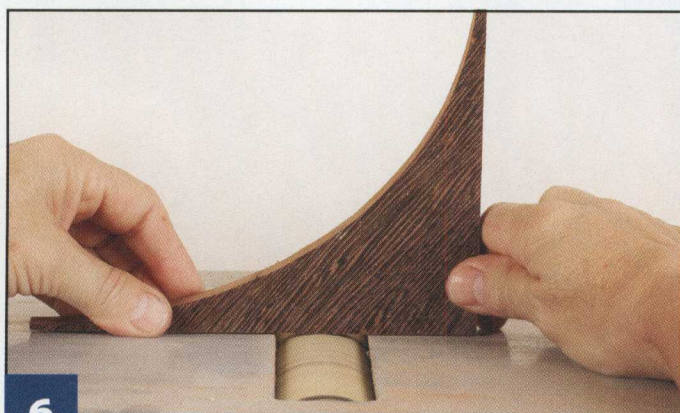
4

Shape the frame pieces. Use your sanders of choice. I use a pneumatic drum sander and sanding drums in a rotary-power carver. Use rubber finger-tip protectors to keep from sanding off your fingerprints. Round the edges of the frame pieces slightly.



5

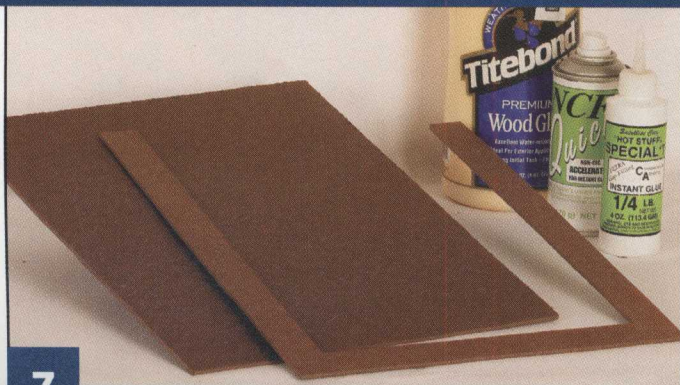
Shape the flower parts. Use tweezers or forceps to hold the small pieces. Round the flower centers. Mark the thickness of the center onto the surrounding petals and sand the petals down to the line. Leave the outside edges of the petals thicker. Refer to the shaping guide on the pattern. Replace the pieces back on the assembly board often to check the fit and flow.



6

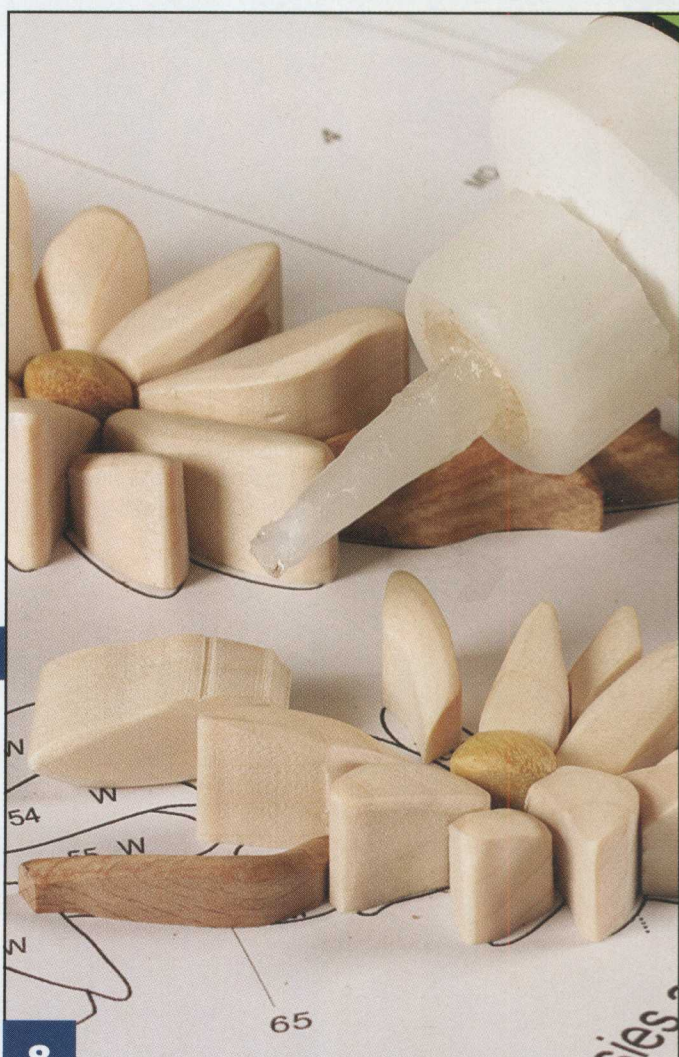
Finish sanding the pieces. Use a stationary drum sander or belt sander to create a flat surface on the straight edges of the frame. Then sand all of the pieces with a 220-grit sanding mop to smooth the pieces. The sanding mop gives the pieces a nice sheen. Hold the small pieces with tweezers or forceps.

FRAME: ASSEMBLE THE FRAME



7

Create the backing board and spacer. Attach the rough side of the backing board and spacer together with double-sided tape. Cut the outside perimeter of the frame and separate the stack. Cut the dotted line on the piece with the pattern attached to create the spacer. Attach the spacer to the backing board using a few dots of cyanoacrylate (CA) glue between dots of wood glue.



8

Glue the intarsia pieces and frame together. Use CA glue to tack the individual pieces together. Work on one section at a time. This keeps the pieces from shifting when you glue them to the backing board. Place the pieces on the assembly board as you glue them together. You may want to sand away some wood from the back edges of the petals to give them a more 3-D look.



9

Glue the frame to the spacer. Intermix dots of wood glue with dots of CA glue on the spacer and apply CA glue accelerator to the back of the assembled frame pieces. Press the frame pieces onto the spacer for a few seconds until the CA glue grabs. Sand a bevel onto the back edges of the spacer and backing board.



10

Attach the flowers to the frame. Intermix dots of wood glue with dots of CA glue on the back of the flowers and apply CA glue accelerator to the frame pieces. Press the assembled flower sections onto the frame for a few seconds until the CA glue grabs.



11

Finish the frame. Apply two coats of clear satin spray varnish to the frame and let the finish dry overnight. Attach your hanger of choice to the back.

Materials & Tools

Materials:

- ½" x 10" x 16" (15mm x 255mm x 405mm) dark wood, such as wenge (frame)
- ½" x 9" x 13" (15mm x 230mm x 330mm) medium-dark wood, such as black walnut (frame)
- ½" x 5" x 5" (15mm x 130mm x 130mm) medium-tone wood, such as beech (leaves)
- ½" x 2" x 3" (15mm x 50mm x 75mm) yellow wood, such as yellowheart (flower centers)
- ¾" x 6" x 8" (20mm x 155mm x 205mm) white wood, such as poplar (flower petals)
- ¼" x 14" x 24" (6mm x 355mm x 610mm) plywood or hardboard (backing boards)
- Roll of clear shelf contact paper
- Spray adhesive

- Titebond wood glue
- Spray varnish
- Wiping rags
- Hanger
- Cyanoacrylate (CA) glue and accelerator

Tools:

- #3 reverse tooth blades or blades of choice
- Pneumatic drum sander
- Rotary-power carver with sanding drum
- Forceps or tweezers
- Stationary drum sander or belt sander

Pattern for the **DAISY PHOTO FRAME** is in the pattern pullout section.



Nationally acclaimed intarsia artist Kathy Wise has authored two books and more than thirty articles. Her award-winning intarsia mural work has set a new standard for the art of intarsia. Private

and semi-private intarsia classes are available. For a free catalog of 450 patterns, contact: Kathy Wise Designs Inc., P. O. Box 60, Yale, Mich. 48097, Fax 810-387-9044, www.kathywise.com, kathywise@bignet.net.



Making Stylish Gifts with Wooden Hinges

Folding mirror and business card holder feature all-wooden hinges

By Gary MacKay

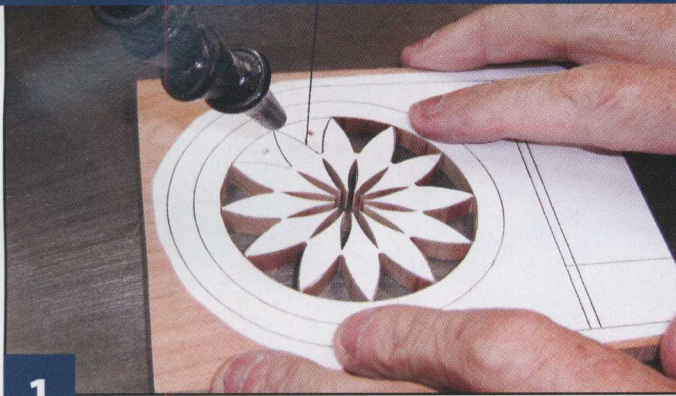


I have been making wooden hinges for jewelry boxes for several years. These large sturdy hinges are designed for repeated use. The mirror features a twelve-point rosette fretwork design. When the hinge is open, the mirror stops at a good angle for viewing. The business card holder uses the same hinge design and includes a contrasting inlay.

Sturdy wooden hinges are easy to make.

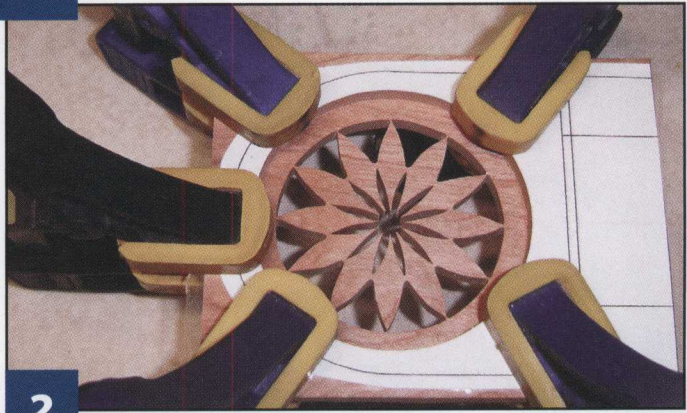


MAKING A COMPACT MIRROR



1

Cut the mirror fretwork. Attach a compact pattern to a $\frac{1}{4}$ " (6mm)-thick blank. Drill $\frac{1}{16}$ " (2mm)-diameter blade-entry holes. Cut the center of the fretwork first with a #2/0 blade. Then, cut the additional twelve frets. Remove the pattern.



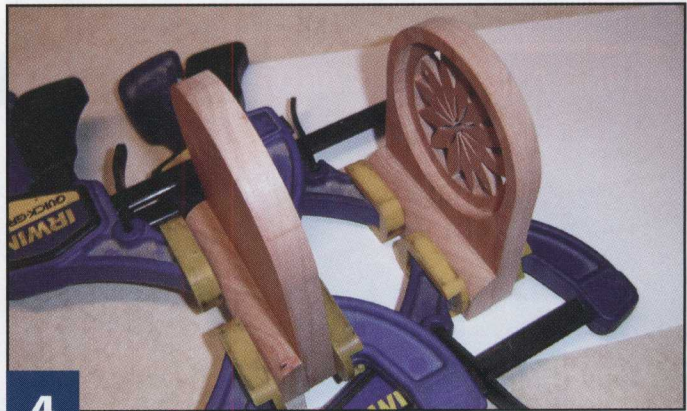
2

Cut the mirror support. Attach a compact pattern to the second $\frac{1}{4}$ " (6mm)-thick blank. Place clear packaging tape over the pattern. Drill a $\frac{1}{16}$ " (2mm)-diameter blade-entry hole inside the dashed circle. Use a #5 blade to cut the circle on the dashed line. Leave the pattern attached. Glue and clamp the mirror support to the mirror fretwork.



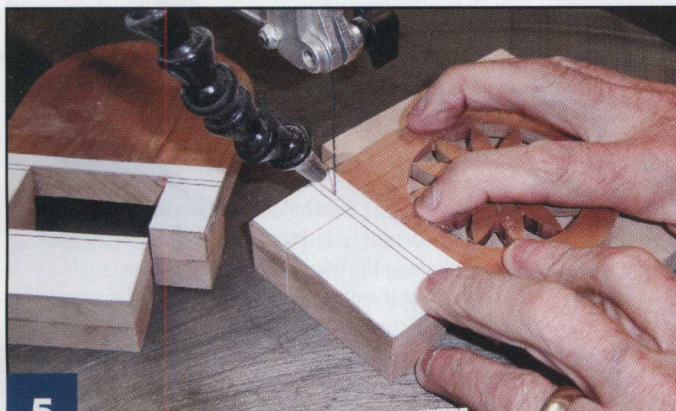
3

Cut the hinge stock. Use a quarter or the template to draw two radius marks on one end of the $\frac{1}{2}$ " (12mm)-thick stock. Sand to the radius marks with a belt sander. Cut a 1" (25mm)-wide piece from the rounded end of the blank. Use the same process to cut another rounded 1" (25mm)-wide piece. Attach a compact pattern to the $\frac{1}{2}$ " (12mm)-thick blank and cover with clear packaging tape.



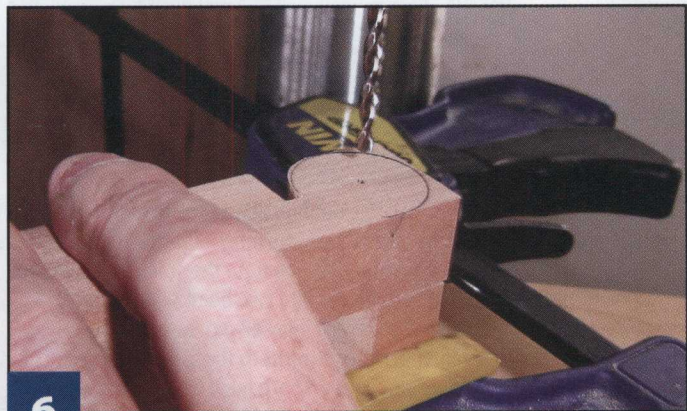
4

Attach the hinge pieces. Cut the outside perimeter on both the base and mirror support pieces. Remove the patterns. Cut the two 1" (25mm)-wide pieces from Step 3 down to $3\frac{1}{2}$ " (90mm) long. Glue and clamp these pieces onto the mirror support and mirror base. Align the flat edges of the pieces so the rounded edges of the hinges face toward the center of the mirror.



5

Cut the hinge barrels. Attach hinge patterns to the flat side of the mirror fretwork and base. Use a $\frac{1}{2}$ " (12mm)-thick piece of scrap to support the blanks as you cut off the outer two tabs on the fretwork blank and the center tab on the solid mirror base.



6

Drill the holes for the dowels. Clamp the base and fretwork sections together and use the quarter or template to trace circles onto both hinge ends. Mark the center of both circles and drill a $\frac{1}{8}$ "-diameter by $1\frac{1}{8}$ "-deep (3mm by 30mm) hole in the center of the circle from both ends. Unclamp the pieces and enlarge the holes in the fretwork hinge using a $\frac{9}{64}$ " (3.5mm)-diameter drill bit.



7

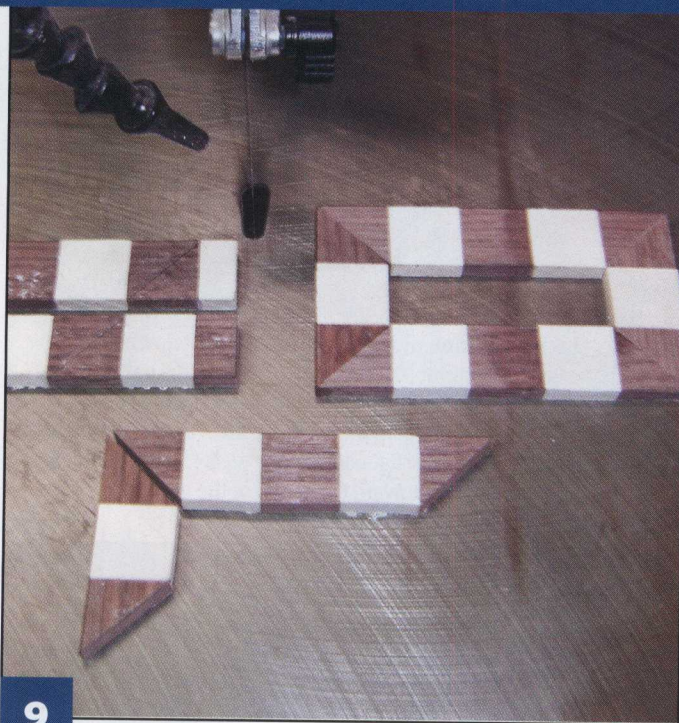
Assemble the hinge. Round one end of two dowel pieces. Assemble the hinge and push the rounded end of each dowel section into both sides of the hinge. Cut off the excess dowel and sand the dowels flush. Round the outside of the hinges on a belt sander using the traced circles as a guide. Apply your clear finish of choice.



8

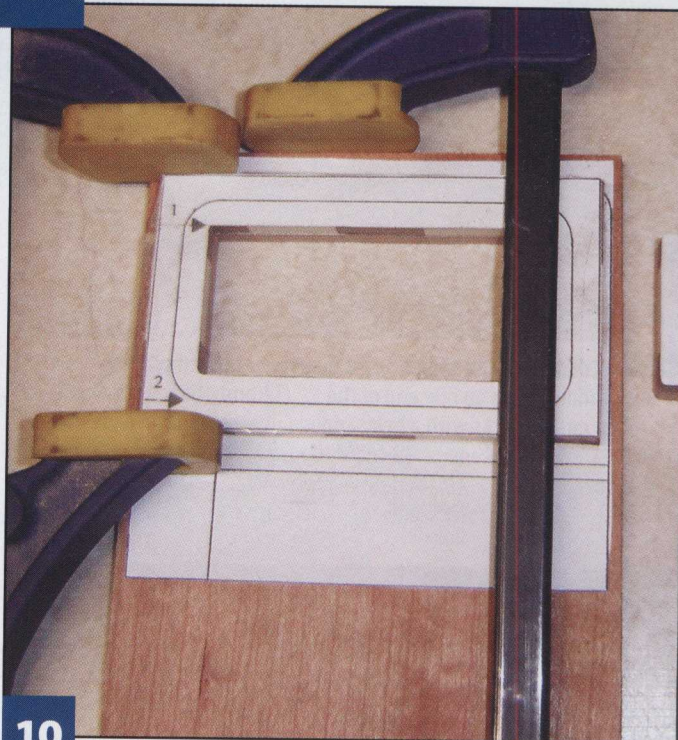
Attach the mirror. Attach a compact pattern to the plywood blank and cut along the dashed circle. Use silicone glue or epoxy to attach the mirror to the plywood backing board and use wood glue to attach the backing board in the recess on the fretwork.

MAKING A BUSINESS CARD HOLDER



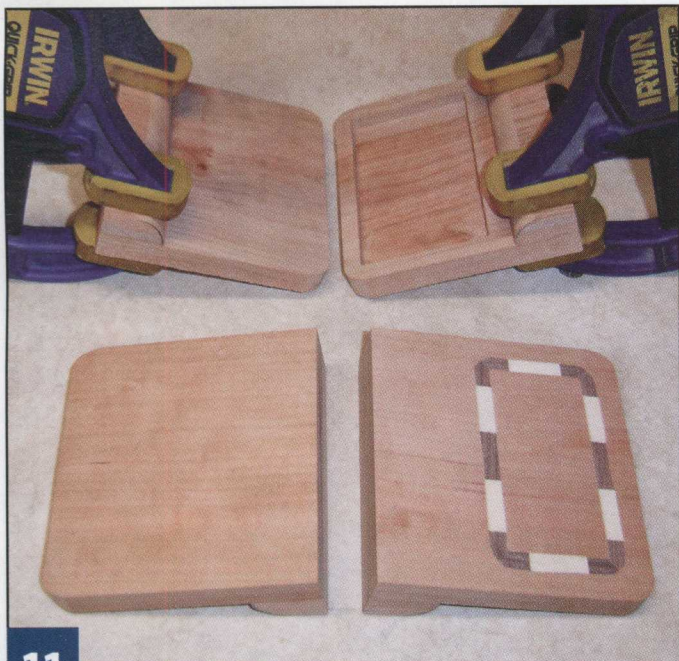
9

Make the inlay band. Use double-sided tape to attach the aspen to the top of the walnut. Attach the inlay #1 pattern to the stack and cut along lines 1 through 7. Separate the stack and glue the alternating light and dark pieces into two blanks, keeping the pieces in numerical order. Attach inlay #2 patterns to the appropriate blanks, matching the patterns to the alternating light and dark blanks. Cut the solid lines on both inlay #2 patterns. Glue the pieces together at the 45° miters to form a rectangle. All four corners are walnut.



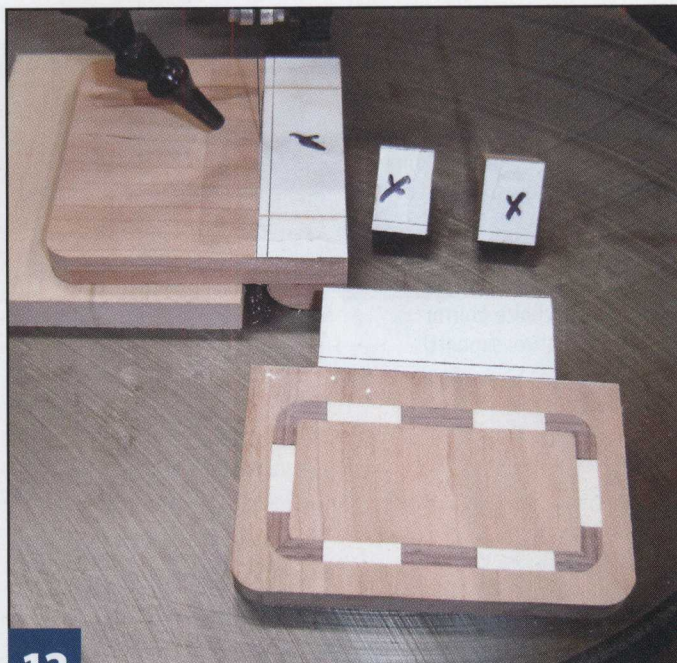
10

Cut the inlay. Attach the card holder #1 pattern to a 1/4" (6mm)-thick blank. Use double-sided tape to attach the inlay stock on top of the blank, aligning the inlay with the dotted rectangle on the pattern. Trim a copy of the pattern along the dotted rectangle and attach it to the top of the inlay stock. Cover the pattern with clear packaging tape. Set your saw table to the correct angle (see sidebar). Cut in along line 1, cutting clockwise along the dashed line. This will raise the solid center up into the inlay band. Apply wood glue to the saw kerf and clamp the kerf closed for two hours. Cut in along line 2 and cut counterclockwise along the solid line. Separate the stack and remove the patterns. Glue the solid center stock into the inside of the inlay band. Then, glue the inlay band into the lid. Glue and clamp the saw kerf from line 2 closed.



11

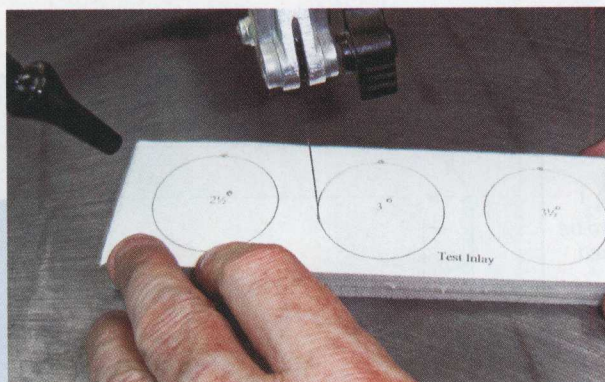
Cut and assemble the lid and base. Return the saw table to square. Attach the card holder #2 pattern to the $\frac{1}{4}$ " (6mm)-thick compartment and lid blanks. Drill a $\frac{1}{16}$ " (2mm)-diameter blade-entry hole in the middle of the rectangle on the compartment blank and cut the opening. Glue and clamp the compartment blank to the $\frac{1}{4}$ " (6mm)-thick base blank. Sand the inlay smooth. Glue and clamp the $\frac{1}{4}$ " (6mm)-thick lid blank to the back of the inlay. Cut around the perimeter of both assemblies. Remove the patterns. Repeat Step 3 from the compact directions to cut the hinge blanks. Cut the two 1" (25mm)-wide pieces down to $4\frac{1}{4}$ " (108mm) long.



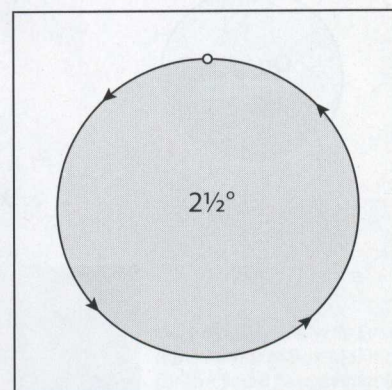
12

Assemble the hinge. Glue and clamp the hinge blanks to the assemblies. Attach the hinges on the side opposite the inlay on the lid and on the side with the compartment opening on the base. Align the flat edges of the pieces so the rounded edges of the hinges face the rounded corners of the card holder. Attach hinge patterns to the inlay side of the lid and the flat side of the base. Use a $\frac{1}{2}$ " (12mm)-thick piece of scrap to support the blanks as you cut off the outer two tabs on the lid and the center tab on the base. Use the techniques explained in Steps 6 and 7 to create a wooden hinge for the card holder. Then apply your finish of choice.

Determining the table tilt for inlay work



Attach two $\frac{1}{4}$ " (6mm)-thick pieces of scrap wood together with double-sided tape. Attach the inlay test pattern (right) to the stack and cover the pattern with clear packaging tape. Drill a $\frac{1}{16}$ " (2mm)-diameter blade-entry hole. Tilt the right side of the scroll saw table down 3° and cut around the circle in a counterclockwise direction with a #5 blade. The bottom piece should drop out and the top piece should fit snugly into the hole in the bottom piece. If the inlay piece protrudes, reduce the tilt of the scroll saw table and cut another piece. If the top piece fits too loosely into the hole in the bottom piece, increase the tilt of the table angle and cut another piece. Keep adjusting the table until the inlay fits tightly into the bottom piece.



Inlay test pattern

Materials:

- 1/2" x 5" x 5" (12mm x 130mm x 130mm) cherry or wood of choice (all four hinges)
- 2 each 1/4" x 4" x 5" (6mm x 105mm x 130mm) cherry or wood of choice (mirror fretwork, mirror support)
- 1/2" x 4" x 5" (12mm x 105mm x 130mm) cherry or wood of choice (mirror base)
- 1/8" x 3 1/2" x 3 1/2" (3mm x 90mm x 90mm) plywood (mirror backing)
- 4 each 1/4" x 4 1/4" x 5" (6mm x 110mm x 130mm) cherry or wood of choice (card holder)
- 1/4" x 2" x 5" (6mm x 50mm x 130mm) aspen or wood of choice (inlay band)
- 1/4" x 2" x 5" (6mm x 50mm x 130mm) walnut or wood of choice (inlay band)
- 2 each 1/4" x 2" x 2" (6mm x 50mm x 50mm) scrap wood (test inlay)
- 4 each 1/8"-diameter x 1 1/2"-long (3mm x 40mm) wood dowel (hinge pins)

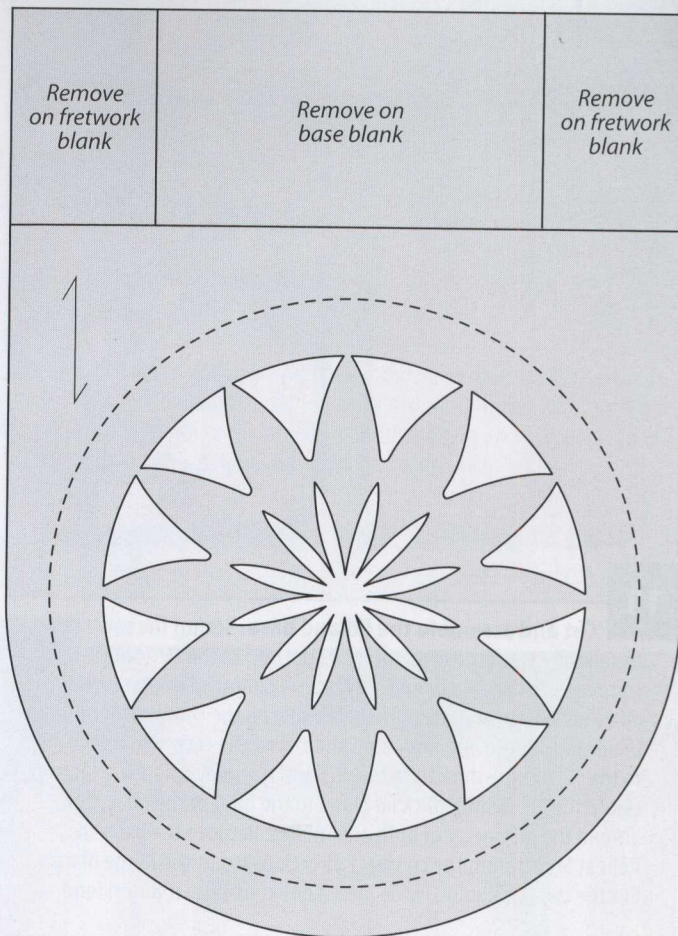
Materials & Tools

- Wood glue
- Temporary-bond spray adhesive
- Masking tape
- Epoxy or silicone glue (attach mirror to backing board)
- Round 3" (75mm)-diameter mirror (Woodcraft #17T01)
- Double-sided tape
- Clear packaging tape
- Assorted grits of sandpaper
- A U.S. quarter (or use template)
- Pin (for glue placement)
- Clear finish of choice

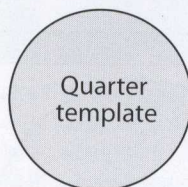
Tools:

- #2/0 and #5 scroll saw blades or blades of choice
- Drill press with 1/16"-, 1/8"-, 9/64" (2mm, 3mm, 3.5mm)-diameter drill bits
- Belt sander
- 5 each quick-grip clamps

Compact pattern



Business card holder patterns



Line 1
Kerf to be glued

Line 2
Kerf to be glued

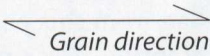
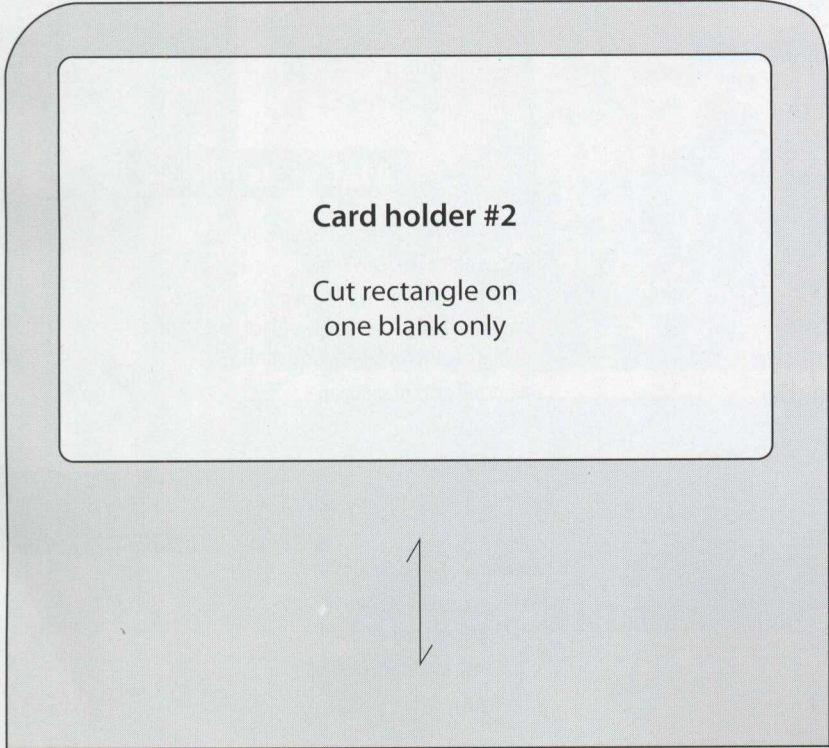
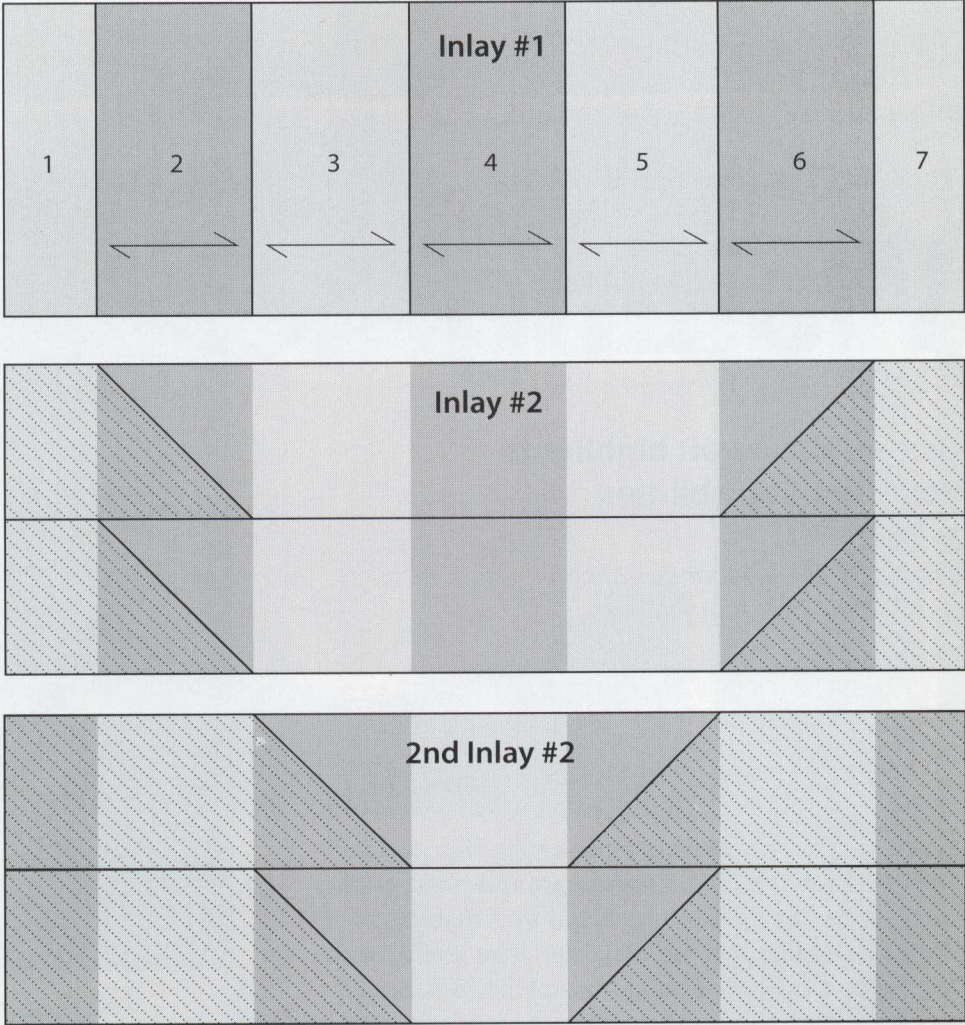
Card holder #1

Remove on lid blank

Remove on base blank

Remove on lid blank

Business card holder patterns



Align the grain in the same direction on all blanks, including the hinges.

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Gary MacKay of Myrtle Beach, S.C., is the author of Box-Making Projects for the Scroll Saw, available from Fox Chapel Publishing, www.FoxChapelPublishing.com.

Waiting

Beautiful portrait highlights your scrolling abilities

By Kerry Hallam

Original photo by Amanda Cannon

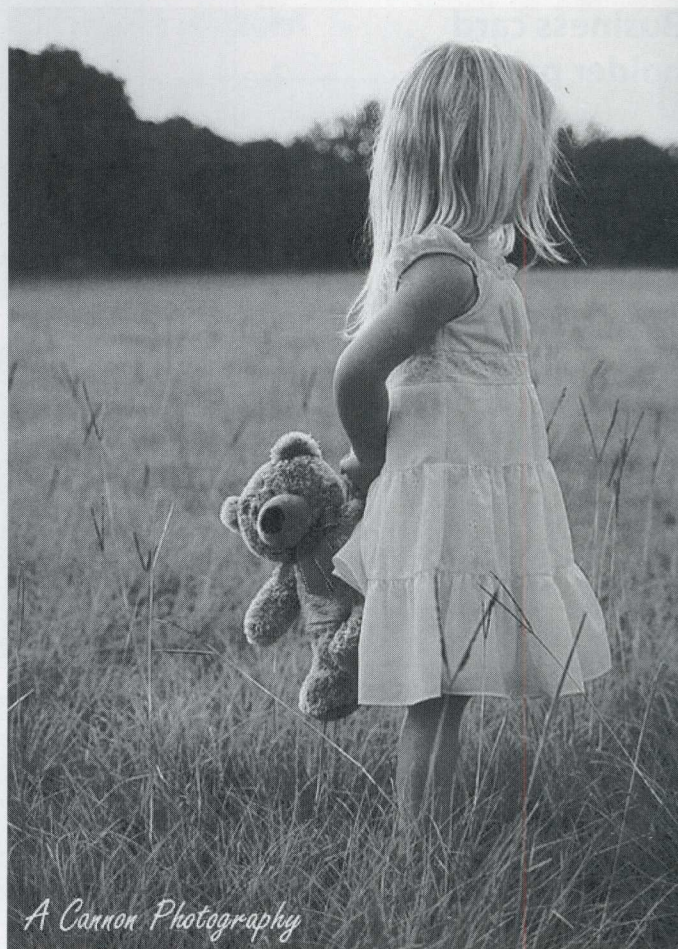
I came across the photo used to create this portrait on www.Eyefetch.com, a digital art and photography community. The photo was taken by Amanda Cannon and features her daughter. The scene made me think of my granddaughter, so I asked Amanda for permission to make a pattern. Amanda was impressed with my work and was even more excited when the piece received an honorable mention in the *Scroll Saw Woodworking & Crafts* 2009 Best Project Design Contest.

The light and shadow in this pattern work together to convey emotion. You can almost feel the girl's anticipation as she stands in the field, waiting. The viewer gets to decide what she is waiting for—her daddy to return from work, her puppy to come home, or her best friend to visit.

Because I usually make my projects 11" by 14" in size, I use spiral blades to cut the portrait. If the throat depth of your scroll saw will accommodate the larger stock, or if you reduce the pattern for a smaller portrait, you can use small flat blades.



Kerry Hallam of Sumter, S.C., earned several awards in the *Scroll Saw Woodworking & Crafts* 2009 Best Project Design Contest. For more of Kerry's work, visit www.kerrysbladeart.blogspot.com.



This photo, taken by Amanda Cannon, is the basis for Kerry Hallam's portrait. Remember to obtain permission before using copyrighted photographs to create scroll saw patterns.

Materials & Tools

Materials:

- 1/8" x 11" x 14" (3mm x 280mm x 355mm) oak or Baltic birch plywood
- 1/8" x 11" x 14" (3mm x 280mm x 355mm) Baltic birch plywood painted black, black felt, or black foam core (backing board)
- Assorted grits of sandpaper
- Wood glue
- Finish of choice
- Frame of choice

Pattern for **WAITING** is in the pattern pullout section.

Tools:

- #1 spiral reverse-tooth blades or blades of choice
- Drill with assorted small bits
- Clamps



WAITING... 2/5

K. HOFFMAN 09

Creating an Intarsia Fox

Realistic design uses shaping and risers to add dimension

By Janette Square

Pattern by Bruce Worthington



I've always had trouble finding the hidden fox in the magazine. When I saw this design from Bruce Worthington, I thought it would be a great project for the magazine. So for all of you hidden-fox-challenged folks out there, this one's for you!

The pattern uses $\frac{3}{4}$ "-thick wood. I've indicated on the pattern where to raise or lower a piece. Raise or lower pieces in $\frac{1}{8}$ " increments. For example, L1 means to lower the $\frac{3}{4}$ "-thick piece by $\frac{1}{8}$ " and R2 indicates the $\frac{3}{4}$ " thick piece should be raised by $\frac{1}{4}$ ".

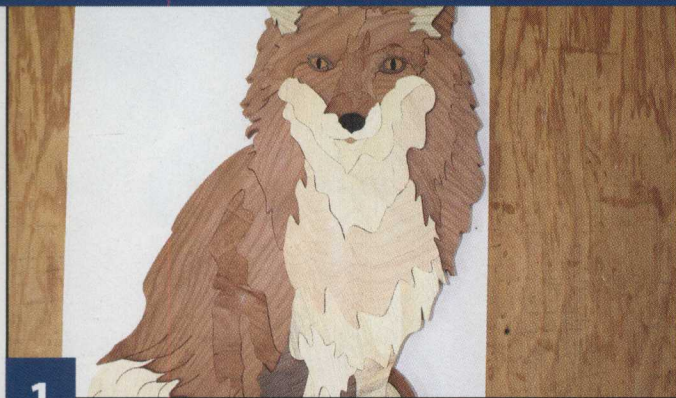
Use thinner wood or sand the wood down to the proper thickness to lower pieces. To raise pieces, use risers under the $\frac{3}{4}$ "-thick stock. I use scrap Baltic birch plywood as risers. Because part of the edge of the outside piece of the right leg is exposed, use a piece of $\frac{7}{8}$ " wood to get the proper height.

I've marked suggested colors of wood on the pattern. Make the project your own by using woods you can find locally. The sizes listed are a guide only; it's best to have a larger board to select the best grain for each piece.

Make multiple copies of the pattern. Number your master copy to keep track of the pieces. Cover the blanks with clear packaging tape and attach the patterns to the tape with spray adhesive.

Pay attention to the grain direction of the pieces when positioning the Patterns.

FOX: CUTTING THE PIECES



1

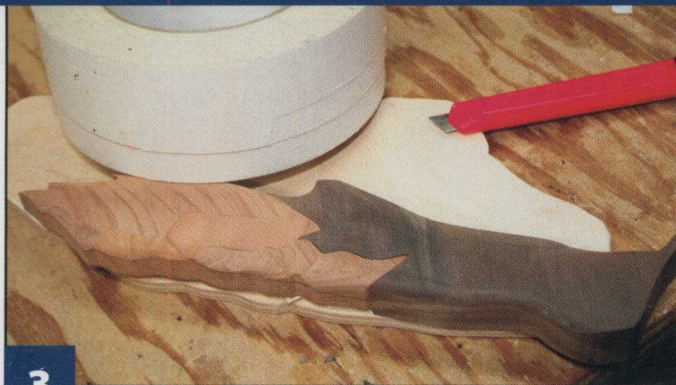
Cut the pieces. Use a #5 blade for soft woods, such as redwood, and a #7 blade for hard woods, such as maple and hackberry. Write the number of the piece on the bottom after you finish cutting.



2

Raise or lower the pieces as required. Use the pattern as a guide. Glue the muzzle pieces together, but do not add the nose yet. Then glue the two parts of the right leg together.

FOX: SHAPING THE PIECES



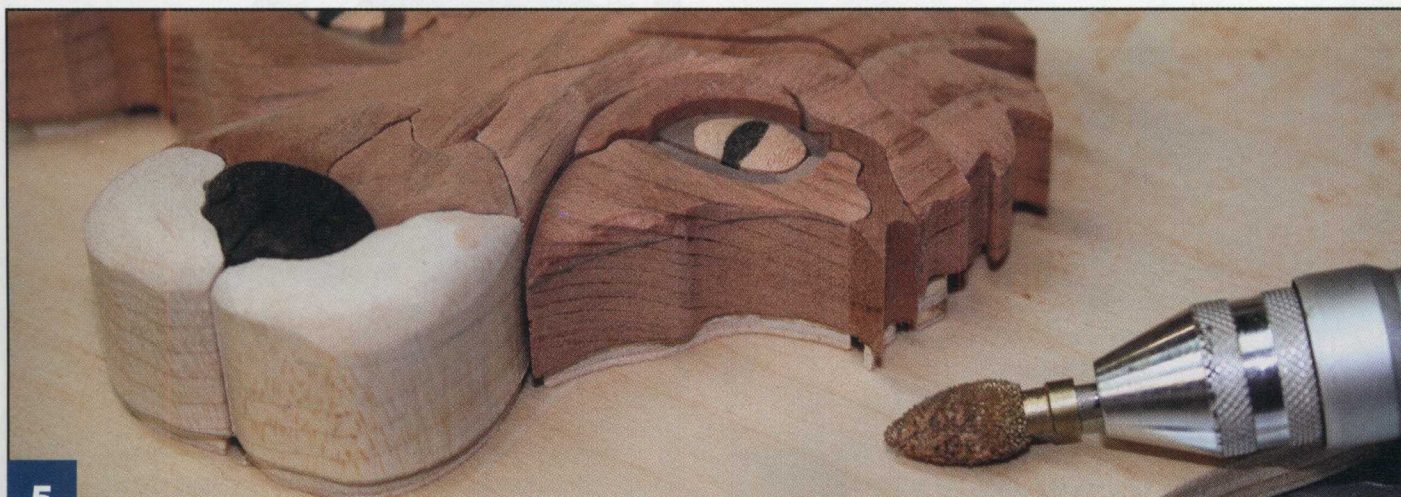
3

Begin shaping the pieces. Taper the upper back as it approaches the head and the fox's right leg. The back is lowest at the top. Round the left edge. Lower the top of the white piece below the back to create fluffy-looking fur. Create sanding shims for the right leg pieces and the two upper back pieces and attach the sections to the shims with double-sided tape.



4

Rough shape the rest of the body. Work your way up from the bottom. Lower the upper portion of each of the fluffy fur pieces. Use a spindle sander to remove lots of wood quickly. Then use a Flex Drum sander to finish rough shaping the pieces.



5

Rough shape the face. Use double-sided tape to attach the face pieces to scrap wood. Draw shaping guidelines on the muzzle. Use a rotary-power carver to sculpt the face. Taper the top of the snout down to meet the forehead. Round the muzzle area. Carve a slight indent around the eye area.



6

Shape the ear pieces. Mark the thickness of the face on the ear pieces. Shape the ear pieces so they are concave and the bottom of the pieces are thinner than the forehead. I use a spindle sander.



7

Finish shaping the fox. The tail is lower on the left so it appears to go behind the leg. Mark the thickness of the feet on the base and shape the base. Use a spindle sander to carve indents in the base. Check the fit and flow of the pieces and add additional risers if desired. Sand each piece with the grain using a 220-grit Flex Drum sander to remove any scratches.

FOX: FINISHING THE PROJECT



8

Finish sanding the pieces. Sand each piece by hand with 220-grit sandpaper and a sanding sponge. Soften the sharp edges and fine-tune the areas where the edges meet. Remove any pencil marks. Then, sand each piece lightly with a 220-grit mop sander.



9

Begin gluing the project together. Dry assemble the project on top of a wax paper-covered pattern. Glue the fox's right leg pieces together, and then glue the pieces to a riser.



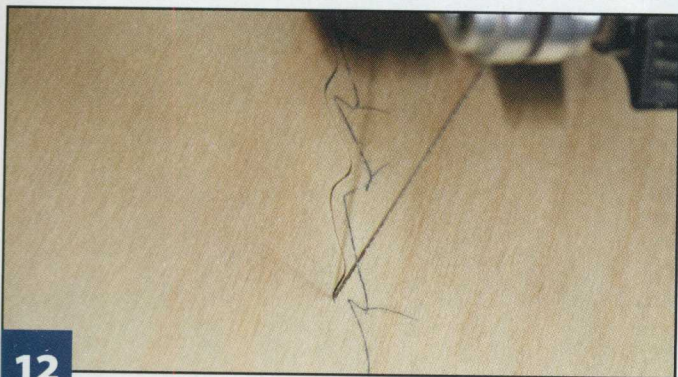
10

Glue the rest of the pieces together. Edge glue the upper back pieces together, and then glue the rest of the pieces together. Be careful the pieces do not shift. Allow the glue to dry thoroughly. Apply highlights to the eyes using white acrylic paint and a skewer.



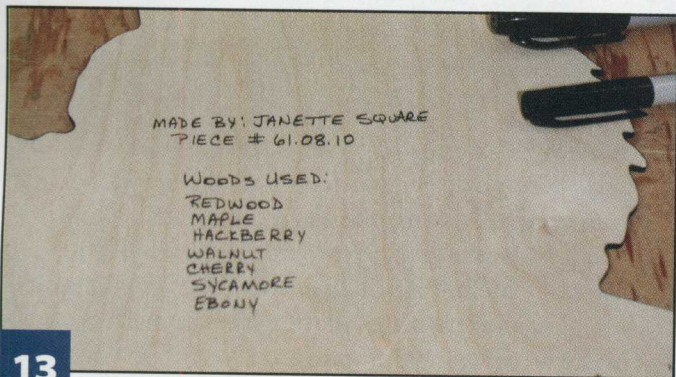
11

Apply the finish. Working in sections, apply gel varnish with a foam brush. Remove the excess before moving on to the next area. Use compressed air to blow the excess varnish out of the cracks. Work any tough varnish out of the cracks with a rubber dental tool and paper towel. Run a sharp dental tool through the saw kerfs to remove any excess varnish. Allow the finish to dry overnight, apply a second coat, and let it dry.



12

Create the backing board. Cover the backing board blank with graphite transfer paper and place the project on top. Trace the outline onto the backing board using an awl so you can get into the tight corners. Cut $\frac{1}{8}$ " (3mm) inside the traced line with a #1 blade. Sand the back and edges of the backing board with 220-grit sandpaper. Color the edges of the backing board with a marker.



13

Attach the backing board. Place the fox face down on a protective cloth, such as an old t-shirt. Sign the back of the backing board and list the woods used. Apply wood glue to the front of the backing board with a foam brush. Place the backing board onto the fox, making sure the edges don't show. Use old socks as cushions to protect the intarsia and clamp the intarsia to the backing board. Determine where the piece balances and attach a hanger to the back.

Materials & Tools

Materials:

- $\frac{3}{4}$ " x 8" x 12" (20mm x 205mm x 305mm) dark wood, such as walnut (tail, legs)
- $\frac{3}{4}$ " x 16" x 16" (20mm x 405mm x 405mm) red wood, such as redwood (body)
- $\frac{3}{4}$ " x 6" x 6" (20mm x 155mm x 155mm) dark red wood, such as a darker shade of redwood (body shading)
- $\frac{3}{4}$ " x 5" x 7" (20mm x 130mm x 180mm) light wood, such as hackberry (light parts of body)
- $\frac{3}{4}$ " x 9" x 10" (20mm x 230mm x 255mm) white wood, such as hard maple (white areas of body)
- $\frac{3}{4}$ " x 2" x 5" (20mm x 50mm x 130mm) red wood, such as cherry (ears)
- $\frac{3}{4}$ " x 2" x 2" (20mm x 50mm x 50mm) red wood, such as cherry (eyes)
- $\frac{3}{4}$ " x 1" x 1" (20mm x 25mm x 25mm) black wood, such as ebony (nose, pupil)
- $\frac{7}{8}$ " x 4" x 5" (22mm x 105mm x 130mm) medium-tone wood, such as gray-streaked hackberry (right leg)
- $1\frac{1}{4}$ " x 6" x 18" (35mm x 155mm x 460mm) medium-light wood, such as figured sycamore (base)
- $\frac{1}{8}$ " x 18" x 20" (3mm x 460mm x 510mm) Baltic birch plywood (backing board, risers)

- Fine-point permanent marker (for signing your work and listing the woods used)
- Wide-point permanent marker (color edge of backing board)
- Clear packing tape
- Spray adhesive
- Sandpaper, 220 grit
- Wood glue, skewer, wax paper (for edge gluing)
- Clear satin gel varnish or finish of choice
- Paper towels, assorted dental tools, foam brush, gloves, and eye protection (for finishing)
- Hanger
- Antique white acrylic paint/skewer (eye highlights)
- Graphite tracing paper, awl (for tracing project onto backing board)
- Dust mask

Tools:

- #5 and #7 reverse-tooth blades or blades of choice
- Flex Drum sanders: 120-grit for rough shaping, 220-grit for smoothing
- Oscillating spindle sander
- Sanding mop
- Rotary-power carving tool with power carving and sanding bits
- Air compressor

Pattern for the
INTARSIA FOX is in the
pattern pullout section.



About the Author

Janette Square, of Eugene, Ore., specializes in wildlife and pet intarsia projects. For more of her work, visit www.square-designs.com.



About the Designer

Bruce Worthington, of Brownstone, Mich., designs a variety of intarsia patterns. For more of his work, visit www.intarsia.net.

Building a Portable Herb Planter



Personalize this functional design with interchangeable name plates

By Fred and Julie Byrne

TIPS

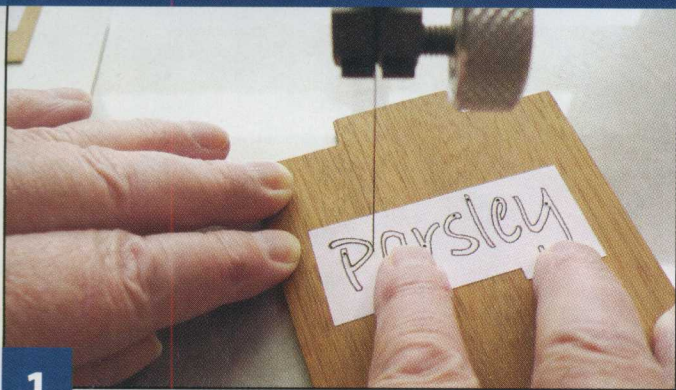
CUTTING THE LETTERS

Cut the inside line of the letter first, and then cut the outside line. That way, the stress placed on the small connecting piece, or bridge, is minimized.

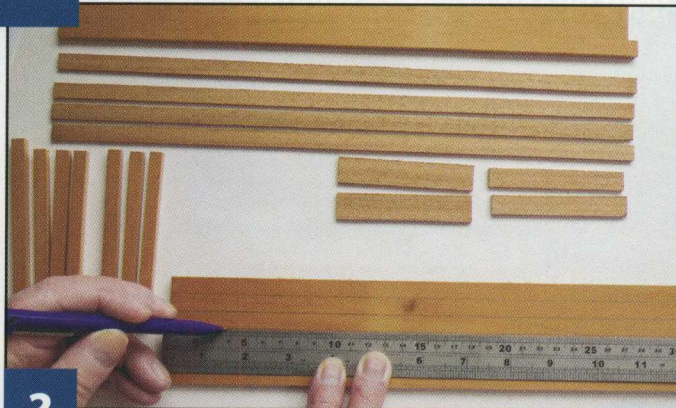
This little herb planter is designed to sit on the kitchen windowsill and be taken into the garden on nice sunny days, especially for watering. After the planter is assembled, simply slide an interchangeable name plate into each section in the front panel to identify the herbs. Change the plates to suit your herb selection. Make an extra set of name plates and attach them to dowels to mark the rows in your garden.

The holder is a compact and convenient way to hold the fresh herbs you use most. Whether the herbs are grown in your own garden or bought from the supermarket or garden center, they'll be at hand to use as you wish!

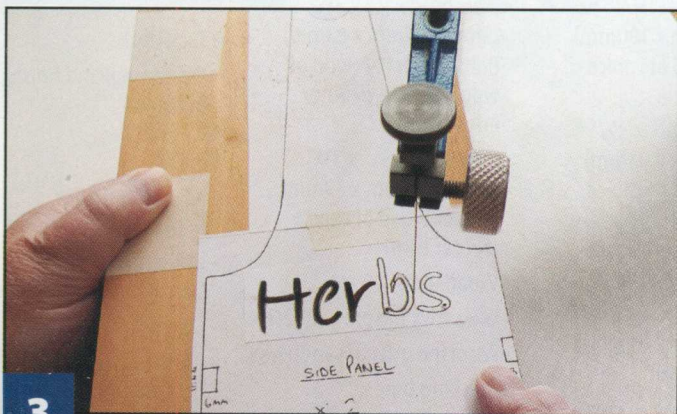
HERB PLANTER: CUTTING THE PIECES



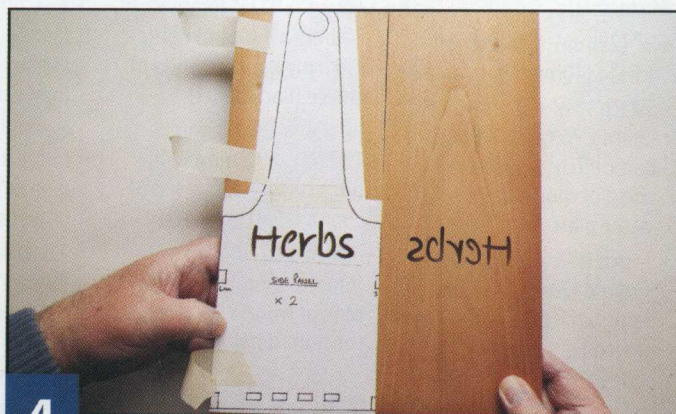
- 1** **Cut the name panels.** Attach the perimeter pattern to the blanks and cut along the lines. Attach the pattern for the herb name to the blank using a glue stick. Drill blade-entry holes with a $\frac{1}{32}$ " (1mm)-diameter drill bit and cut the letters.



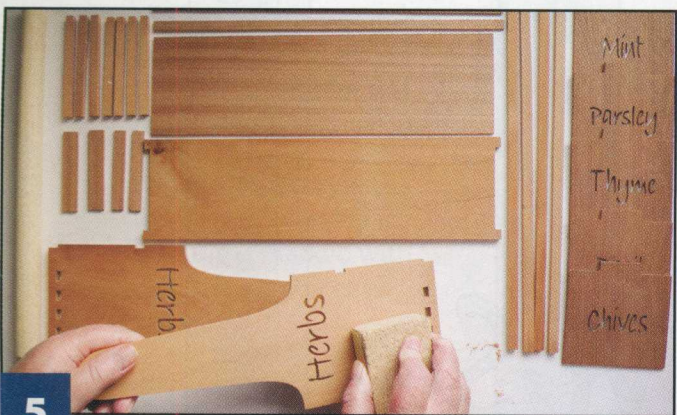
- 2** **Cut the bottom, dividers, and supports.** Use the dimensions in the materials and tools list to mark the sizes of the bottom and rails. Cut the pieces to size. Use a #2 blade to cut the $\frac{1}{8}$ " (3mm)-thick pieces and a #5 blade to cut the $\frac{1}{4}$ " (6mm)-thick pieces.



- 3** **Begin cutting the side panels.** Stack together the blanks for the two side panels and secure the stack with masking tape. Attach the pattern to the stack. Drill blade-entry holes and cut the letters. Then, cut straight up both sides of the pattern. Do not cut the notches or the handle.

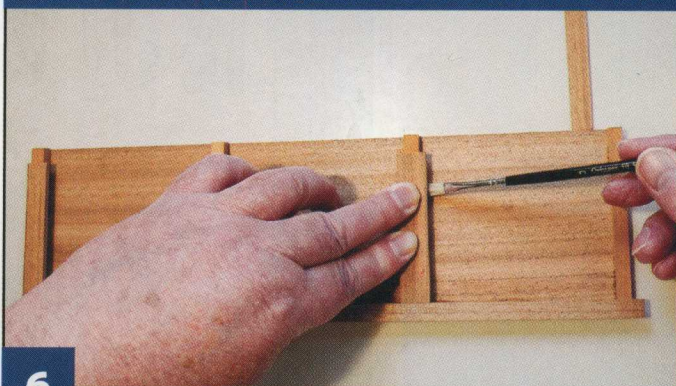


- 4** **Finish cutting the side panels.** Separate the stack and flip the bottom piece over so the word *herbs* is reversed. Secure the stack and drill blade-entry holes for the dowel and bottom slats. Cut the holes for the dowel and bottom slats. Cut the four notches.



- 5** **Sand the pieces.** Dry assemble the pieces to make sure everything fits together. Remove the patterns and sand the pieces with progressively finer grits of sandpaper up to 220 grit. Remove the fine dust with a tack cloth. Stain the dowel and pieces as desired.

HERB PLANTER: ASSEMBLING THE PIECES



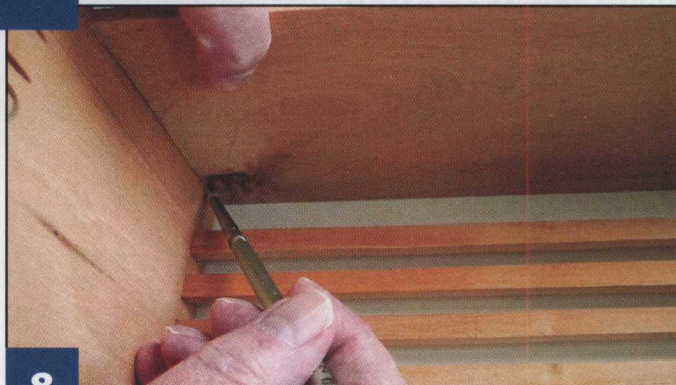
- 6** **Assemble the front panel.** Glue the four upright spacers and three lower spacers onto the front panel. Clamp the spacers in place and let the glue dry. When dry, glue and clamp the six trim pieces in place. Wipe away any excess glue.

HERB PLANTER: ASSEMBLING THE PIECES



7

Assemble the bottom. Glue the bottom slats into the side panels. Be sure to clean up any glue squeeze-out as you assemble each piece.



8

Finish assembling the planter. Glue the back panel in place. Slide the dowel handle in place and secure it with glue. Glue the front panel in position. Secure the whole project with clamps or masking tape. After the glue dries, apply a few coats of varnish, sanding between coats with fine-grit sandpaper.

Materials:

- $\frac{7}{8}$ " (23mm)-diameter by $13\frac{3}{8}$ " (340mm)-long dowel
- 5 each $\frac{1}{8}$ " x $3\frac{3}{4}$ " x $4\frac{1}{4}$ " (3mm x 96mm x 105mm) Baltic birch plywood or wood of choice (herb name plates)
- 2 each $\frac{1}{4}$ " x $4\frac{3}{4}$ " x $12\frac{1}{2}$ " (6mm x 120mm x 320mm) Baltic birch plywood or wood of choice (side panels)

- $\frac{1}{4}$ " x 4" x $13\frac{3}{8}$ " (6mm x 100mm x 340mm) Baltic birch plywood or wood of choice (back panel)
- $\frac{1}{8}$ " x 4" x $13\frac{3}{8}$ " (3mm x 100mm x 340mm) Baltic birch plywood or wood of choice (front panel)
- 4 each $\frac{1}{4}$ " x $\frac{3}{8}$ " x $13\frac{3}{8}$ " (6mm x 10mm x 340mm) pine or wood of choice (bottom slats)

- 4 each $\frac{1}{4}$ " x $\frac{5}{16}$ " x 4" (6mm x 8mm x 100mm) pine or wood of choice (upright spacers)
- 3 each $\frac{1}{4}$ " x $\frac{5}{16}$ " x $3\frac{7}{8}$ " (6mm x 8mm x 98mm) pine or wood of choice (lower spacers)
- 2 each $\frac{1}{8}$ " x $\frac{3}{8}$ " x $13\frac{3}{8}$ " (3mm x 10mm x 340mm) Baltic birch plywood or wood of choice (upper and lower trim)

- 2 each $\frac{1}{8}$ " x $\frac{1}{2}$ " x $3\frac{1}{4}$ " (3mm x 12mm x 83mm) Baltic birch plywood or wood of choice (outer edge trim)
- 2 each $\frac{1}{8}$ " x $\frac{5}{8}$ " x $3\frac{1}{4}$ " (3mm x 16mm x 83mm) pine or wood of choice (center trim)
- Wood glue
- Glue stick or spray adhesive
- Assorted grits of sandpaper
- Masking tape

Materials & Tools

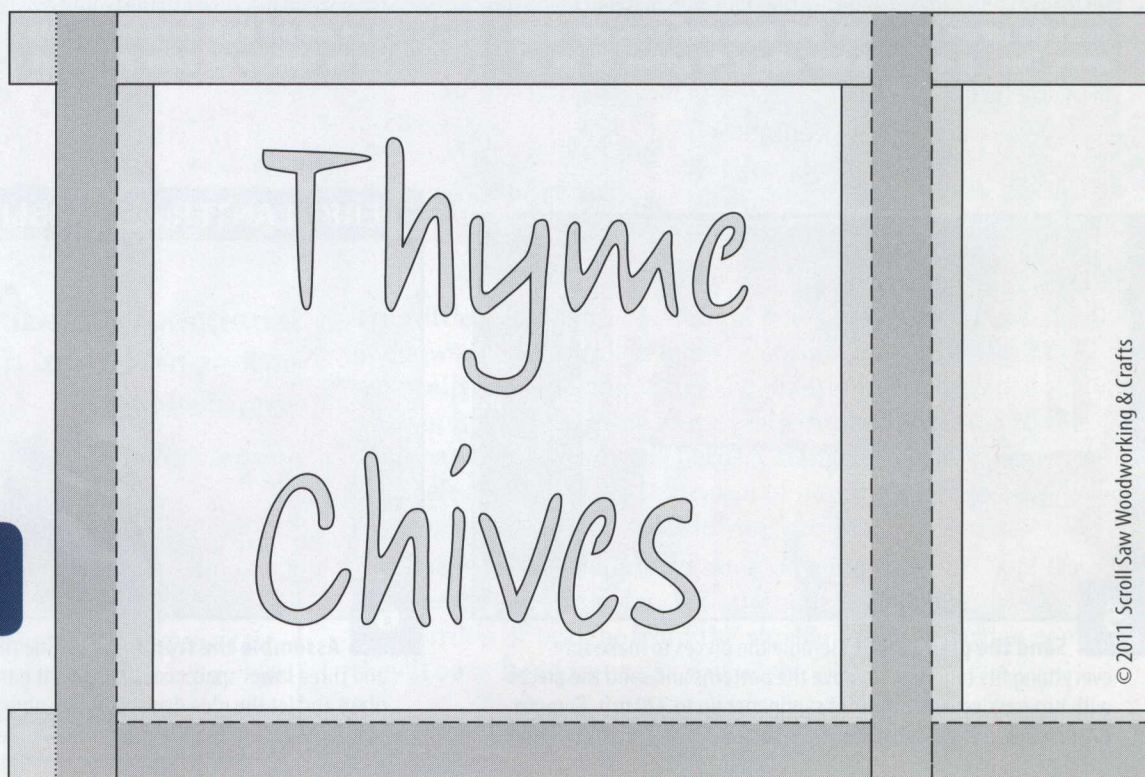
- Tack cloth
- Wood stain and finish of choice

Tools:

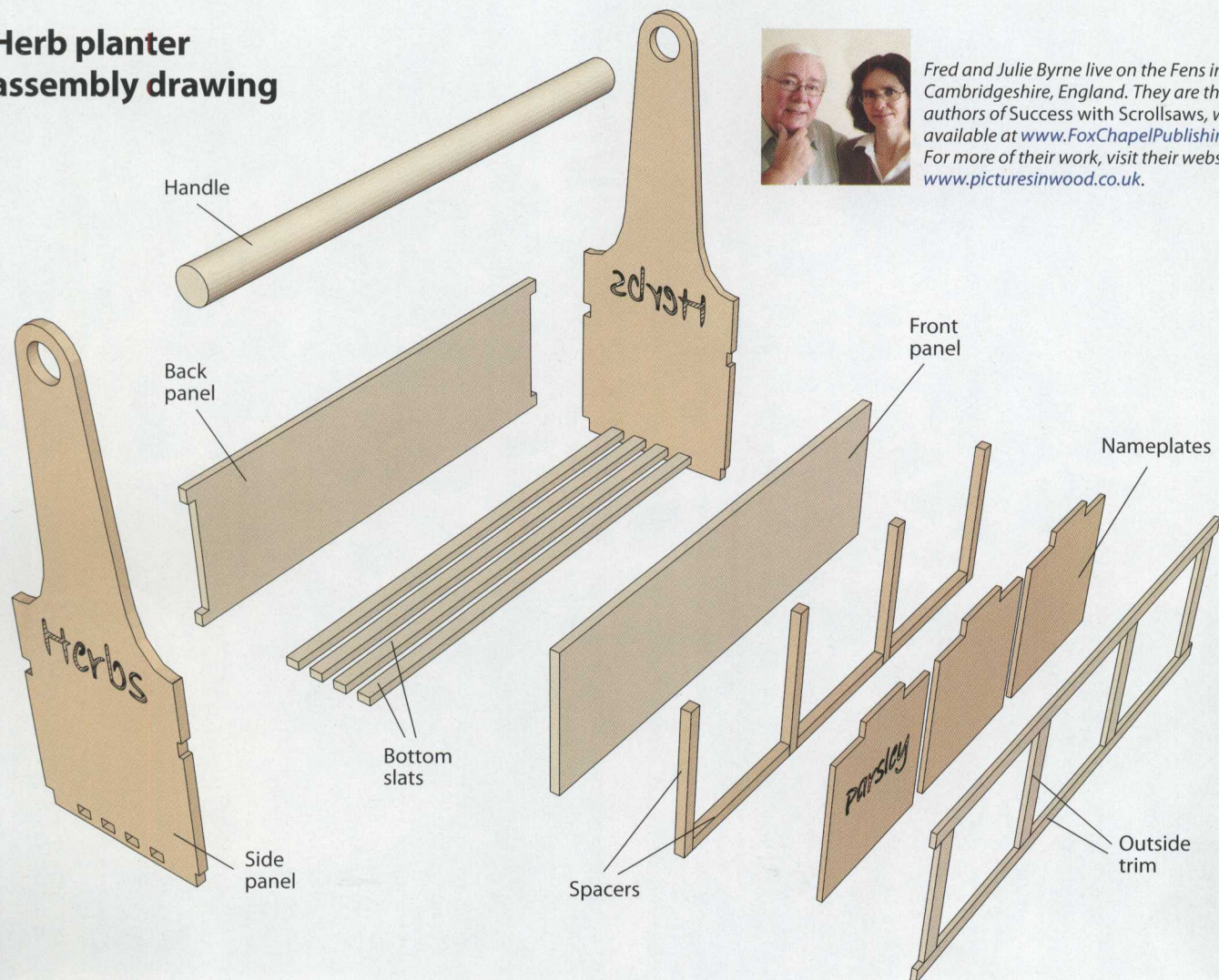
- #2 and #5 blades or blades of choice
- Drill press with $\frac{1}{32}$ " (1mm)-diameter bit
- Clamps
- Brushes (to apply glue)

Herb planter patterns

Additional patterns for the **HERB PLANTER** are in the pullout section.



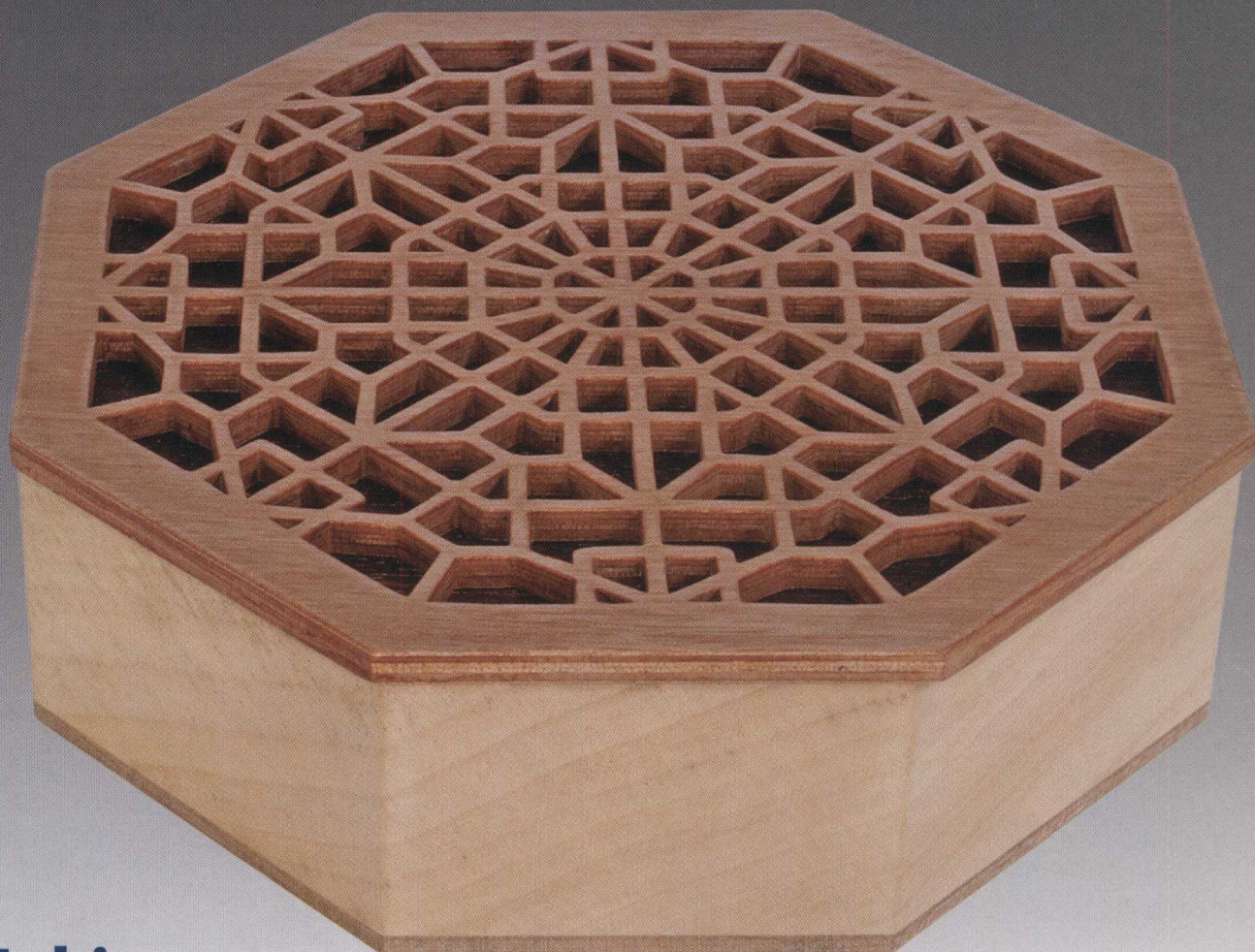
Herb planter assembly drawing



Fred and Julie Byrne live on the Fens in Cambridgeshire, England. They are the authors of *Success with Scrollsaws*, which is available at www.FoxChapelPublishing.com. For more of their work, visit their website at www.picturesinwood.co.uk.

- Cut around the perimeter only for the back panel.
- Cut around the perimeter and cut the tabs off at the dotted lines for the front panel.
- Align the spacers with the dashed lines. Spacer position is marked with dark shading for easy assembly.
- Align the trim pieces with the solid lines. The trim pieces cover the spacers.

Basil
Mint



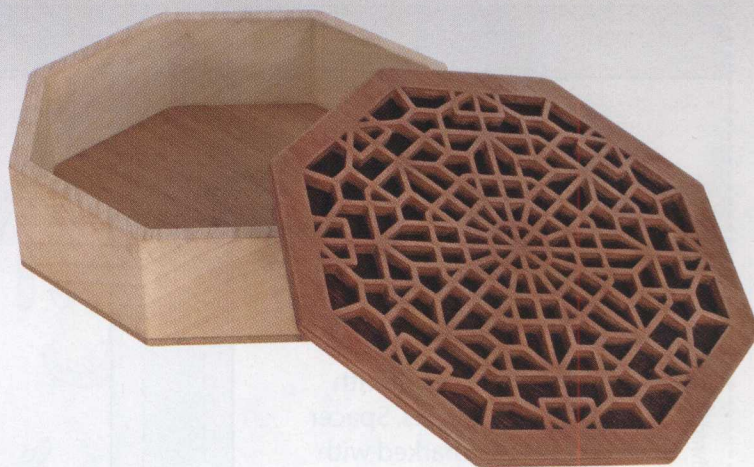
Making a Geometric Box

Intricate fretwork lid highlights this easy-to-make box

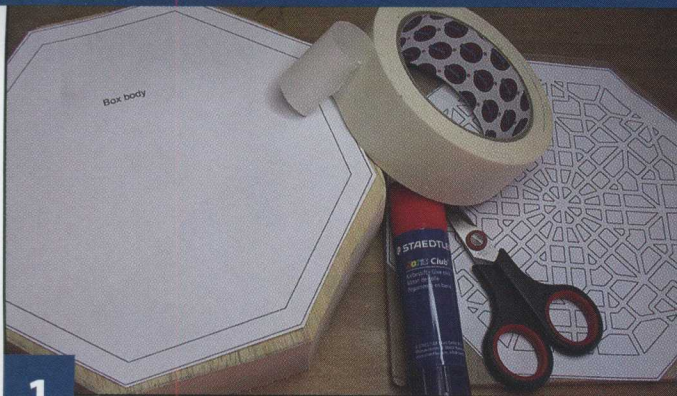
By Sue Mey

Handmade boxes are popular projects because they are both functional and decorative. This geometric box is simple to make, requiring minimal woodworking skills. The sides are cut from a single 1½"-thick blank, eliminating the need to cut miters or align rings.

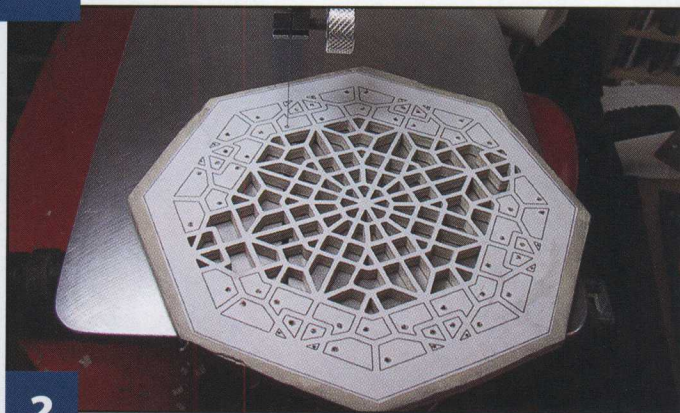
Mosaic artists painstakingly select and cut small pieces of tile or semi-precious stones and use the small pieces to create pictures or designs. The design used for the fretwork lid reminds me of classic mosaics and adds a decorative touch to this otherwise basic box.



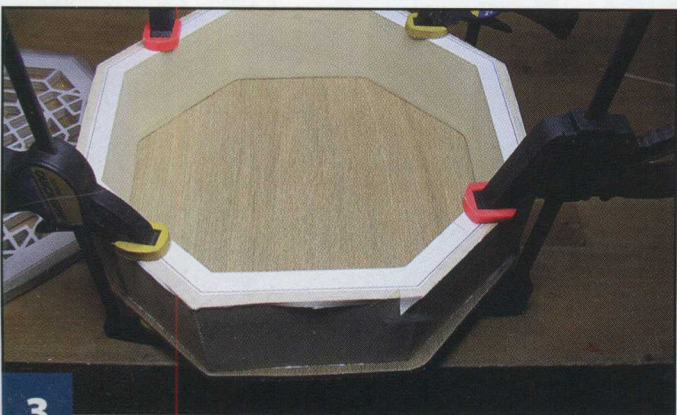
BOX: MAKING THE BOX



- 1 Prepare the blanks.** Cut the materials to the rough size for easier handling. Cover the blanks with masking tape and attach the patterns to the blanks with spray adhesive or a glue stick.



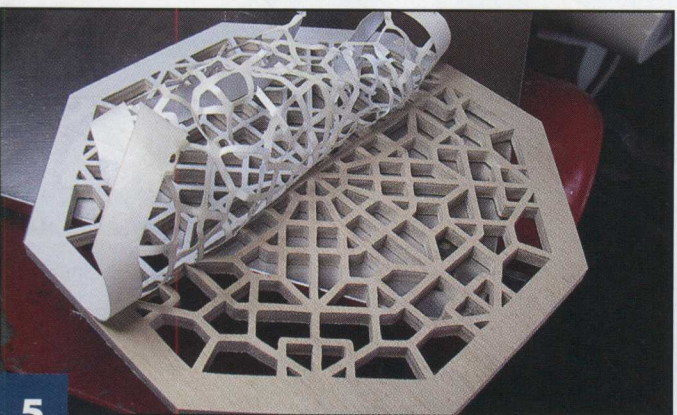
- 2 Cut the frets.** Drill a $\frac{1}{8}$ " (3mm)-diameter blade-entry hole for the box sides. Drill the blade-entry holes for the frets with a smaller bit. Cut the frets with a #3 blade.



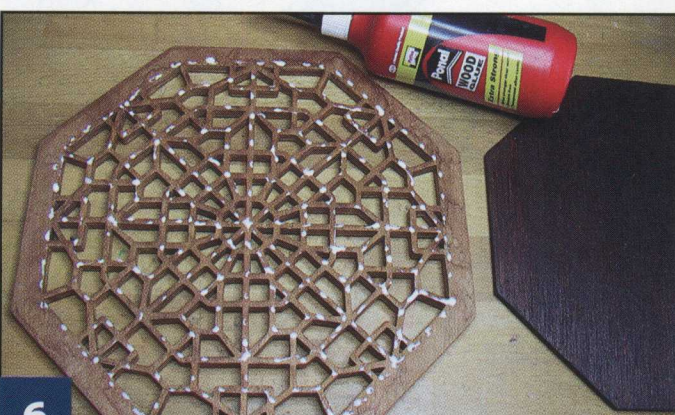
- 3 Make the box.** Cut the inside line of the box sides with a #12 blade. Sand away any imperfections on the inside of the box sides. Trace around the opening on the inside of the box sides on the lid liner stock. Remove any pencil marks from the box sides. Then, glue and clamp the box sides to the blank for the box bottom.



- 4 Cut the perimeter of the pieces.** Cut along the perimeter pattern lines on the fretwork lid and the assembled box sides and bottom. Cut along the traced line on the lid liner. You can cut slightly outside the lines and sand up to the pattern lines with a disc sander.



- 5 Sand and stain the pieces.** Remove the patterns and tape. Sand all of the pieces by hand and remove the sanding dust. Apply wood stain to the pieces if desired. I recommend a dark stain for the lid liner to provide contrast for the fretwork.



- 6 Assemble the lid.** Apply small beads of wood glue to the back of the fretwork lid and drop the lid, glue-side down, onto a sheet of clean paper to remove the excess glue. Carefully lift the lid off of the paper. Center the lid liner on the lid and clamp it in place. Remove any glue squeeze-out using toothpicks and cotton swabs. Apply several thin coats of clear spray varnish to the box and lid.

Geometric box sides pattern



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Materials:

- 3 each $\frac{1}{4}$ " x 8" x 8" (6mm x 200mm x 200mm) plywood or hardwood of choice (lid, lid liner, box bottom)
- 1" to $1\frac{1}{2}$ " x 8" x 8" (25mm to 40mm x 200mm x 200mm) hardwood of choice (box sides)
- Masking tape
- Wood glue

- Temporary-bond spray adhesive or glue stick
- Sandpaper, assorted grits
- Wood stain (optional)
- Clear spray varnish

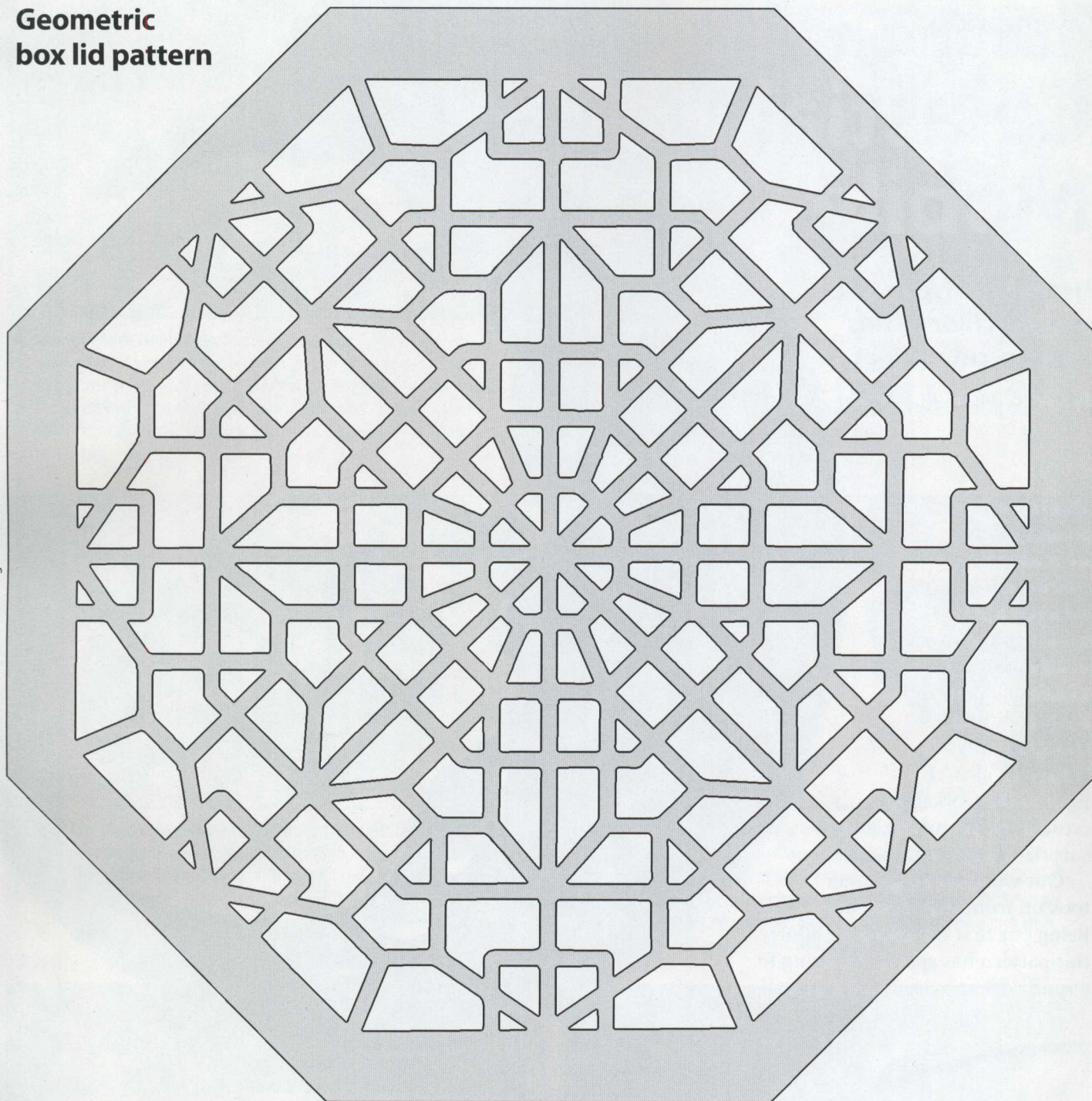
Tools:

- #3 and #12 reverse-tooth blades or blades of choice

Materials & Tools

- Drill press with $\frac{1}{8}$ " (3mm)-, $\frac{1}{16}$ " (2mm)- and $\frac{1}{32}$ " (1mm)- diameter bits
- Disc sander (optional)
- Clamps
- Sharp pencil
- Toothpicks and cotton swabs

Geometric box lid pattern



Sue Mey lives in Pretoria, South Africa. To see more of her work, including a variety of patterns and pattern-making tutorials available for purchase, visit www.scrollsawartist.com. Her first pattern book, *Lighted Scroll Saw Projects*, is available from www.schifferbooks.com and other outlets.

Making a Celestial Mobile

Use fabric dye to add vibrant color to this easy-to-cut project

By Daniel and Ruth Johnson

This is the first project where we made the connection between Ruth's drawings and my woodworking. I looked at a pattern Ruth drew and thought to myself, "I have an idea." I went to the workshop, created the prototype, and surprised Ruth with it.

Our woodworking career took off from that moment. Being our first collaborative effort, this pattern has special meaning to us and we hope you enjoy it as well.



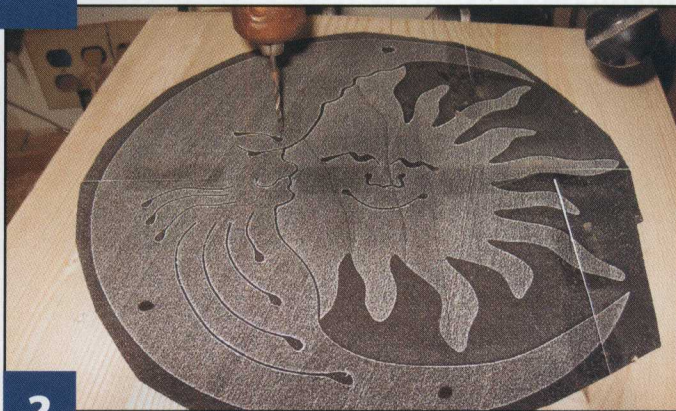
Reduce the pattern to make pins, magnets, and pendants.



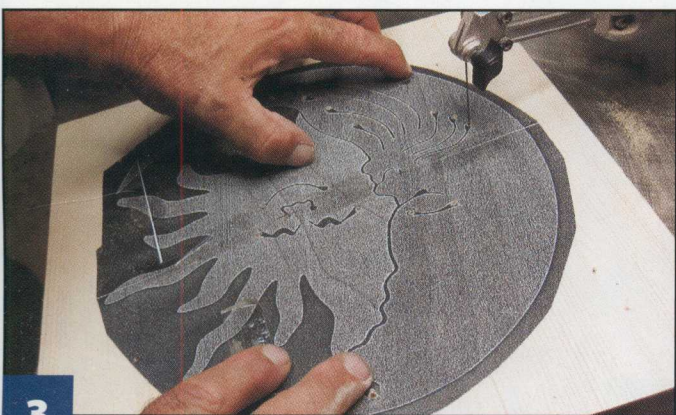
MOBILE: PREPARING THE PIECES



1 Prepare the blank. To prevent warping, select quarter-sawn strips of wood and glue them edge-to-edge to get the required width. I use Titebond II glue, which is water resistant. Plane the wood to the desired thickness, but keep it at least $\frac{5}{8}$ " (15mm) thick. Sand the blank with progressively finer grits of sandpaper up to 120 grit.



2 Drill blade-entry holes. Attach the pattern to the blank with temporary-bond spray adhesive. Drill holes for the hemp cord as indicated on the pattern and drill the blade-entry holes. Sand any tear-out from the drill and remove all of the dust from the blank with an air compressor or tack cloth.



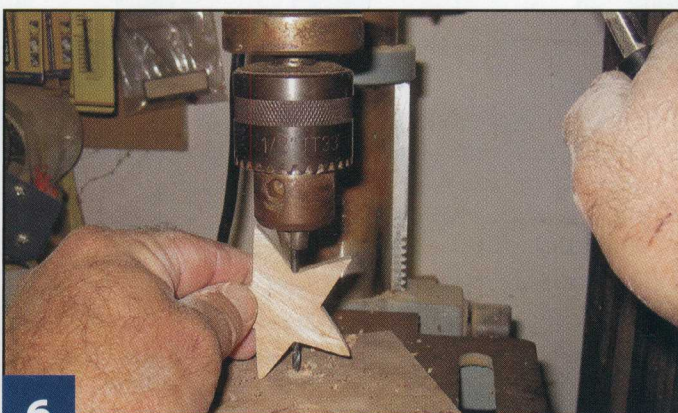
3 Cut the sun and moon. Cut the interior frets first. Then, cut along the perimeter of the sun and moon. I use a #5 blade. Remove the patterns and sand both sides of the pieces with 220-grit sandpaper.



4 Round the edges. Use a $\frac{3}{8}$ " (10mm)-radius roundover bit with a bearing in a router on the outside of the moon. Do not round over the area where the sun will be attached. Use a $\frac{1}{8}$ " (3mm)-radius brass-tipped router bit on the areas where the sun and moon meet on both pieces. Sand the edges of the moon with 220-grit sandpaper in a Flex Drum sander.



5 Cut the stars. Use #5 blades or your blades of choice. Cut several stars of each size. I use a light wood, such as sycamore. Use wood that is about $\frac{3}{8}$ " (10mm) thick.



6 Drill the holes in the stars. Use a $\frac{1}{8}$ " (3mm)-diameter bit. Drill through the sides so the stars will hang vertically when the hemp is threaded through the holes. Sand the stars on a belt sander equipped with a 220-grit belt.

MOBILE: COLORING AND ASSEMBLY



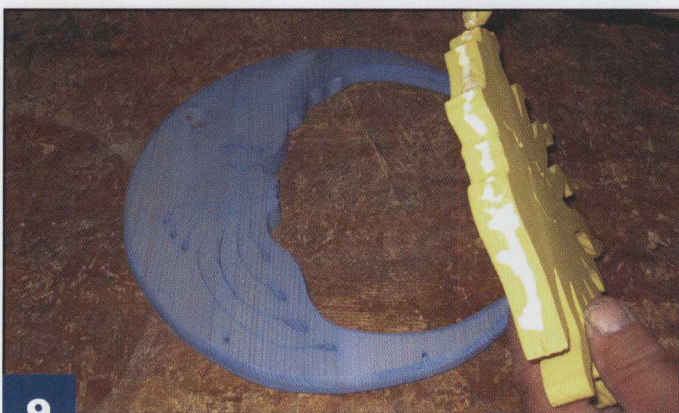
7

Dye the yellow pieces. Mix ½ ounce of yellow fabric dye with 2½ gallons of hot water. Place the sun and half of the stars in the mixture for 3 to 5 minutes. Constantly move and turn the pieces for uniform coverage. Remove the dyed pieces and place them on a flat surface to dry for 24 hours.



8

Dye the blue pieces. Mix ½ ounce of royal blue fabric dye with 2½ gallons of hot water. Place the moon and remaining half of the stars in the mixture for 3 to 5 minutes. Constantly move and turn the pieces for uniform coverage. Remove the dyed pieces and place them on a flat surface to dry for 24 hours.



9

Glue the pieces together. Glue the sun and moon together and let them dry for 2 hours. Apply your finish of choice. I use a moisture-resistant sealer and moisture-resistant lacquer made by Sherwin-Williams. Run a length of hemp through the top hanging hole and tie it off to suspend the mobile.



10

Attach the stars. Run a long piece of hemp through a hole in the bottom of the moon. Knot the hemp under the moon. Thread one end of the hemp through a star and tie a knot on the end. Cut off the excess hemp. On the other side, run the hemp through another star and tie a knot. Then run the hemp through another star, tie a knot, and cut off the excess. Repeat for the second hole.

Materials:

- ¾" x 12" x 12" (20mm x 300mm x 300mm) pine (moon and sun)
- ¾" x 3" x 6" (10mm x 75mm x 150mm) sycamore or light wood of choice (stars)
- Temporary-bond spray adhesive
- Hemp cord
- Titebond II glue
- Fabric dye: (such as Rit dye) yellow and royal blue
- Sherwin-Williams moisture-resistant sealer and lacquer or clear finish of choice
- Sandpaper, assorted grits

Materials & Tools

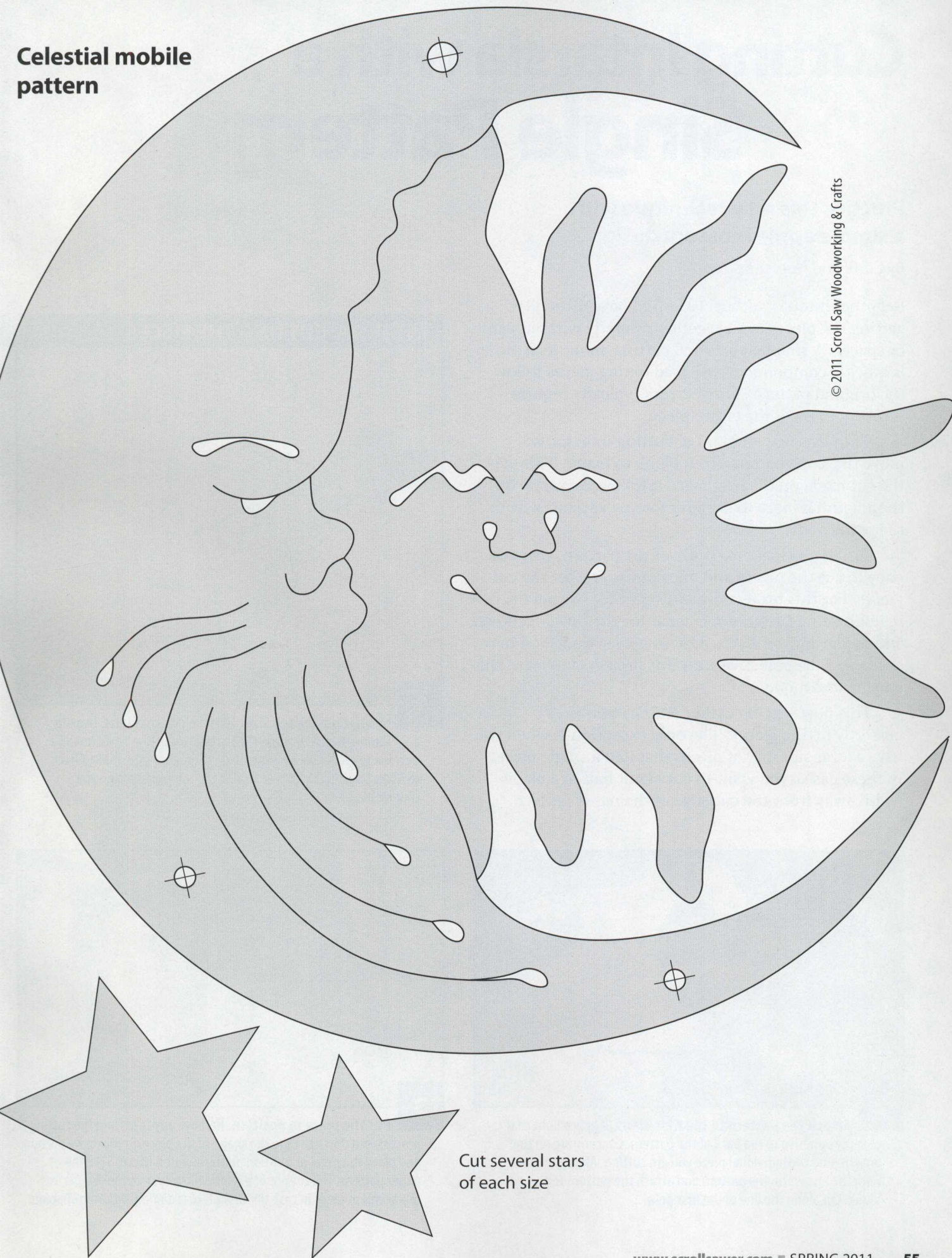
Tools:

- #5 blades or blades of choice
- Belt sander
- Flex Drum sander
- Random orbital sander
- Drill with ⅛" (3mm)-diameter bit
- Router with ⅜" (10mm)-radius roundover bit and ⅛" (3mm)-radius brass-tipped roundover bit
- Air compressor or tack cloth
- Clamps



Daniel and Ruth Johnson live with their many dogs, cats, and pot-bellied pigs in south-central Indiana between the Brown County State Park and the Hoosier National Forest. They participate in many art shows each year in Indiana, Illinois, and Ohio. Daniel has been making a living as a woodworker since 1994.

**Celestial mobile
pattern**



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Cut several stars
of each size

Cutting Intarsia with a Single Pattern

Practice this new technique with a simple apple blossom design

By Carol and Homer Bishop

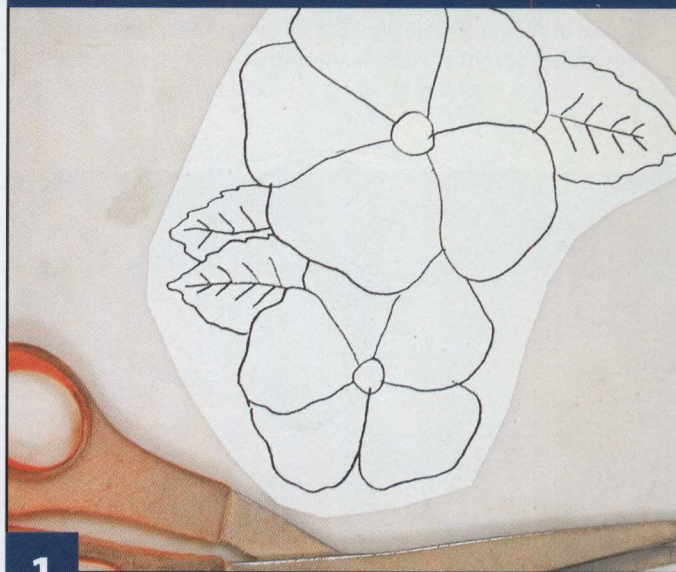
Beginner intarsia enthusiasts often have difficulty getting the pieces to fit together properly without gaps or spaces. A small error when cutting an intarsia piece is quickly compounded when adjoining pieces follow the original pattern. These errors typically require scrollers to recut the entire piece.

With this new method of cutting intarsia, we move the same pattern from blank to blank. This way, the cut made on the first piece is followed exactly on the adjoining piece to account for any variances from the pattern line.

To start, make two copies of the pattern. Use one copy to cut the pieces and one copy to lay out the cut pieces. For this project, we used pine for the petals, medium-tone Western red cedar for the flower centers, and poplar for the leaves. Use whatever wood you have available. The objective with this project is to learn the cutting technique.

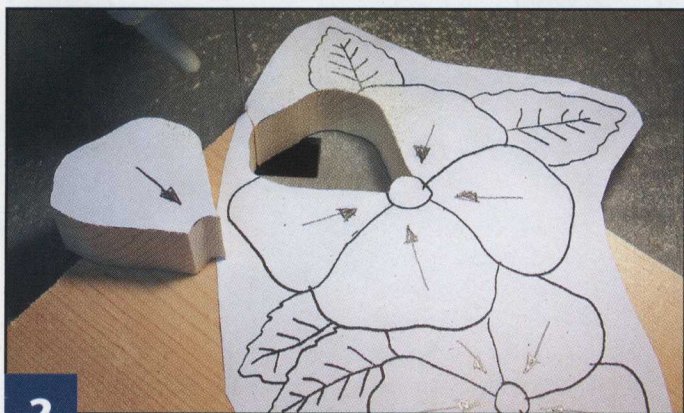
This new way of cutting intarsia produces perfectly fitting pieces. The only exception is when you have a large number of pieces that join a single piece. In these cases, you want to cut about half of a blade width away from the cut edge of the paper pattern.

INTARSIA: CUTTING THE PIECES



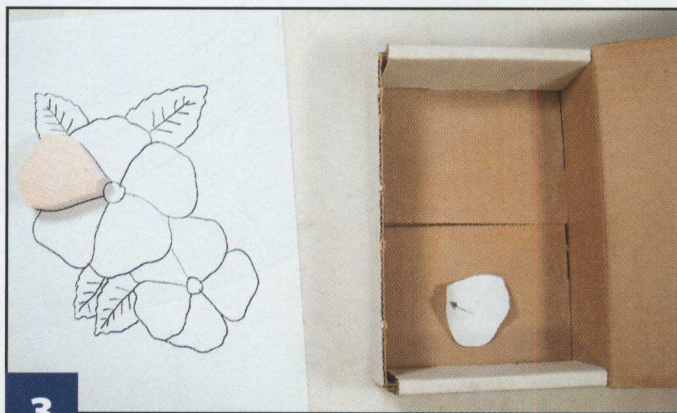
1

Cut the pattern to size. Trim the pattern to size, leaving a $\frac{1}{4}$ " (6mm) margin outside the perimeter pattern lines. Install a new blade and make sure the blade is square to the table. Check to make sure the blade is square to the table every time you change blades.



2

Attach the pattern to the first blank. Apply a light coat of spray adhesive to the back of the pattern. Concentrate on the area behind the individual piece you are cutting. Align the grain with the arrows on the pattern and attach the pattern to the blank. Cut along the line of the first petal.

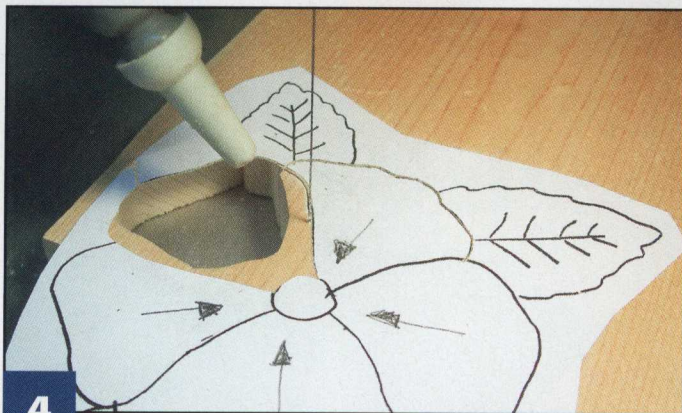


3

Put the piece in position. Remove any fuzz from the cutting process, but don't change the shape of the piece. Remove the pattern and place the petal in position on the layout pattern. Save the paper pattern. The cut paper pattern allows you to make a perfect replacement piece in case the first piece is damaged during shaping.

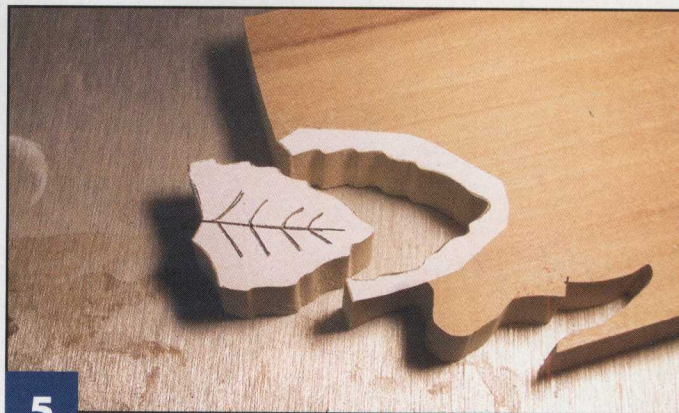


This simple apple blossom is an attractive project, ideally suited for perfecting the new intarsia cutting technique.



4

Cut the second piece. Pull the pattern off of the blank and apply more spray adhesive if necessary. Place the pattern in position to cut the second petal. Cut along the pattern lines when possible. When you get to the area where the pattern line has been cut away, cut right next to the paper pattern, but do not cut the paper. This produces a piece that is perfectly matched to the adjoining piece.



5

Cut the remaining pieces. As you cut each piece, remove the fuzz and place the cut piece on the layout board. Use the same technique to cut the remaining pieces. If your initial cut doesn't follow the pattern line exactly, make sure your subsequent cut follows the paper edge from the first cut to ensure a good fit.

INTARSIA: SHAPING THE PIECES

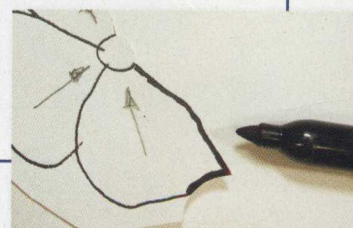


6

Shape the petals. Make a mark $\frac{1}{4}$ " (6mm) down from the top of each petal where it joins the flower center. Sand the middle of the petals down to this mark to create concave petals that are thinner in the middle and thicker on the edges. Reduce the thickness of the petals on the smaller flower by $\frac{1}{8}$ " (3mm) before shaping them. Finish sand the petals and round the flower centers. The centers protrude $\frac{1}{8}$ " (3mm) above the petals.

TIPS SEEING THE EDGE

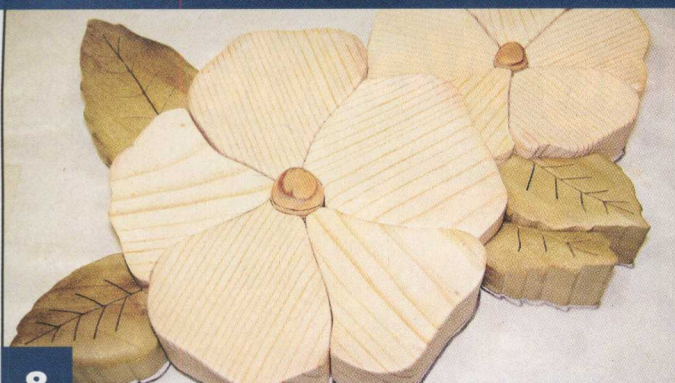
If you have a hard time seeing the edge of the paper to follow for the second cut, try coloring the cut edge of the paper with a marker before you glue the pattern to the wood.



7

Shape the leaves. Make a mark $\frac{3}{8}$ " (10mm) down from the top of the leaves on the sides where they attach to the petals. Taper the leaves to this mark using the scroll saw. Round the edges of the leaves with a sander. Where there are two leaves together, reduce the thickness of the smaller leaf where the two leaves join. Use an old saw blade to remove any dust from the veining lines.

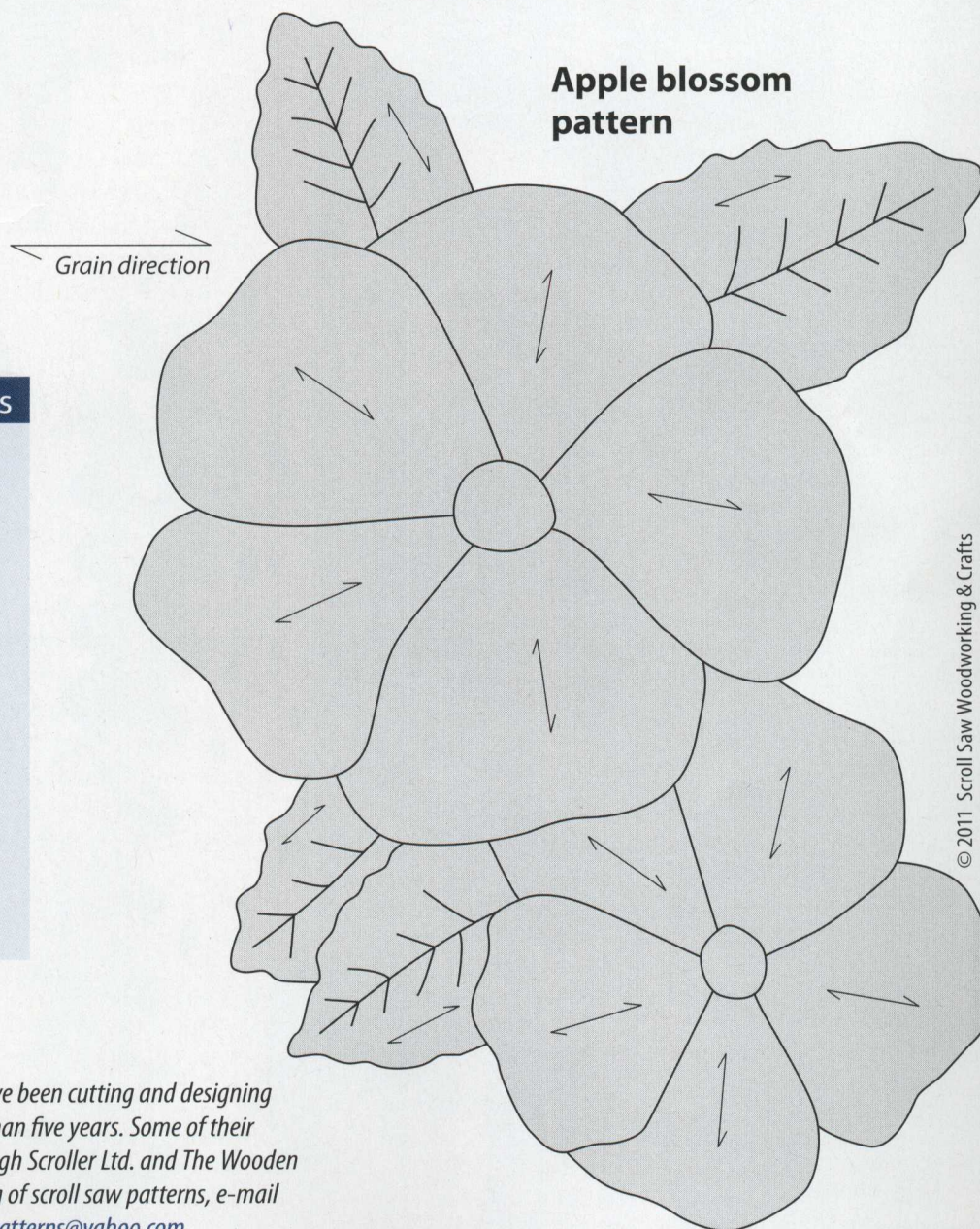
INTARSIA: FINISHING THE PROJECT



- 8** **Glue the pieces together.** Finish sand the pieces and check the fit and flow of the project. Use a small amount of wood glue to attach the pieces together. Remove any glue squeeze-out.



- 9** **Apply the finish.** Apply your finish of choice. When dry, attach a hanger to the back. Instead of using a hammer to drive in nails for the hanger, we use a staple gun loaded with brads to attach the hanger. You could also use small wood screws.



Materials:

- $\frac{3}{4}$ " x 6" x 6" (20mm x 155mm x 155mm) light wood, such as pine
- $\frac{3}{4}$ " x 2" x 6" (20mm x 50mm x 155mm) green wood, such as poplar
- $\frac{3}{4}$ " x 1" x 1" (20mm x 25mm x 25mm) medium-dark wood, such as a medium-dark piece of Western red cedar
- Spray adhesive
- Wood glue
- Sealant or varnish

Tools:

- #4 skip-tooth blades or blades of choice
- Drill press with a sanding drum
- Flap sander

Materials & Tools

Carol and Homer Bishop have been cutting and designing intarsia patterns for more than five years. Some of their patterns can be found through Scroller Ltd. and The Wooden Teddy Bear. For an e-catalog of scroll saw patterns, e-mail Homer and Carol at bishoppatterns@yahoo.com.

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Building a Working Wooden Gear Clock

**Genesis clock is specifically
designed for first-time builders**

By Clayton Boyer

Test cut by Bob McDonough

Numbers woodburned by Lora S. Irish



Making a chunk of wood move is fun; making it actually tell time is truly amazing. I love the idea of taking a piece of tree, hanging a rock from it, and having it tick away—singing its beautiful song into the next morning when I enter my shop.

Wooden gear clocks are both beautiful and unique. These chunks of tree fashioned into working mechanisms are not only truly amazing to watch, but can be surprisingly accurate clocks. However, don't expect atomic accuracy. These clocks are modeled after 17th-century technologies.

Even after building more than fifty wooden clocks, I still enter my shop with a smile on my face as my *Simplicity* clock greets me with her beautiful song. The *Numbers Six* clock in my office always mesmerizes those who view her large prominent escape wheel.

Because this will be most builders' first attempt at taking a piece of wood and making it tell time, I created the *Genesis* wooden gear clock. *Genesis* is the simplest wooden clock I have designed to date. Best of all, *Genesis* is a quick clockworks to build. I built the clock in a weekend and it has been performing flawlessly ever since. As a bonus, because of the unique escapement I designed for the *Genesis*, it is one of the quietest mechanisms I've ever built.

The *Genesis* has only four wheels, which use no bushings, all set into a single adjustable frame. The hours, minutes, and seconds are easily read as the wheels move past the stationary hands. When wound, the clock runs for a full day without the use of extra gears or a doubling pulley.

It is important to cut all of the pieces on the center of the line so none of the black pattern line is left on the part after cutting or sanding. The only exception to this rule occurs on the pallet. The pallet has two important faces on which we want to leave some of the black line visible. These faces are labeled on the pattern and the extra wood will be used to exactly mate the pallet to the escape wheel. The details of this adjustment will be discussed later.

On my website, www.lisaboyer.com, you can view a variety of the wooden gear clocks I designed, including *Modern Times*, another clock I specifically created for scroll sawyers. You will also find a section of frequently asked questions and a fantastic video section that will answer all of your questions about getting your own wooden clockworks to tick along happily.



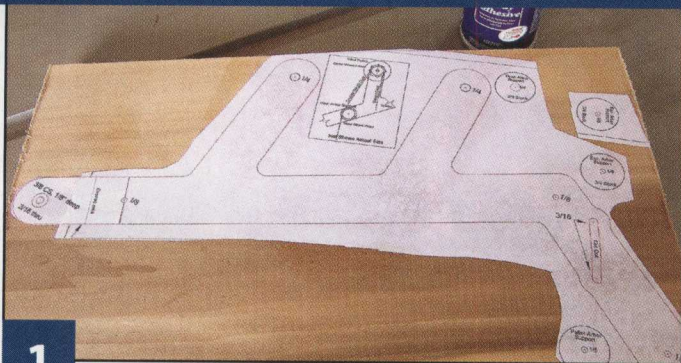
The *Genesis* wooden gear clock runs for an entire day on a single wind.



Perfectly Round Wheels and Pinions

In order to make the clock run properly, the wheels and pinions must be perfectly round. Mount the finished wheel or pinion on a board with an arbor rod or center pin attached. Set the board flat on a disc sander table. Press the wheel or pinion against the sanding disc and rotate it on the rod or pin. This rounds the wheel exactly on its center. Having a perfectly round escape wheel is especially important, because it is the most sensitive wheel in the clock mechanism. This wheel-rounding technique is demonstrated on my Website in the video section under *Making the #6*.

GEAR CLOCK: CUTTING THE MAIN PARTS



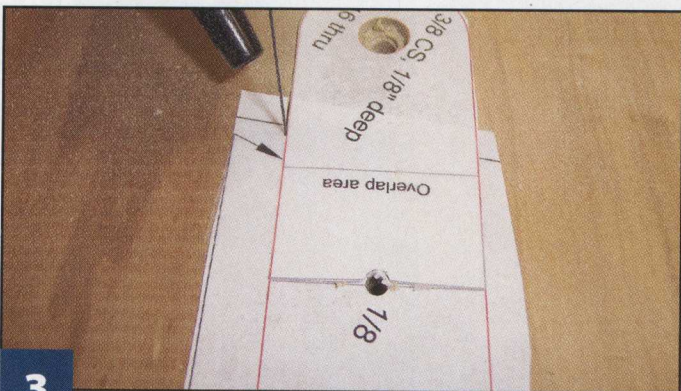
1

Attach the patterns to the blanks. Apply spray adhesive to the back of the patterns and attach them to the appropriately sized blanks. Stock thickness is indicated on each pattern.



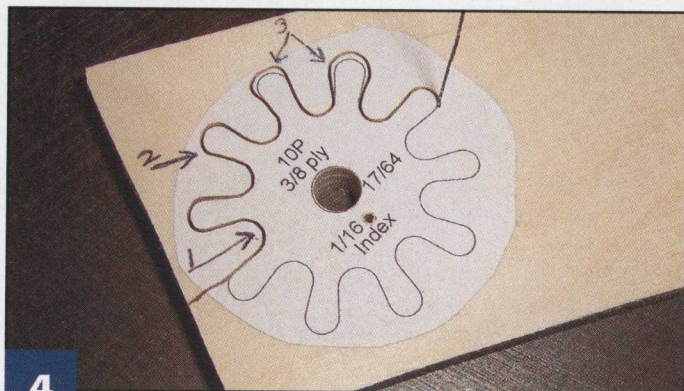
2

Drill the required holes. Brad point bits give you a more accurately aligned hole. Mark the center of the holes to be drilled with an awl. Then, drill the holes with the bit size indicated on the patterns.



3

Cut the hands, frame, and bob. Remember to remove the entire pattern line as you cut or sand each piece. Cut the hour, minute, and second hands. Tape the waste back in place, turn the hands on their side, and cut the taper along the back of the hands. Cut the frame and the parts of the bob. Use your best-looking wood for the front and back of the bob. Then, cut the supports, connectors, and spacers.



4

Cut the wheels, gears, and pallet. Slow down and cut accurately when cutting the valleys, or dedendums, between the gear teeth (area 1 in the photo). There is no easy way to clean up these valleys. Cut accurately around the lobes, or addendums, (areas 2 and 3 in the photo) or cut outside the line and sand to the lines. Cut the pallet, but cut outside the line on the important faces. These faces will be sanded to fit the escape wheel later.



5

Finish shaping the gears and remove the patterns. If you cut outside of the lines on the lobes, sand up to the line. Cut the remaining pieces and remove the patterns. Label the back of all of the pieces before removing the patterns. I briefly soak the pieces face down in a tray of mineral spirits, which dissolves the adhesive. Wipe the surface with a paper towel, and then allow the mineral spirits to evaporate.

GEAR CLOCK: MAKING THE NUMBERS AND ARBORS



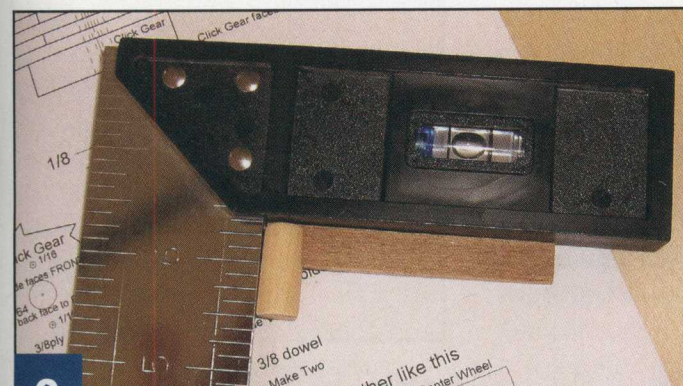
- 6 Add the numbers.** Woodburn the numbers or add the optional number shields. Use a piece of blue painter's tape to mark the 00 position on the minute wheel and the 12 position on the hour wheel. If using the shield numbers, attach the shield patterns to the stock, drill the holes, and cut the pieces. Glue the number shields in place. I use a short metal rod to align the shields properly. Note the numbers on the hour wheel are placed in the usual order, but the numbers on the minute and second wheels are positioned in reverse order.



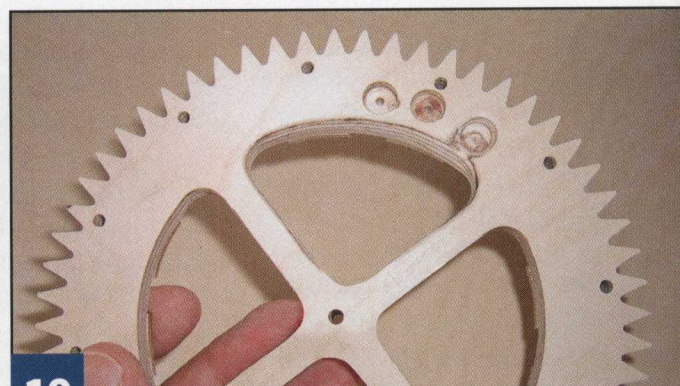
- 7 Cut the arbors.** Lay the rods on the patterns and mark the length. Use a hacksaw or a metal cut-off wheel in a rotary-power carver to cut the rods to the proper length. Use $\frac{1}{8}$ " (3mm)-diameter rods for the pallet arbor, hour-wheel arbor, and escape-wheel arbor. Use $\frac{1}{4}$ " (6mm)-diameter rods for the third-wheel arbor and minute-wheel arbor.



- 8 Polish the arbors.** Sand off any burrs and smooth the ends. Chuck the rods in a drill and polish them with buffing compound in a leather strap or between two pieces of hardwood. Continue to press the wood or leather against the rod until the rod is polished. Do not use a buffing wheel, which may make the rods oval instead of round. Remove the excess buffing compound from the arbors.



- 9 Create the clicks.** Cut a $\frac{1}{8}$ " (3mm)-wide by $\frac{3}{8}$ " (10mm)-deep slot into the end of a $\frac{3}{8}$ " (10mm)-diameter dowel. Cut the dowel to the length shown on the pattern. Cut the click from $\frac{1}{8}$ " (3mm)-thick plywood or hardwood and glue it into the slot in the dowel. Use a square to make sure the two parts dry exactly perpendicular to each other. Repeat the process to create the second click.



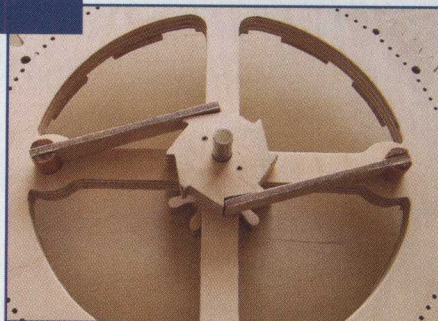
- 10 Balance the wheels.** Place a rod through the center of the wheel and round the wheels with a disc sander (see sidebar). Then, hold the rod horizontal to the ground and let gravity draw the heaviest part of the wheel to the bottom. Mark the heavy side of the wheel. Remove the wheel from the rod and reduce the weight of the heaviest part of the wheel by drilling holes part of the way through the back or sanding away some wood from the back of the wheel. The clock will run best if the escape wheel is perfectly balanced.

ASSEMBLING THE CLOCK

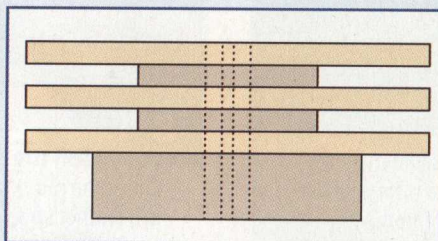
As you work through assembling the clock, keep in mind that supports are glued to the frame and connectors are glued to wheels and pinions. Spacers float free and are not glued to anything.

Step 1: Attach the arbors and supports to the frame. Rub the ends of the arbors with paraffin and press-fit the arbors into the appropriate holes on the frame. If the arbors won't slip into the holes, chuck $\frac{1}{4}$ " (6mm) of the arbor into a hand-held drill and press the arbor into the hole while the drill is running. If you push the arbors too far into the frame, tap the end of the arbor with a hammer until it is flush with the back of the frame. Glue the hour arbor support and counterweight cord guide together. Then, glue the hour arbor support to the frame. Glue the remaining supports to the frame using the assembly diagram as a guide.

Step 2: Mount the frame on the wall. Insert a screw through the left screw hole and attach the frame to the wall. The left screw is 63" (1,600mm) above the floor. Use a level or plumb line to make sure the frame upright for the minute-hand wheel is perfectly vertical. Insert a screw and washer through the center of the right adjustable mounting-hole slot and tighten the screw snugly into the wall. You must use a washer to keep from denting the wood and making it difficult to adjust the action of the clock later. Pendulums do not like breezes. Wind currents, open windows or doors, forced-air units, or any blowing of the pendulum may stop your clock. Wind currents are why the old-timers put clocks into cases.



▲ Step 3: Assemble the clicks. Place the minute wheel face down on the bench and use a $\frac{1}{4}$ " (6mm)-diameter dowel to hold the click gear in position on the back of the minute wheel. Make sure you have the front of the click gear against the wheel (see photo). Use the click gear to align the clicks as you glue the dowels into the back of the minute wheel. Do not glue the click gear in place. Remove the click gear after the glue on the dowels is dry.



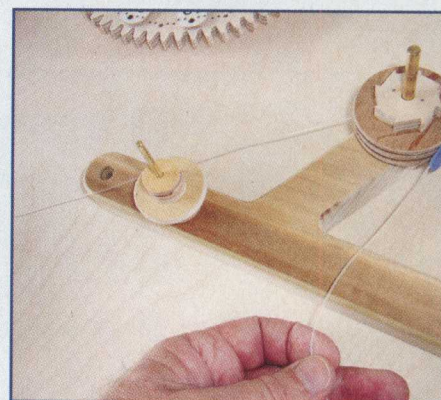
▲ Step 4: Assemble the wind pulley. Use the support pins for alignment and glue together the three wind pulley pieces and the two pulley centerpieces. Use hardwood for the pulley centerpieces because the monofilament can cut into and split plywood. Then, glue the back of the click gear to the wind pulley assembly, using the support pins for proper alignment. Make sure the back of the click gear is against the pulley assembly.

Step 5: Glue the pinions and connectors to the wheels. Use the assembly diagram and top-view drawing as a guide. Use the indexing pins for alignment where noted on the patterns. The connector and pinion are glued to the front of the

minute wheel. The connectors and pinions are glued to the back of the escape wheel and the third wheel. The connector is glued to the back of the hour wheel. Remember, spacers are not glued.



▲ Step 6: Begin stringing the wind pulley. Cut a 14' (4,270mm)-long piece of 50-pound test monofilament fishing line. Thread half of the fishing line through the hole in the center section of the wind pulley so you have 7' (2,135mm) of line on either side. The click gear is in the front of the wind pulley. Wrap the front half of the fishing line clockwise around the front pulley centerpiece 15 times. Tie a loop in the end of the line and temporarily tape the line in place so it does not unwrap. This is the drive weight side of the line.



▲ Step 7: Finish stringing the wind pulley. Tie a loop in the other end of the line. This is the counterweight side of the line. Do not wind any line around the back part of the pulley. Slide the pulley assembly onto the minute-wheel

arbor with the click gear facing front. Thread the counterweight line over the hour arbor support so the weight and counter weight rise and fall without hitting each other.

Step 8: Assemble the hands.

Glue the caps onto the hands. The stationary hands point to the time as the wheels rotate past the hands.

Step 9: Assemble the wheels.

Slide the minute wheel onto the arbor, aligning the clicks with the click gear. Assemble the other wheels on the proper arbors, inserting the spacers as indicated on the assembly diagram. Spacers are not glued in place. Fit the hands onto the ends of the arbors to keep the wheels in place. Leave about $\frac{1}{16}$ " (2mm) of space between the wheel or pinion and the hand so the wheel can move freely. Move the wheel forward and backward on the arbor to make sure there is enough space.

Step 10: Check the fit of the pallet.

Remove all of the wheels from the frame and then place the escape wheel and spacer back onto the arbor. Slide the compression spring onto the pallet arbor. Then, position the pallet on the pallet arbor. The spring sits behind the pallet, but should not touch the pallet. The spring will come into play when you set the time on the clock. If the spring puts pressure on the pallet, the clock will stop. Place a small #8 flat washer between the pallet and the cap on the pallet arbor to minimize friction. Slowly turn the escape wheel to see if its teeth gently nudge the pallet into a rocking motion. Make sure one escape wheel tooth connects with the top important face of the pallet and pushes this face out of the way while almost simultaneously another escape wheel tooth catches on the bottom important face of the pallet. Manually unlock the tooth from the

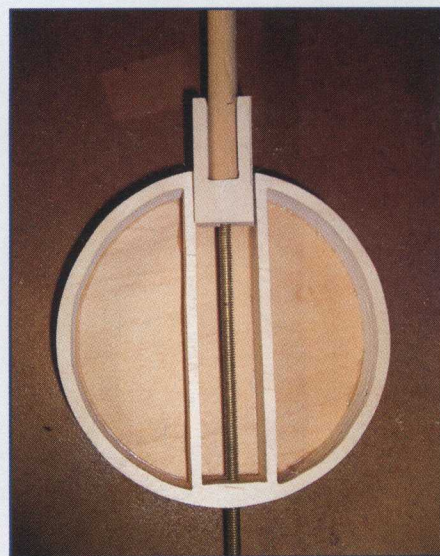
bottom face by rocking the bottom of the pallet to the right. Another tooth should then come into contact with the top important face, pushing the bottom of the pallet back to the left. Turn the escape wheel all the way around and check that the pallet rocks back and forth, catching every tooth on the escape wheel.

Step 11: Adjust the pallet. If the pallet faces are tight enough on the escape wheel to prevent the wheel from turning, remove the pallet and sand a small amount off either the top or bottom important face. Replace the pallet onto the arbor and test again. If the pallet faces are still too tight, remove the pallet and sand a little off of the other important face. Sand away just enough wood so the pallet rocks gently back and forth as you rotate the escape wheel. If the escape wheel teeth miss the important faces all together, you have taken too much off of the important faces or drilled the frame arbor holes too wide. Cut a new pallet and cut the top and bottom important faces outside of the pattern lines. Then test and adjust the pallet again.

Step 12: Fine-tune the pallet.

If the newly adjusted pallet works through most of the escape wheel teeth, but occasionally locks between two teeth, take a pencil and mark the top of the offending tooth. Remove a little wood from only the back of the tooth on which the top important face catches. Do not remove any wood from the front of any tooth! The front is the part of the tooth that contacts the important faces of the pallet. The back is the part of the tooth that faces up toward the ceiling. Remove wood only from the back of the tooth. Recheck the action of the pallet as you turn the escape wheel completely around a few times. Getting a perfect fit between the escape wheel and the pallet

faces is important and should be completed before moving forward with the assembly.

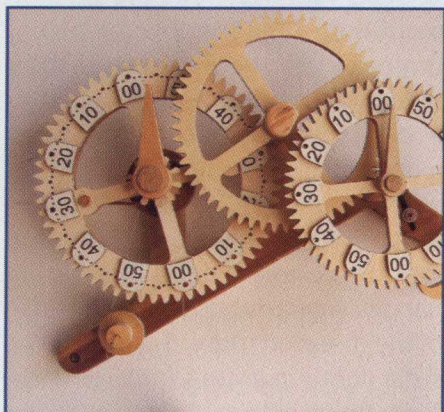


▲ Step 13: Assemble the pendulum.

Glue together the bob center and bob back. Make sure the slider slides easily inside the center bob. Fill the voids on both sides with regular BBs. Do not use lead. Glue on the bob front. Cut the threaded rod to length and thread it through the bottom hole in the slider. Use paraffin wax to lubricate the threads of the threaded rod and clamp the slider lightly in a vise to prevent the slider from splitting. Attach the slider to a $\frac{3}{8}$ " (10mm)-diameter dowel using a metal pin. The dowel serves as the pendulum shaft. Insert the slider into the bob so the threaded rod comes through the bottom hole. Screw the adjusting nut onto the bottom of the threaded rod to hold the assembly together. The adjusting nut regulates the speed, or beat, of the clock. Friction-fit the other end of the pendulum shaft into the pallet. Adjust the shaft so the bob sits parallel with the wall when the pallet is on the arbor rod. Do not glue the pendulum shaft in place yet; you may need to shorten the shaft to get the perfect one-second beat.

Step 14: Create the weight and counterweight. After you've cut the copper pipe to size, polish it with a buffing wheel. Add 6½ to 7 pounds of lead to the weight. The amount of weight needed depends on the internal friction of each individual clock. Some clocks require more drive weight and some require less drive weight. Leave the counterweight empty. The weight attaches to the loop in the fishing line coming off of the right side of the clock's pulley—the one you wound 15 times clockwise around the pulley. The counterweight's fishing line hangs over and to the left side of the hour arbor support.

SET THE BEAT OF THE CLOCK



▲ **Step 15: Adjust the beat of the clock.** Reassemble the clock, leaving the hour wheel off for now. Put the weight and counterweight onto their respective cords and remove the tape from the pulley. Put the clock into beat by gently pushing on the pendulum shaft. If the clock runs fine, has a nice even tick-tock sound, and does not stop, your clock is in adjustment. If the escape wheel tooth consistently stops on the top important face of the pallet, raise the right side of the frame slightly. If the escape wheel tooth consistently stops on the bottom important face of the pallet, lower the right side of the frame slightly.

Step 16: Let the clock run. Some clocks beat slow or fast at first until they drop into their normal consistent beat. Let the clock run for a few weeks before adjusting the length of the pendulum shaft.

Step 17: Adjust the pendulum shaft. Use the adjustment nut to position the bob in the middle of the threaded rod. Set the clock in motion and count the beats the clock makes in 60 seconds. If the clock beats fewer than 60 times, adjust the bob up the pendulum shaft using the adjusting nut. If you run out of room to raise the bob, remove the shaft from the pallet, cut ½" (15mm) off of the dowel, reinsert the shaft, move the bob to the middle position, and test again. Repeat this procedure as many times as it takes, removing just ½" (15mm) at a time, until the clock beats about 60 times a minute with the bob at its midpoint on the threaded rod. Let the clock run overnight and make any necessary fine adjustments with the adjustment nut. Then, pin or glue the shaft into the pallet.

Step 18: Add the hour wheel. The index mark on the tooth of the hour wheel must be aligned with the index mark on the pinion of the minute wheel. The hour wheel is held onto the arbor by the hour-hand arbor cap. Allow ¼" of space between the hour hand and the hour wheel.

Step 19: Lubricate the wheels. Lubricate the mating surfaces between the wheels' teeth and their pinions. Push the pallet back. The drive weight will cause the wheels to spin freely. Hold a candle or paraffin wax to the areas where the teeth of the wheels and pinions meet. The wax is released into the high-friction areas. Only a small amount of wax is needed; too much wax will clog the teeth, causing the clock to stop.

Step 20: Finish lubricating the clock. Add a little paraffin on the arbors where the wheels and pinions run to reduce the internal friction. Then, lubricate the monofilament cord. Push the pallet out of the way and run the weight the whole way to the floor. Rub the paraffin up and down the full length of the cord. Since the counterweight cord carries no weight, it is not necessary to lubricate the counterweight cord.

TIPS TROUBLESHOOTING

Remove all of the wheels from the frame and install only the minute wheel and third wheel with any appropriate spacers and arbor caps. Blow on the larger wheel to make sure the wheels move easily and smoothly. If not, find out why and make any necessary adjustments. Remove the minute wheel and test the third wheel and escape wheel using the same technique. Then, remove the wheels and test the hour wheel and minute wheel.

TINTING THE SHIELD NUMBERS

For a more coordinated look, tint the paper on the shields after you cut them. Soak two tea bags in a ½ cup of hot water. When the tea is cool, paint the paper with a few light coats of the tea wash. Then spray the shields with multiple light coats of lacquer. Use light coats of the wash and lacquer, as heavy coats will lift the paper from the wood.

BROKEN CONNECTORS

If you do not use high-grade plywood, the connectors can crack and break between the plys. If this happens, use a solid hardwood, such as cherry or maple, in place of the plywood for the connectors.



Leave the clock natural for best performance. If you must apply a finish, avoid getting any finish in the teeth of the wheels or pinions.

Finishing the Clock

I strongly advise leaving the clock natural. Finishes can prevent the clock from working properly. If you must apply a finish, I suggest many light coats of spray lacquer. Polyurethane and other varnishes create a thick finish that never seems to completely dry.

To apply a finish to the frame, mask off all of the arbors. I seldom apply finish to the wheels and pinions—because I like my clocks to run. If you must apply a finish to the wheels, plug the center arbor holes with a rolled-up paper towel. Spray the finish from the center of the wheel outward so the finish doesn't blow into the areas where the teeth meet the pinions. Keep the inside of the tooth area free of finish if you want your clock to run well for a long time. If you get finish inside the tooth area and your clock no longer runs, you'll have to sand the finish out of each tooth. If you are using the paper numbers on the shields to tell time, too much lacquer can make the numbers lift. Apply many light coats of lacquer to the numbers.

Setting the Clock

Once the clock is fully assembled and running, it is easy to set the correct time. Stop the pendulum. Hold the third wheel so it does not move. Push the pallet toward the wall, against the compression spring, to unlock the pallet faces from the escape wheel's teeth.

With all of the wheels free to move, set the clock to the appropriate time by moving the third wheel forward or backward to the correct time. It is easiest to let the weight move the clock forward to the correct time. Make sure the escape wheel has completely stopped moving before re-engaging the pallet.

This clock was designed to run about one day on a single wind. Once the weight has run down, to rewind your clock, stop the pendulum and pull gently downward on the counterweight while simultaneously gently lifting the weight. You will hear the clicks clicking as you raise the weight. Make sure the clicks have engaged before fully releasing the weight, and then gently restart your pendulum. Your pendulum should swing less than 1" to either side, which produces about 1 $\frac{3}{4}$ " total swing measured at the bottom of the bob.

Humidity and Wood Movement

Because this clock is made of wood, some movement in the wooden parts is to be expected, especially with changes in heat and humidity. Here in Hawaii, on those few days a year when we have high humidity, some of my clocks swell up and stop. I do nothing to my clocks during those times. Eventually, as the days get less humid, the mechanisms free themselves and allow me to restart the clocks.

Some people living in very dry areas of the country experience the opposite problem—but the result is the same. For them, this occurs most frequently around the time when their forced-air heaters come on in the winter months.

Humid conditions, usually in the summer months, will make your clock run slower. Dry conditions, which usually occur in the winter months, will make your clock run a bit faster.

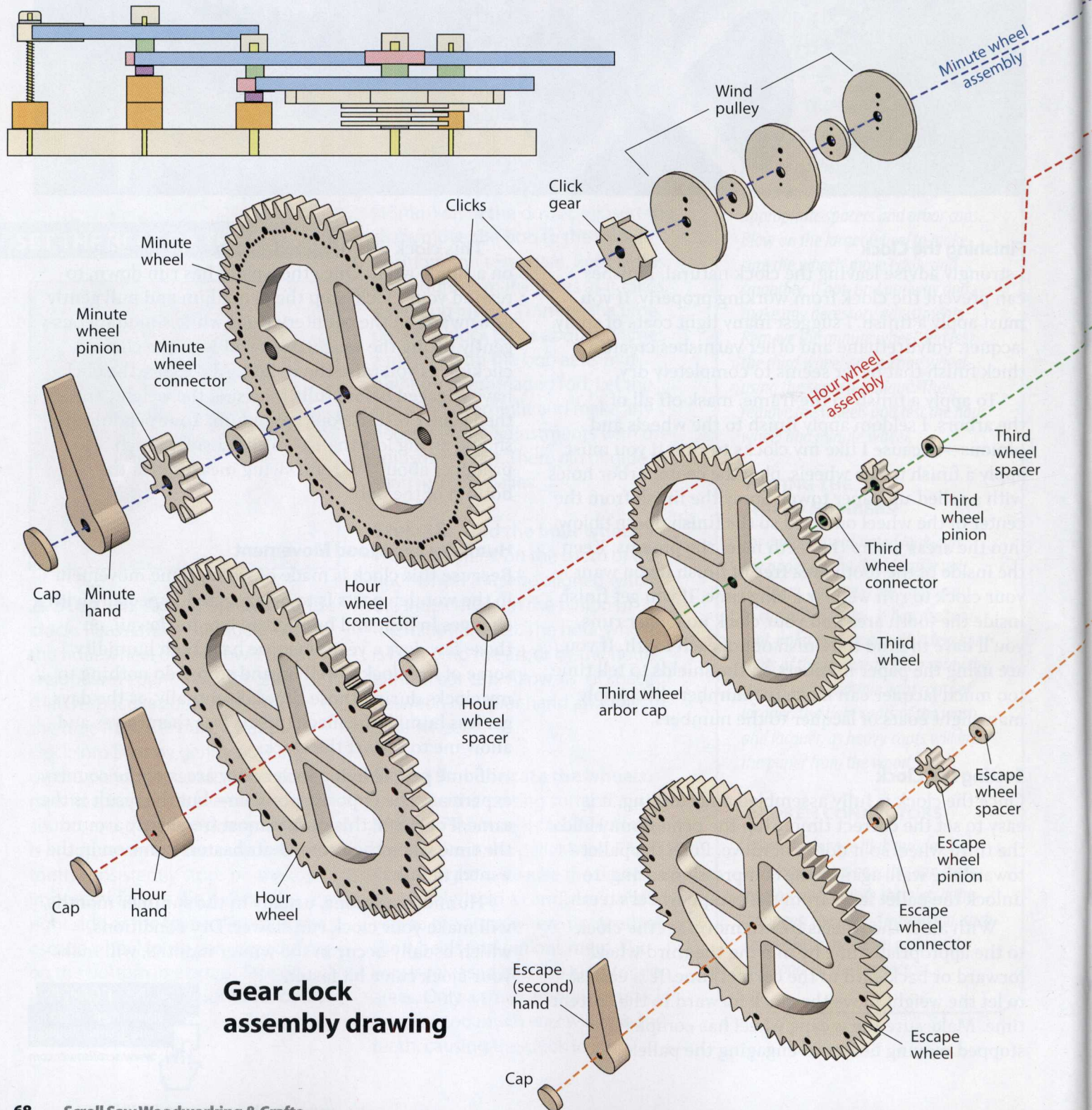
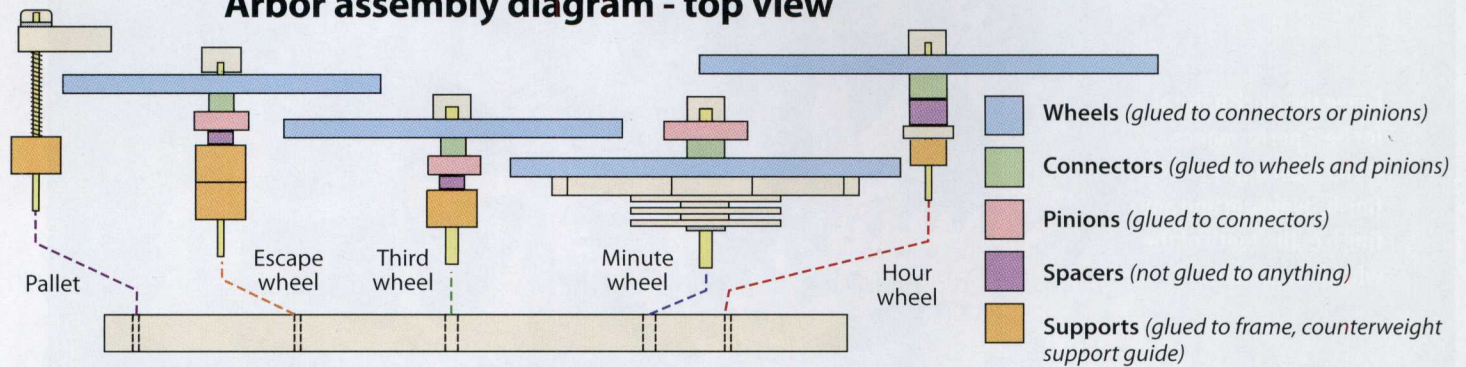
ONLINE BONUS

Video of the Gear Clock in motion is on our Website.



www.scrollsawer.com

Arbor assembly diagram - top view



Materials & Tools

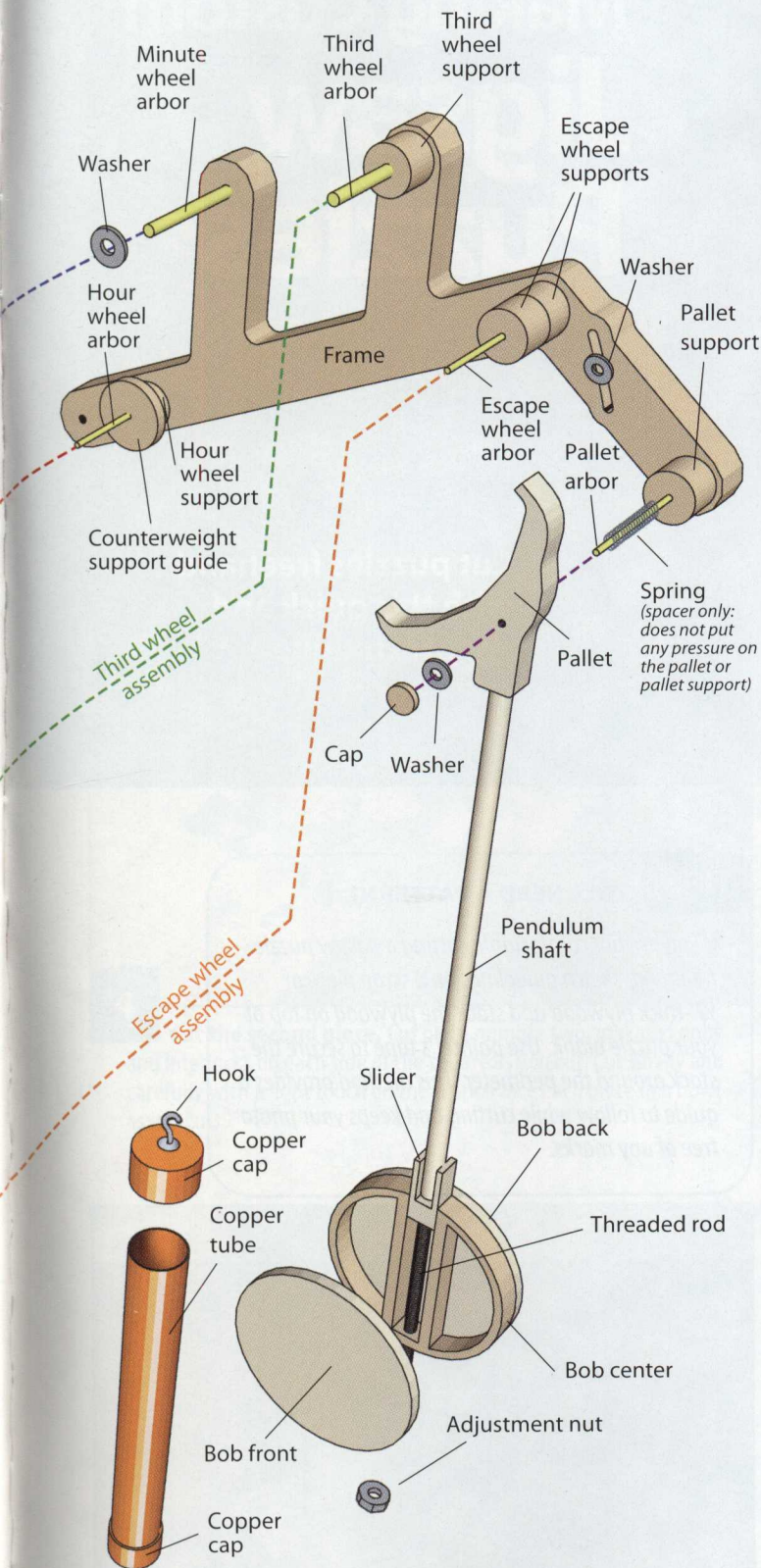
Materials:

- Spray adhesive
- $\frac{3}{4}$ " to 1" x 12" x 16" (20mm to 25mm x 305mm x 405mm) hardwood or high-grade plywood (frame, supports)
- $\frac{1}{2}$ " x 12" x 12" (15mm x 305mm x 305mm) high-grade plywood (pallet, bob center, slider, caps, supports, hands, spacer)
- $\frac{3}{8}$ " x 24" x 24" (10mm x 610mm x 610mm) high-grade plywood (wheels, click gear, hands, pinions, connectors)
- $\frac{1}{4}$ " x 12" x 12" (6mm x 305mm x 305mm) high-grade plywood (bob front and back, spacers, counterweight support guide, pallet cap)
- $\frac{1}{8}$ " x 24" x 24" (3mm x 305mm x 610mm) high-grade plywood (wind pulley, caps, clicks)
- $\frac{1}{8}$ " x 2" x 2" (3mm x 50mm x 50mm) hardwood (wind pulley centers)
- $\frac{1}{4}$ " (6mm)-diameter flat washers (minute wheel arbor)
- 2 each #8 by 2" (50mm)-long wood screws (to mount clock to wall)
- 2 each #8 flat washer (to mount clock to wall, pallet cap)
- 14' (4,270mm) 50-pound monofilament fishing line (weight cord)
- $1\frac{1}{2}$ " (38mm)-diameter by $13\frac{1}{2}$ " (345mm) copper pipe (weight)
- 2 each $1\frac{1}{2}$ " (38mm)-diameter copper pipe cap (weight)
- $\frac{1}{2}$ " (13mm)-diameter by 5" (130mm)-long copper pipe (counterweight)
- 2 each $\frac{1}{2}$ " (13mm)-diameter copper pipe cap (counterweight)
- 2 each small copper hooks (weight and counterweight)
- Approximately 7 pounds of lead shot (weight)
- $\frac{1}{16}$ " (2mm)-diameter by 12" (305mm)-long stainless steel rod or wire (pins)
- $\frac{1}{8}$ " (3mm)-diameter by 12" (305mm)-long stainless steel or brass rod: brass is easier to cut (arbors)
- $\frac{1}{4}$ " (6mm)-diameter by 12" (305mm)-long stainless steel or brass rod (arbors)
- #8-32 by $3\frac{1}{4}$ " (83mm)-long threaded rod (bob)
- #8-32 nut (adjusting nut)
- $\frac{3}{8}$ " (10mm)-diameter wood dowel (pendulum shaft, click holders)
- $1\frac{1}{8}$ " (40mm)-long light compression spring that fits easily over a $\frac{1}{8}$ "-(3mm)-diameter rod (pallet arbor spring)
- BBs (bob weight)
- Wood glue
- Paraffin wax

Tools:

- #5 reverse-tooth blades or blades of choice
- 1"-wide bench top belt sander or sander of choice
- Rotary-power carver with metal cut-off discs
- Drill press
- Brad point drill bits: $\frac{3}{8}$ " (10mm), $\frac{1}{4}$ " (7mm), $\frac{1}{8}$ " (6mm), $\frac{3}{16}$ " (4mm), $\frac{1}{16}$ " (3mm) and $\frac{1}{32}$ " (2mm) diameters

Patterns for the **WOODEN GEAR CLOCK** are in the pattern pullout section.



Dr. Clayton Boyer lives in Hawaii and loves to make wood move. Clayton has built more than fifty of these remarkable wooden clocks and mechanisms, and would like to thank all of the builders who helped make these projects possible; Bob McDonough, Adrian Iredale, Marc Tovar, John Hilgenberg, Forrest Burnett, Bob Brown, Jeff Hecht, Drew Nagle, and Chris Savold. To purchase gear clock plans, access tips, or view Clayton's clocks and videos, visit www.lisaboyer.com.



How the Clock Works

The weight holds the wheels under pressure, but the pallet keeps the wheels from spinning. As the pendulum swings back and forth, the pallet releases the escape wheel to move one click forward. This movement is transmitted through the escape-wheel pinion to the third wheel. The third-wheel pinion transmits the movement to the minute wheel, and the minute-wheel pinion transmits the movement to the hour wheel.



Making Custom Jigsaw Puzzles

Cut puzzles freehand with this quick and easy technique

By Charles Ross

Cutting puzzle pieces row by row is a technique called strip cutting. You've seen commercial puzzles made from thick cardboard—these are strip-cut puzzles. For this project, we will strip cut 1" pieces using guidelines. After you master the strip-cutting technique, you can attach your photo of choice to a piece of wood and make a custom jigsaw puzzle without using a pattern.

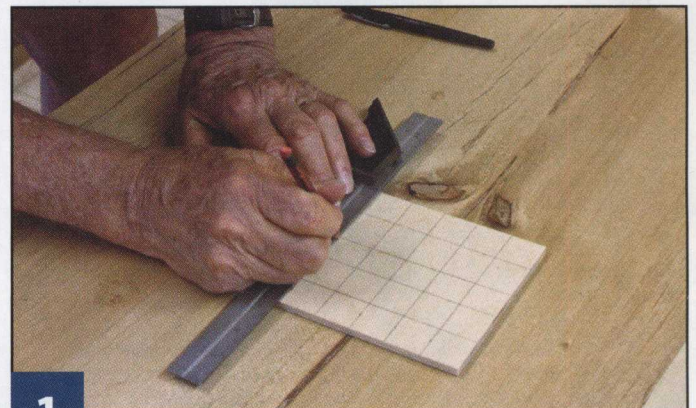
The first step to strip cutting is to draw in the guidelines, dividing the blank into 1" squares. Next, cut the interlocking pieces using the lines to keep the pieces the same size.

Start by preparing your workspace. Install a new blade in your scroll saw. Make sure you have an adjustable fluorescent light, a stool of proper height, a bowl to receive cut puzzle pieces, a small ½" (15mm) brush, a guide stick for cutting the last few pieces, safety glasses, and a sieve to vacuum off the sawdust.

Once you master the strip-cutting technique using practice boards, affix your photo to the blank and use the strip-cutting technique to create your own custom jigsaw puzzle. Adhere the photo to the blank with spray adhesive, spraying a light coat on both the photo and the blank. Wait a few minutes and carefully place the photo on the blank, working from one corner to the opposite corner. After the photo is in place, use a good clean roller to squeeze out any air bubbles trapped under the photo.

TIPS STILL NEED A PATTERN?

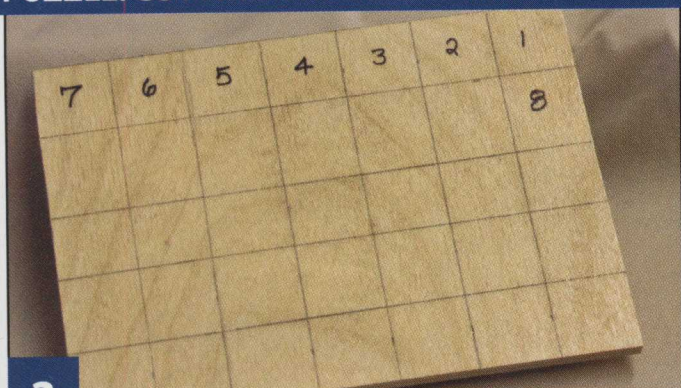
If you are not comfortable cutting a jigsaw puzzle freehand, sketch guidelines on a scrap piece of ¼"-thick plywood and stack the plywood on top of your puzzle blank. Use painter's tape to secure the stack around the perimeter. This method provides a guide to follow while cutting and keeps your photo free of any marks.



1

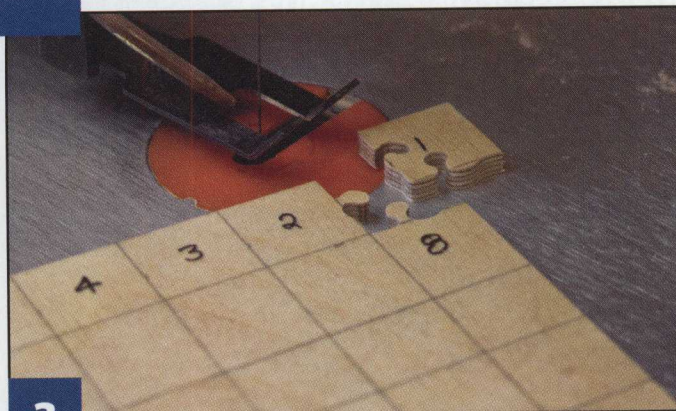
Prepare the blank. Select one 5" by 7" (130mm x 180mm) puzzle blank and draw pencil lines 1" (25mm) apart across the 7" (180mm) side of the blank. Repeat along the 5" (130mm) side. This divides the blank into a grid with 1" (25mm) squares.

PUZZLE: CUTTING THE FIRST STRIPS



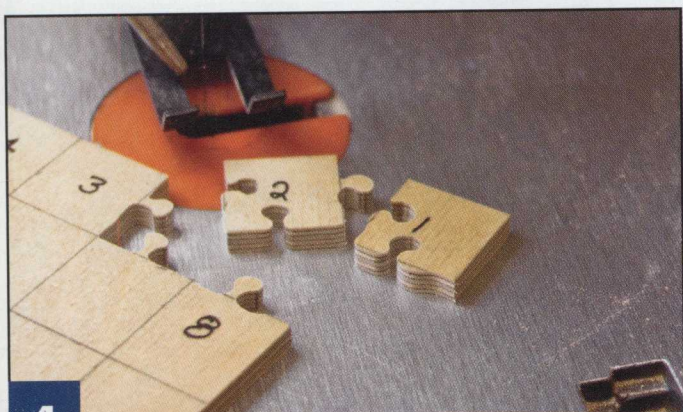
2

Finish the face of the blank. Vacuum the surface of the blank to clean off any loose sawdust. Use a tack cloth to wipe the surface to remove all remaining sawdust. Apply spray lacquer, acrylic, or your finish of choice. Once the finish is dry, you are ready to begin. I number the pieces to make it easier to describe the cutting process. You do not need to number the pieces.



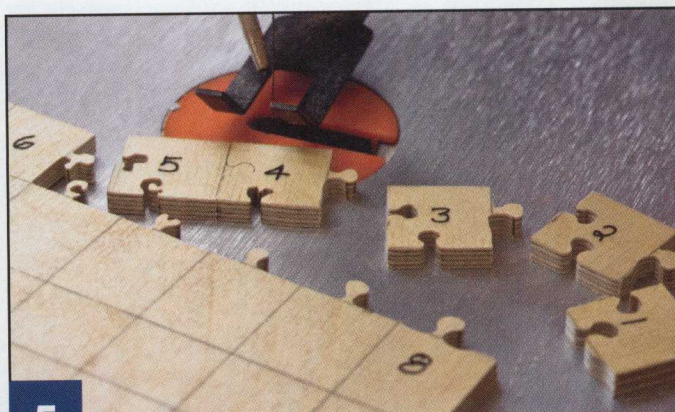
3

Cut the first piece. I start on the top right-hand corner of a puzzle and strip cut pieces from right to left. Cut in along the guideline and create an interlocking knob near the center of the square. Turn the 90° corner and follow the remaining guideline, creating an interlocking knob near the center of the square.



4

Cut the second piece. Cut piece number two, making knobs and interlocks on each side of the square as you cut. Cut slowly and carefully with a light touch on the work. Place each piece in a bowl as it is cut.



5

Complete the first strip. Continue to cut along the strip, cutting pieces three, four, and five. Try creating fancy knob shapes on a few pieces. Visualize what each piece will look like before you actually cut. Plan where the knobs and interlocks will be located and allow sufficient room for each knob and interlock.



6

Cut the second strip. You do not have to follow the lines exactly. What you need to learn is that pre-planning is necessary before cutting each piece. This knowledge will be invaluable when you start cutting small puzzle pieces.



7

Cut the third strip. Don't rush the process of cutting pieces. Smooth cuts are what give wooden jigsaw puzzle pieces that delightful feel. Note there are several fancy knobs, which make the puzzle more interesting and also easier to solve.

PUZZLE: FINISHING THE PUZZLE



8

Begin the last two rows. The last two rows should be cut together. By doing this, you will end with four pieces to cut and have more wood to hold as you make the final cuts. Reduce the speed of the saw. This will slow the blade and improve control, allowing you to move the piece through the blade precisely.



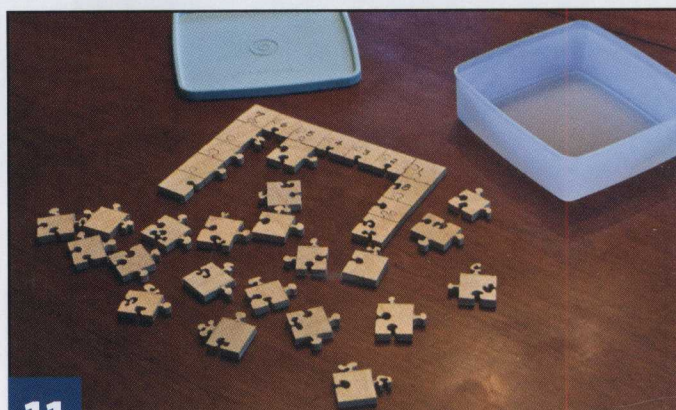
9

Cut the last four pieces. Make your cuts slow and smooth. These last cuts become increasingly more difficult with smaller puzzle grids.



10

Vacuum the pieces. Pour the finished pieces into a sieve and vacuum off the sawdust. I make a sieve by stretching plastic screen across a wooden frame.



11

Assemble the puzzle and store it. You never get all of the sawdust off of a newly cut puzzle until it has been assembled at least once. Assembling a freshly cut wooden jigsaw puzzle is fun and relaxing. Store the pieces in a container afterward.

Materials:

- $\frac{1}{4}$ " x 5" x 7" (6mm x 130mm x 180mm) Baltic birch plywood or puzzle blank of choice
- Tack cloth
- Spray lacquer, acrylic, or finish of choice
- Spray adhesive (to attach photo)
- Bowl to hold cut pieces
- Sieve (to hold pieces while vacuuming)
- Vacuum (to remove dust from pieces)
- Ruler
- Pencil

Materials & Tools

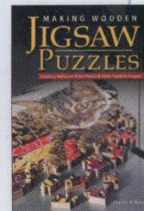
Tools:

- #2/0 reverse-tooth scroll saw blades or blades of choice
- Clean roller (to smooth photo onto blank)

Further Reading

Making Wooden Jigsaw Puzzles

Add a new twist to puzzle making with tips and tricks from author Charlie Ross as he teaches how to make personalized and challenging puzzles from photos and digital images.



Available for \$14.95 + \$4.75 s&h (parcel post) from Fox Chapel Publishing, 1970 Broad St., East Petersburg, Pa. 17520, 800-457-9112, www.FoxChapelPublishing.com, or check your local retailer.



Charles Ross of Belle Haven, Va., is a second-generation puzzle maker who is currently retired from a career in occupational safety—he is the author of one book and many articles on the subject. An avid photographer, Charles spends much of his time behind the camera and exhibiting his work in galleries.

Spring Songbirds



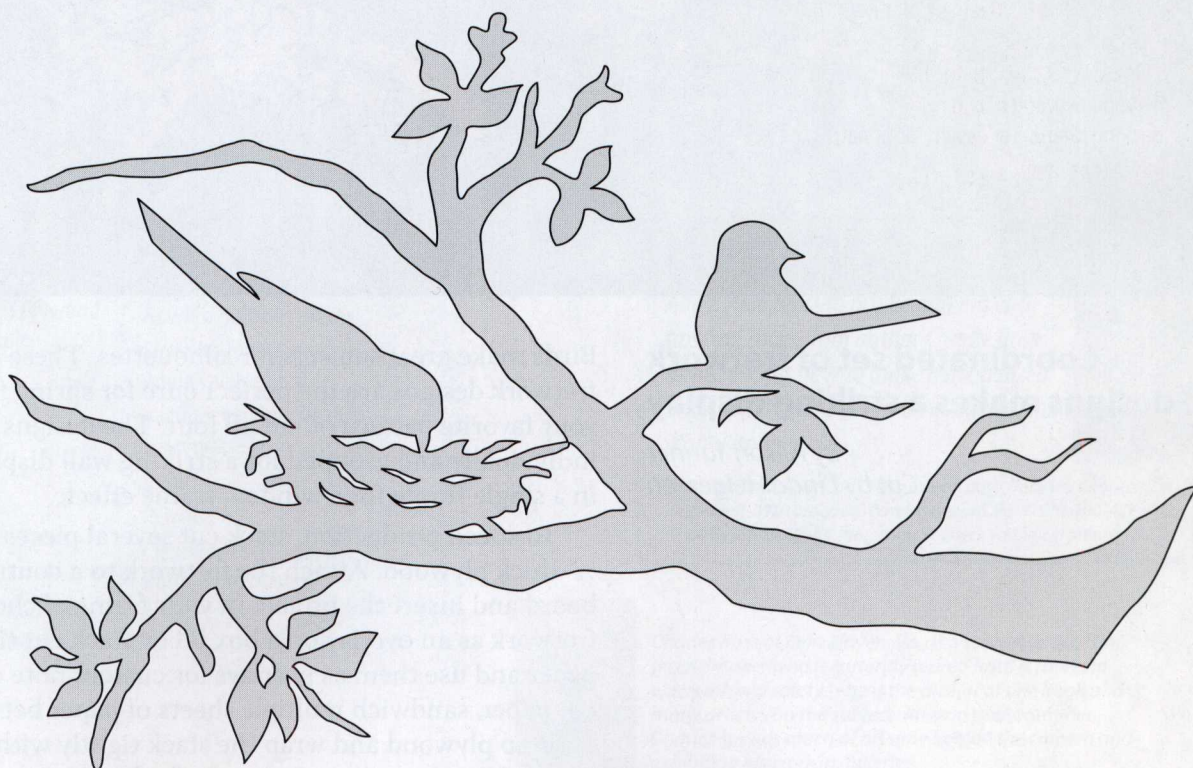
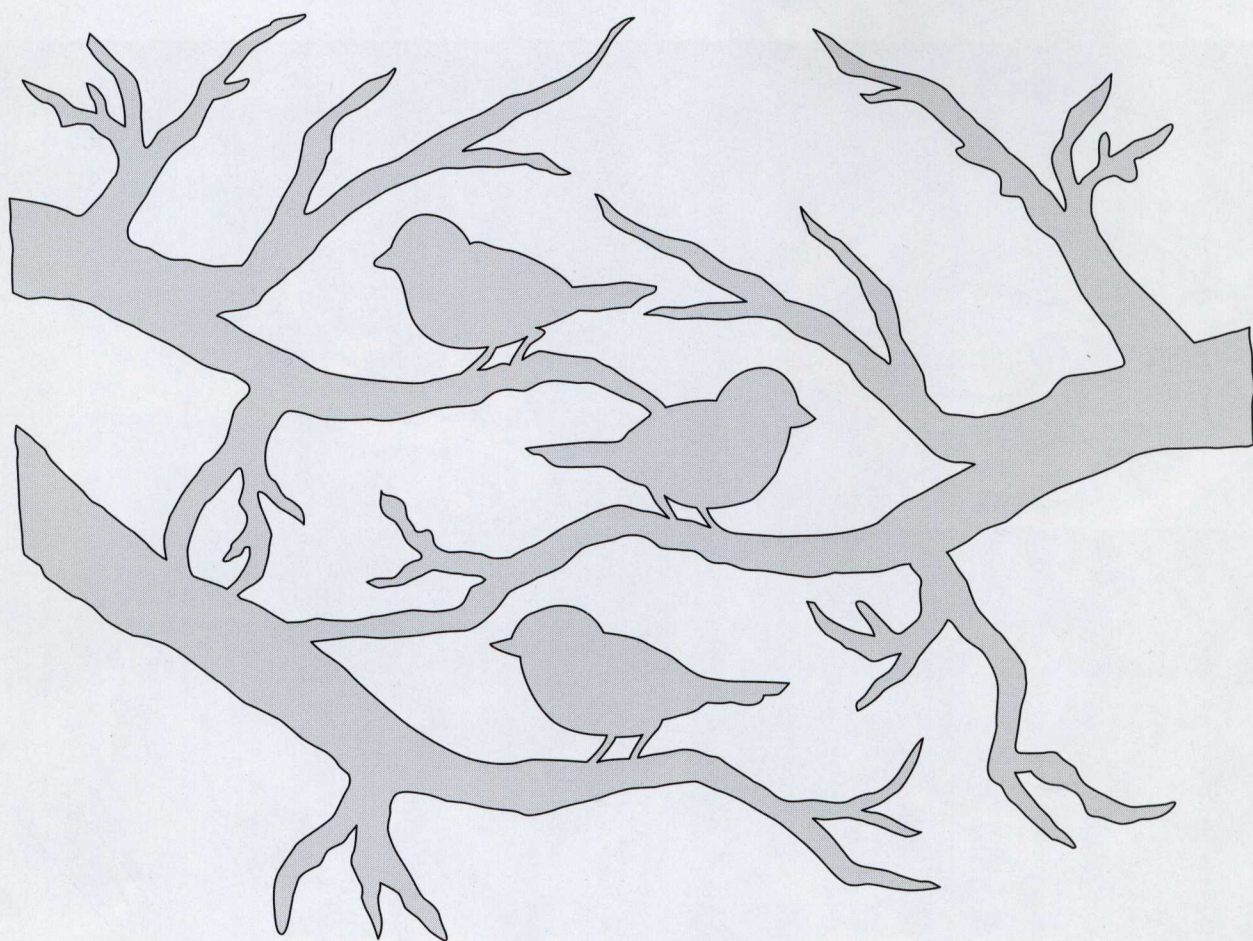
Coordinated set of fretwork designs makes a striking display

*By Alison Tanner
Cut by Linda Helgersen*

Birds make great subjects for silhouettes. These coordinated fretwork designs are the perfect cure for spring fever. Choose your favorite pattern or cut all four. The designs can be framed individually and grouped for a striking wall display or mounted in a single frame for a window-frame effect.

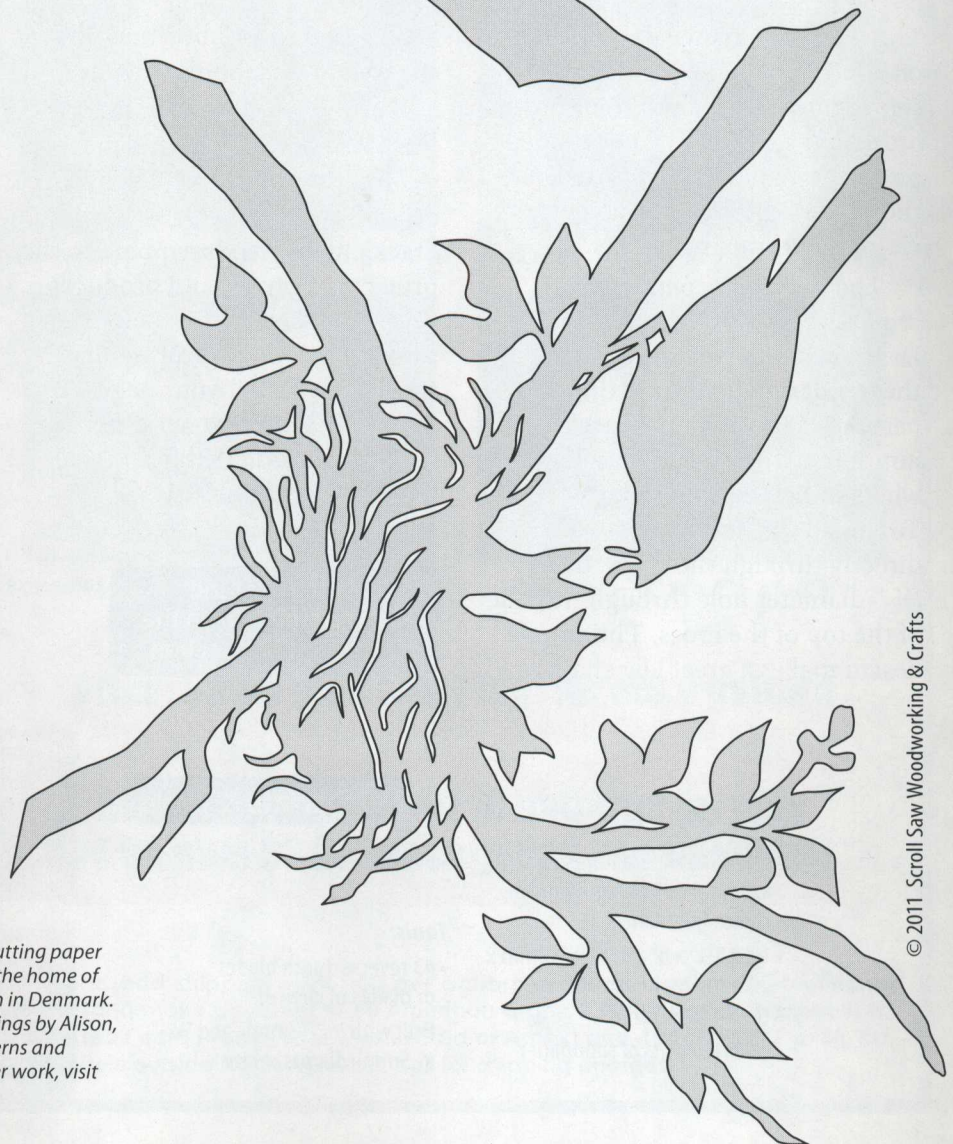
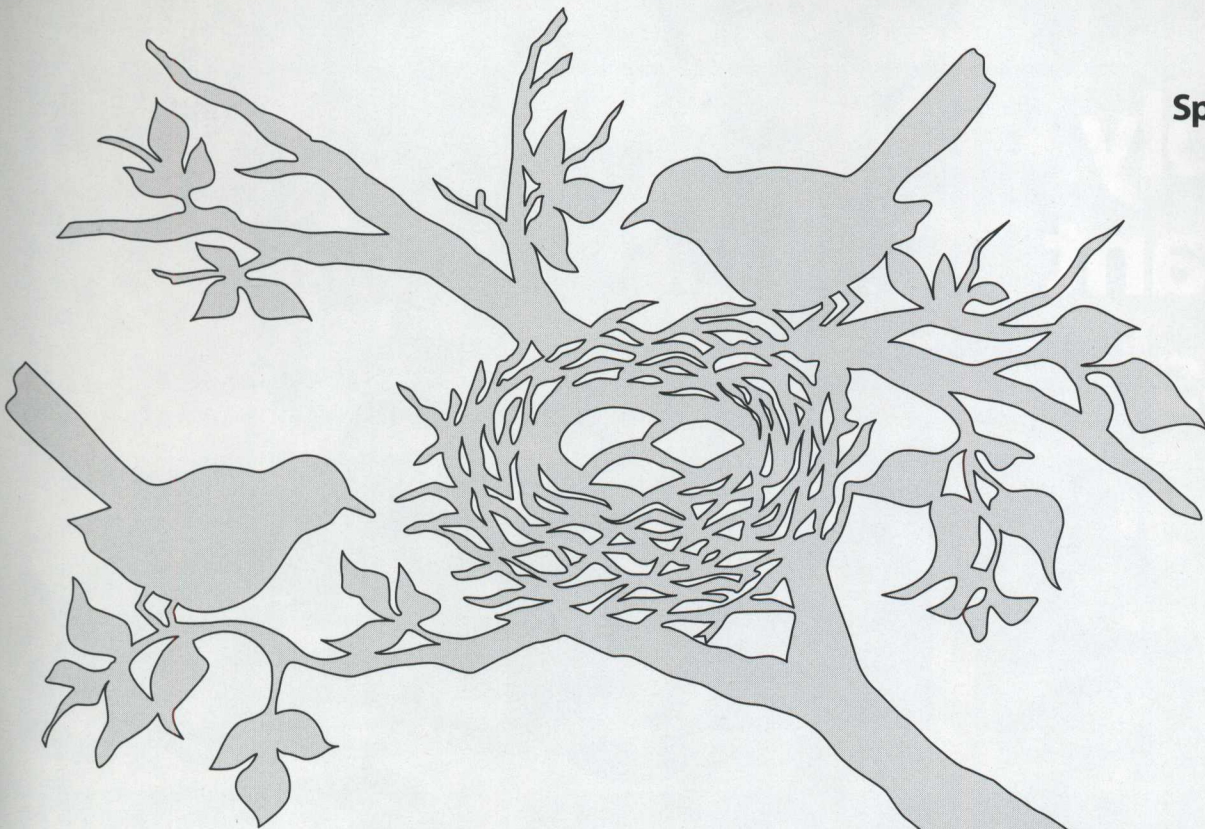
To speed production, stack cut several pieces of $\frac{1}{8}$ " - to $\frac{1}{4}$ "-thick plywood. Attach the fretwork to a contrasting backing board and insert the project in your frame of choice. Use the fretwork as an overlay on a box lid or stack cut the designs from paper and use them as overlays for custom note cards. To stack cut paper, sandwich multiple sheets of paper between two pieces of scrap plywood and wrap the stack tightly with masking tape. The tighter you secure the stack, the better the results.

Spring songbird patterns



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Spring songbird patterns



Materials & Tools

Materials:

- $\frac{1}{8}$ " to $\frac{1}{4}$ " x 5" x 7" (3mm to 6mm x 130mm x 180mm) Baltic birch plywood or wood of choice (per design)
- $\frac{1}{8}$ " to $\frac{1}{4}$ " x 5" x 7" (3mm to 6mm x 130mm x 180mm) Baltic birch plywood or wood of choice (backing board, per design, optional)
- Frame (optional)
- Assorted grits of sandpaper
- Finish of choice
- Wood glue

Tools:

- #3 reverse-tooth blades or blades of choice
- Drill with $\frac{1}{16}$ " (2mm)-diameter bits
- Assorted clamps



Alison Tanner of Sarasota, Fla., began cutting paper at the age of eight, inspired by a visit to the home of fairy tale writer Hans Christian Andersen in Denmark. Alison is the owner/creator of Papercuttings by Alison, which carries the largest variety of patterns and supplies for the scissorist. For more of her work, visit www.papercuttingsbyalison.com.

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Simply Elegant Cross Designs

Express your faith with easy-to-make projects

*Pendant by Gene M. Reilly
Word Art by Bobby Riggs*

These designs are easy to create on a scroll saw. The pendants are super simple to cut and the word-art design can be stack cut to speed production. Both projects make thoughtful gifts and are ideal for church fund-raising efforts.

The solid cross pendant requires only two cuts to complete. Drill a blade-entry hole and cut the fret design before cutting the perimeter. If you plan to use a jump ring, drill a 1/16"-diameter hole where indicated on the pattern. To thread the hanging cord directly through the cross, drill a 15/64"-diameter hole through the side of the top of the cross. The simple design makes a great key chain or

can be tied to a ribbon and used as the weight on a bookmark.

For the word-art design, drill the blade-entry holes and cut the interior frets first. Then, cut around the perimeter of the design. Stack cutting lends support to the project as you cut and produces several finished projects for the same effort. Enlarge or reduce the design to suit your needs. If you make the word-art cross as a pendant, use Baltic birch or oak plywood for durability.

Patterns for the **CROSS DESIGNS** are in the pattern pullout section.

Materials:

- 3/8" x 1 1/2" x 2 1/4" (10mm x 40mm x 60mm) oak or hardwood of choice (pendant)
- 1/4" x 4 1/4" x 8" (6mm x 110mm x 205mm) mahogany or wood of choice (word art)
- Assorted grits of sandpaper

Materials & Tools

- Finish of choice

Tools:

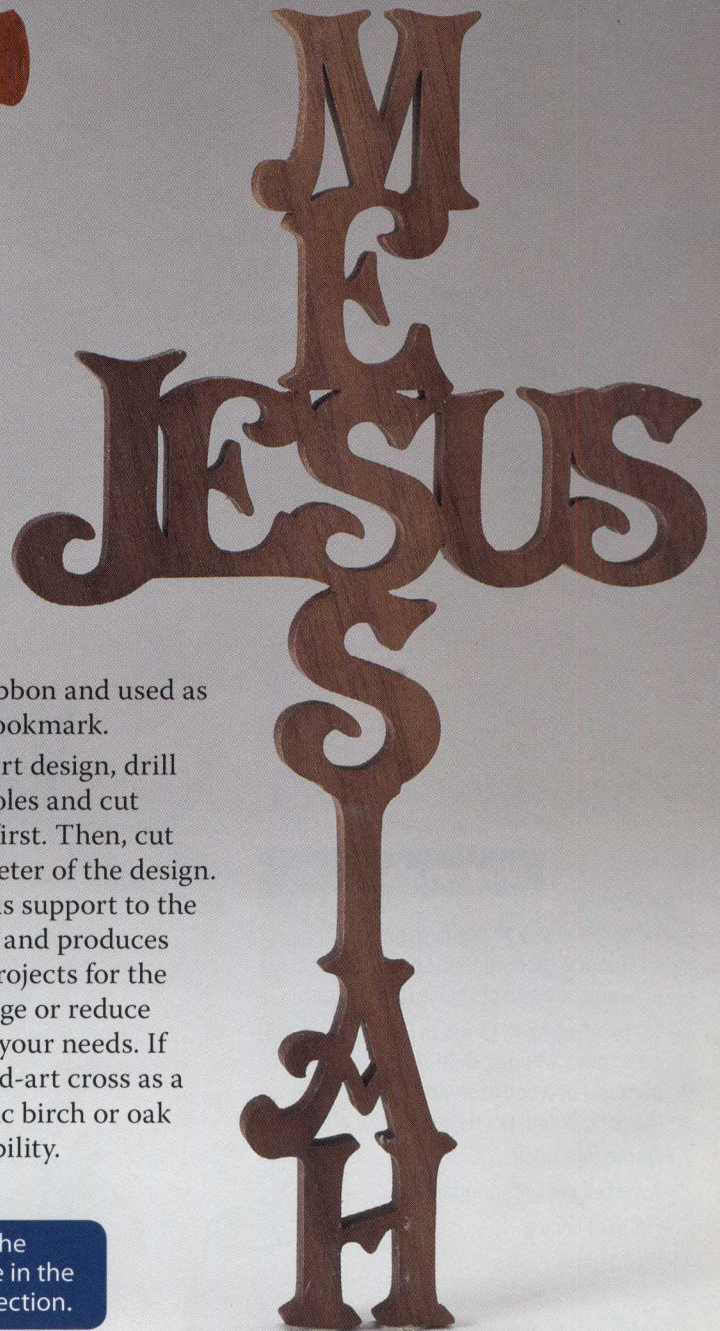
- #3 reverse-tooth blades or blades of choice
- Drill with 1/16" (2mm)- and 15/64" (5.5mm)-diameter bits



Gene M. Reilly of Norwalk, Conn., has been a woodworker for most of his life and started scroll sawing after his wife passed away in 2006. Gene cut portraits of all of his grandchildren and donates crosses to many organizations.



Bobby Riggs has been scrolling for ten years. Born in West Virginia, Bobby now lives in Texas, where he works for a large airline. Bobby and his wife have two sons and three grandchildren. Crosses are Bobby's favorite subject to cut.



The Elegant Art Basket Pattern Collection!

NEW!

Here's something innovative, beautiful, and exciting from the publishers of Creative Woodworks & Crafts — ten magnificent basket designs you can build with your scroll saw. They're also economical — each basket is made from just two pieces of wood, saving you money!



Basket #1 — 5-1/2" W x 10-1/2" L x 3-1/4" H



Basket #2 — 6-1/2" W x 10" L x 3-1/2" H



Basket #3 — 8" W x 9" L x 3-1/4" H



Basket #4 — 6" W x 10" L x 3-1/2" H



Basket #5 — 7-3/4" W x 7-3/4" L x 5-1/4" H



Basket #6 — 5-3/4" W x 10" L x 3-3/4" H



Basket #7 — 6-1/2" W x 9" L x 4" H



Basket #8 — 8-1/4" W x 8-1/4" L x 4-1/4" H



Basket #9 — 7" W x 9" L x 4-3/4" H



Basket #10 — 7-1/2" x 10-3/4" L x 4-3/4" H

Price: \$3.95 plus shipping* for each pattern

Best buy: Receive all 10 patterns for only \$24.95 plus \$3.00 for shipping and handling!**

To Order: specify which patterns you want and add shipping — *\$1.00 per pattern ordered; maximum \$4 shipping charge per order. Send check or money order (and make payable) to All American Crafts, 7 Waterloo Rd., Stanhope, NJ 07874, Attention R. Becker. By phone — have credit card ready (Visa, MasterCard or Amex) and call (973) 347-6900, Ext. 143, and ask for Robert. U.S. funds only. **For orders outside North America, call for shipping charges.

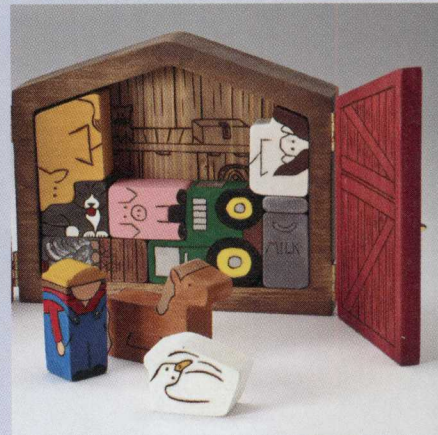
In our next issue...



Easy-to-cut dolphin puzzle makes a striking display



Natural materials create a unique frame for intarsia owls



Store this whimsical farm puzzle in a custom barn box

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BEST PROJECT DESIGN CONTEST 2011

Deadline is March 31, 2011

You asked for it! Entries in the 2009 contest were due on December 31. Many readers were busy making sawdust in preparation for the holiday season. This year, we've pushed the deadline back a few months to give you a chance to get caught up. We listened—so there's no excuse not to enter!

Submit your entry today! You may enter as many projects as you wish. Entries must be your original designs and will be evaluated on originality of design, quality of construction, and aesthetic appeal.

Entries are accepted in five categories. Each category listed above (traditional fretwork, intarsia and segmentation, fretwork portrait, compound cutting, and general scrolling), as well as the Best in Contest Award, will have two winners: one chosen by the editors and one chosen by the online community. All entries are eligible for the Best in Contest Awards. Entries will be posted on our website, www.scrollsawer.com, for voting.

Depending on the number of entries, it may not be possible to have all entries available for online voting. SSW&C staff reserves the right to determine the category for entries.

SUBMIT ENTRIES TO: Best Project Design Contest,
Scroll Saw Woodworking & Crafts, 1970 Broad Street,
East Petersburg, Pa., 17520 ■ Or e-mail: Editors@ScrollSawer.com

CONTEST RULES:

- Patterns must be your original design. **Designs cannot be altered versions of existing patterns by another designer or based on copyrighted images.**
- Projects must feature a significant amount of scrolling. (Projects may include other common woodworking tools in the creation, for example: router, table saw.)
- Projects must be able to be made from commonly available wood.
- Projects cannot have been previously entered in a SSW&C sponsored contest.

TO ENTER:

Submit the following information:

- Category of entry
- Clear photographs of your work. Digital images or traditional prints only. **Prints from a home printer cannot be used.**
- Information on the project size and types of wood used
- Information on special construction or finishing methods
- Your name, address, phone number, and e-mail address

*Your project could be
published in a future issue of*

SCROLLSAW

Woodworking & Crafts

Check out future issues for articles
featuring these great contest entries



Sea Creature Puzzle
by Ruth Chopp



Battle Cry
by Kerry Hallam



Amazing Grace
by Gloria Chandler

Artists retain all copyrights, but consent to having a pattern of their project published in SSW&C. Entries will be acknowledged, but photos and materials will not be returned.
Please do not submit original artwork.

The Puzzle of Autism

When Susan Ambrose spied an Autism Awareness ribbon magnet on the back of a car, it inspired a creative idea.

"It looked like a puzzle, so I thought why not make an actual puzzle?" Susan said. Susan, the mother of a special-needs child, approached her woodworking father Mike Fritz with the idea of creating a floor puzzle based on the Autism Awareness ribbon design.

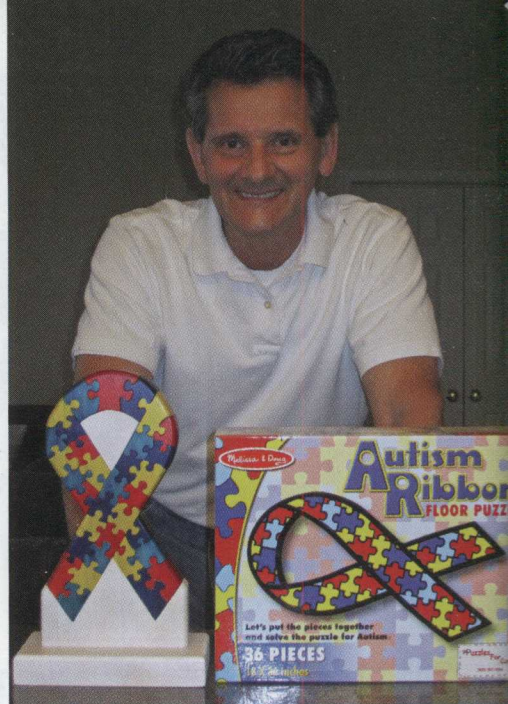
"My grandson, Anthony, has cerebral palsy, so I was very interested in doing something to help raise awareness for children with challenges," said Mike.

After securing permission from the Autism Society of America, Mike crafted the puzzles out of birch plywood. Susan started the company Puzzles for Cures and began selling the puzzles at fund-raising events.

"But we weren't able to keep up with the demand," Susan said with a laugh. "That's when I realized we needed to take it to the next level." Susan and Mike contracted with Melissa and Doug, a well-known manufacturer of high-quality puzzles and toys, to produce the puzzles.

The nontoxic ribbon-shaped floor puzzle measures 18" by 36" and has 36 pieces. The puzzle sells for \$15 to \$20. A portion of the profits goes to the Autism Society of America. But Mike's not done by a long shot; he has a list of puzzles he'd like to start producing.

"I'm really excited about the response to this puzzle and plan to make even more puzzles to help raise awareness for other organizations—including a cerebral palsy puzzle," Mike said.



Mike Fritz transformed the Autism Awareness ribbon into a wooden floor puzzle.

For more information or to purchase a puzzle, visit the e-store at the Autism Society of America's Website, www.flaghouse.com/asa/ or www.shopbecker.com.

Industrial Arts Students Create Silhouettes

Industrial arts students from Chester-Joplin-Inverness Junior High School teamed up with the Hi-Line Health Foundation to create farm scenes and livestock silhouettes for the foundation's fund-raising Wall of Honor at Liberty Medical Center in Chester, Mont. Each silhouette represents a

certain amount of money received in contributions and holds a plaque with the names of the donors.

The Wall of Honor was designed by Marlene Grammar, a former Hi-Line Health Foundation board member, as a way to recognize and honor contributors. The display depicts the activities of the surrounding agricultural community.

Under the direction of industrial arts instructor Gail Shatkus, students create, cut, prepare, and finish all of the silhouettes in their shop classes. The farm-related silhouettes include recognizable scenes, such as grain bins, windmills, grain trucks, cattle, and corrals. Each piece is cut from ¼"-thick plywood using a scroll saw, sanded, and stained to depict the different breeds of cattle raised in the area.

"Once the students got comfortable with the cutting techniques, they became really focused and were proud of their accomplishments," said Gail.

Participating students acquire new woodworking skills, experience the value of doing community service, and learn to take pride in their work.

Industrial arts teacher Gail Shatkus helps Jordan Keltner cut out cows for the Hi-Line Health Foundation's Wall of Honor at Liberty Medical Center.



A detailed woodcut-style portrait of a Native American woman. She has long, dark brown hair styled in two thick braids that hang down. Her face is characterized by deep, expressive lines, particularly around the eyes and mouth, giving her an aged and wise appearance. She is wearing several strands of light-colored, cylindrical beads as necklaces. Her earrings are large, circular, and light-colored, each featuring two small dark dots. The entire portrait is rendered in a monochromatic brown and tan color scheme, with fine lines and shading to create texture and depth. In the lower right corner of the portrait, the signature 'Judy Gale Roberts' is visible.

A photograph showing two wooden bowls. The bowl in the background is decorated with a vibrant, multi-colored geometric pattern in shades of red, orange, yellow, and brown. The bowl in the foreground is a solid, light-colored wood with a smooth, horizontal-grained finish.

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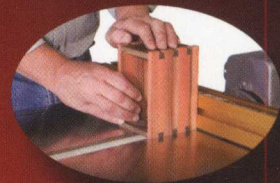
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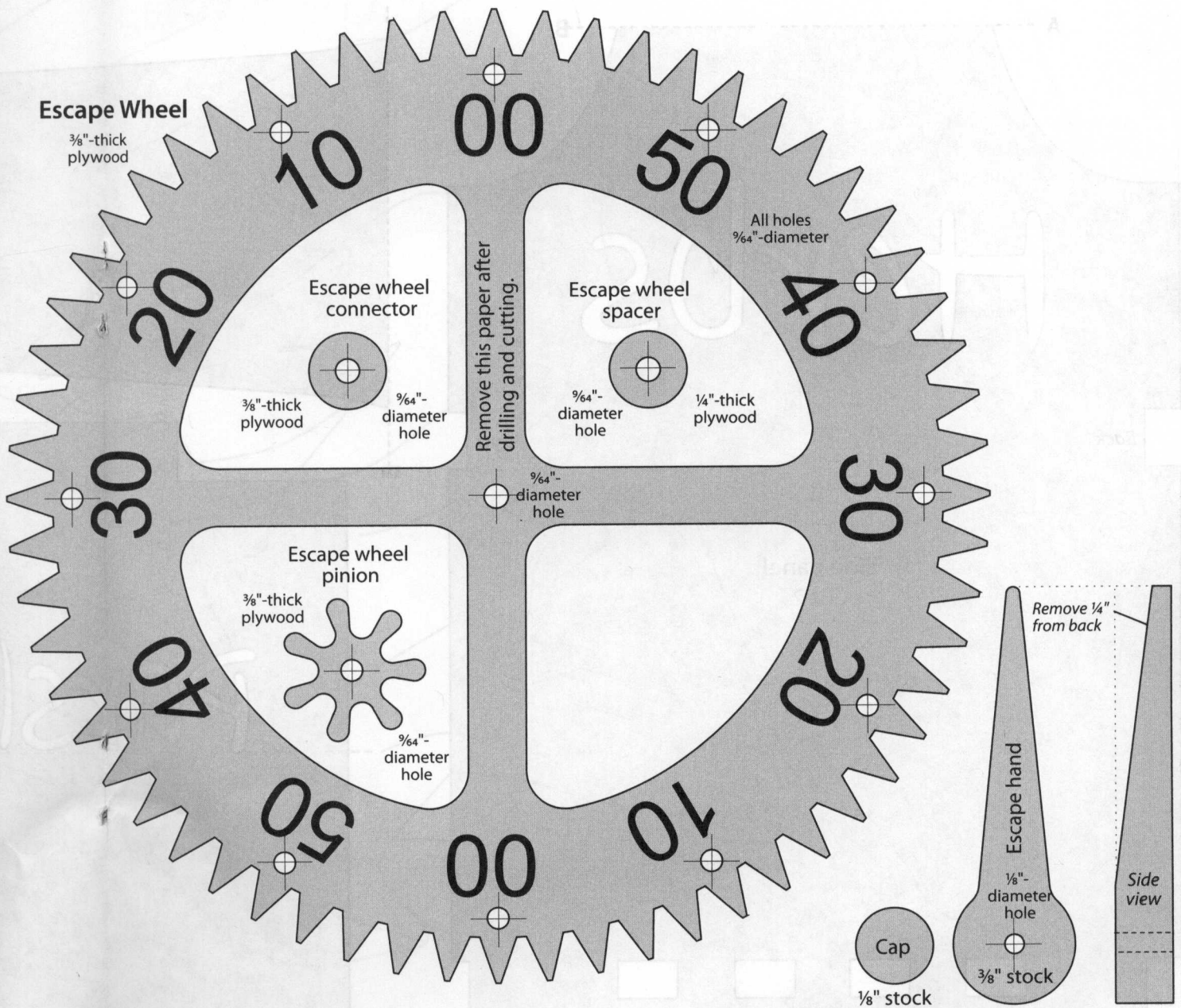
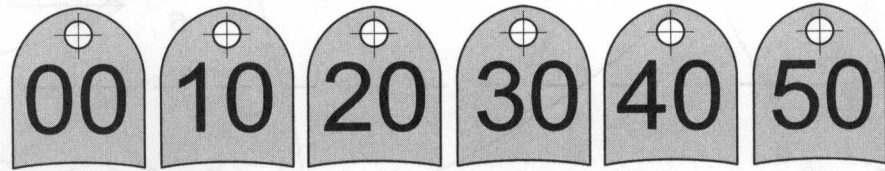
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Optional numbers for escape wheel

All holes $\frac{9}{64}$ "-diameter - apply to $\frac{1}{8}$ " stock - make 2 sets

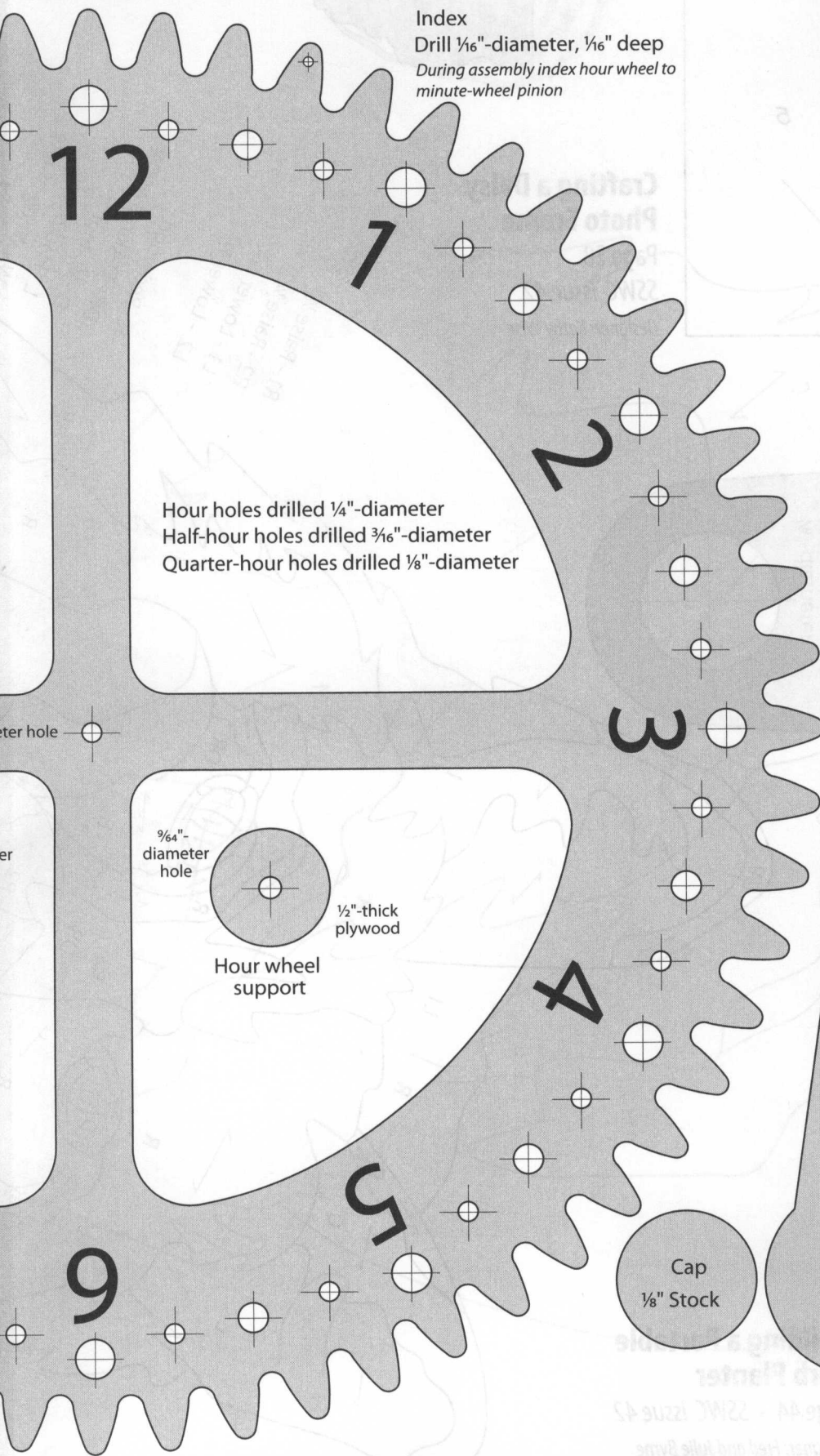


diameter
hole

$\frac{1}{4}$ "-thick
stock

$\frac{3}{8}$ "-diameter
wood dowel,
48" long

Index
Drill $\frac{1}{16}$ "-diameter, $\frac{1}{16}$ " deep
During assembly index hour wheel to
minute-wheel pinion

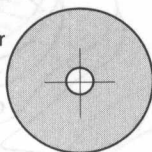


Hour holes drilled $\frac{1}{4}$ "-diameter
Half-hour holes drilled $\frac{3}{16}$ "-diameter
Quarter-hour holes drilled $\frac{1}{8}$ "-diameter

er hole

er

$\frac{5}{64}$ "-
diameter
hole



$\frac{1}{2}$ "-thick
plywood

Hour wheel
support

9

5

4

3

2

1

12

Cap
 $\frac{1}{8}$ " Stock

$\frac{1}{8}$ "-
diameter
hole
 $\frac{1}{2}$ " stock

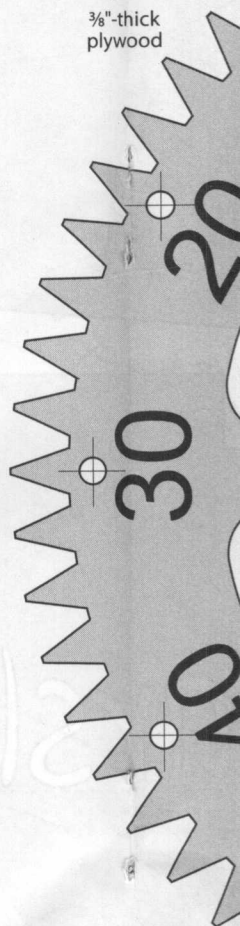
Hour Hand and Arbor Cap

Remove $\frac{1}{4}$ "
from back

Side
view

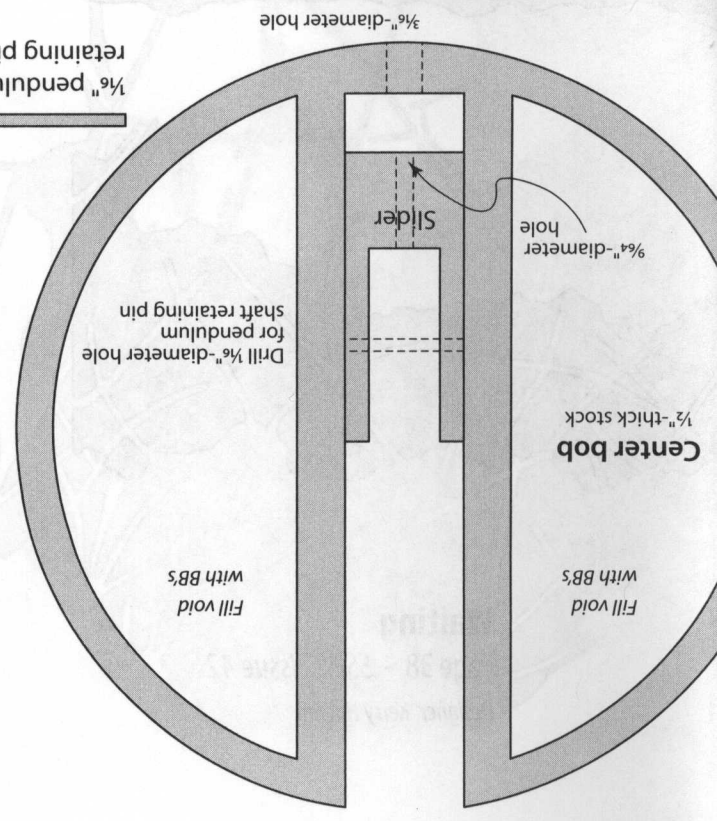
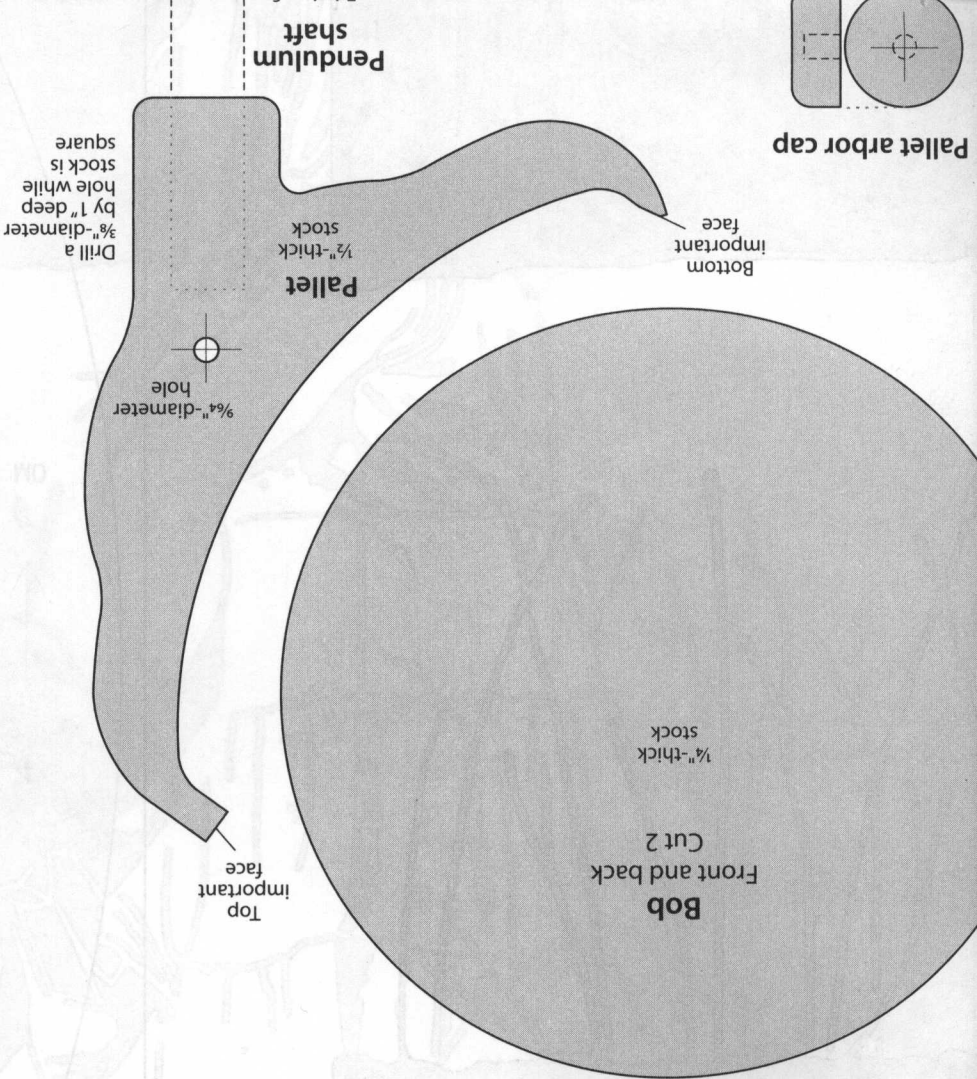
Escape Wheel

$\frac{3}{8}$ "-thick
plywood

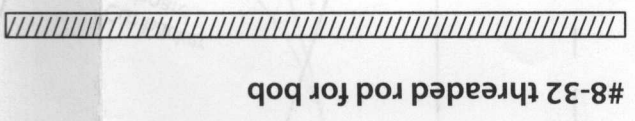




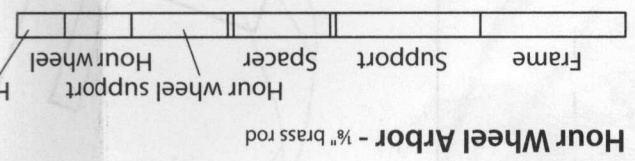
Pallet arbor cap



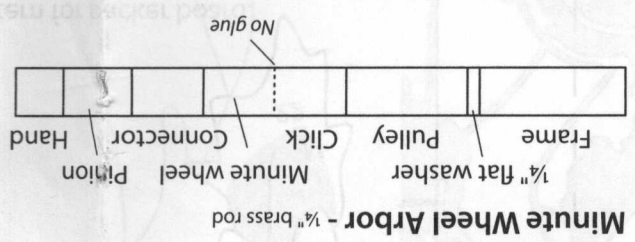
1/4" pendulum shaft retaining pin



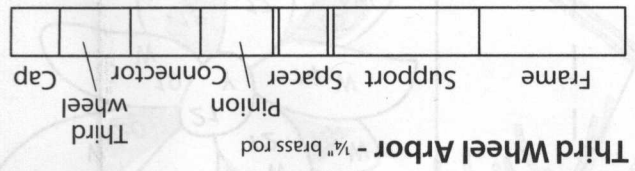
#8-32 threaded rod for bob



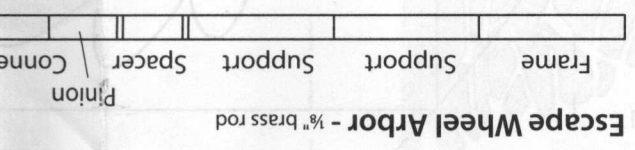
Hour Wheel Arbor - 1/4" brass rod



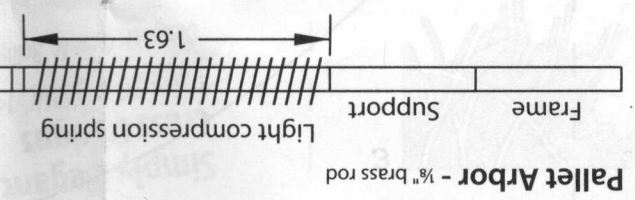
Minute Wheel Arbor - 1/4" brass rod



Third Wheel Arbor - 1/4" brass rod



Escape Wheel Arbor - 1/4" brass rod



Pallet Arbor - 1/4" brass rod

1970 Broad Street
East Petersburg, PA 17520

SCROLLSAW

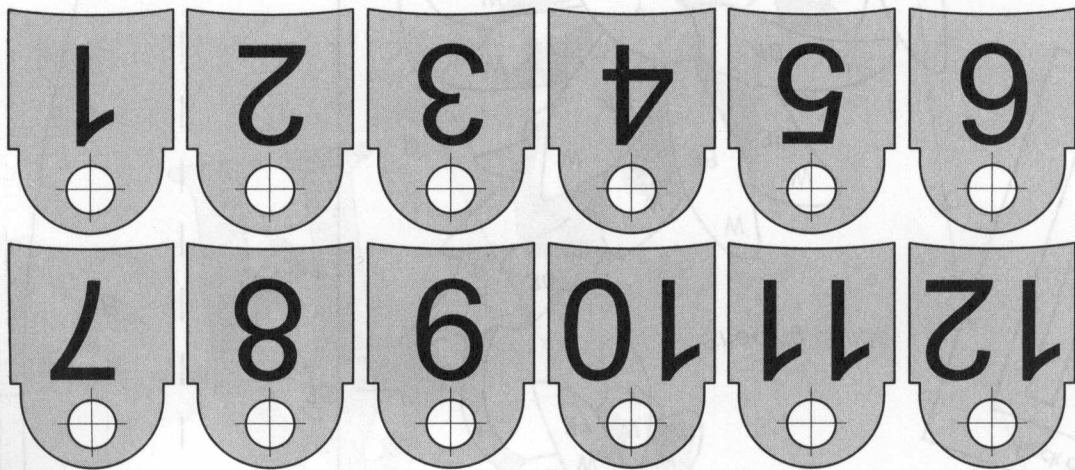
Woodworking & Crafts

All patterns to be copied at 100% unless otherwise indicated.

All patterns on this pullout section: © 2011 Scroll Saw Woodworking & Crafts

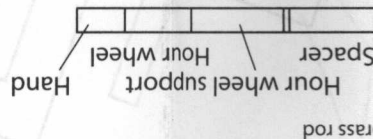
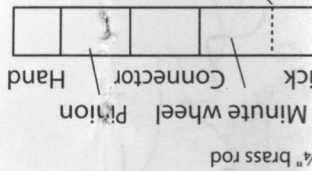
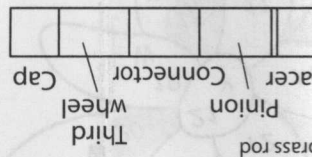
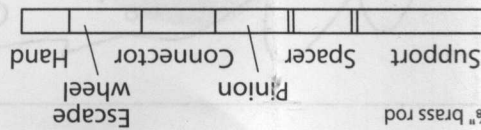
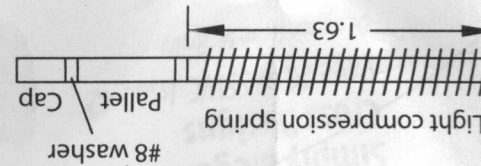
- Crafting a Daisy Photo Frame 28 Building a Working Wooden Gear Clock.. 60
Waiting 38 Simply Elegant Cross Designs..... 76
Creating an Intarsia Fox..... 40

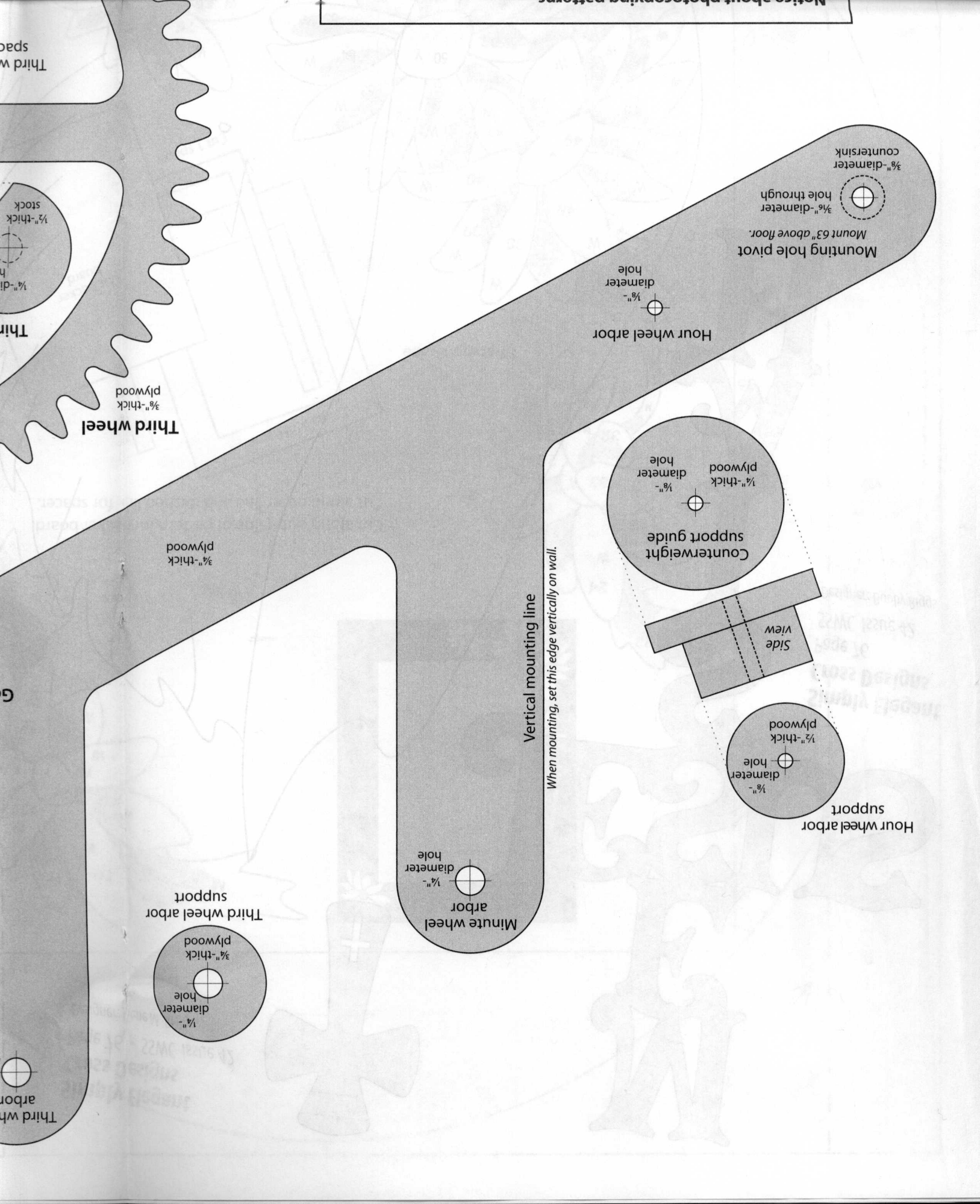
Note to professional copying services: You may make up to ten copies of these patterns for the personal use of the buyer of this magazine.

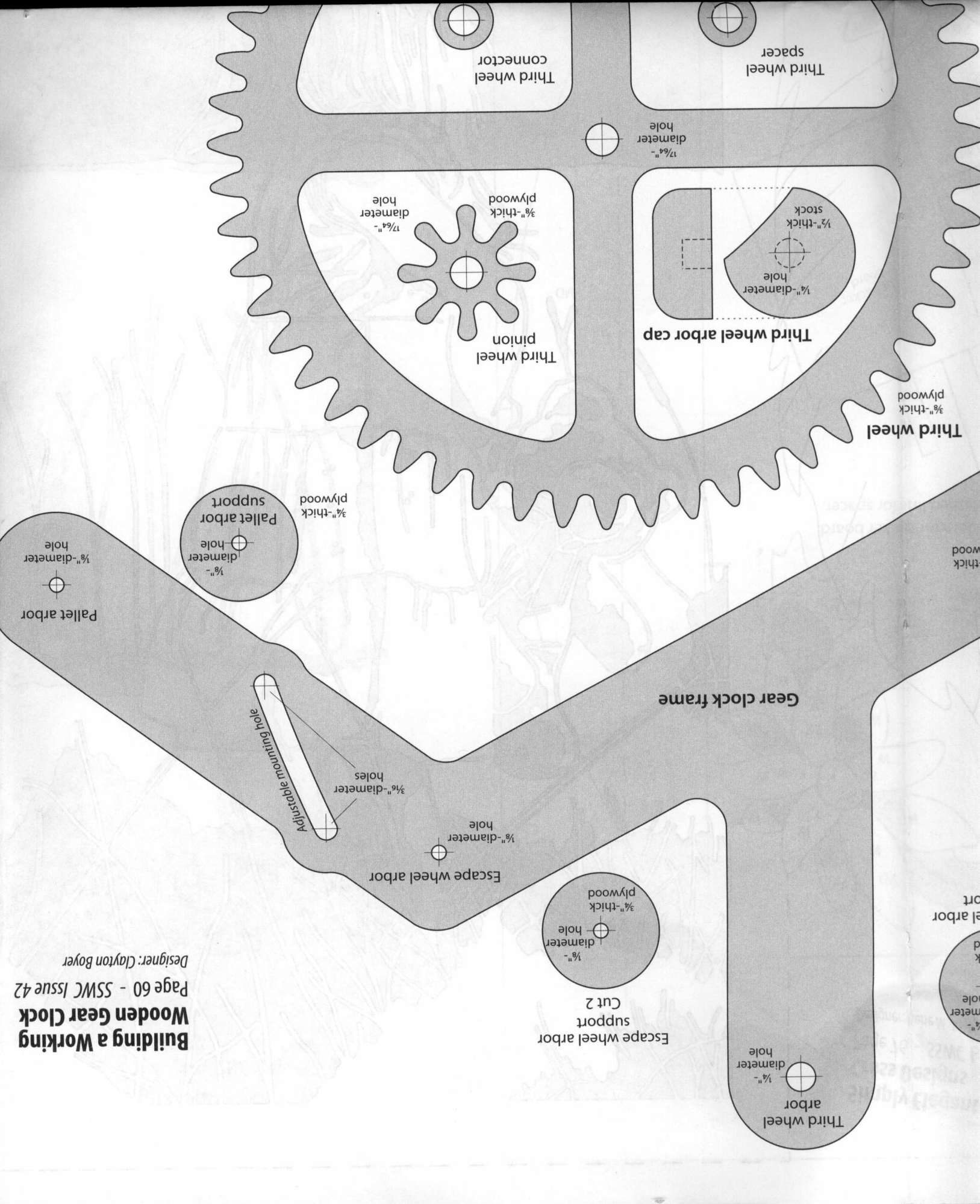


Optional numbers for hour wheel
All holes 1/4"-diameter - apply to 1/8" stock

Optional numbers for minute wheel
Small holes 1/6"-diameter, larger holes 5/32"-diameter - apply to 1/8" stock - make 2 sets



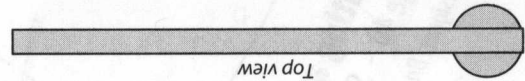




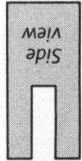
Some photocopyers and home printers can distort patterns when you print them, making them slightly off-size or stretching the image. Use the 1" bar printed below as a guide when copying the patterns and hold the photocopies of the pattern up to the original to check for any distortion.



Top view

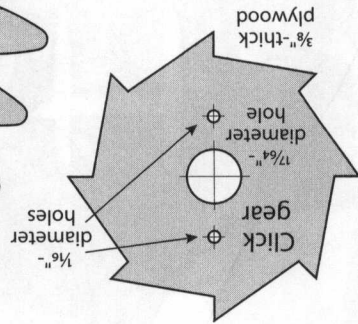


Click - cut 2 1/8" stock

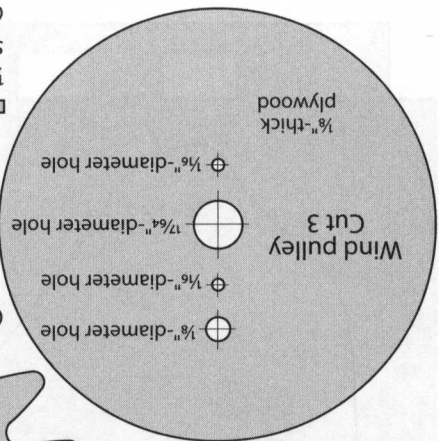
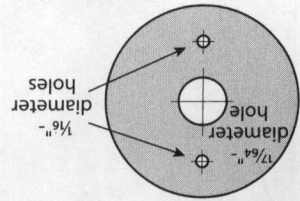


Click holder Cut 2

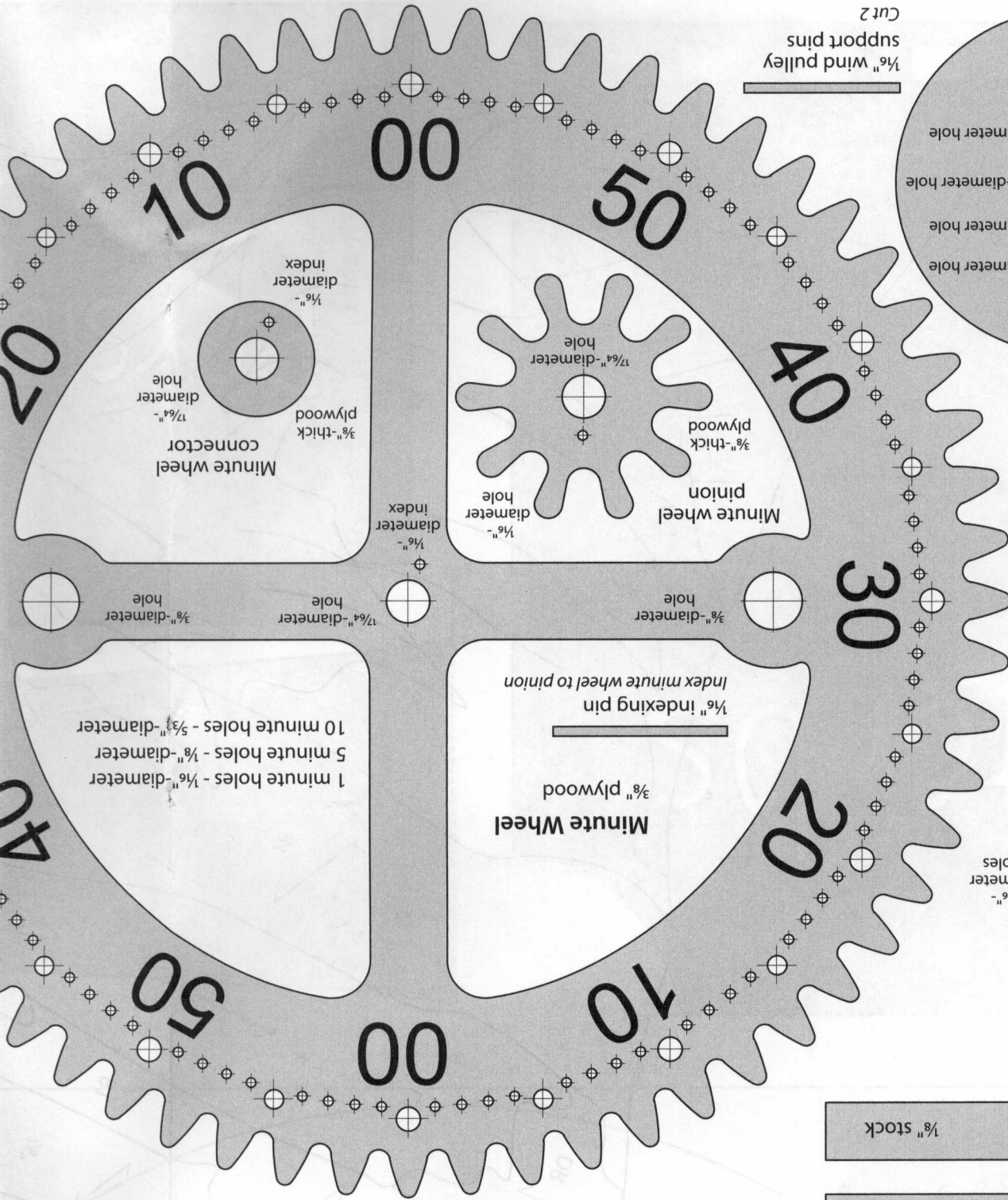
3/8" dowel



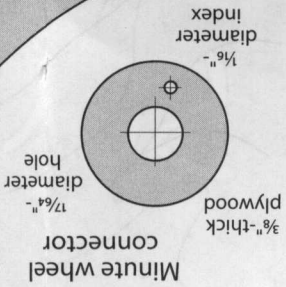
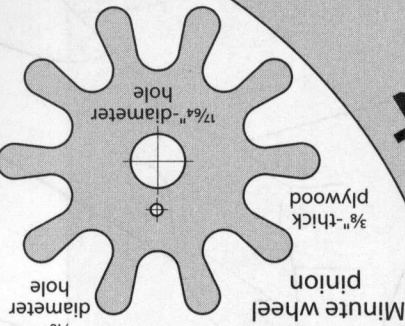
Pulley Center Cut 2 1/8"-thick hardwood



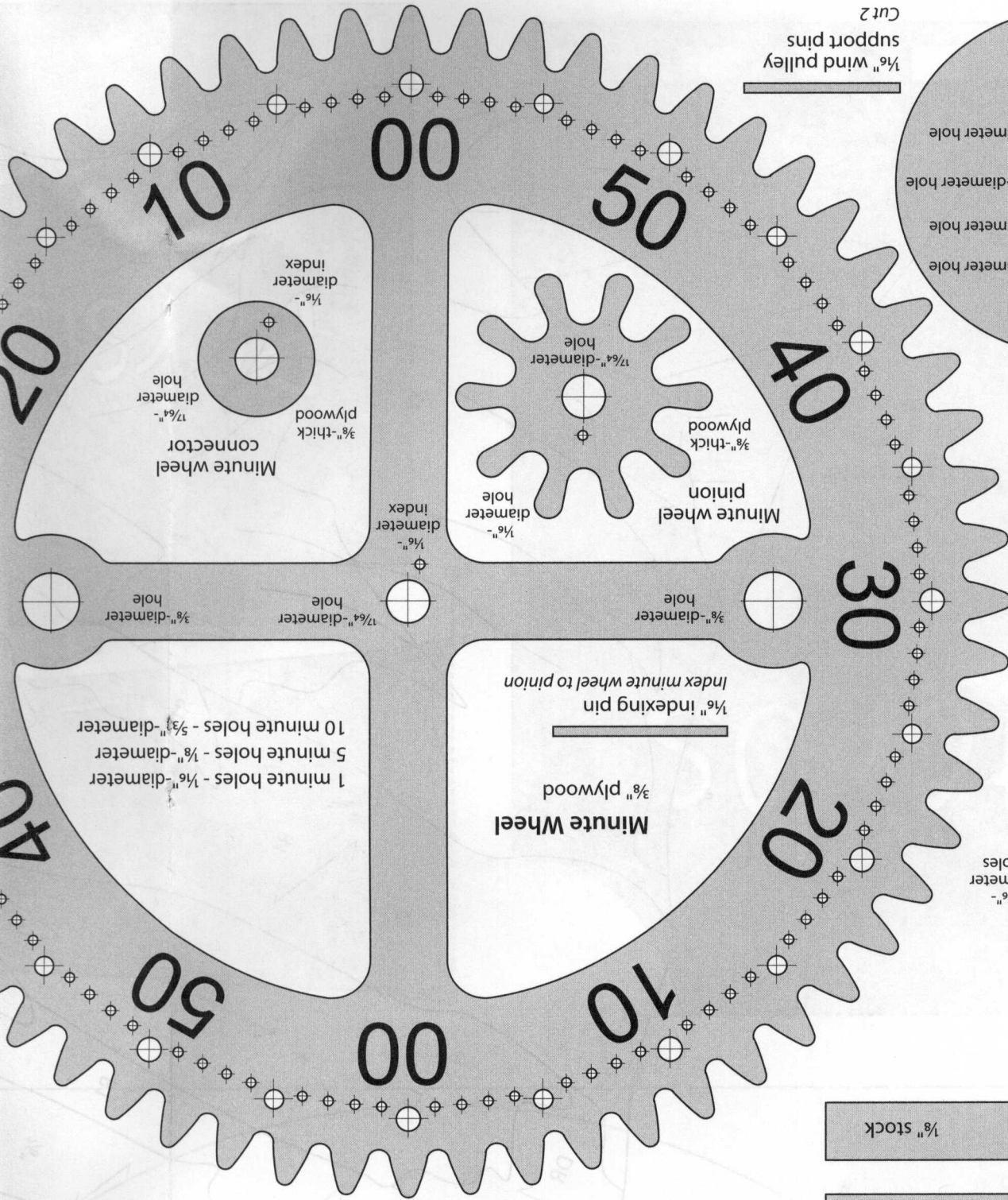
1/8" wind pulley support pins Cut 2

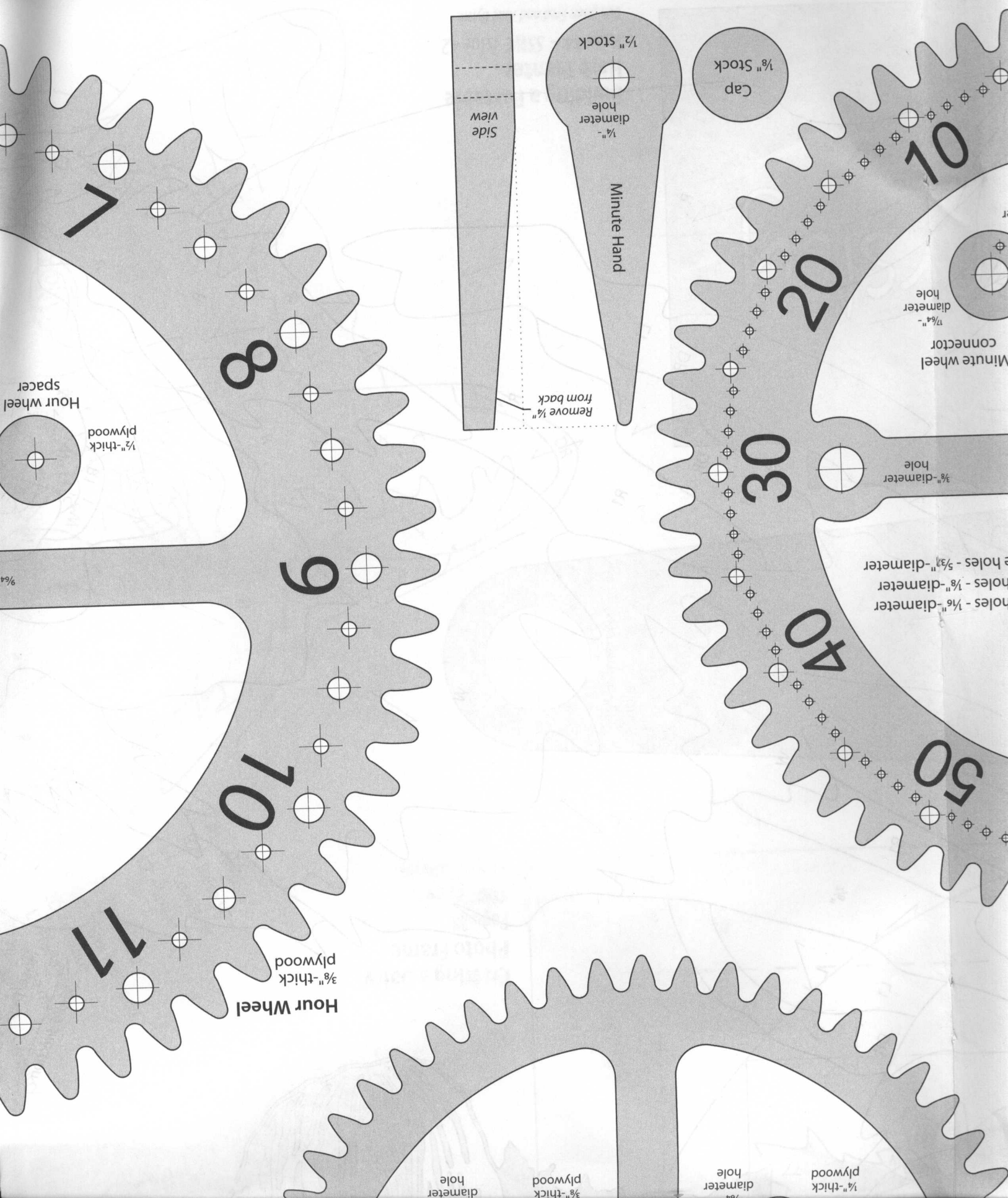


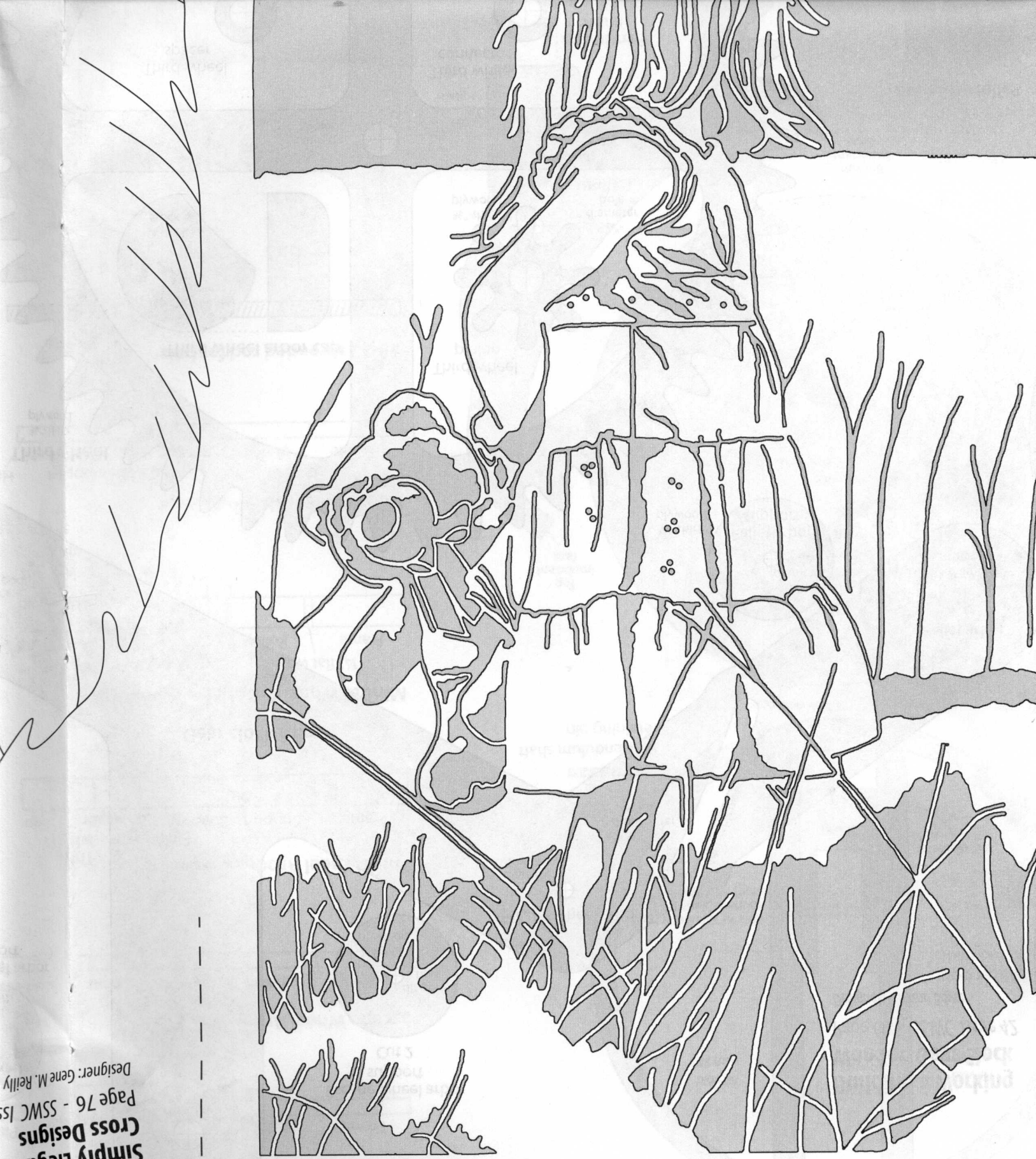
Minute Wheel 3/8" plywood 1/8" indexing pin Index minute wheel to pinion



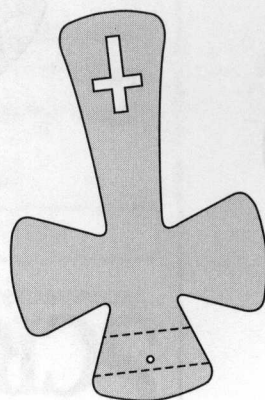
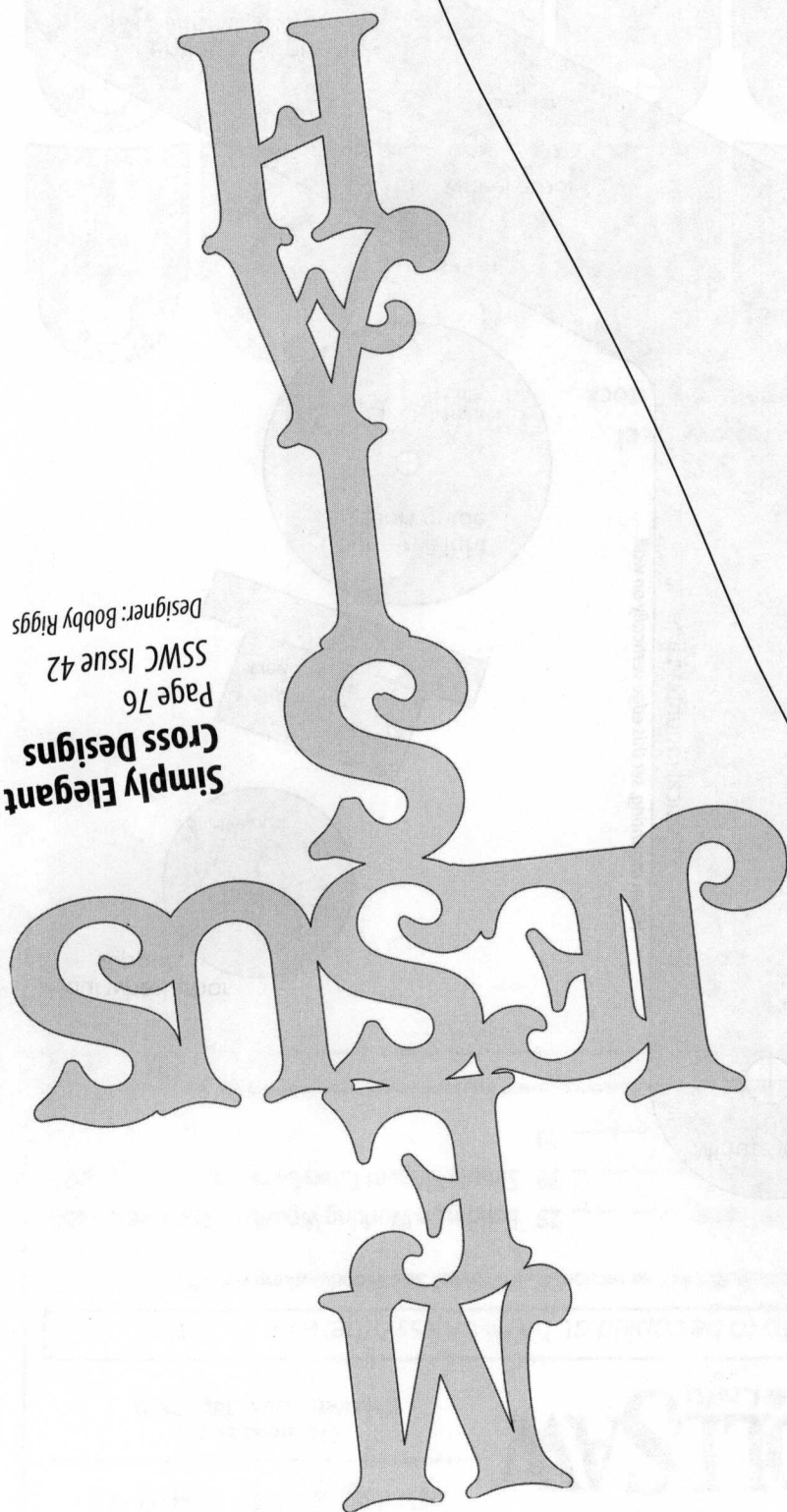
Minute wheel connector 3/8"-thick plywood 1/8"-diameter index diameter hole







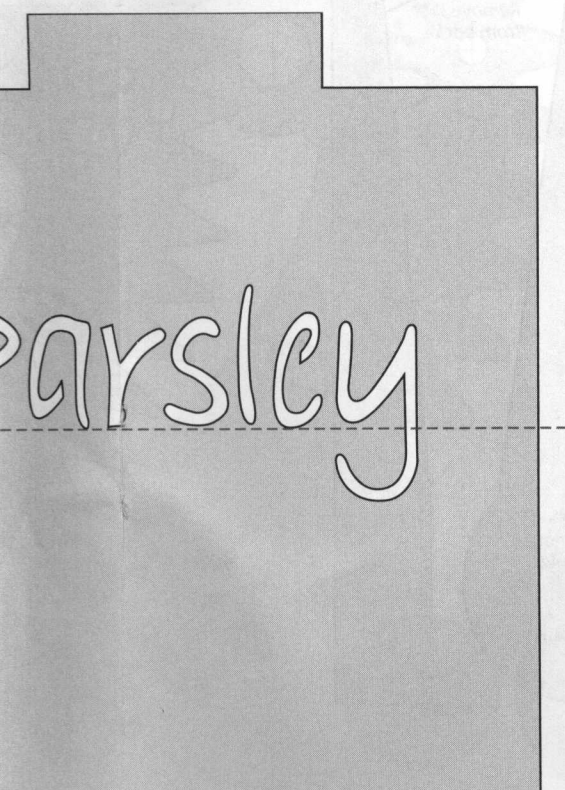
Simply Elegant
Cross Designs
Page 76
SSWC Issue 42
Designer: Bobby Riggs



Simply Elegant
Cross Designs
Page 76 - SSWC Issue 42
Designer: Gene M. Reilly



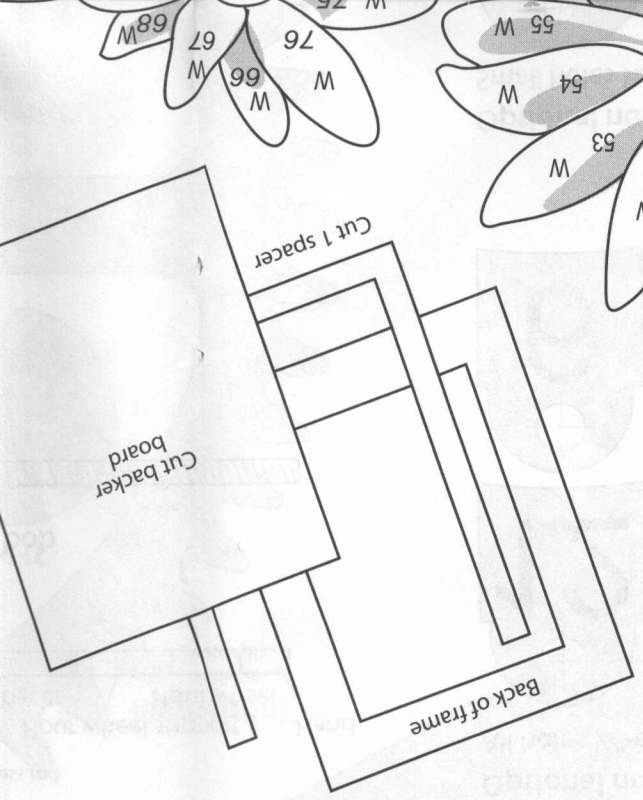




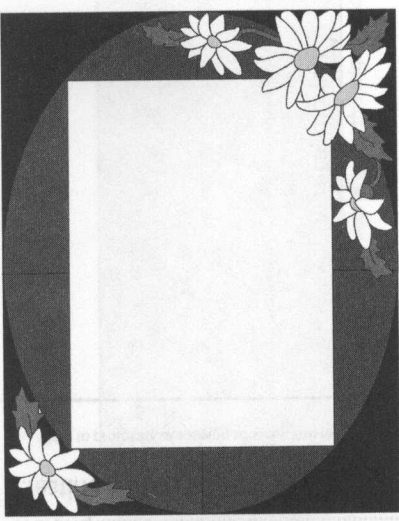
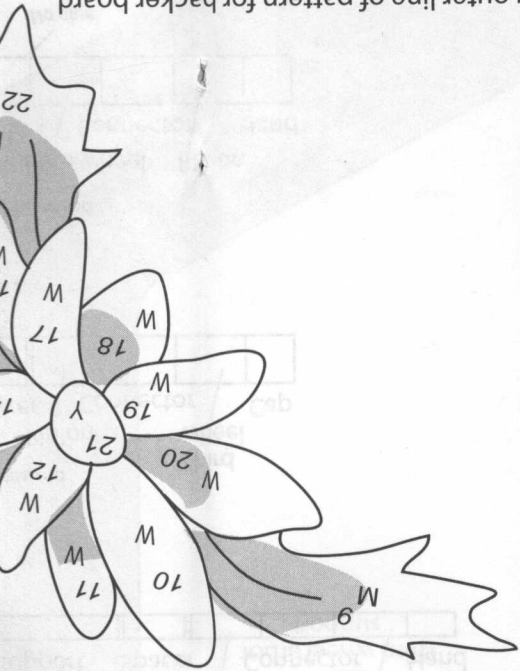
Designer: Kathy Wise



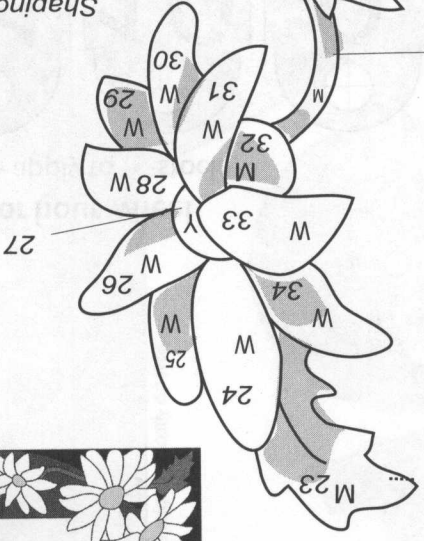
Designer: Fred and Julie Byrne



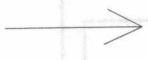
Cut along outer line of pattern for backer board.
Cut along outer line and dashed line for spacer.



Shaping Guide



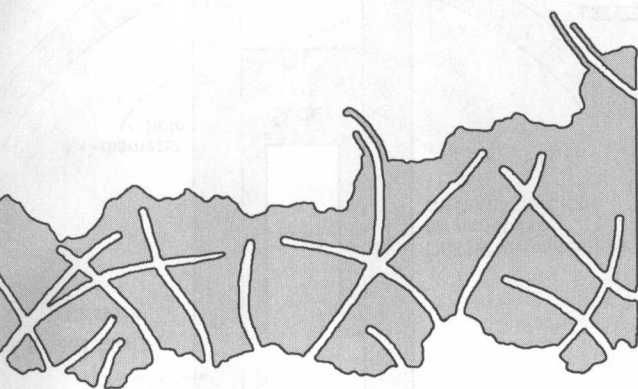
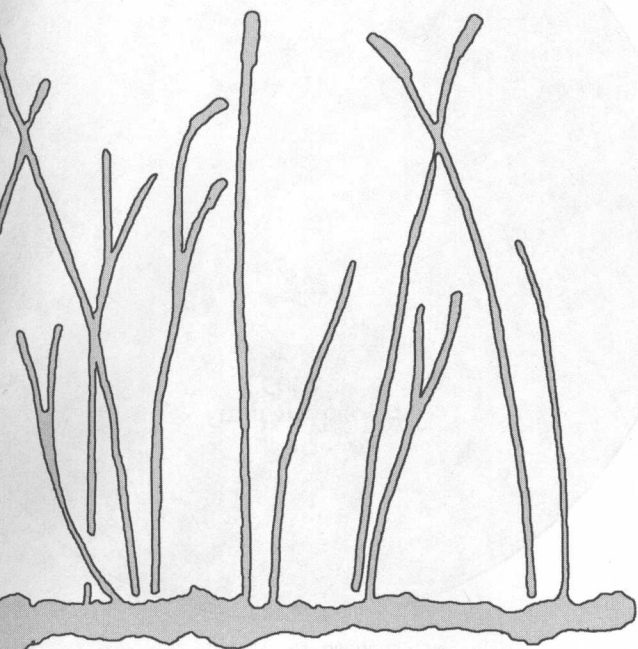
8
↑
MD



2



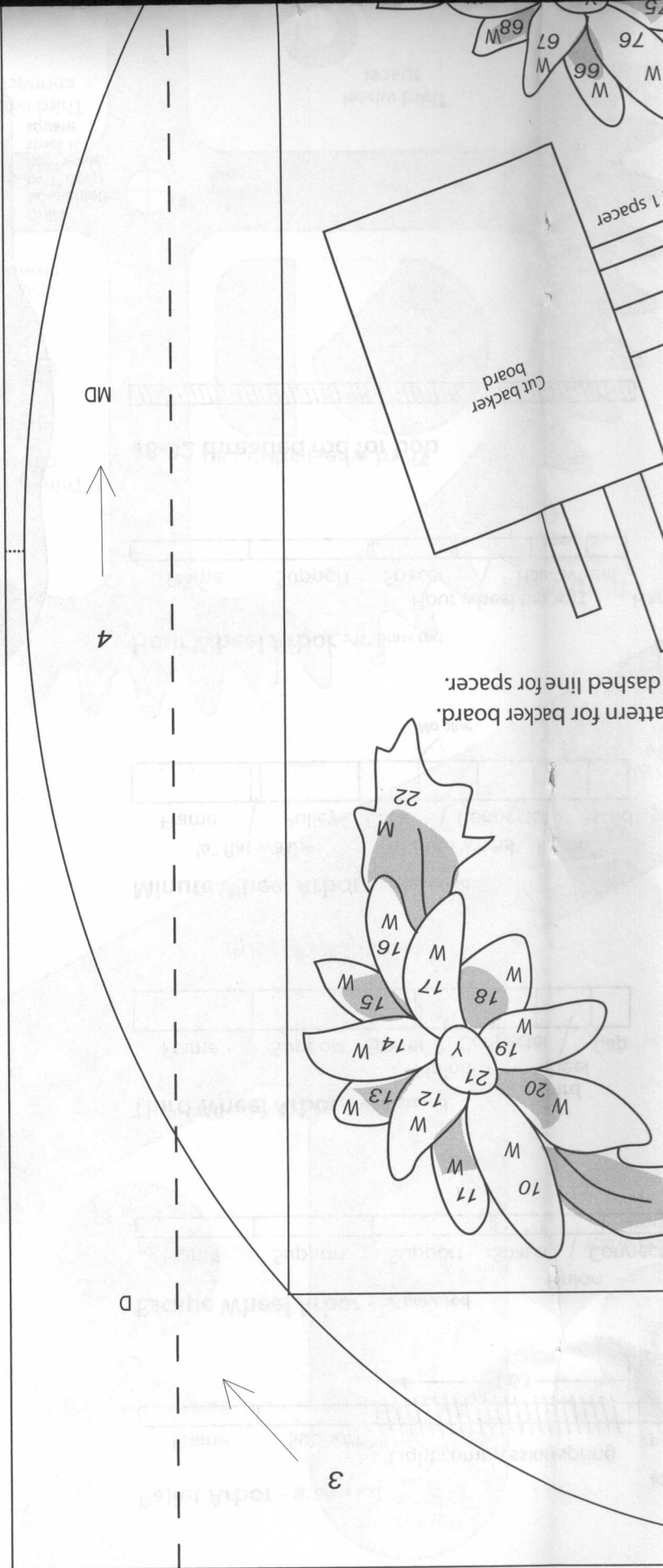
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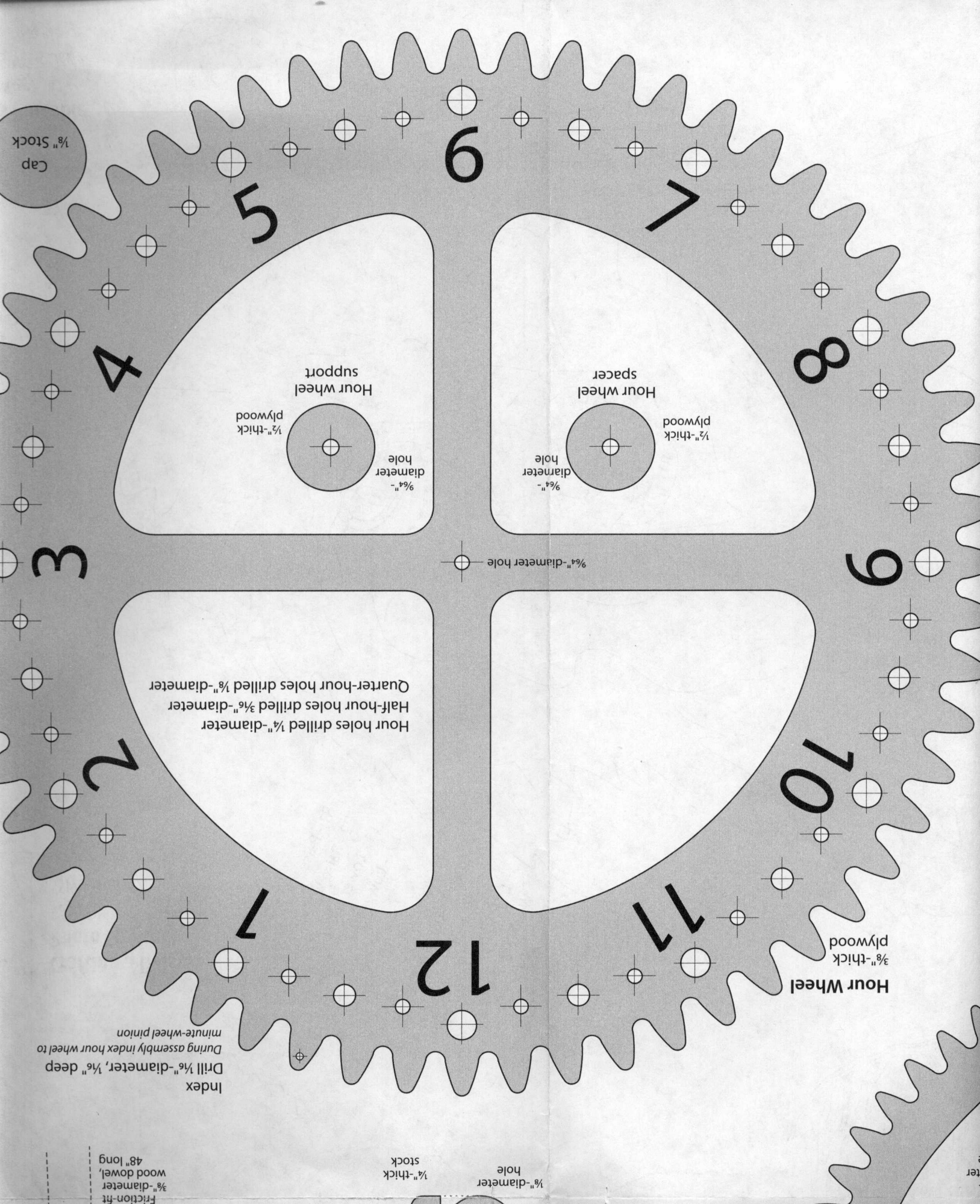


Waiting

Page 38 - SSWC Issue 42

Designer: Kerry Hallam





Cap
1/8" Stock

Hour wheel
support
1/2"-thick
plywood
3/4"-
diameter
hole

Hour wheel
spacer
1/2"-thick
plywood
3/4"-
diameter
hole

3/4"-diameter hole

Hour holes drilled 1/4"-diameter
Half-hour holes drilled 3/16"-diameter
Quarter-hour holes drilled 1/8"-diameter

Hour Wheel
3/8"-thick
plywood

Index
Drill 1/16"-diameter, 1/16" deep
During assembly index hour wheel to
minute-wheel pinion

Friction-fit
3/8"-diameter
wood dowel,
48" long

1/8"-diameter
hole
1/4"-thick
stock

ation-fit
iameter
d dowel,
48" long

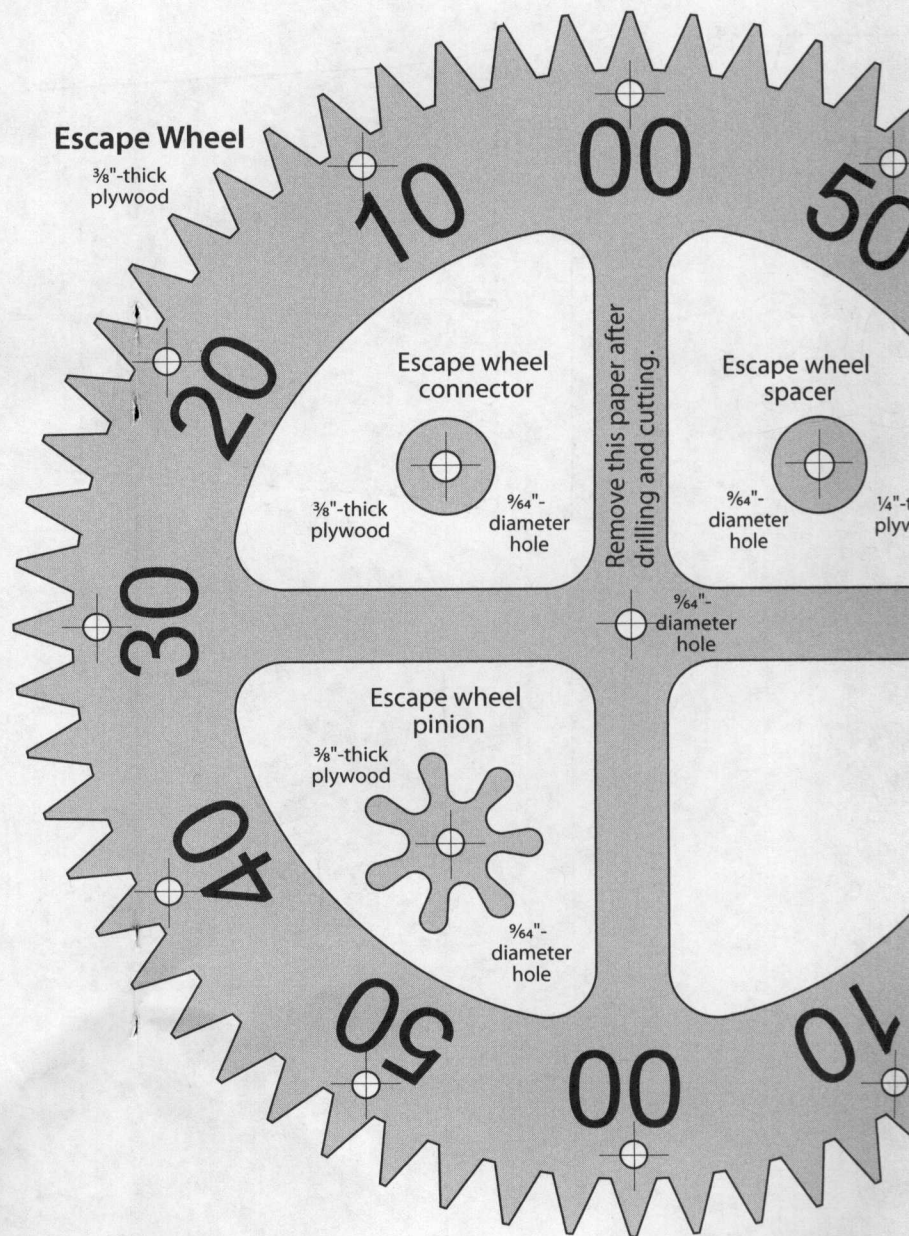
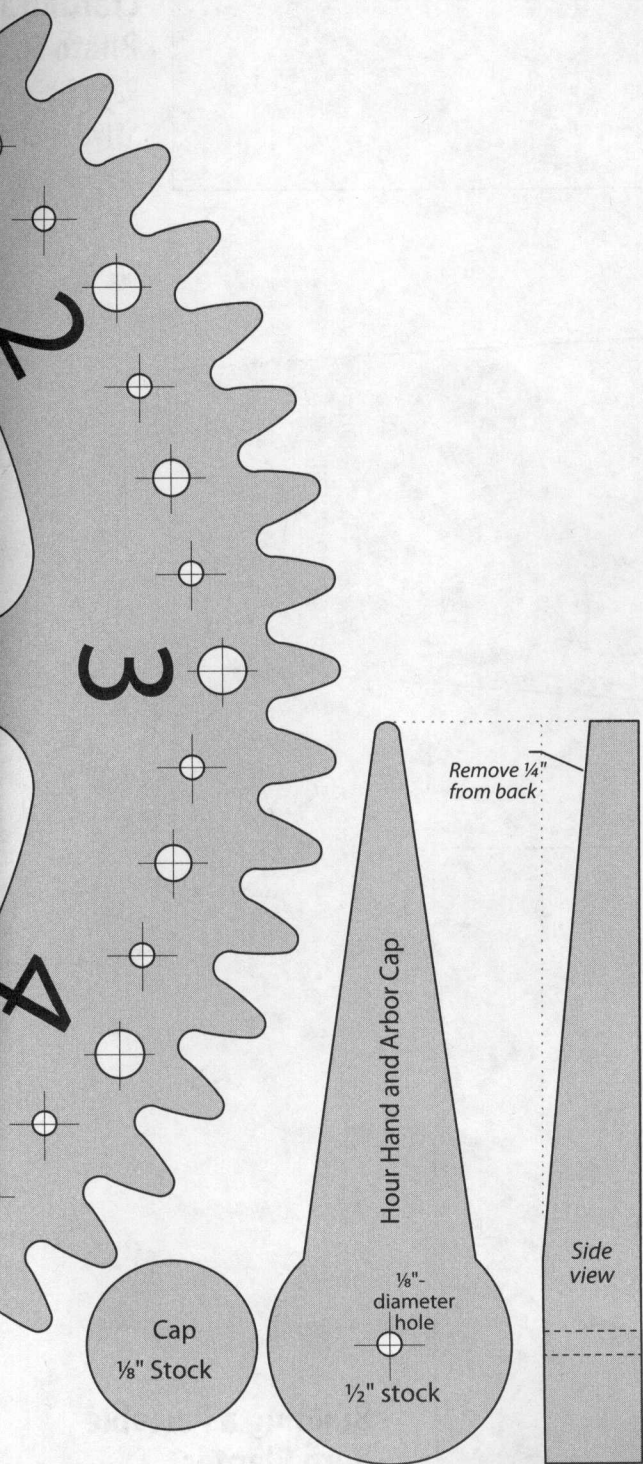
meter, 1/16" deep
index hour wheel to
union

00 10 20

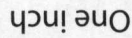
Optional numbers for escape wheel

All holes 9/64"-diameter - apply to 1/8" stock

00 10 20 30



photocopiers and home printers can distort patterns when print them, making them slightly off-size or stretching the e. Use the 1" bar printed below as a guide when copying patterns and hold the photocopies of the pattern up to the al to check for any distortion.



mai d

meter
-96"- eter
es

-17/64"-diameter hole

-17/64"-diameter hole

6"-diameter hole

8"-diameter hole



3/8"-diameter
hole

Minute Wheel

$\frac{1}{2}$ " indexing pin
index minute wheel to pinion

plywood
3/8"-thick

hole

00

50

40

20



50

Ov

00

1 minute holes - $\frac{1}{16}$ "-diameter
5 minute holes - $\frac{1}{8}$ "-diameter
10 minute holes - $\frac{5}{32}$ "-diameter

3/8"-diameter hole

$1\frac{7}{64}$ "-diameter hole

Minute wheel
connector
17/64" -
diameter
hole

plywood
3/8"-thick

index
diameter
- 9/16

Cap
1/8" Stock

Minute Hand

1/2" sto

1/4" - diam
hole

1/4"-thick plywood
diameter hole

17/64" - diameter