

10 PROJECTS

PLANS

TIPS

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TOOLS

Canadian

Woodworking

APRIL/MAY 2003

Vol.6, No. 2

Kitchen Cabinets

Two Major Designs

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Rustic Wagon Wheel
Theme

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editorsletters

LINDA FULCHER

Perhaps you have used a screwdriver for hundreds of screws and, therefore, you really appreciate how amazing an electric drill is. Or, perhaps you have spent years looking for outlets and extension cords to get your drill to reach your project and you now appreciate the cordless version.

We used to layout magazines on flats of gridded paper and drive them to the printer's. Now almost everything is done on the computer and sent to the printer's over the internet.

To keep up with technology, I spend a lot of time talking to technical support people on the telephone. While they are helping me to navigate a site, install software, or use a service, we spend a lot of quiet time together, waiting for our computers to reach the same page.

On one such occasion, I began musing about how my father used to walk miles to school through the woods. (Did I mention he was barefoot?) I bet my kids will astonish their children with similar feats. For example, they will tell them, "When I was a kid, we only had version 3.1 of that software program and it took 10 minutes to load on a computer!"

In this issue we feature an interesting story about a woodworker who couldn't get the tools he needed for his woodworking projects. Fortunately, Leonard Lee did something about that and it improved the situation for all Canadian woodworkers. Today, after 25 years, he looks back over the changes he has seen in woodworking. His view on technology, is that it does not replace learning the principles of woodworking.

There are many ways to learn about woodworking: go to woodshows, take seminars or college courses, find a mentor, join a club, make use of the forums on the internet, read books and magazines.

When I think about how technology is changing how I do things, I do note one unchanging fact: my father walked to school, I rode my bike, my kids ride the bus and my grandchildren may be transported to school on light beams but, at the end of the trip, we all end up at school!

Never stop learning and share what you learn. Information is the most important tool in your workshop.



PAUL FULCHER

While talking to Leonard Lee for this issue's WoodStory (pp 28-29), he said something that is echoed by several of our writer's in the articles that appear in this issue.

He said: "Somewhere along the way, you have to learn the basics of woodworking: how wood reacts to the cutting process, how wood reacts to changes in humidity ..."

He added: "Professional cabinetmakers use power tools differently (than hobbyists). They know the principles of wood and how to work with it, and as a result, they use their tools differently."

It's a basic premise, but one that is easily overlooked: Understand the properties and principles of the medium that you are working with.

I was reminded of that premise again and again as we put together this issue.

Hendrik Varju (pp 6-7) shares his knowledge of wood in a new series of articles called WoodScience. It outlines the basic science of wood and how to use basic scientific principles to design furniture so as to eliminate disappointments later (like warped wood, failed joints, etc.)

Chuck Holder (pp 42-43) deals with a design problem concerning wood and changing humidity.

John Cryderman, before learning the principles of wood, didn't know why his stains or finishes wouldn't apply properly. Now that he knows the reasons, his finishes are exquisite. See "Making Beautiful Boomerangs" (pp 23-25).

Jeff reveals in the "What's your favourite part of woodworking?" question that he posed on our WOODWORKING FORUM (p 3), that finishing was his least preferred woodworking activity, but after trial-and-error, a lot of reading and a bit of practice, he learned enough wood science to not only get good at finishing, but even enjoy it.

So what do you like and dislike about woodworking? Could it be that the areas you like least are just areas that you need to learn a bit more about? Perhaps you can concentrate on those areas and see if understanding wood, and its properties, will help you to improve, and even enjoy, those areas. Then, like Randy (p. 36), you will love the whole process of woodworking, start to finish.



Correction re: Feb/Mar '03 issue - For Denis Roy's "Half Moon Table" grid pattern and/or Fred Martin's step-by-step photos of "Humpback Whale" intarsia project, send a request to fulcher@canadianwoodworking.com or fax (519) 449-2445.

dear editors

I recently saw a string of postings on our WOODWORKING FORUM that I found interesting. It was started by Jeff in Vancouver BC, and was responded to by woodworkers across Canada. I have selected and edited some of the posts here:

Q: What is your favourite part of woodworking?

Is it drafting your plan, picking out the wood, the first or last cut, or are you like me and love the brush stroke of stain?

Finishing was my least favourite part of woodworking (I used to be horrible at it) but

after trial-and-error, a lot of reading, and a bit of practice, I now have some solid finishing techniques and products that produce good results for me. Now finishing has become something I really enjoy.

Jeff (Vancouver BC)

A: When two pieces of wood fit together ... such as a special joint ... and I make it just right. Or, a special finish and it looks great! I guess it is the little successes that I enjoy most.

Glen (Edmonton AB)

A: ... being in the shop and entering "the zone". ... after the cobwebs clear and you pick up where you'd left off, and you cruise along on the project, and the next thing you know it's about 3 or 4 hours later. I love the solitude.

Dave

A: There's nothing better for me than to have struggled through the difficult steps of a project and then see all of the hard work come together with the first wipe on of finish.

Jennifer

■ continued on page 36

Night Table

Use this night table next to your bed and your favourite reading material will be close at hand. It will also give you a place for your reading light and alarm clock.

Make Top and Sides

Make the top and side panels by gluing up 5 1/2" boards at least 1" longer than needed. Make sure one end is perfectly flush and even; then cut the second end to size, once dry.

Half Circles

Using a compass, draw the 1/2 circle at the bottom of the side pieces and cut them out with a jig saw. Sand the cut edge smooth by hand using #180 sandpaper folded up or with a drum sander mounted in your drill.

Join Top and Sides

The top and sides are joined with dowels. For the top, drill four evenly spaced dowel holes at each end. The holes should be 3/8" in from the end and 1", 6", 11" and 16" from the edge. Drill matched dowel holes in the top edge of both sides, making sure that the best side of the boards will be facing outwards.

Make Supports

Make the drawer and shelf supports by first drilling countersunk pilot holes in one end of each side support, then screwing the side supports to the front supports so that they are flush on the top and front.

Place Shelves

Tack the shelf in place on one of the support assemblies with brads so that it is flush at the front and sides. If necessary, trim the shelf to size with a sanding block or block plane after it has been nailed to the support.

Install Supports

To install the supports, first drill countersunk pilot holes in the support side pieces, then screw the two supports in place onto the side pieces 3 3/8" from the bottom and 5 1/2" from the top.

Attach the Top

Add the top by applying glue to the mating edges of the top and side panels and to the dowel holes. Insert the dowels into the holes in the side panels and place the top over the dowels, pressing them into the matching holes. Make sure the night table is square then clamp it down or set the night table upright and place books or other items on the top to weigh it down while it dries.

Face Pieces

Screw the face pieces to each support from behind through countersunk pilot holes.



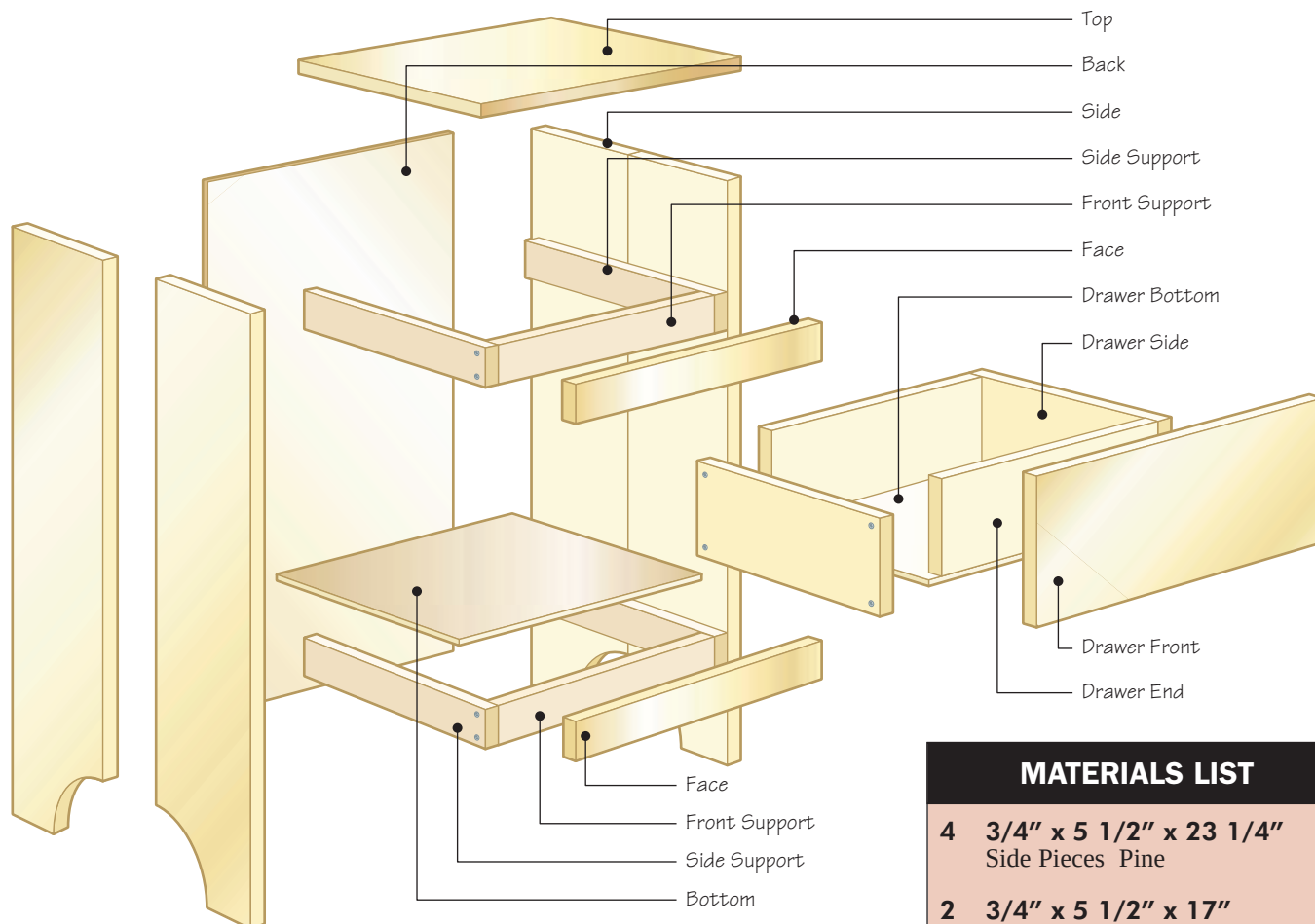


Illustration by Len Churchill

Assemble Drawers

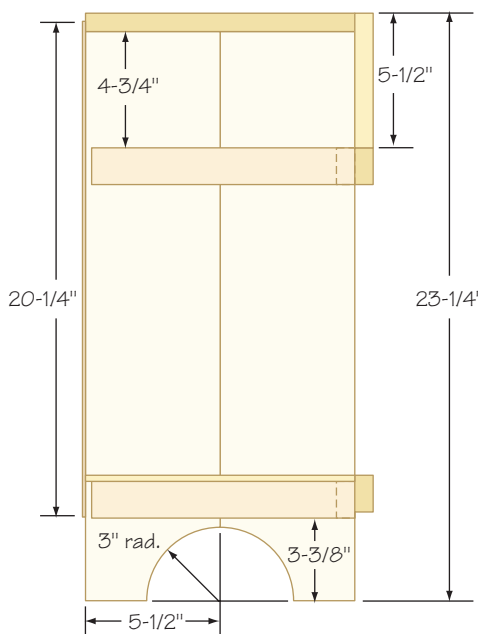
Assemble the drawers by screwing the side pieces to the front and back pieces through countersunk pilot holes drilled $\frac{3}{8}$ " from the edges. Glue and tack the bottom on from underneath with brads, trimming with a sanding block or block plane if required. Screw the drawer front onto the drawer from inside so that it is centered and flush at the bottom.

Drawer Handle

Add a drawer handle and insert the drawer into the night table.

OPTIONS

- Screw the top onto the sides with counterbored pilot holes and flat screw hole plugs instead of using dowels.
- Skip the decorative hole in the bottom of the side pieces if you don't have a jig saw.



TIP Buy pre-laminated 12" wide panels for the top and sides, adjusting the other measurements as required.

MATERIALS LIST

- | | | | |
|---|---|----------------|---------|
| 4 | $\frac{3}{4}$ " x $5\frac{1}{2}$ " x $23\frac{1}{4}$ " | Side Pieces | Pine |
| 2 | $\frac{3}{4}$ " x $5\frac{1}{2}$ " x 17" | Top Pieces | Pine |
| 1 | $\frac{1}{8}$ " x $16\frac{1}{4}$ " x $20\frac{1}{4}$ " | Back | Plywood |
| 1 | $\frac{1}{4}$ " x $15\frac{1}{2}$ " x 11" | Bottom | Plywood |
| 2 | $\frac{3}{4}$ " x $1\frac{1}{2}$ " x 17" | Face Pieces | Pine |
| 1 | $\frac{3}{4}$ " x $5\frac{1}{2}$ " x 17" | Drawer Front | Pine |
| 2 | $\frac{3}{4}$ " x $3\frac{1}{2}$ " x $13\frac{7}{8}$ " | Drawer Ends | Pine |
| 2 | $\frac{3}{4}$ " x $3\frac{1}{2}$ " x $10\frac{1}{2}$ " | Drawer Sides | Pine |
| 1 | $\frac{1}{4}$ " x $10\frac{1}{2}$ " x $15\frac{3}{8}$ " | Drawer Bottom | Plywood |
| 2 | $\frac{3}{4}$ " x $1\frac{1}{2}$ " x 14" | Front Supports | Pine |
| 1 | $\frac{3}{4}$ " x $1\frac{1}{2}$ " x $10\frac{3}{4}$ " | Side Supports | Pine |

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Wood Cuts and Where They Come From

Many of you have heard of such terms as “flat-sawn”, “rift-sawn”, and “quarter-sawn” lumber. Yet you might not understand what these terms mean, or where these various cuts of wood come from.

The first thing to understand is that any species of wood can be cut in any one of these ways. The term “quarter-sawn oak” refers to oak lumber that has been “quarter-cut”. In other words, quarter-sawn oak is not a separate species, but merely oak that has been cut from the log in a particular way. The actual species of oak, such as red oak, white oak, overcup oak, etc., is a completely separate issue.

If you look at fig. 2, you’ll see where each of the three basic cuts of lumber comes from in relation to the log. Quite simply, flat-sawn lumber comes from anywhere in the log where the growth rings on the ends of each board are roughly parallel to the wide surface of the board. We are used to seeing the “U”-shaped growth ring patterns on the ends of boards and this, essentially, represents flat-sawn lumber.

Similarly, rift-sawn lumber comes from an area of the log yielding growth rings roughly 45 degrees to the large surface of the board. And quarter-sawn lumber has vertical growth rings, or rings that are perpendicular to the large surface. There is nothing magical about these terms. There are many ways to saw up a log, but the growth ring orientation on the ends of the boards determines whether the lumber is flat-sawn, rift-sawn, or quarter-sawn.

One would assume then, that the only way to know what cut of lumber you have

in front of you is to look at the end grain. Although this is the easiest way, especially with rough-sawn lumber (which is hard to get a clear look at), you can also tell a great deal from the grain patterns on the surface of a board. This is set out in fig. 1.

Fig. 3 shows that, in addition to growth rings, which look like concentric circles, there are also other anatomical features in a tree that radiate out from the centre like spokes on a wheel. They are called medullary rays, or just “rays”, for short. They conduct sap horizontally in the tree and some can store carbohydrates until other growing cells need them.

The tricky thing about rays is that, although all trees have them, they are not always visible to the naked eye. If you’d like to see them, one of the best and most common examples is oak. Take a look at the ends of an oak board or an oak log and you will see the rays. But look at the ends of a pine board or cherry board and you won’t see them. Rays are still present in pine and cherry, but they are so small as to be visible only under magnification. In fact, rays are so thin in all species of softwoods that they are only visible under a microscope. But in hardwoods, some rays are highly visible and some are invisible to the naked eye.

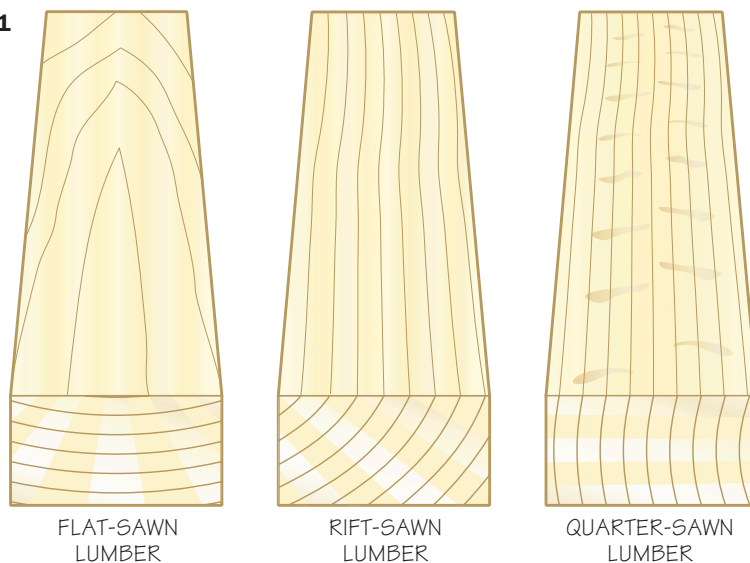
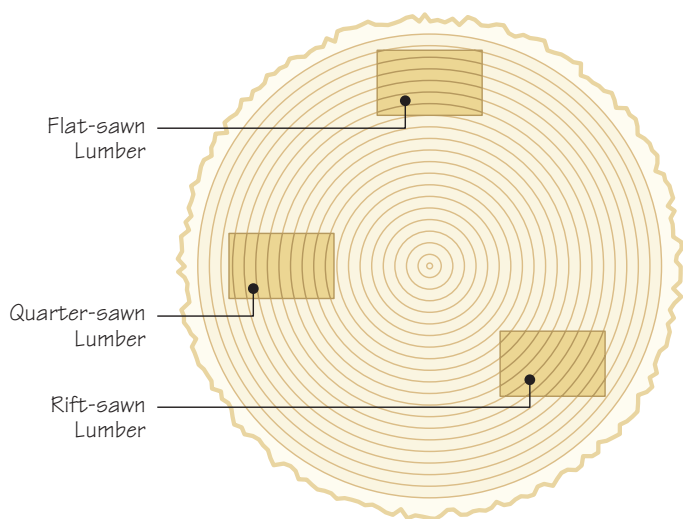
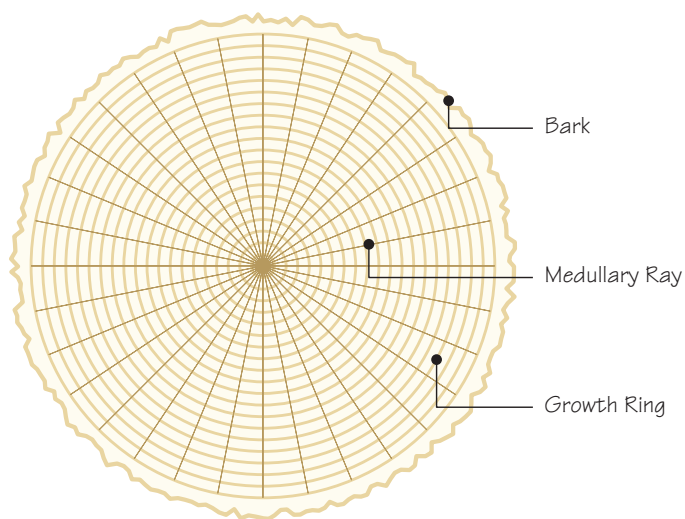
Fig. 1 shows you how to identify the 3 basic cuts of lumber based solely on surface grain pattern, assuming that you don’t have access to the ends of the board in question. The first example on the left is clearly flat-sawn, based on the end grain. On the surface, though, notice the beautiful grain pattern known as “cathedrals”. The angle at which the flat growth rings intersect the surface produces a series of

arches. This is one of the features for which flat-sawn lumber is desired, although it can be too “busy” looking, depending on the piece being built and your goals. It is a bold look that ought to be used carefully in already bold species like oak.

The second example in fig. 1 shows you what rift-sawn lumber looks like on the surface. There are no cathedrals, but only straight lines. As each growth ring intersects the surface, it produces just a straight line along the length of the board. This can also be desirable for a more subtle, or “quiet” look, in a finished piece of furniture. For example, if you have gorgeous cathedrals on the panel of a frame-and-panel door, you might want the frame to have more subtle grain patterns so as not to distract from the panel itself.

The third example in the diagram shows quarter-sawn lumber. The growth rings still produce just straight lines on the surface. However, notice the other markings on the surface. These are caused by cross-sections of the medullary rays (now parallel to the wide surface of the board) intersecting the surface at irregular intervals. It can be absolutely stunning and is known as “ray fleck figure”, or simply “ray fleck”. Remember, though, that rays are not visible in all species and, even if they are, they can be very small. In red and white oak, they are huge and add tremendous interest to the piece. In cherry and maple, they are small and add just a hint of interest. In pine, you won’t see any ray fleck at all since the rays are invisible in softwoods.

This can create a little confusion. If I give you a rift-sawn board and a quarter-sawn

Fig. 1FLAT-SAWN
LUMBERRIFT-SAWN
LUMBERQUARTER-SAWN
LUMBERFlat-sawn
LumberQuarter-sawn
LumberRift-sawn
Lumber**Fig. 2****Fig. 3**

board in a species where the rays are invisible, it will be almost impossible to know which cut you have in front of you without access to the ends. In both situations, you will see just straight lines on the surfaces. The lines will be closer together in quarter-sawn lumber than in rift-sawn lumber of the same species, but line spacing can also vary by subspecies, growing conditions, age of the tree, etc. So this is a tough thing to identify based on grain pattern alone.

However, remember as well that a flat-sawn board can often have a quarter-sawn surface on its edges and a quarter-sawn board will have a flat-sawn surface on its

edges. This means that a flat-sawn board will often have ray fleck figure on its edges, while the edges of quarter-sawn boards will usually display cathedrals. Remember that flat-sawn and quarter-sawn cuts are exact opposites of each other. Each is the other cut just turned 90 degrees. So if you see just straight lines on the surfaces but cathedrals on the edges, then you know the board is quarter-sawn. If you see just straight lines on all surfaces and edges, then you know it's rift-sawn.

I hope this has clarified what all of these terms mean. Realize, too, that a given board, depending on width, will often have two cuts of lumber within it. If you look at

a flat-sawn board that has distinctly "U"-shaped growth rings on the end grain, it technically is rift-sawn at the outer areas and is only truly flat-sawn at its centre. Combinations of the various cuts are often involved in a single board as well.

In our next issue, Hendrik will discuss the relationship between moisture content and relative humidity and show you how each of the three basic cuts of wood react to changes in moisture content.

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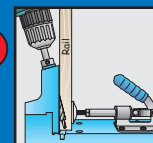
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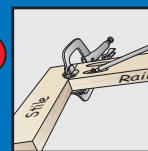


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Building Kitchen Cabinets



This article is the first in a series of five that will explore many of the issues and cabinet styles for those of you who want to build kitchen and bathroom cabinets.

In this first installment, I'll detail some of the issues involved in design, as well as the two major cabinetmaking styles.

Kitchen design

Kitchen design is an important issue, as most family members spend a great deal of their time at home in the kitchen. The kitchen is used to prepare meals, for informal eating, and as a casual gathering place for family and friends. People soon realize how important that room is when it's torn apart during renovations – even the simple task of making a cup of coffee becomes a major undertaking without a kitchen. It is therefore critically important that tear-out and new installation are co-ordinated properly to minimize down time.

Most experts agree that a kitchen renovation project will return almost 100% on investment when the property is sold. Surveys by the real estate industry show that a kitchen is one, if not the most, important feature with potential

purchasers. Real estate agents have told me that the quality of the kitchen often makes or breaks the sale.

Kitchen design is very subjective; there are few hard and fast rules. A feature or layout that is perfect for one person is far from perfect for another. The issue of lifestyle and how that lifestyle revolves around the kitchen is very unique to each family. In most cases, the family, and especially the prime user of the kitchen space, have very definite ideas about what the end result has to be to meet their needs.

Design considerations

1. Discuss the existing kitchen space and layout with everyone involved, listing the good and bad points of the design.
2. Investigate the traffic patterns in and through the kitchen.
3. Analyze the day-to-day meal preparation tasks. Try to formulate a "normal" daily meal preparation routine.
4. Questions should be asked about your family's desire to do more in the kitchen. Is there a hobby of interest or area of interest, such as baking that they would like to do more of, if there was added space or facilities?
5. Do the family members feel that a lot of walking or movement is necessary during meal preparation?
6. Ask whether or not cleaning up after meals seems to be a monumental task. You may not solve that problem, however, it could be reduced by simple layout changes.
7. Question everyone who uses the room about his or her desire to entertain more in the kitchen or formally in the dining room, if the kitchen space functionality could be improved.
8. If you run a business, determine how long the client plans to own the house. A \$20,000 kitchen renovation may not be fully recoverable if the intention is to upgrade for a quick sale in the near future. If you over improve and the return is not realized during re-sale, you may lose a client and the good references they would give if they were pleased.
9. Discuss the wish list. If space or money were no object, what would family members like to have in their dream kitchen?
10. Discuss topics such as lighting, area and task illumination, kitchen seating needs, and appliance upgrade needs.



Proper room illumination is an important issue to consider when designing your kitchen.

Two design “rules” that seem to be true in every case deal with colour and illumination. Light colour or natural wood cabinets tend to brighten and visually enlarge a space. Improved general and task

lighting always enhances the project. Older kitchens seem to have dark cabinets and poor illumination, which gives the impression of being in a cave.

There are many styles of kitchen layouts

including the L kitchen, galley, U-shaped and island style. However, most kitchen designers agree that the perimeter of a work triangle – formed by distance between the fridge to the stove to the sink and back to the fridge – be not less than 10 feet and not greater than 25 feet. If the perimeter of a work triangle is too small, people will be tripping over each other and, if too large, food preparation may be a very tiring task. I analyze this work pattern each time I design a kitchen layout and it’s proven to be a valuable exercise.

Bathroom cabinets are built using the same kitchen cabinet construction methods. The counter heights are typically lower on bathroom cabinets so adjust the side and back board dimensions to suit your requirements.

Bathroom renovations are as popular as kitchen renovations. Frameless cabinets edged with wood veneer and wood doors, in light natural finishes, seem to be the style of choice. Bathrooms, like kitchens, are being given more space during the design process in new construction and renovation projects in existing homes. The trend seems to be towards larger, brighter, and more functional bathrooms with whirlpools, shower stalls, and all the other new fixtures that are available.

Face Frame Cabinets

It’s now common to see a modular blend of European and North American cabinet construction methods. The final product, once installed, looks more traditional because of the use of the face frame on a frameless box cabinet. The main difference between the two styles, traditional and European, is the use of the face frame.

Today, many cabinet shops have adopted the best features of the frameless cabinet system and incorporated those designs into their face frame cabinet. This



photo credit Canac Kitchens



hybrid style is extremely popular and can almost be considered a standard. Once you understand the frameless system, you'll see that most "traditional" styled kitchen and bathroom cabinets are a frameless carcass with a wood face frame applied.

Neither system is "best" – it's a simple matter of design choices. Credit should be given to those cabinet designers that realize the qualities in other systems and have the good sense to incorporate those superior features of each into a "best of both worlds" cabinet.

Face frame material for the standard cabinet is solid hardwood, normally oak, cherry or maple. Traditional North American style cabinets, with wood doors installed, have the exposed panel edges covered with a thick wood frame. The stiles (the vertical members of the face frame) are 3/4" thick by 1" wide and 31 3/4" long. The rails (the horizontal pieces of the face frame) are 3/4" thick by 1 1/2" high, and 2" shorter than the overall width in the standard cabinet design. This applies to both the upper and base cabinet face frames.

Standard upper and base cabinets can be full door, drawer-over-door, drawer bank cabinets, or a combination design. Cabinet door height is variable, particularly in the base units, as overall door height is dependant on whether or not a drawer will be fitted above the door(s) in the cabinets. Special sized cabinets, such as those used over the stove, refrigerator, or sink, need smaller doors to match the reduced cabinet height.

As previously mentioned, the North American traditional style of kitchen cabinet is basically a box with a wooden face frame attached to the front edge. Doors are installed so they overlap the face frame with a space between cabinet doors. Many designs make use of exposed hinges but the recent trend is to use the superior European hinges to eliminate the center stile, which is the vertical face frame component between doors.

Cabinets were traditionally supported on a wooden base with end cabinet sides extended to the floor. Often the drawers were supported on wooden runners or tracked in grooves on the drawer box. Early traditional North American cabinets were frame and panel construction, typically using glued up boards for the sides, backs and bottoms. And, most often the cabinets were built in place.

Frameless Cabinets

Frameless cabinets have been designed without a centre stile. When the cabinet doors are open, in the case of a two-door cabinet, you have complete access to the

INSTALLATION SIDE VIEW

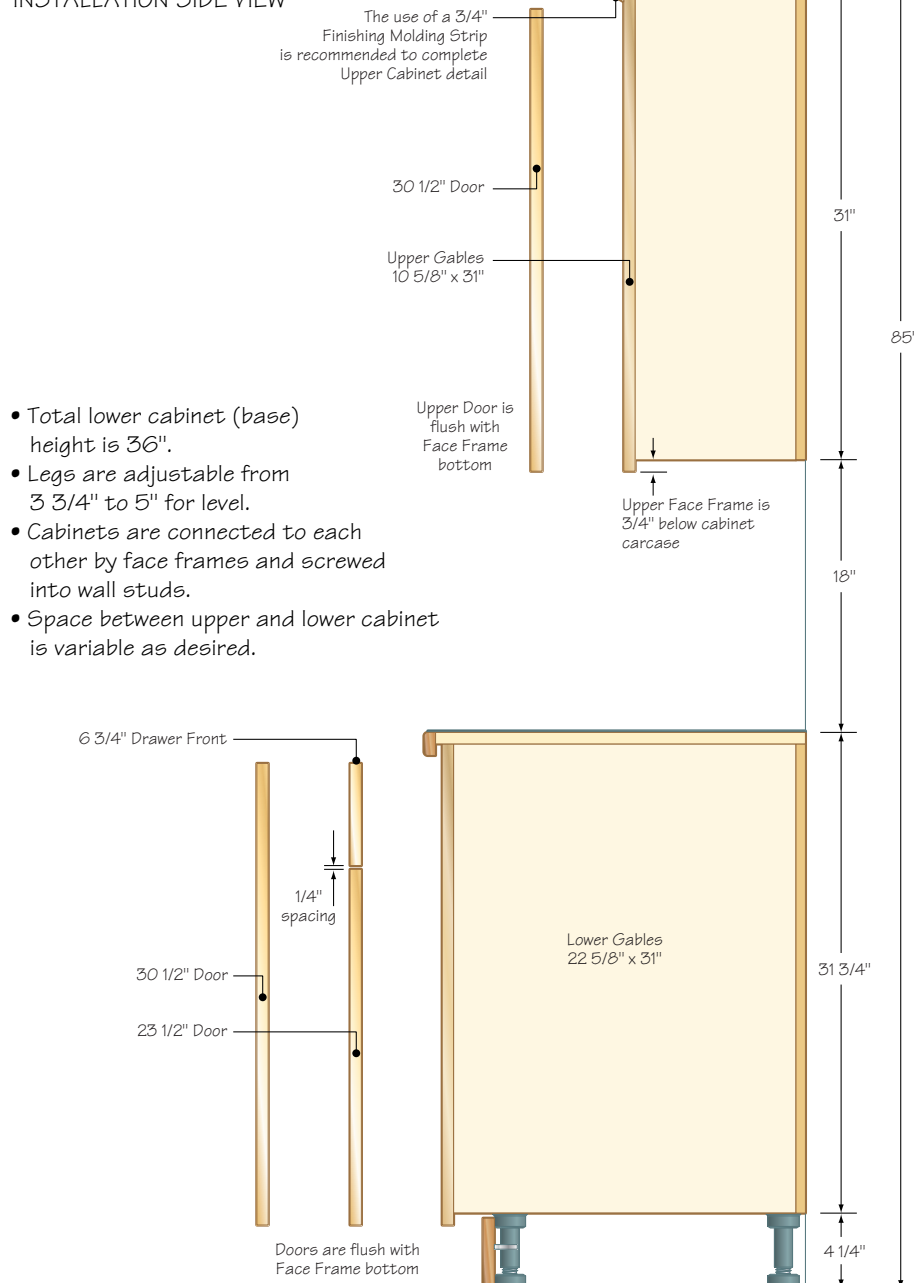


Illustration by Len Churchill

interior. This is made possible by the use of the fully adjustable European hinge. Doors can be adjusted with a 1- to 2-mm gap between them when closed. European hinges are installed on each door by way of a 35-mm hole drilled on the inside of the door. They are high quality hardware items and simple to install. The other added advantage of the European hinge is that they are hidden when the door(s) are closed so you don't have to worry about carrying different styles of hinges. In about 90% of the applications I use a 100 to 120 degree full overlay cabinet hinge.

The sides of the standard upper and base cabinets can be the same length for easy production cutting. Only the depths are

different, about 300mm (12") deep for the uppers and 600mm (24") deep for the base units. These dimensions allow for maximum use of a 4' x 8' standard sheet of melamine-coated particleboard for carcass construction. The sheet length of 97" gives three side ends, and the side depths of the standard cabinet allows for four upper side ends and two base side ends across the 49" width of the sheet (most sheet goods are described in Imperial measurement sizes in North America).

Five panels are needed for the uppers, two sides, one top, one bottom, and the backboard. The base units require four panels plus a 50mm (2") high rail at the top, two sides, one bottom and one back. A



top panel for a base is not required because the kitchen countertop assembly covers it.

Cabinet Doors

You will have to decide whether you want to build or buy your cabinet doors. If you are building cabinets as a hobby, time may not be a relevant cost factor. On the other hand, if you own or manage a cabinet shop, labour, material and machinery costs often dictate the final decision. As a cabinetmaking contractor, I find it more economical to buy my doors from a specialty manufacturer. From a business point of view I can't hope to offer all the styles that are readily available from the suppliers. I would have to equip myself with routers, shapers, and jigs in many different styles and sizes to be able to offer a competitive selection to my clients.

However, if you're planning to build new kitchen cabinets for your home, make your own doors and save money. If you plan on

opening a small cabinet shop, look at all the cost issues and then decide if you should build or buy your doors. They are among the most expensive items in any kitchen renovation project, so being able to build your own will be a real plus, but be sure it's cost effective from a business point of view.

Door width, using full overlay European or hidden hinges, is determined by using a simple rule. The interior cabinet width plus 26mm (1"), equals the required door width for that cabinet. If you need two doors, divide the total number by two.

Interior cabinet width is the shortest distance between the inside faces of the stiles on a face frame cabinet or side panel inside faces with frameless cabinets. A 760mm (30") wide frameless base cabinet has an inside dimension of 728mm (28



3/4"), if the cabinet has been constructed with 16mm (5/8") sheet material. Adding 26mm (1") to that dimension means you need one 754mm (29 3/4") wide door, which is too wide, or two 377mm (14 7/8") wide doors for the cabinet.

Drawer Design

Kitchen cabinet quality is sometimes judged by the construction style of the drawers. While this is true in some respects, a drawer in a working kitchen does not have to be constructed out of solid hardwood with dovetail joints to be high in quality. And, drawer construction is not always the absolute measure of craftsmanship.

It is true however, that a high quality drawer is a requirement. It should be solid, well constructed, and easy to maintain. Drawers are subjected to a good deal of abuse by normal everyday opening and



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closing. Spills can occur, grease and grime can build up on the interior, and wear on the movable parts are facts of life.

Countertops

The choice of countertop materials has greatly increased over the last few years. At one time, a kitchen countertop was simply a piece of plywood with square edges covered with high-pressure laminate, known as the self-edged countertop. Fortunately, we've realized that countertop material was more than just a covering for the base cabinets. It's understood now that it must be functional, able to withstand years of use, and add design, as well as interest to the kitchen.

In the next issue I'll begin detailing the construction of cabinets. The first types we'll look at are the face frame and frameless upper cabinets, including hinge theory, door sizing, and joinery options.

The hybrid cabinet system is fully detailed in Danny's book, *"Build Your Own Kitchen Cabinets"*.

The European or frameless style cabinet is the subject of his book, *"Building Frameless Kitchen Cabinets"*.



DANNY PROULX is a woodworking author and teacher.
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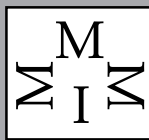


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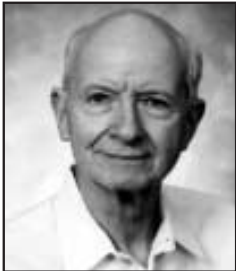
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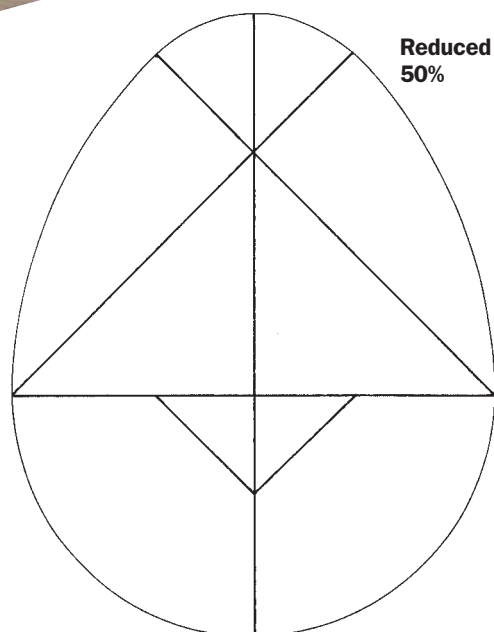
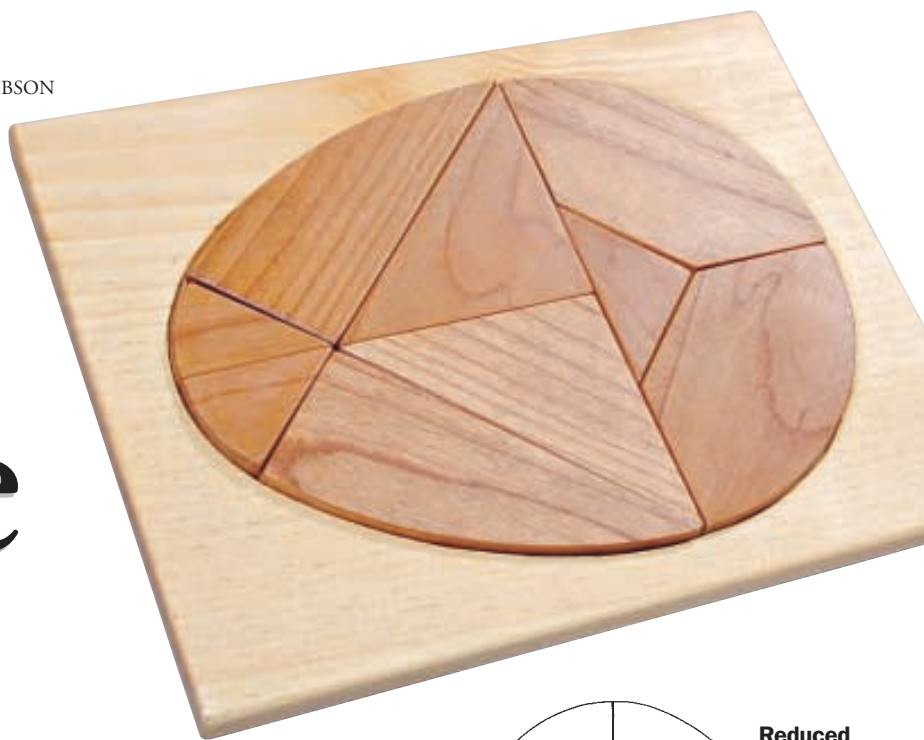
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Egg Puzzle



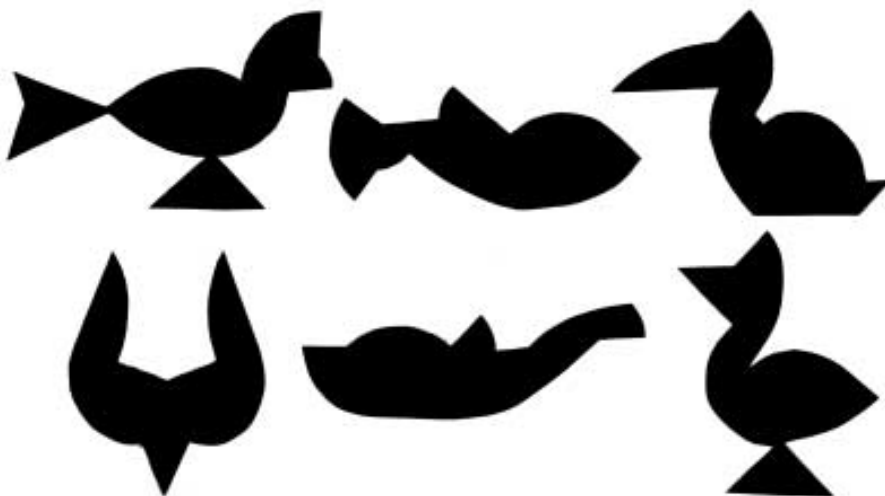
We all learn early in life that birds and fish come from eggs. So let's have some fun with that knowledge and see how many birds and fish we can get out of this wooden egg puzzle.

This is a simple, yet entertaining puzzle. The object of the puzzle is to make the bird and fish shapes (as shown) from pieces of the egg.

This egg is made from solid cherry 1/4" thick. It is 5" wide and 7" long. The tray is 3/8" thick, 6" wide and 8" long.

This is a great puzzle for the toy box or the classroom. There are dozens of other bird and fish shapes that can be devised from this egg. Just use your imagination.

The solutions for this puzzle will be shown in the next issue.



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The Butternut for this ornamental piece becomes a focal point and provides visual interest. In this article I will give you the method for turning the actual nut, itself. Alternate materials such as Tagua nuts also make interesting knobs for lids as they contrast with the wood.

I chose to work with the Butternut because it is something a little different and because it is from Ontario, so it is readily available. Various other nuts, such as the Tagua Nut or Uxi Kernal from South America, are also easy to turn, producing a

fine finish and a nice result (photo 1).

They are “vegetable ivory”.

The big advantage of these exotic nuts is that they can be substituted for real ivory, which is illegal to import.

To turn the Butternut, glue it onto a waste

centres, then remove the tailstock and hollow out the front and inside of the nut.

Before you shape the outside make sure that the Butternut is on the spigot, secured on the chuck and that the tailstock is in place as support. Now use a 3/8” spindle gouge to shape the outside. The Butternut cuts somewhat like acrylic and produces a very smooth cut at a fast running speed.

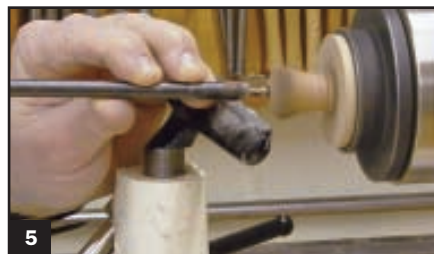
Make sure the spindle gouge is ground in the profile of a fingernail, on a 35-degree angle. Face the flute in the direction of the cut, and always cut downhill, going from high to low. The Butternut has no grain; cutting downhill helps the tool fall into the shape you are cutting (photo 2).

The shaped Butternut, with the tailstock removed, is now ready for hollowing out (photo 3). The tools for hollowing have to



photo 1

block (spigot) so that you can grab it and hold it with a chuck. Shape it between



correspond to the small size of the piece. I used a set of three miniature hollowing tools (photo 4). Each tool is a 1/4" bar with a high-speed steel tip glued into the end; one tool is straight; another is cranked at a 45-degree angle; and the third tool of the set is hooked.

There is no need to drill out the middle, as the piece is so small. This can be done quickly using the straight tool. In fact, about 80% of the hollowing out process can be done with the straight tool (photo 5). The larger the curvature of the piece, the more appropriate it is to use the cranked or offset tools.

Attach the turned Butternut to a pedestal. I made this one from Palmwood, which is a wood with a prominent grain. Rough out and shape the foot, using a 1/2" spindle gouge (photo 6).

Square off the ends. Use a 1/16" parting tool, as shown in photo 7 and part each end down to a little pip. Leave the piece mounted between centers, to allow for further shaping and tool work.

Now turn a double bead with a 9-in-1 tool (photo 8). It is important that the cross section of this tool is diamond shaped and ground to about a 30-degree angle on the end. The tool can be used like a little skew to roll a bead to the left and right, even to the point of undercutting the bead with the point left and right. This tool produces a super clean cut, one that requires very little sanding.

Having cut so cleanly, all that is required for sanding is starting with about a 280 grit through to 400 grit, using J-flex, which is a little softer paper that allows you to get into the smaller areas (photo 9).

Part off the Butternut entirely, with the chuck holding the Butternut mounted back onto the lathe. Use the small 1/16" parting tool (photo 10).

Turn both ends of the foot; one end for the Butternut to be glued on to and the other end for the bottom of the foot. One way of doing this is to take the steel jaws off the chuck and, using the rubber bungs, (which come with the One-way jumbo jaws) screw these directly onto the base jaws of the chuck. Now what you've created is a chuck with soft rubber jaws (photo 11).

Clean both ends of the foot with the toe of a tiny skew. Make a nice shearing cut by lifting the toe into the centre of the piece (photo 12).

Roll a bead with the 9-in-1 tool where the Palmwood meets the Butternut to blend them together (photo 13). Now complete the piece by gluing the Butternut onto the foot.

PAUL ROSS owns and operates Chalet Woodcraft and teaches woodturning in Boston, Ontario.
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Turning Classic Tops



Wooden tops have fascinated children down through the ages with their mystifying ability to defy the laws of gravity. Who knew that physics could be so much fun?

To make your own handcrafted tops all you need is a lathe, a few scraps of wood, and some spare time. Be forewarned though, making and spinning these marvelous toys can become addictive.

Spin Into Action

Get started by preparing a blank that is at least 6" long and 2" square. Any wood you find lying around the shop will do but dense species, like hard maple, work best. If you don't have 2" stock in your scrap bin, laminate thinner boards together.

When the blank is ready, locate and mark the centre point on each end by scribing diagonal lines from corner to corner (photo 1). Before you mount the stock between the lathe centres, take the time to chamfer the edges using the tablesaw with the blade tilted 45 degrees (photo 2). Removing this waste material now will reduce vibration and save time at the lathe.



MATERIALS LIST

- 1 **2" x 2" x 6"**
Top Blank Hard Maple
- 1 **1" x 1" x 8"**
Handle Blank Hard Maple
- 1 **1/2" x 1/2" x 5"**
Peg Blank Hard Maple

With the lathe turning at a slow speed, use a large gouge to rough out a cylinder that is approximately 1 3/4" in diameter along the entire length (photo 3). When this is done, mark the locations for the stem and body sections on the blank by touching a pencil to the rotating cylinder (photo 4).

Now you're ready to begin forming the stem section with a square nosed parting

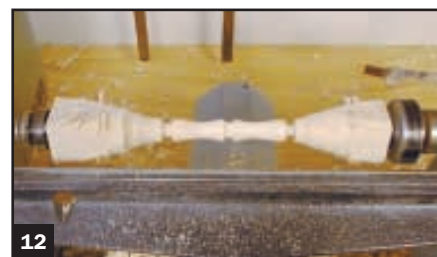
tool. When using this tool, avoid jamming the tip directly into the side of the blank. A better technique is to gradually lower the chisel onto the top of the cylinder until the cutting edge begins to make contact and shavings start to fly (photo 5). Periodically check your progress with calipers as you approach the final dimensions. When the diameter is a hair wider than 1/4" along the entire length, switch to sandpaper to finish the job.

When the stem is done you can turn your attention to the body section. Start with the crown by rounding over the top edge using a skew or gouge, then complete the decorative grooves that run around the perimeter by cutting in with the tip of a chisel (photo 6). Clean up the crevices with the folded edge of 200 grit sandpaper before continuing on.

Top Tip

Below the crown, the body gradually tapers towards a point. With your gouge, start roughing out the profile until the area at the tip is approximately 1/4" in diameter. At this stage things get a little tricky because the point will become weaker as more material is removed. Sand all the areas that are complete before you continue refining the tip using sharp tools and a delicate touch. It's a bit of a game to see how fine you can shave the point before it breaks off (photo 7). Remember to periodically sand as you work because your next pass could be your last. When the top finally breaks free, complete the sanding on the end by hand.

After using the bandsaw to cut away the remaining waste material attached to the stem (photo 8), bore a 1/8"-diameter hole with the drillpress to receive the end of the cord used to wind the top. Drill the hole



with the top on its side and a piece of scrap under the stem for support.

To make the top more durable and reduce friction when the top is spinning, add a round-headed brass nail, called an escutcheon pin, to the pivot point. Escutcheon pins, typically used to install decorative brass hardware on wooden boxes, can be purchased at any well-stocked woodworking supply store. Insert the stem into a hole bored in a piece of 2" thick scrap to hold the top upright while drilling the pilot hole for the pin (photo 9). When you're done, tap the pin into place before moving onto the next step (photo 10).

Handle and Peg

A simple handle is required to hold the stem vertical when the top is sent spinning. You can turn one on the lathe (photo 11) or use an 8" length of 1" diameter dowel as a ready-made alternative. On the end of the handle drill a 1/4" diameter hole to receive the stem and make a 1" deep slot for the windings. To prepare the slot, drill a 3/8" diameter hole at the end, then remove the remaining waste material with the band-saw or scrollsaw. Take a look at the plans for further details.

A wooden peg tied onto the end of the winding cord will allow you to get a good grip when it's time to spin the top into action. Use a piece of 1/2" diameter dowel for this or make one on the lathe in no time at all (photo 12). The overall shape and size isn't important but a notch in the centre will prevent the string from sliding out of place.

After securing a 10" length of cord to the peg, you're ready to take your top for a spin. Insert the end of the top into the handle, then wind the string around the stem 10 or 12 times. Hold the top a couple of inches above a flat surface, then firmly pull the cord to get the action started. If the top is properly balanced it should spin in place for a lengthy period of time without wobbling or skipping.

Finishing Up

I applied several coats of wipe-on polyurethane to the top, handle and peg to enhance the natural grain but stains, aniline dyes, and brightly coloured paints are other finishing options that would look great. If appearance isn't a consideration, forget about the finish all together – it won't affect the performance of the top in any way.

Once you've built one of these fascinating tops, others are sure to follow. For your next attempt, why not be creative by laminating different types of contrasting wood together to make interesting and eye-catching designs. You

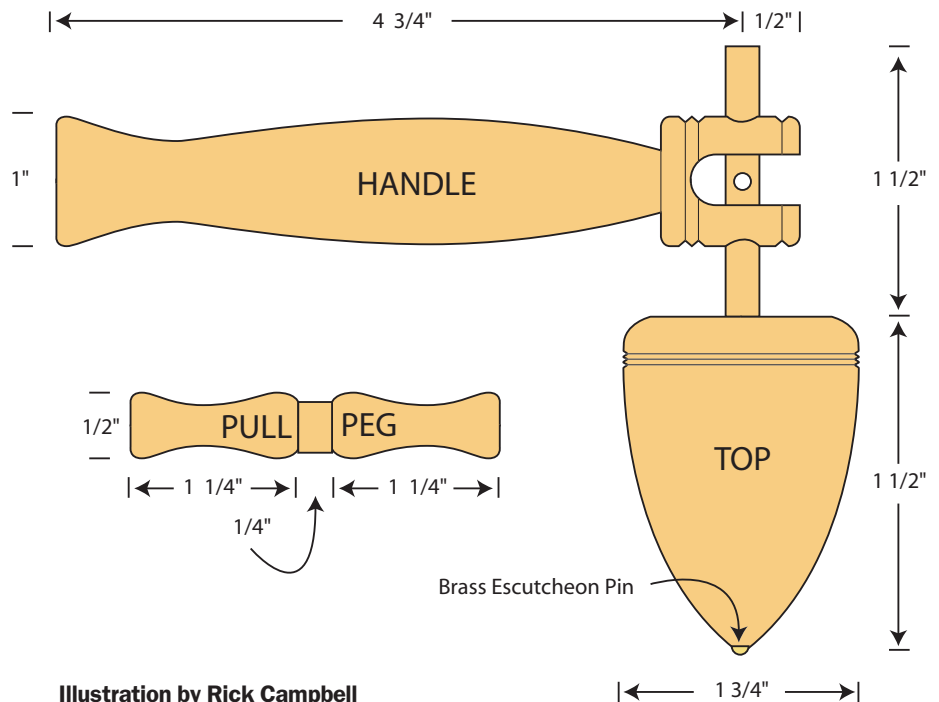


Illustration by Rick Campbell

can also experiment by altering the basic profile within certain limitations. Rest assured that every top you build is certain to find a good home with an appreciative child.

RICK CAMPBELL is a writer and woodworker living in London, Ontario. (519) 668-1775

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Accent Mirror

Accent mirrors add to your décor by brightening up a wall that would otherwise be stark. This little mirror with its wagon wheel theme can do just that in your home.

Start by selecting your wood, as listed in the materials list. I built this one out of red oak, but you can use your favorite wood with similar results.

Cut the 60-degree ends on the pieces that will make up the arch as shown in the drawing. A mitre saw is the preferred tool for this task, but a table saw, or mitre box will do the job too.

Join the three pieces together permanently, in preparation for cutting the curve. I used a pocket hole jig, screws, and glue. If you prefer, you can use dowel pins, small biscuits, or a spline, for equivalent strength.

Cut the centre hub of the mirror with a band saw, scroll saw, or jigsaw, and finish-sand it. Prepare the bottom 24" board and finish-sand. Glue the hub to the bottom board, being careful to contain glue squeeze-out.

Now it's time to draw the arch. Place the

bottom board, with the hub attached to it, against the bottom of the three-piece assembly. Centre it on the assembly, and fasten it there with the pocket screws. If you are not using pocket screws, prepare the joint as you need but don't glue it together. Clamp it down to your bench top so it won't move while you draw the arch.

If you have a large compass, draw the two arches, using the centre of the small half circle as your centre point. If you don't have a large compass you can do the job just as well with a thumbtack and string.

Don't unclamp your pieces, as it is time to mark the spoke locations. Two of them are at the glue joints in the arch. The other three are found by marking the centre of the three boards making up the arch. Draw a line from there to the centre of the hub, as shown in the drawing. Draw these same lines on the hub for all five spokes.

Unclamp your pieces and cut the arch. You'll want to drum sand the cut edges.

Once you have it smooth, transfer the spoke locations to the edge of the arch with a square. I like my combination-square for this because the body sits nicely on the top of the material, while the blade hangs down the side to make the mark. Transfer the spoke locations to the hub.

I picked up hundreds of arrow-back spindles at a chair factory that was shutting down and I am using some of them for my spokes. Don't panic ... if you want to make

them, they can be made in a couple of ways.

The easiest method is with a wood lathe. Unlike regular turnings, your spindle blank is not square or round; it's rectangular, so you end up with the flats remaining on the spindles. Take care to keep your fingers away from the spindles while they're turning.

Another method that is not as easy, but just as effective, is to cut the spindles with the same saw that you used to cut the arch. Then, with a drum sander, shape them to that of the turned spindle. It's easier than you think.

Of course, if all else fails, you can use dowel. It does have its advantages because more of the mirror is visible when you use dowels.

Whether you use spindles or dowels, sand a substantial round-over on both ends, as shown, to ease assembly.

Measure the diameters of the ends of your spindles, and drill their mounting

MATERIALS LIST

Wood is of your choice

3 3/4" x 3 1/2" x 15"

1 3/4" x 1 3/4" x 24"

1 3/4" x 2" x 4"

4 pocket screws

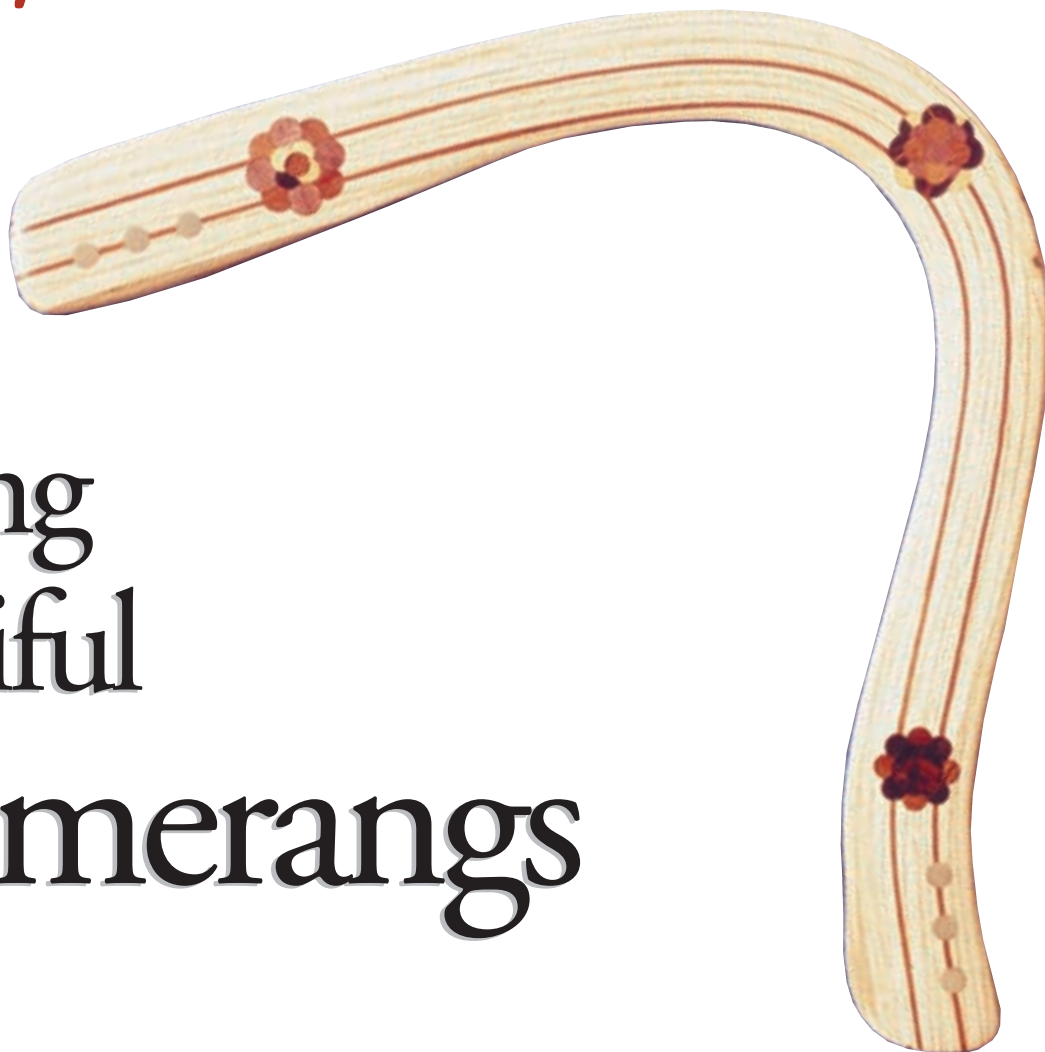
1 mirror

5 spindles

4 mirror clips

*STEVE SIDDALL is the president of Workshop Supply Inc., based in Embro, Ontario.
1-800-387-5716 www.workshopsupply.com*

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Making Beautiful Boomerangs

Part II

This is the final part of our two-part article on making laminated boomerangs. In the previous issue we covered selecting lumber, cutting it into strips, steaming them and bending the strips to shape in your mold.

Gluing and Clamping the Strips Together

My favourite glue for boomerangs is a two part epoxy mix of 50% hardener and 50% base. Unlike the water-soluble glues, the epoxy can be used with wood that may have a higher moisture content (8% or even up to 15%) and still glue-up very well. Epoxy is also the best choice to stand up to moisture and severe temperature changes while the boomerangs are being used outside.

Before placing your glued hardwood strips into the mold, wax the surface of the mold that comes into contact with the strips, using your fingers or a cloth. Give your mold a coating of wax each time you

use it for gluing your strips (photo 1). Any quality paste-type wax will work well. Without this coating of wax your glued strips would adhere to your mold. With the wax coating, all that is necessary is a light tap with a hammer to remove your strip-laminated hardwood blank (photo 2) from the mold after the glue has cured.

I found it best to slowly clamp the strips together to about 75% of the total clamp pressure. Don't fully clamp the strips, because if the adhesive is still a bit watery you may squeeze all the epoxy out from between the strips and weaken the lamination.

Once you feel the epoxy has become good and tacky, continue to squeeze the strips together. Generally I allow the epoxy-glued strips to cure over night. When the temperature is cooler, allow extra time for the epoxy to cure. A good way to test the degree of curing is to poke the epoxy with the tip of a sharp nail; if you can puncture it, the epoxy hasn't cured.

Cutting Your Mold Blank to Obtain Multiple Boomerang Blanks

Take the bonded hardwood strips from your mold by giving it a tap to loosen your blank away from the mold. The 1 1/2" or 2" thick blank has to have both surfaces leveled. A table saw can be used for this but I have found it very hard on the blades. Using a table saw also makes it a little more difficult to prevent twisting during the cut. Instead, level the surfaces on the bandsaw (photo 3) with a custom fence about six to eight inches high. Another option is to level both blank surfaces on your jointer - being careful to remove only about 1/16" on each pass over the blades.

Once you have trued your thick boomerang blank, slice it into thinner blanks suitable for a boomerang. The thickness can vary from 1/4" (6mm) to 3/8" (9mm). For this project try 1/4". You should be able to get four to six boomerang blanks from your laminated stock (allowing for the blade thickness

and any inaccuracies in your cuts). If the thinner blank is not exactly the same thickness throughout, don't worry; this will not affect its flight. However, if you do want consistency in thickness then a thickness sander works very well. Do not run your blank through a thickness planer because you would be planning against the grain and it would blow your blank apart.

Profiling Your Boomerang

Using the pattern (fig. 1) provided, cut out the boomerang pattern, then trace the desired shape onto your strip laminated blank (photo 4). Trace the pattern and cut it to shape on your bandsaw.

Once the shape is cut,

contour each wing to resemble an airplane's wing. Because there are right and left hand boomerangs, (fig. 2) be careful that each wing is contoured in the right direction for either a right or left hand thrower.



2 A typical mold with strips fully clamped.

sandpaper up to 320 grit. Early in my woodworking years I would sand my new wood to the point where it was like glass (almost burnishing it), and then wonder why my stains or finishes wouldn't apply properly. Later I learned that stains



3 The easiest way to level the sides of the glued-up blank and to cut the blank into boomerangs is with the bandsaw.



5 Profile the boomerang on a pneumatic drum sander.



6 Tune the boomerang wing for proper lift by using a kettle to steam it and twist the wings slightly.

couldn't penetrate this hardened surface.

I have not had a great deal of success with the oxide papers (generally a brown or orange colour) without the grit coating. They clog and I have experienced the grit falling off onto my work. I have had great success with the silver coloured, aluminum oxide paper that has a grit coating. You can sand your project without having the paper gum up. This paper is available in various grades. Although they are initially a little more expensive, in the long run they are cheaper because they have a longer sand life, and they provide better finishes.

Sealing and Finishing

I generally use a readily available sanding sealer compatible with my spray-on lacquer. To create a very nice finish try the following: one or two coats of sanding sealer simply rubbed on with a soft cloth; leave it to dry; sand with 0000 steel



1 The inside surface of the boomerang mold must be waxed to prevent the glued layers of strips from sticking to it.



4 Trace the outline of your boomerang onto the boomerang blank.



7 Checking the boomerang for proper wing twist after tuning it.

Fig. 1

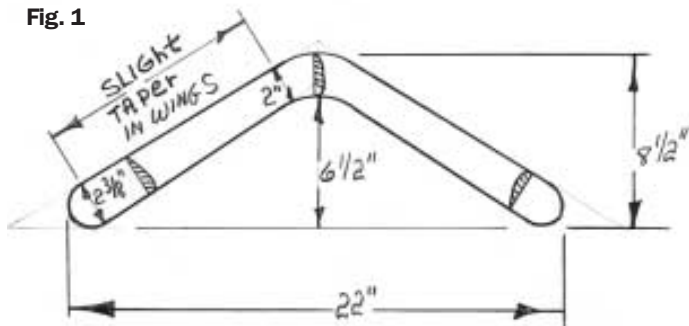
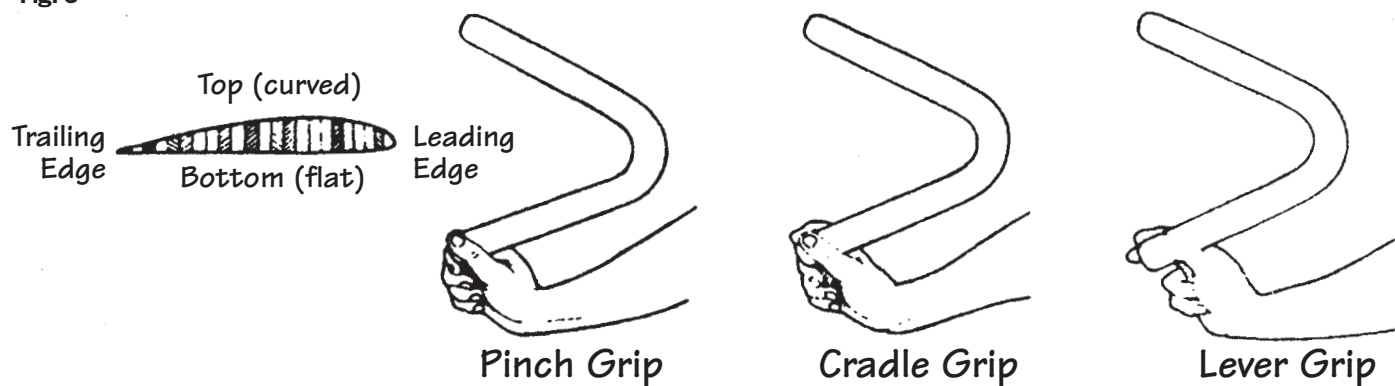


Fig. 2



Fig. 3



wool; and complete with two or three coats of lacquer spray.

To prevent bubbles/fisheyes in your lacquer coatings, do not use steel wool products that are processed with oil. Lacquer dries rapidly and applies nicely in a spray. To gain better control of your spraying, purchase a spray handle made for spray cans for \$3 or \$4. This spray handle

fits conveniently on any spray bomb.

To obtain an even better finish, use fine steel wool or fine sanding paper between 4-6 coats of lacquer and then apply the final finish. You will be amazed by this hand-rubbed finish.

A simple and quick method I use is exterior varnish or urethane mixed with boiled linseed oil and paint thinner. Until

you become familiar with this type of mix it's probably best to mix small amounts at a time (say, 1/3 of the recommended amount). This is a mix that can be rubbed on and fine finished between coats. Although it takes longer it will produce a finish equal in appearance to the best fine European hand rubbed finishes. It will be something you can be proud of.

Tuning Your Boomerang

Although tuning a boomerang is not like tuning a violin or guitar, some boomerangs do require tuning in order to return to the thrower. These include boomerangs that have a shape other than the traditional "V" shape. The only tuning necessary for the boomerang shape featured in this article occurs during the making of it, before applying the final protective coatings.

I always use a kettle for steaming (photo 6), which produces just the right amount and intensity of moisture and heat. All facts of science, which explain how aircraft fly, apply to most boomerang shapes. The more the boomerang shape differs from the traditional shallow "V" shape, the more likely it will require tuning. With the more circular shaped boomerangs the wings have to be steamed upwards and twisted; that is to say, the wings have to be given either a positive or negative dihedral

(inclination/angle from true horizontal). The wings must also be adjusted with a negative or positive angle of attack – just like an airplane. In addition, both wings have to have the right proportion of wing width to their length (wing aspect ratio) in order to fly and return.

Once the wing has received enough heat and moisture through the steam I'll twist the wing. Holding it over a high intensity cooling fan will quickly dry that portion of the wing so that it remains in the position it was bent. When making more circular shaped boomerangs check for proper wing twist (photo 7). Some competition boomerangs have to be a certain weight and thickness. For these I use a special scale for weighing each boomerang and a vernier scale (measures fine adjustments) for measuring boomerang wing thickness. However for this project, your "V" shape boomerang, tuned during the making, will stay tuned for a long time.

Throwing Your Boomerang

Throwing a boomerang requires a slight breeze. Do not practice throwing in a strong wind. Stand so the breeze is blowing in your face.

If you are a right-handed thrower, hold the boomerang with the flat part of the boomerang away from you. Turn to the right, away from the oncoming breeze. Tilt the boomerang to one o'clock and throw straight out, parallel to the ground. The boomerang will fly straight, and then make a large swooping circle to the left, and come back to you.

If the boomerang lands too far in front of you then throw a little more to your left. If the boomerang lands too far behind you then throw a little more to your right.

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Founded in 1906, William Knell and Company Ltd. has a rich and deep history throughout the industrial and hardware supply chains of Southern Ontario.

Knell's Industrial division, with locations in Kitchener and Elmira, stocks a wide selection of machinery, power tools, abrasives, cutting tools, hand tools and more, catering to both the wood working and metal working industries.

Knell's Door and Hardware division was created to address the specialized nature of the commercial and residential door and hardware industries.

These two divisions provide contractors, fabricators, tradesmen and hobbyists a complete range of products and support, tailored to their needs.

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Tegs Tools was established in Hamilton in 1979. For over 20 years we have been providing Hamilton and surrounding areas with, not only the best selection, but also the most qualified experience and knowledge, amounting to the best customer service in the industry. We cater to industries, trades and, of course, the home handyman and woman.

Our huge showroom boasts one of the largest selections of machinery and power tools in the country. We carry a complete line from the biggest brand names in the tool industry. Our huge on-hand inventory ensures that you can get what you need when you need it.

In addition, we carry a complete line of hand tools, specialty tools and accessories. We have acquired the reputation as being the only supplier who can not only provide the tools necessary but be able to source special requests as well.

We provide the best customer service in the industry based on many years of experience and first-hand testimonials from our customers. This is what sets us apart from the large home improvement retailers. If you need advice on the right tool for the job, you know that you can depend on us.

Leonard Lee, C.M.

While building his cottage in Canada in the early 70s, Leonard Lee needed tools that weren't readily available. He tells us, "I couldn't get a slick. I couldn't get a broad axe. I couldn't even get a decent draw knife." This experience, along with careful research, common sense, and a love of woodworking, resulted in the creation of Lee Valley Tools, one of the world's finest suppliers of woodworking tools.

Before Lee Valley Tools

Leonard was born in Wadena, Saskatchewan (near Algrove). His father was a farmer and built the log house that Leonard grew up in. In his early years he attended a one room grade school and later a one room high school. After graduating from university, he joined the Canadian Foreign Service. There he would assist Canadian companies that were doing business outside the country. He was first stationed in Chicago and later in Lima, Peru. The job left him unfulfilled and, by age 39, he was looking seriously into his career options.

Leonard remembers, "Woodworking was my hobby, and I knew that there were a lot of woodworking tools needed by woodworkers." So, he applied the marketing research skills he had developed in the Canadian Foreign Service and began taking a critical look at the woodworking market in Canada. "It looked like the American market for woodworking and hand tools, by mail order, was about \$10 million. At that time I estimated the Canadian market would be about one million and, if we could capture the Canadian mail order market we would have a company that could employ about 10 people."



Photo by Ray Pilon, Ottawa ON

Starting Lee Valley

Leonard Lee remained at his job while he formed the company, Lee Valley Tools. The company's name combined Leonard Lee's last name, the Ottawa Valley, where he lived, and the products he intended to offer. He says, "Originally all we sold was a cast-iron, barrel stove kit . . . You want a tough job! But it worked. We actually didn't lose any money. Of course, during that first year, customers kept asking, 'How come you're selling stoves, and you're called Lee Valley Tools?' I said, 'Well, you're going to have to wait. It was taking time to collect the variety and the quality of tools that I had in mind.'"

In August 1978, Leonard Lee quit his job. In October, he and Lorraine, his wife, cut and pasted together their first catalogue on their dining room table. It featured 950 items.

Leonard had just placed an ad on the

back cover of Harrowsmith. It was a quick and unexpected decision to place the ad, but the page was offered at a discounted price because an advertiser had just dropped out, and the magazine was ready to go to press. "We weren't entirely ready for something like that, but we pulled together an ad. We showed a black walnut tool chest, with the top open, and

tools in it. All the ad said was: 'For our 78 page catalogue of fine woodworking tools, send one dollar to this address'. We ended up getting 2,200 one-dollar bills. It was an unbelievable response for us, and jump-started our entire business. After that initial mailing our client list grew, mostly by word of mouth."

Early Days of Lee Valley

"I had no business experience. I'd only been in farming and government, but business is really just common sense. One thing I learned in government, is that the atmosphere at work



Lee Valley Tools first catalogue.

makes a huge difference in the productivity of the individuals. In the government, you have lots of responsibility and no authority. This is why so many government workers have ulcers. They're trying to do a good job but they really don't have any authority.

In contrast, employees at Lee Valley have authority. When you walk into any one of our stores, the first person you talk to has the right to refund your money. No matter what you spent, they have the right to refund it. There is no big manual telling them what to do. We just tell them, do exactly what you would do for a friend. This isn't complex at all. Most people have very common standards on what they do for a friend.

"In those early days, the most frequently asked question was: 'How do I sharpen this?' or 'How do I sharpen that?' At the time, I didn't know any more than the average customer, so I spent a lot of time looking into sharpening – I had to learn a lot about it because so many people were asking me." In response to those questions Leonard wrote a book on sharpening. "I just figured that it would be better to answer all those sharpening questions at once."

Woodworking, Then and Now

"Woodworking, as a hobby, is more popular now than ever before. The reason being that, in the last 25 years, there have been fewer and fewer jobs that depend on the labour of your hands. Most jobs only require mental activity. So people, many of whom grew up with a father who made a living by being a plumber, an electrician, a farmer, a lumberjack, or whatever, want a hobby where they can build things with their hands. Most people do. There are very few people who are satisfied living a life where they do nothing that requires manual dexterity. One of the reasons that woodworking is so popular is that you can actually see the result of an evening's work. It isn't all in bits and bytes."

"If there has been a change in woodworking over the last 25 years, it's that people can buy tools that are consistently beyond their skill level. Today, people have a lot more money than they have time, and so they try to substitute equipment for skill.

But remember, power tools are just hand tools working at speed. Somewhere along the way you have to learn the basics of woodworking: how wood reacts to the cutting process, how wood reacts to changes in humidity, and all those other things."

"Cabinetmakers today can't afford to use only hand tools. They have to use power. But they know the principles of wood, and how to work with it and, as a result, they use the power tools differently. For example, a good cabinetmaker will invariably feed work into his table saw slower than the average hobbyist. He knows what the saw is doing and that, if he feeds it too quickly, his cuts won't be as true and he will get more tear out."



Member of the
Order of Canada

Lee Valley Tools is now 25 years old, employs 695 people, and offers a mail order catalogue with over 5000 items.

In addition to being a successful entrepreneur, Leonard Lee has volunteered generously in the community, serving on the Cabinetmaking Advisory Committee for Algonquin College and on the Advisory Board to the Faculty of Business at the University of Ottawa.

He has retired from the day-to-day operations of Lee Valley and has started a new company, Canica Design, which designs and develops innovative surgical tools.

Recently, Leonard was awarded the Order of Canada, hence the C.M. after his name.

For more information on the Order of Canada: www.gg.ca/honours/order_e.asp

The Business of Woodworking

"One of the difficulties in Canada, in recent years, is that we're not training people. The skilled trades are in terrible shape. The good news is that, for anyone who does take up woodworking, the market for cabinetmakers is going to be better as time goes by."

"I think custom cabinet making will become as popular in Canada as it is in the U.S. If you're a custom cabinetmaker in the U.S. you can make a decent living.

"However, if someone does want to make a living in woodworking it will have to be high-end woodworking. They're going to have to be doing some teaching as well. Teaching gets your name known among potential buyers, providing a source of revenue. I don't think teaching is a necessity, but it certainly helps, especially the high-end woodworkers. I guess it's because, after a student woodworker has tried to make a table, and not done so well, they make good customers."

"Overall, I think that if somebody's going into woodworking to make a living, it's not because it's an easy way to get rich, it's because of a love of the craft."

LEE VALLEY BARREL STOVE KITS

Lee Valley stove kits were designed specifically for use with a heavy gauge 45 gallon barrel (not included in any of the kits). Properly charged and damped it will burn efficiently for 8 to 12 hours using wood up to 34" long and up to 12" in diameter.

All of the kit parts, except the fasteners and the shelf top, are cast for us by Foundry Foundry Ltd., well known for its quality in this field.

Features

- large door to enable the Lee Valley to be used as a fireplace as well as to accept large diameter wood.
- slatted design of door seal to minimize air leakage and maximize efficiency.
- damper door for quick starts.
- ash guard for safety.
- extra heavy legs and leg brackets for stability and strength.
- durability of cast iron.
- low cost.

Basic Model

This kit includes the door assembly, legs, leg brackets and pipe collar. It is recommended for use in areas where the lack of an ash guard will pose no safety hazard.

Ash Guard Model

Recommended for use where occasional sparks from an open damper would be hazardous. Also recommended for people who like to kick back on their chair with their feet on the ash guard and stare into the fire. (We have a sturdy brace under the ash guard so it will accept this sort of thing.)

Flat-Top Model

Recommended for people who might want to melt snow in a tub, keep a glue-pot warm in the workshop, or kick back on their chair with their feet on the ash guard and have the coffee-pot or muller wire handy. The two 8" x 24" shelves have four cast iron brackets which slip into four cast iron slots bolted to the barrel, creating a 4 square foot area level with the stove top.

Assembly

Any of the kits can be assembled in an evening by a novice using our instruction sheet. All that is required is a drill with a 1/4" bit, a screwdriver and a rigid blade hacksaw. If you have a sabre saw or a friend with a cutting torch, we prefer those in that order to the hacksaw.

Remember: All necessary nuts, bolts, door pins, etc., come with the kit as well as a detailed instruction sheet.

Lee Valley Guarantee

All Lee Valley products are guaranteed to be free from defects. Any defective merchandise can be returned immediately for replacement or cash refund including parcel post charges.

Additionally, if for any other reason you decide that you do not want the kit within 21 days of purchasing it, you can return it to us for immediate refund of full purchase price. All we ask is that you include a note saying why you did not like it so that we can improve our products accordingly.

Lee Valley TOOLS LTD.
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Lee Valley Tools first product flyer.



Lighthouse

The woods listed are given only as a guide. Use whatever woods that are available to you and that provide the required contrast.

Although this is a 3D intarsia, like any other intarsia design, it can still be made with a backing if you prefer.

The advantage to 3D intarsia is that the intarsia isn't limited to wall mounting alone, but can be displayed on a table, on its own stand, on an easel, or even hung in a window.

Instructions

Transfer the pattern onto tracing paper, making sure to include the grain direction arrows. The tracing paper allows you to see the grain of the wood as you mark your pieces. Select the piece of wood for the lower shore, then, using the traced pattern and transfer paper, mark and cut it to shape (using a bandsaw or scroll saw). Sand the edges with an oscillating spindle sander or a sanding drum mounted in a drill press. Ensure that the edges are square (photo 1).

Square perpendicular edges are essential for the pieces to fit correctly. After the edges are sanded, make sure you remove the "burr" from the underside of the piece with sandpaper or a bow sander. This allows the piece to sit flat. Do this to every piece.

Select the piece for the second part of the shore, slide the transfer paper under the pattern, and place the first piece in position. Mark the piece using the pattern and the edge of the first piece as a guide (photo 2). After this piece is cut, the edge sanded and fitted, tape the pieces together using duct tape. I use duct tape as it holds much better than masking tape. Continue marking, cutting, fitting, and taping pieces together until the entire lighthouse is cut out.

Remove the tape and drill blade entry

TIP Sand the edges square on smaller pieces before they are completely cut out. This makes it much easier on the fingers (photo 3.)

holes for the windows (alternatively, these could be burned or painted on), cut the windows out (photo 4). Drill a 3/8" hole for the round window, above the door, and glue in walnut dowel. Select the walnut for the windows. Mark the windows using the holes as a guide. A draftsman's pencil allows you to extend the lead, making marking easier. (photo 5). Apply glue and slide them in (photo 6). Don't worry about excess glue. It will be sanded off later.

The piece of wood used for the sky is fairly wide and it is easier and more stable to laminate it out of several pieces. I use western red cedar fence boards and plane them down to 5/8" and edge glue pieces. Let dry and sand smooth (photo 7).

Now it is time for shaping and contouring. The sky is the lowest part of this design so use this to mark the edge of the lighthouse where the contouring starts (photo 8). Use what tools you have to shape and contour the lighthouse, staying above the line you marked. Continue contouring using the previously shaped piece as a guide to mark the next (photo 9).



After contouring use a bow sander or a piece of sandpaper to blend and smooth each piece (photo 10). When all the pieces are shaped and sanded, place a piece of wax paper over the pattern. Apply glue to each piece, using an accordion glue bottle, (photo 11) and assemble.

Mark the clouds on a selected piece of wood, using the pattern and then cut and square the edges (photo 12).

Lay the pattern on the wood. Slide transfer paper under it. Place the lighthouse and clouds in position (photo 13). Carefully scribe the lines, cut out, and check fit. Contour the sky and clouds.

Place wax paper over the pattern and apply glue to the left side of the sky (photo 14). Lower the lighthouse into position

and insert clouds. Apply glue to the other half of the sky. Insert clouds and slide into position. Let dry.

You can fill any gaps on the back by applying glue and rubbing it into the joints (photo 15). Sand the back flat and contour the back edges (photo 16).

Apply the finish of your choice. Attach a hanger for wall mounting or display it on a stand to be viewed from all sides!

*FRED MARTIN is an intarsia artist from
Moose Jaw, Saskatchewan
www.intarsiabyfred.com*

Tools and Supplies:

- Scroll saw with #5 blades
- Band saw
- Oscillating spindle sander *or*
- Sanding Drum in a drill press (including 3/16" dia., 3/8" dia. drill bits)
- Bow sander
- Accordion glue bottle
- Duct tape
- Draftsman's pencil
- Tracing paper
- Transfer paper
- Finish of choice
- Waxed paper

Wood

butternut	1" x 4" x 16" (shore)
walnut	3/4" x 2" x 4" (windows and doors)
western red cedar	5/8" x 9" x 16" (sky)
white ash	3/4" x 3" x 15" (lighthouse)
eastern red cedar	3/4" x 3" x 6" (roofs)
pine	3/4" x 4" x 8" (clouds)
yellow birch	3/4" x 2" x 4" (lighthouse tower)
bird's eye maple	3/4" x 4" x 9" (base) optional



Mast-R-Lift

Some readers may not be familiar with the JessEm Tool Company of Barrie, Ontario. JessEm, founded in 1999, was the first company in North America to manufacture a router lift, and over the past three years their flagship product, the “Rout-R-Lift”, has been consistently rated the best lift on the market.

Recently JessEm announced a new addition to their family of router accessory products, the **Mast-R-Lift**.

A router lift, as the name implies, is a mechanical device that enables you to raise and lower your router without having to mess around under your router table. If you do a lot of router work this accessory can be a real time saver.

The Mast-R-Lift (photo at top) is both an insert plate and router lift. The top of the Mast-R-Lift, which serves as an insert plate, is manufactured from a solid piece of 1” aluminum, and measures 11 3/4” wide by 9 1/4” deep. The plate on the unit I tested was perfectly flat, with no deflection at all. There is a 3/8” rabbet along the bottom edge of the plate to enable you to make a snug fit in your router tabletop.

The bit opening is a generous 3 5/8” diameter. When using small sized bits you insert a reducer ring, which has a 1 1/2” diameter opening. The reducer ring is easily inserted or removed with the supplied tool. For greater convenience you can purchase an accessory kit of reducer rings with openings of 1/4”, 1/2”, 1 3/8” and 2 1/2”.

Underneath the insert plate is a carriage that holds the router. The carriage, which is CNC precision machined from 1” solid

aluminum, allows 3 1/2” of vertical router travel. The two carriage posts are 1 1/4” in diameter with 1” diameter precision steel pins. In between the two carriage posts is a threaded steel arm, which is attached to a gear via a maintenance-free rubber belt (photo 2). Turning the gear moves the carriage up or down. You turn the gear by means of a height adjuster handle that fits into the gear through the top of the insert plate (photo 1). One full turn of the height adjuster handle moves the bit 1/16” (.0625”). There are a series of 32 tick marks on the adjustment dial. Each tick mark measures a .0020” movement of the bit. That’s probably the best level of accuracy you’re likely to get with any router riser on the market.

Installing your router on the Mast-R-Lift is very easy. Loosen the two bolts that hold the carriage clamp to the body of the Mast-R-Lift. Then slide your router in between the carriage posts. The Mast-R-Lift was designed to hold the Porter Cable 7518 router. For mid-size fixed-base routers with 3.2” or 3 1/2” diameter motors, like my Porter Cable 690, you’ll need their adapter collar, which you place over the router. Tighten the bolts, and install the Mast-R-Lift into the opening in your tabletop. (Note: you may have to enlarge the opening in your tabletop). You can easily level the insert plate flush with the top of your router table by means of the four levelling bars located under each corner of the insert plate. At 14 pounds (without your router attached), the Mast-R-Lift has a lot of mass, which helps to reduce vibration.



About the most convenient feature of the Mast-R-Lift is the

ability to change router bits without having to reach under the router table or remove your router from its housing. Simply turn the height adjustment handle until the lock nuts on the router bit are above the tabletop (photo 3). If you are doing a lot of router work, constantly changing bits, then this feature alone is worth the price of the Mast-R-Lift.

I was very pleased with how quickly and accurately I could adjust bit height. When first setting height adjustment I double-checked accuracy with the Blade Gauge II precision height adjustment tool. Once I got the knack of using the height adjustment scale I made a dozen successive cuts with 1/32” increments; every one was bang on.

The Mast-R-Lift is a very durable, well-constructed product, which should provide years of trouble free service. It does exactly what it claims to do, and does it well. I highly recommend this woodworking accessory.

The Mast-R-Lift jig is competitively priced at \$379.99, and comes with a two-year warranty. For the dealer nearest you call JessEm at 1-866-272-7492, or visit their Web site at: www.jessem.com

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Fat Car



As I mentioned in my last article (see Fat Truck, Feb/Mar 03), I love to doodle. Sometimes I spend a bit more time on a drawing and it develops into an intarsia pattern. This is one of those doodles. I really like the soft, round look of the curves. The shape flows from one soft intersection to another.

It is a basic intarsia project. I used Western Red Cedar for the whole thing.

Start with a base material 3/4" thick. The door handle is cut, shaped and glued onto the surface of the door with a 1/4" dowel.

Choose your wood

Choose the various colors and shades of wood you want to use (or as the pattern suggests). This is a very creative step, so pay close attention to grain and color to achieve an attractive project.

Transfer the pattern

Transfer the pattern to the wood with whichever technique you prefer: carbon paper, template, or photocopy, and glue onto the wood.

Cut out the pieces

Cut out the pieces very carefully. This is the most important step as far as the fitting is concerned. If you cut carefully, right on the line, the pieces should fit fairly well off the saw. I like to use a scroll saw with a #5 or #7 P/S (precision skip blade). New scrollers might find it easier to follow a line with a #5 or #7 DT/R (double tooth reverse blade).

Assemble the pieces

Assemble the pieces and check for fit. Fitting is the fussiest part of the process. There are a number of techniques. Don't get too fussy. If I am within a saw kerf or 1/16" I am happy. You just don't want large gaps between the pieces.

Raise and/or Lower the Pieces

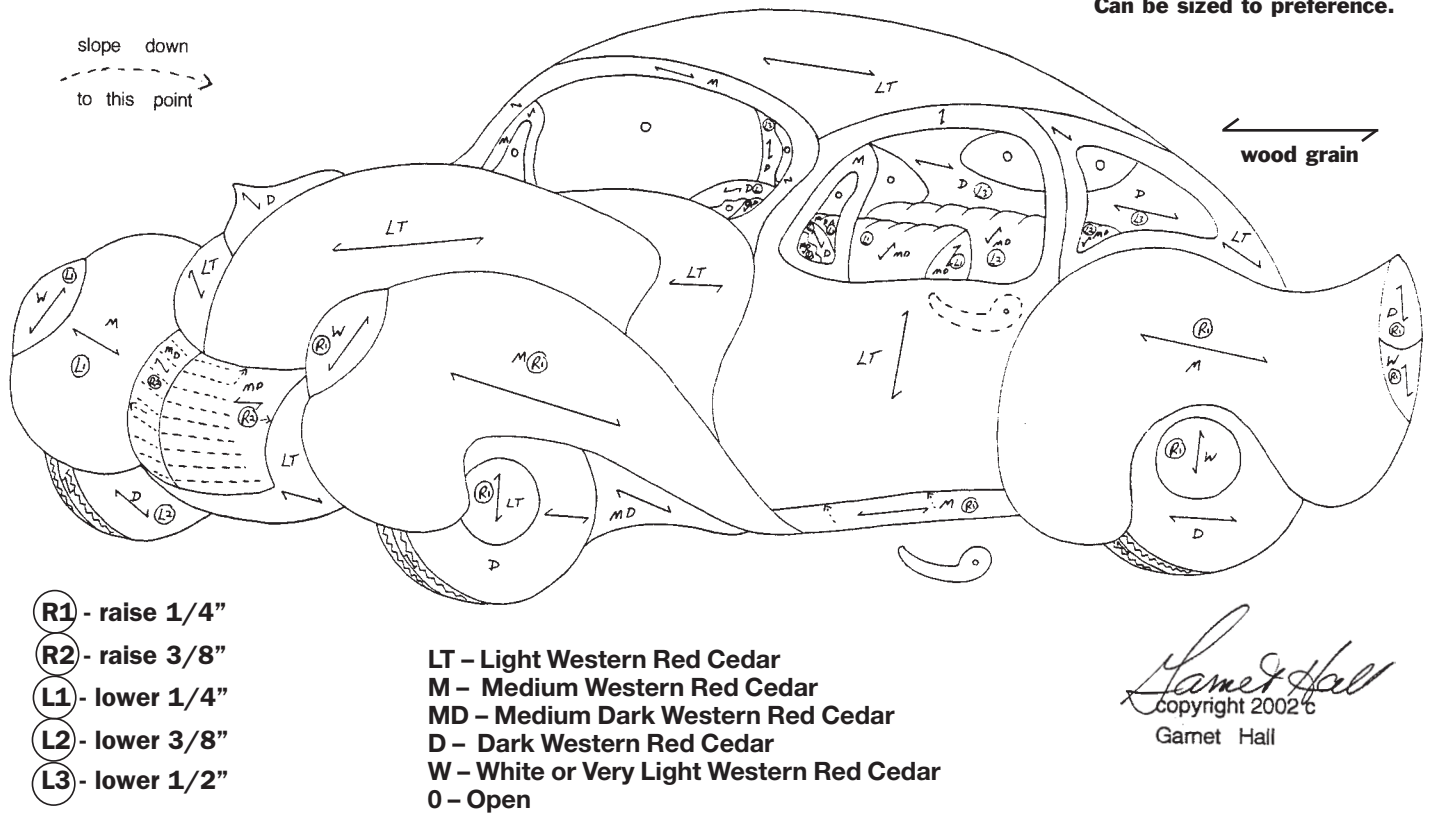
Once the pieces are fitted to your satisfaction, raise and lower any pieces the pattern suggests. I raise with scrap plywood and lower by resawing on my band saw. Some pieces can be sawn lower with a scroll saw or just sanded thinner.

Reassemble and draw reference lines to help with the shaping.

Dust Protection

Make sure you have some dust protection for the next two steps. It's a good idea to have all your tools hooked up to a dust collection system. Have an air filtration devise and wear a good mask. These three steps should protect you from the harms of dust. Shape the pieces to achieve a smooth transition from one level to the next. This too is a creative step. The more shaping you apply to the project the better it will look. Almost any sanding tool will work for this step. I like using a hand held pneumatic sander. I like the control it gives me over the shaping.

Pattern reduced to 75%.
Can be sized to preference.



Sand the pieces

Use either good old elbow grease and sand paper or a flap sander. Flap sanders have saved me hours and hours of sanding. I no longer sand past 220 grit. It's my philosophy and practice not to create any more dust than I have to.

Glue the pieces onto a backing

The best backing material is 1/4" Baltic Birch, but any good quality backing material will work fine. I use: 1/8" for projects under 1' square; 1/4" for 2 ft

square projects; and 3/8" to 1/2" for larger projects. Assemble the project on the backing material and trace around it. Remove pieces and cut out the back. Re-assemble the pieces onto the cut out back and glue up. Any white carpenters glue will work.

Finishing

Any finish made for wood will work. You can brush, spray, wipe, or dip it on - whichever works for you. The finish can also be applied before glue up. Apply three

coats on the front and one on the back.

With some basic woodworking skills and patience anyone can do a project like this. It can be rewarding and challenging to come up with your own designs. Never mind if the first one is not perfect and don't worry about what others may think. With each project, you will learn something about design, and the next one will be better.

GARNET HALL is an intarsia artist living in
 Stoughton, SK. 1-800-729-2473 www.sawbird.com

MATERIALS LIST

43 pieces

1 piece 6" x 12" - LT

1 piece 6" x 12" - M

1 piece 6" x 6" - MD

1 piece 6" x 6" - D

1 piece 4" x 4" - W

Backing material -

1 piece 1/4" plywood,
 9 1/2" x 21 1/2"

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■ Cont'd from pg. 3

A: ... the WOODWORKING FORUM. Without it, I would still be in the dark. In my shop my favourite thing to do is to turn. To see a chunk of an old log turn into something beautiful (hopefully).

J.P. (Hamilton ON)

A: Tools, tools, tools! Oh yeah, and cutting wood with them as well. I hate sanding.

Randy (Dartmouth NS)

A: After making a plan from a drawing, the best part for me is to assemble everything and see that it actually fits together and the outcome approaches what I had in mind.

Werner (Winnipeg AB)

A: ... Buying tools! Least favourite part: My line of credit after buying tools ... oh well, I'll save in the long run building furniture right?!

Raymond (Ladysmith BC)

A: When someone asks about a project, with something like "That's nice. Where did you get it?", or "Can you make one for us?"

Ed (Calgary AB)

A: ... Final smoothing of a nice piece of wood ...very thin shavings, less than 0.001 sometimes. Takes a couple of passes to take off a pencil line with that. But oh, the beauty and the feel of the wood. Nice.

Darrell (Oakville ON)

A: I'd have to say that my favourite part of woodworking is ... the whole thing! When I start planning a project I get excited about the fact that I have another reason to get into the shop ... trying a new technique or building a new jig ... Selecting the wood is enjoyable because ... I just love wood – the smell of it, the feel of it, the fact that there are unlimited possibilities in a rough piece of lumber ... building the project increases the enjoyment even further and finally doing the finish is the climax of it all ...

I think I'd have to say the thing I like the least about woodworking is not having a project on the go!

Randy (Langley BC)

Check out the Woodworking Forum at
www.canadianwoodworking.com

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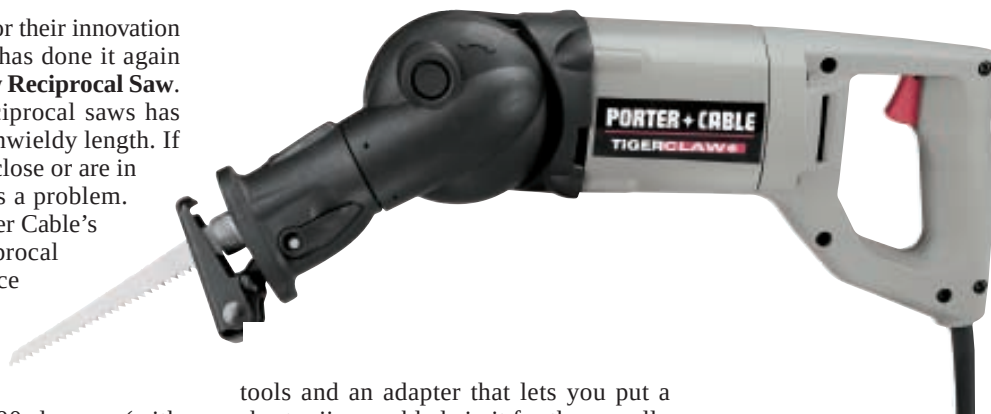
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Tiger Claw Reciprical Saw

Porter-Cable, known for their innovation and high quality tools, has done it again with the new **Tiger Claw Reciprocal Saw**.

The problem with reciprocal saws has been their sometimes-unwieldy length. If you are trying to get in close or are in tight quarters the tool is a problem. That is, until now. Porter Cable's new Tiger Claw Reciprocal Saw solves such space problems in a hurry. It bends and twists.

With the press of a button the Tiger Claw head raises or lowers 90 degrees (with 13 positive stops) or it rotates 360 degrees. The new Tiger Claw has a unique and fast blade-changing button that requires no



tools and an adapter that lets you put a shorter jig-saw blade in it for those really tight spots.

The Tiger Claw has power as well with its 11.5 amp variable speed motor that cuts

from 0 to 2,900 strokes per minute.

Add to that a 1 1/4" stroke and you have one great tool with a ★★★★★ star rating.

Triton Router

In this issue I have chosen four new and innovative tools that all deserve our highest rating. If you're looking to pick up a router, reciprocating saw, thickness planer or dovetail jig, be sure to check out the features of these new and impressive tools.

One doesn't usually associate Australia with the manufacturing of woodworking tools, but maybe that is just a quirk that we, living north of the equator, seem to have. That is, until Triton, a company based in Melbourne, introduced their Triton Plunge Router. This is one great tool.

The **Triton Router** (rated at 2400 watts) is equivalent to a 3-1/2hp machine. It is a variable speed tool with many features previously unseen in a router. First, and probably foremost, is the fact that the Triton Router is as comfortable to use above or below the table.

The tool has a couple of unique features for under-the-table use. First, the plunge spring pops out with the twist of a screw-driver. Second, when you raise it up to its highest point, two things happen. You will

quickly see that the entire collet head sits well above the table surface and, second, the motor shaft locks so a one-handed bit change becomes possible. When the router is under the table, all controls are at your fingertips and facing front. An illuminated power switch is very visible and the simple turning of the handle raises or lowers the tool. In addition there is a micro-winder for precision adjustments.

In the upright position the Triton Router performs equally as well. In the plunge mode you can do either a direct plunge or use the winder handle to feed it slowly. The lock-down is simple and convenient, with no fumbling; it's right where it should be.

The Triton is a big machine. When you first lay eyes on it, you can see it is quality built and Triton backs this with a three-year warranty! The tool has a "soft-start" feature and a speed control that regulates it from 8,000 to 20,000 RPMs. As if that isn't enough, they have a front and rear safety



shield that is crystal clear. Want more? You've got it. The Triton comes equipped with a base plate that includes a multi-function fence with a circle-cutting feature. Still more features include a 1/2" router bit, a 1/4" collet, and a Triton 1/2" straight router bit.

How did I rate the Triton Router? The maximum is a ★★★★★ star and the Triton Router Plunger gets all of them easily. Busy Bee Tools are Triton dealers.

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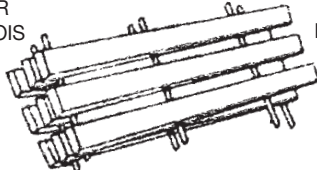
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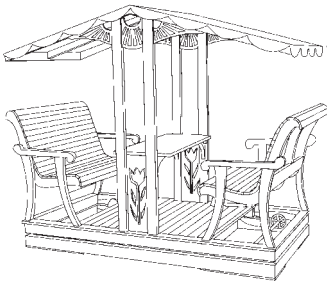
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Ryobi 13" Thickness Planer

Ryobi has hit the front pages again as they continue to prove that they are in the professional tool business.

Home Depot just received the new **Ryobi 13" Thickness Planer** and it has features that are very impressive. The model AP1300 has 11 1/2" chromed infeed/outfeed tables, and a Rapid-Set knife-changing system that makes knife changing a breeze. The knives are double-edged and they can be moved laterally to extend their life. Moving one knife slightly left or right will nicely compensate for a nick.

The AP1300 has an eight-stop re-plane set gauge for positive thickness control. For example, if you set the gauge at 3/4", you can be assured that the boards coming out are precisely that.

The head raising/lowering handle controls all four posts and a slick lever to lock the cutter head to help prevent "snipe". The planning depth gauge tells you the exact depth setting for that board so that you will not run the board through and take off too much or too little. The 15-amp motor is a hungry beast that

handles oak and maple like it was pine.

Ryobi includes a dust hood that will accept both 4" and 2 1/4" dust collection hoses, a neat hinged compartment on top of the machine for tools and accessories and a cloth pocket under the out-feed table to keep the owners manual and the power cord.

Speaking of power cords, Ryobi supplies their corded tools with a 10' cord and have been for sometime now. The other manufacturers still use the old 8' measure.

Ryobi gets another ★★★★★ star home run with this under \$450 winner.

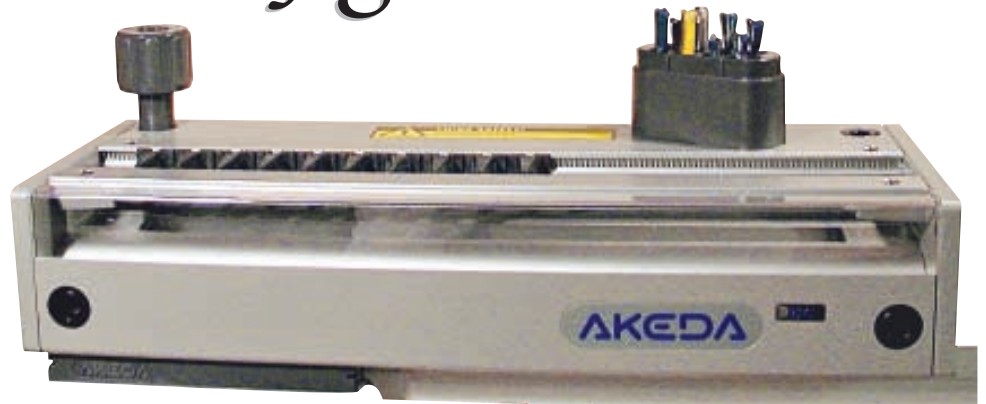


Akeda Dovetail Jig

Akeda is a Vancouver company that makes a tool that blew me away with its ease of use, simplicity of design, and innovation. Akeda makes the model **DC-16 Dovetail Jig** that has so many neat features that you just have to see for yourself.

Half-blind, through dovetails, box joints, rabbeted drawer fronts, variably spaced, the Akeda does it all. The jig will handle stock up to 16" wide – wide enough for the majority of work.

The Akeda is different from other dovetail jigs. It is a heavy and stable tool and its top surface prevents any chance of the router tipping and destroying the guide pins. In addition, your work is clearly visible even with the dust port in position. The dust port, by the way, takes better than 90% of the dust right into your shop vacuum. Akeda supplies two carbide-tipped dovetail bits and, if you get the



optional accessory kit, eight more bits are included along with the dust port.

If you want more innovation, Akeda has it. A single knob clamps the boards accurately and securely. Just turn on the router. Another ★★★★★ star rating, this time for Akeda.

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- ★below average quality
- ★★average quality
- ★★★very good quality/value
- ★★★★excellent quality/value
- ★★★★★ ..top of the line

GRAHAM McCULLOCH is a woodworker and writer living in Halifax, NS. (902) 479-0221
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Router Compass & Ellipse

A lot of woodworkers get intimidated with the idea of cutting circles, let alone arcs and ellipses. However, it's simple to rout out a large circular or elliptical tabletop if you have the right equipment. Now, with the **Router Compass and Ellipse J/A** router accessories from **Trend Machinery**, you can say goodbye to the square top!

The **Router Compass** is a straightforward accessory. Although most convenient to use with a plunge router, it will mount to any router. The

Router Compass is made of 1/4" thick clear acrylic, and has a 1.18" (30 mm) center hole. You'll have to drill and countersink holes in the underside of the compass to fit your router. The compass comes with a pin centre that you can press into your stock, and a 1/8" rod centre, which you insert

into a pre-drilled hole in your stock. I find the rod centre counter clockwise. I rout no more than 1/8" deep each pass. I've had great success using 2-flute up-cut spiral bits. Even so, when the bit runs against the grain you might get a bit of tear out, which will need some sanding. Once you've cut the circle you can change bits and apply a decorative edge. All in all, this is a very useful product to have in the shop.

Cutting ellipses is just as easy with the **Ellipse J/A**. This accessory enables you to cut circles and ellipses as well as circular and elliptical arches from 21 1/2" (550 mm) to just over 70 inches (1800 mm), and will accommodate any brand of router. The **Ellipse** comes with a 1" thick Duralumin cross frame (an alloy of aluminum, copper and magnesium), 2 sliders that ride in the

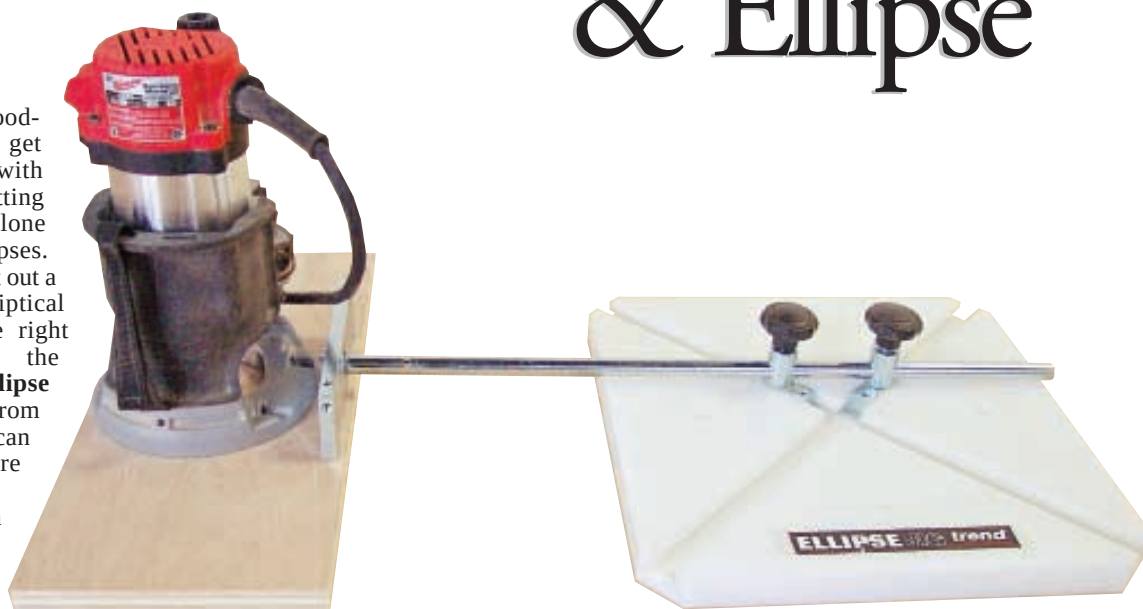
piece of 1/4" hardboard, which broke away from the connector plate rather quickly). You also attach your router to the plywood base. Placement of the connector plate and router on the ply base is not crucial. Just remember to countersink the screws in the bottom of the base; else you will risk scratching your work piece. I put a couple of strips of low friction tape (Lee Valley catalogue #25U04.01) on the bottom of the base; it slides like water off a duck's back. Again, as for the **Router Compass**, a plunge router would be the tool of choice here. However, I used my non-plunge router with no problems.

All that remains is to slip the two sliders into the channels on the cross piece, then connect one or both of the metal arms to the connector plate and to the sliders.

You're now ready to use the **Ellipse**. A set of clearly written instructions shows you how to arrange

the two sliders to set the maximum and minimum axis (i.e. length and width) of your ellipse.

I used the **Ellipse** to make an elliptical cherry table top (7/8" thick by 33" wide and 46" long). The idea of routing through 7/8" of cherry didn't appeal to me, so I made a second ply base and attached my Porter Cable jig saw to it. I cut about



most convenient to use. You can rout circles from 4" to 24" diameter. Adjustments are a snap with the graduated scale printed on the arm of the compass.

I mount the compass on the underside of material that I'm routing, and take shallow, controlled cuts moving my router

channels on the cross frame, a metal connector plate that attaches to your router, two 20" metal arms, along with the requisite tools and instruction booklet (see photo at top of page).

You will need to attach the metal connector plate to a base; I used an 8" by 14" piece of 3/4" ply (my first try was a



1/8" outside the final cut line. It went surprisingly quickly, and I think it kicked up less debris than the router would have done and it also saved wear on my router bit. I then attached the router to the **Ellipse** and made my finish cut using a 1/2" spiral up-cut carbide bit. You could also attach a portable oscillating spindle sander to the **Ellipse** to speed up your final edge

it with double-sided tape.

I wouldn't recommend back cutting with your router when using the **Ellipse**. When using a fixed-based router you want to be careful when the router bit first makes contact with the tabletop, as the bit may grab the wood.

There is enough flex in the metal arms that you can lift the router slightly above

sanding.

When routing with the grain the finish was perfect; where I routed against the grain there was a bit of tear out that required some hand sanding.

Remember to turn your table top over and rout on the underside. You can screw the cross frame to the underside of your table or, as I did, you can attach

your work piece, switch the router on, then bring the router to bear on the work piece.

The **Ellipse** is an excellent product that is very easy to use. It's also durable. I accidentally dropped the cross frame on my concrete floor and it came out none the worse for it.

For those of you who will be making an occasional circular tabletop, the **Router Compass** is the way to go; if woodworking is your life, then the **Ellipse** will be a real lifeline. Certainly, if you will be cutting any number of circles or ellipses, it's a worthwhile investment that will save you both time and money.

Trend Machinery is out of England, UK. For information you can contact their North American Sales Manager, Terry Cole, at 1-859-485-2080 or terryc@trendm.co.uk. You can also order either of these router accessories direct from Trend. The Router Compass is priced at \$74 CDN while the Ellipse is competitively priced at \$371 CDN.

For more information, or to order, contact Trend Machinery at www.trendmachinery.co.uk.

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Light Box

I make boxes, and recently, a new customer presented a unique challenge for me. The item she required was a “circular light box” – some two feet in diameter – designed to hold a circular stained glass work of art. The prospective owner wanted self-contained lighting to softly backlight the stained glass. She also wanted the box to be made of oak to fit in with the décor of her home, where it was to be wall hung. As mentioned, this presented some interesting design challenges.

Design considerations

First, the normal air humidity on the west coast of British Columbia, where the box would reside, is a lot greater than that of the dry Canadian prairies of Alberta, where it would be made. How to overcome the moisture differences and the resulting movement of the wood?

Second, in order to backlight the stained glass the interior void in the box must provide for a minimum of one inch clear space to house the “rope lighting” to be installed – a string of small light bulbs housed in a flexible clear plastic tube (fig. 3).

The prospect of building this cross-section in a circle out of solid oak, or any solid wood for that matter, given the concern over humidity conditions, was not appealing. Also, the prospect of cutting the circular frame from solid stock (albeit glued up) almost 2 inches thick, or from jointed and joined segments of solid wood arcs, was even less appealing.

Instead I proposed using MDF (medium density fibreboard) as the base material for the box frame and cladding the entire frame in oak veneer. During construction these 1/4” thick circles would be much more readily cut using 1/4” MDF than solid wood stock. The veneered MDF design would remain stable when moved to a more humid climate, and also provide a more economical and easily fabricated box.

With this design I could also provide a top cap ring on the frame that would allow

the stained glass to be removed for service if necessary; and a removable back for access to the rope light. Fortunately, the client agreed to the change in materials and the project was begun. As with many creative projects, new challenges came up as I proceeded.

The light source needed to be softened or diffused so as not to appear too bright behind the stained glass piece, which was somewhat clear in places. This called for a diffuser plate of translucent white plastic to be mounted behind the stained glass itself, requiring another circle cut, this one in thin, brittle, white plastic (from a fluorescent light cover). This required smooth edge circle cuts. While all other circle cuts, inside and out, could be made using a standard circle guide and a router, I came up with a circle cutting jig for the diffuser plate which is safe and easy to use on the table saw (fig. 2).

Making the Circle Jig

Let’s start with the jig, which is simple to build. Use a 28-inch square sheet of MDF with a plastic runner screwed to the underside. Rest the runner in the groove of the table saw. Then, screw a cleat to the underside of the MDF sheet and position it so that the sheet hugs the surface of the saw’s table. Make sure the inboard edge of the MDF sheet just clears the saw blade as it is raised above the table.

To cut a circle in stock using this jig, measure back from the saw blade, a radius of the circle required. Drill a 1/8” hole vertically at that point. Now drill a hole in the centre of the square stock on which the desired circle has been laid out. Use the



drill bit as a centre pin and insert it through the stock into the hole in the jig. Make sure that the centre line of the jig and stock is precisely at 90 degrees to and aligned with the centre, or highest point on the saw blade. Now, with the saw blade below the underside of the stock, start the saw and raise the blade until it just enters the stock. Rotate the stock counterclockwise, against the direction that the saw blade is moving, about the centre pin in the jig. When a full 360-degree rotation of the stock is complete, raise the saw blade by about 1/16” inch (about one full turn of the raising handle on my saw) and continue rotating the stock another 360 degrees. Continue this process until the saw blade comes through the top surface of the stock, all the way around and the cut is complete.

You will be amazed at how smooth a cut is achieved by the saw blade. Very little sanding, if any, is required to achieve a perfect, vertical, finished circular surface.

Making the Light Box

Cut five circles for this box on the table saw (fig. 1). Two of 1” and 5/8” thick MDF stock for the frame body, one of 1/4” MDF for the cap ring, one in 1/4” MDF stock for the back plate and one in 1/16” white plastic for the diffuser plate. Make the two inside rabbet cuts and interior circle cuts using a plunge router mounted on the circle cutting jig centred on the same base plate

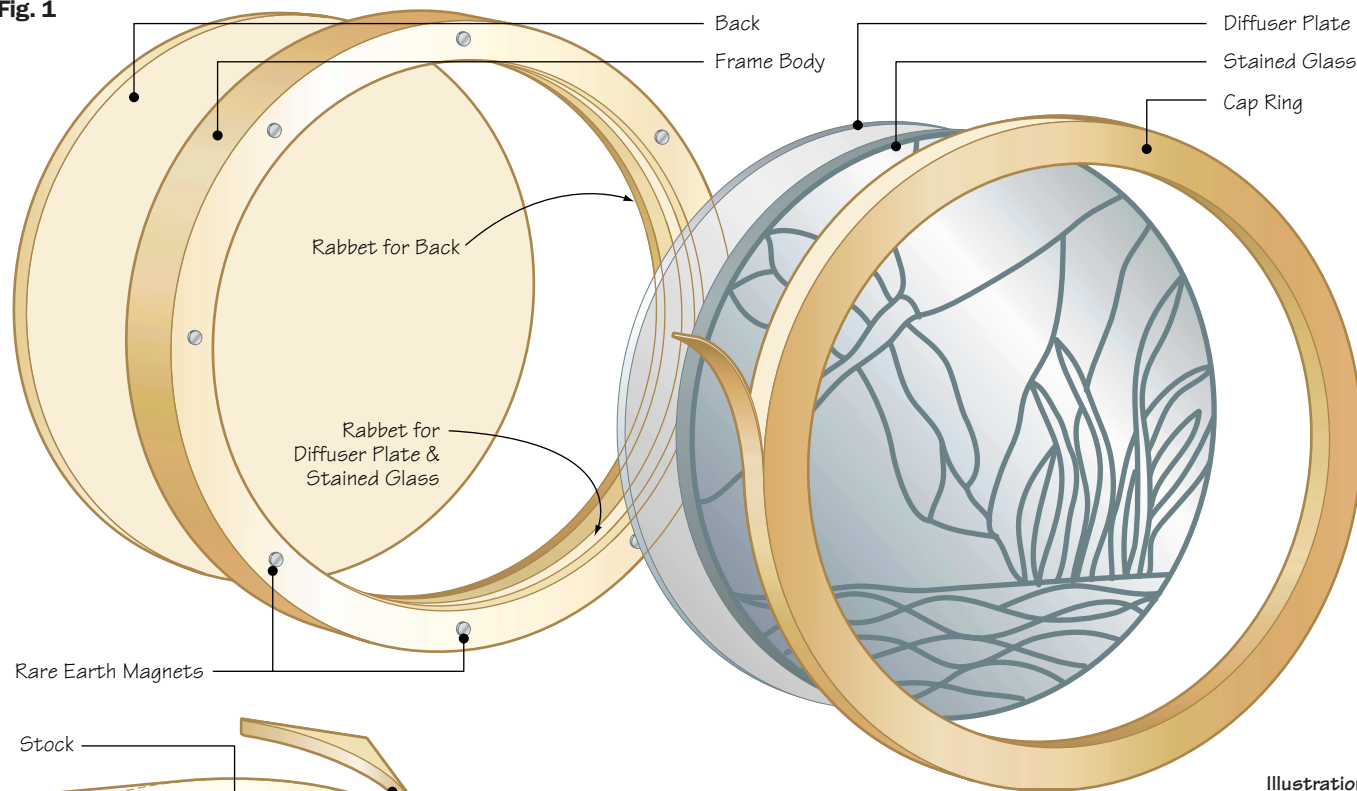
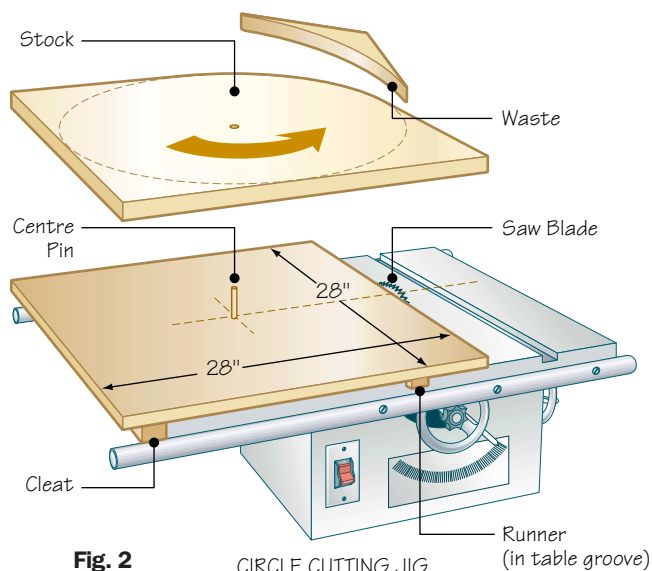
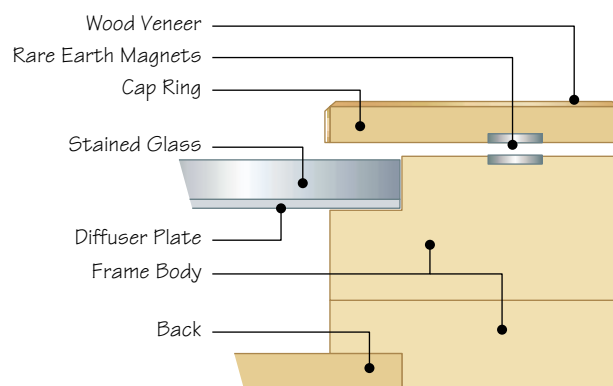
Fig. 1

Illustration by
Len Churchill

**Fig. 2**

CIRCLE CUTTING JIG

**Fig. 3**

CROSS SECTION

used for the table saw. Glue the two thicker rings together to achieve the depth needed for the box. Make sure all parts fit together with adequate clearance. Test fit the back and the cap ring with the diffuser plate and stained glass in place in the top rabbet. Clad the cap ring and main frame body of the box with oak veneer for the solid wood look.

Magnetic Fasteners: My original design of the box called for the cap ring to be screwed to the frame in order to lock in the stained glass art. However, I realized that, no matter how delicate, the little round-headed brass screws would still be a distraction on the frame surface.

In addition, not only was there was not enough thickness in the cap ring stock to allow the countersinking and the hiding of screw heads, but they also still had to be accessible. This presented a perfect application for rare earth magnets. You will need 16 of these powerful little magnets, in eight pairs. Embed them into the underside of the cap ring and top of the box frame, using epoxy. They are so strong that the stained glass circle is held in securely, yet they can be slid off their normal firmly mounted position by applying firm sideways pressure. However, in case the magnet mount fails, I inserted some safety clips to hold the work of art in the frame.

Finishing Touches: Drill two holes in the back plate, one to provide entrance for a sturdy hanging bolt to catch the inside lip of the main frame, the second at the bottom to provide egress (exit hole) for the rope light power cord. Drill the bottom hole to provide for flat, flush mounting of the frame on a wall.

Credits: Thanks to Zo Ann Morten for permission to photograph the stained glass artwork of her own design. Photo by Pat Morten, Norlynn Audio/Visual.

CHUCK HOLDER is a woodworker and owner of HolderBuilt WoodCrafts, Calgary, Alberta and member of SAWS, Southern Alberta Woodworkers Society



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Reduce Dust from Your Lathe

This article focuses on dust collection for the wood turner, however, any woodworker who works with the woods listed below should take the same precautions when handling or working with these woods.

I often hear turners say that the only time that they feel they really need dust collection is when they are sanding. I generally agree, since turning involves the removal of wood with chisels that cut or gouge the wood off in large shavings. However, the other main reason for dust collection while turning is to reduce contact with toxic or hazardous woods. The most common hazardous wood is spalted maple (maple that has started to rot). This wood is identified by the black line patterns running through its grain. It contains corticale mold. Mold is made up of spores, which thrive in dark damp places, such as lungs where it causes "pneumonitis" or "alveolitis", (hypersensitivity pneumonia). Virtually any thing you do to spalted maple, can release the spores contained in the wood: so be especially careful when cutting, machining or sanding this wood.

Rosewood is another wood that needs to be handled with caution; it can be an irritant to your skin, your eyes, and your respiratory system. Cocobolo, Obeche, Olivewood, and Beech also fall into this category.

The dust from the following woods is known to cause cancer of the nose: Beech, Hemlock, Oak, Quebracho, Redwood, and Sassafras. Although some woods are more toxic than others, people can become sensitized to any wood if they are overexposed to the wood and especially to its dust.

Protect yourself by wearing a special mask and protective coatings for skin. If you turn in your basement, remember to be responsible toward other people who live in the house. Forced-air furnaces in homes can easily transmit dust and spores throughout the home if there is not proper dust collection to remove it as you work.

The recommended velocity for dust and shaving removal in industrial applications is between 3500 and 4200 feet per minute and the volume should be near 785 cubic feet per minute. To achieve this, the home shop owner would need to have at least a 2hp dust collector with a 6-inch line

running to the lathe's dust collection hood. It is easy to find the 2hp dust collector but 6" flex hose is expensive and rather hard to find. So I developed a hood to fit a four-inch flex line.

A typical roughing out operation on a piece of green wood (photo 1), results in the long shavings being directed toward the operator. These shavings are typically harmless except in the case of toxic woods.

When sanding a bowl there are a couple of important things to note about proper dust collection (photo 2). First, the dust hood is positioned and oriented toward the bowl to maximize its effect. Secondly, the operator is keeping his hands in the 6 - 9 o'clock quadrant of the bowl, which is the safest position.

Notice the operator's hand placement (photo 3) in this spindle sanding operation, with the hood oriented for pick up.

This is a manufactured lathe hood. The arrow indicates the universal mounting bracket. The bracket is bendable and can be bent as necessary and permanently fastened or clamped to the lathe (photo 4).

The "end boot" is an HVAC (heating, ventilating and air-conditioning) fitting that can be adapted to dust collection. You can fashion a bracket to hold it in place or you can permanently fasten this to your lathe. Be sure to fold the exposed edges over to eliminate the sharp edges indicated by the arrow (photo 5).

Another option is to wet sand your project, thus eliminating the need for dust collection. This procedure is done using mineral oil on the sand paper. However, note that the oil is not compatible with all finishes.

CHESTER VAN NESS is a Dust Removal Consultant in Scotland, Ontario. (519) 484-2284



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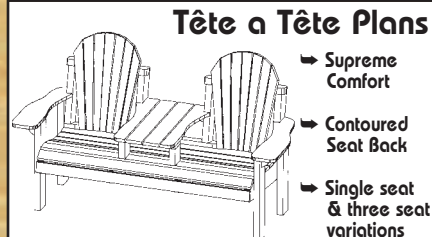
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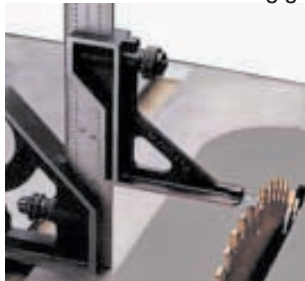


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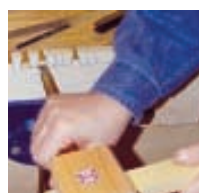
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3/4" Cherry	\$60.	1" Birch	\$50.
1/2" Maple	\$35.	3/4" Knotty Pine	\$40.
5/8" Maple	\$37.	1/2" Oak	\$38.
3/4" Maple	\$40.	3/4" Oak	\$35.-\$40.
1" Maple	\$50.	3/4" MDF (Ply core)	\$30.
1/2" Birch	\$32.		

ROUGH LUMBER

1" Red Oak Sel.	\$3.15	1" Butternut	\$2.40
1" Knotty Pine	\$1.45	1" & 2" Walnut	\$4.00
1" Sel Pine	\$2.40	1" Cherry	\$4.25
1" QuarterSawn White Oak	\$4.50	1" Ash	\$2.50
1" Basswood Sel.	\$2.25	1" Maple	\$4.00

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