

TODAY'S

November/December 1989

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WOODWORKER

PROJECTS, TIPS AND TECHNIQUES





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 A new angle on an old standard.
 This table expands to seat eight.

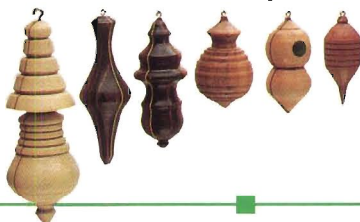


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(Photography by Scott Jacobson)

TODAY'S WOOD

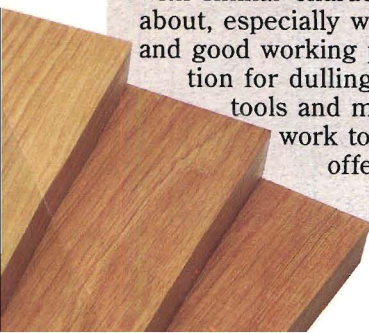
White Oak (*Quercus alba*)

Whenever you hear the old song "Roll Out the Barrels," white oak should come to mind. In days of old, most of those barrels were made from white oak. That's because the pores of white oak are filled with tyloses, a substance which gives the wood water-tight and water resistance properties.

White oak, a name which refers to numerous species with similar characteristics, is a wood worth singing about, especially when considering its natural beauty and good working properties. Oak once had a reputation for dulling tools quickly, but modern power tools and machinery make it an easy wood to work today. Generally speaking, white oak offers somewhat less dimensional stability than red oak, but it's a rela-

tively minor problem for both. Quarter sawn white oak (right) offers improved stability compared with plain sawn lumber (left). However, quarter sawn white oak is limited in availability and generally more expensive because less usable lumber is produced by cutting logs with this method.

Tannic acids, which protect the wood from insect and fungi attacks, make white oak a good choice for outdoor applications where decay resistance is essential. Its hardness, strength, durability and easy-to-finish nature have made it one of the most popular domestic species since early colonial days.



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ON THE LEVEL

Our First Year

As Volume One comes to a close, we'd like to thank all the readers who have encouraged us and sent in their ideas. It's been an exciting first year and it's clear that Today's Woodworker is finding a place in woodworking shops across the country. (We've moved from the starting gate to about 15,000 subscribers already!)

As we enter year two, we'd like to reiterate the importance of your involvement. Send us your "Shop Stumpers" and we'll put one of our experts right on it. Send us

photos of your best work and you may soon find it featured in the "Reader's Gallery." Send us a "Trick of the Trade" and if it's published, we'll send you \$30.00. And finally, send us your "Repros" (A project based on a photo in a catalog) and we'll send you a check for \$100.00 if it's published! We'd also love to hear your ideas on the projects we should be featuring and the topics our contributing editors should be covering.

Larry N. Stoiaken

I am an amateur woodworker interested in 18th century furniture —especially the ornate carvings that are characteristic of the period. For example, ball and claw feet, shell carvings and decorative foliage.

I wonder if John Goff, your contributing editor, knows of anyone in the Minneapolis area who builds 18th century furniture and is skilled in carving shells etc.?

Tony Kubalak
Minneapolis, Minnesota

John Goff Responds: I recommend that you read "Master Craftsmen of Newport" by Michael Moses, published by MMI American Press; 1984. As far as local contacts go, I recommend that you get in touch with the Minnesota Woodworkers' Guild, P.O. Box 8372, Minneapolis, MN 55408.

I read the trick of the trade on "Grinding Fine Tools" in the January/February issue of Today's Woodworker. I too have used friable oxide wheels for several years and they're everything the writer mentions. I've also had great success with "Cratex Power Wheels" made by Continental Abrasives of Indiana. These are impregnated silicon carbide wheels. They are cool running wheels that don't need the dressing conventional wheels do. With them, you don't have to worry so much about over-heating or burning the edge of finer tools.

Tim M. Cartwright
Columbus, Ohio

I must say I am quite pleased with your publication. I just received the Sept/Oct 89 issue. Tell Bill Rockler that I've been making business card holders a lot like the one in his article on page 15, and they are a popular item at art and craft shows. Keep up the good work.

Robert F. Stamm
Fredericksburg, Texas

I read Bruce Kieffer's article on the Futon Sofa Bed in the July/August issue and would like to build this piece. It would be very helpful if your projects could indicate approximate cost of materials and man hours.

Ron Chmelar
Chicago, Illinois

Bruce Kieffer Responds: the approximate cost of materials for the Futon Sofa Bed is \$450.00. Plan to spend roughly 30-40 hours in your shop.

I received my first couple of issues of your magazine and enjoyed reading both of them and look forward to future issues. I'm a beginning woodworker and cannot afford all the expensive tools that are out there. I don't know whether I should be saving up for a table saw or a radial arm saw.

Then in your July/Aug 1989 issue on page 23 you showed something I've never heard of —The Blade Runner. I would like to know where I could find one and I wonder if this is a good, inexpensive alternative to the table saw or radial arm saw?

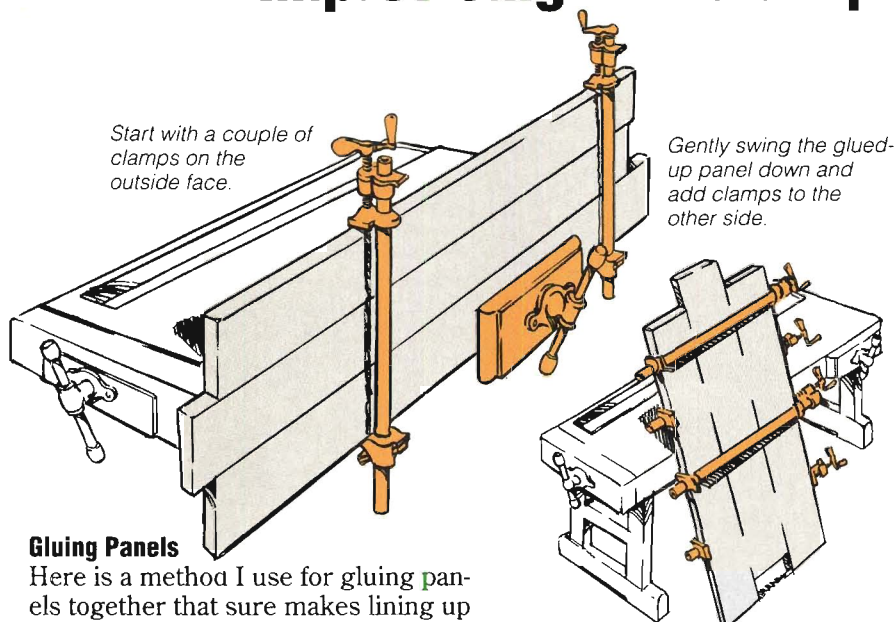
Tom Dietz
Depere, Wisconsin

Today's Woodworker Responds: Progressive Technology Inc. (PO Box 98/1003 Murphy Rd., Stafford TX 77477) manufactures the Blade Runner. With a miter attachment the unit costs about \$120.00.

Please accept my order for your back issues Jan/Feb, March/April and July/Aug 1989 of Today's Woodworker. Your magazine shows promise. Just don't succumb to being too simplistic or too "avant-garde". We woodworkers are intelligent beings who enjoy the challenge of advancing our techniques with time.

Chip Lindley
Henley, Missouri

Improvising in the Shop



Start with a couple of clamps on the outside face.

Gently swing the glued-up panel down and add clamps to the other side.

Gluing Panels

Here is a method I use for gluing panels together that sure makes lining up everything a lot easier and more accurate.

Clamp your first board in a bench vise with the jointed edge on top. Tighten the bench vise's grip to hold a fair amount of weight. Now put glue on this edge and all the other joint edges, and begin stacking the boards in order onto the one held in the bench vise. Once the boards are in place put a bar clamp across the middle of the panel. You now have easy access to push and pull each board into line with the others. Put more

clamps into position, alternating their placement on each side of the panel (if you can) as everything lines up.

I can lift this whole assembly off the bench and set it against the wall to dry. Carefully add clamps at this time to fill the space where the bench had been in the way.

This system works well for me as I have access to both sides of the stock and can do my work while standing.

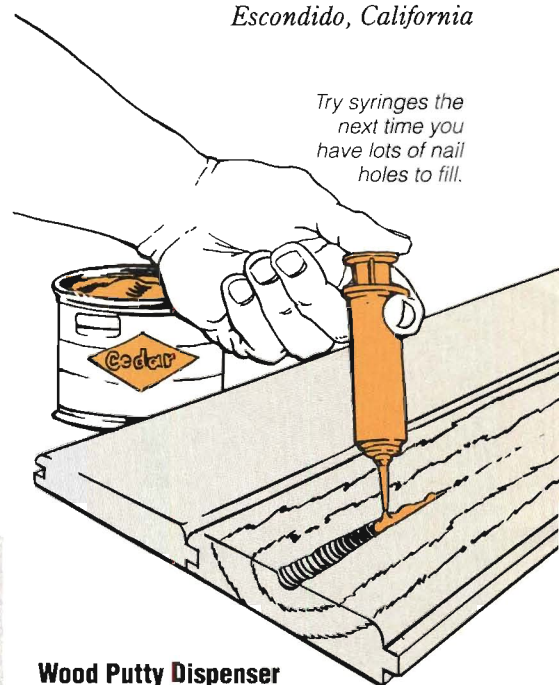
Lynn Mickelson
Seattle, Washington

Low Tech Drill Stop

As most of us amateurs know, we can prevent drilling through an important surface by applying masking tape to a drill as a poor man's drill stop. We estimate the maximum depth of drilling and tape accordingly.

Most tape adhesives stick on the drill however, and make a mess for the next job. I use plumbers Teflon™ tape instead, since it adheres well without any adhesive and its removal is clean and easy.

Pat Warner
Escondido, California



Try syringes the next time you have lots of nail holes to fill.

REPROS

Walnut/Cherry Headboard

By Richard P. Ornstein, M.D.

The Company Store, a linen supply catalog, featured a beautiful headboard in one of their recent issues that tickled my daughter's fancy. "Make me one just like the picture," she said, "but out of walnut and cherry." The headboard shown here features cherry posts and frames with cherry plywood panels. Glued on the surface of each panel is 1/2" plywood with fancy matched walnut veneer. The edges are outlined with a roman ogee router bit and highlighted with black semigloss paint. My "client" was so pleased with the results that I had to proceed with matching night tables!



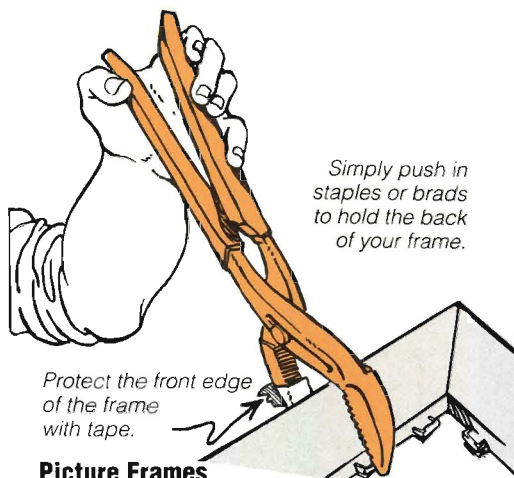
Today's Woodworker pays \$100.00 for all "Repros" published. Send your submission to Today's Woodworker, Box 44, Rogers, MN 55374.

Wood Putty Dispenser

Used syringes can make great dispensers for plastic wood to fill nail holes and cracks.

Snip off the needle holder on a typical hypodermic syringe and enlarge the hole to 1/16". Put putty into the empty chamber and then insert the plunger. You can push out the exact amount you need directly into the crack or nail hole. The wood plastic will remain soft in the syringe for several hours, and usually the plunger will pull out the dried plug if the putty solidifies.

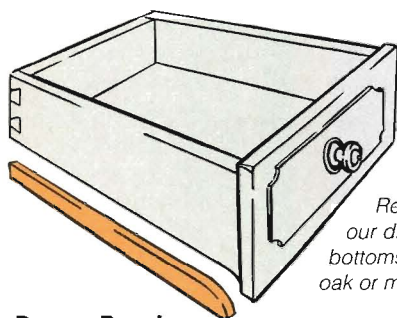
Alice and Robert Tupper
Canton, South Dakota



Picture Frames

A pair of automotive pliers can be used effectively to install brads or staples into picture frames. Be sure to use tape or shims to protect the wood from the plier's teeth.

*Raymond Dobelstein
Concord, North Carolina*



Drawer Repair

Frequently when I repair an old chest of drawers I find that the soft wood used in the drawer sides has worn to the point where drawers "hump" rather than slide into their openings. After repairing this common ailment incorrectly many times, I found an easier way to do it.

Take a strip of hardwood, probably oak or maple, and plane it to the thickness of the drawer sides. Make sure the strip is as long as the drawer side. Now hold this strip up to the worn drawer side and trace the contours of the worn area onto it. Cut the repair piece, staying close to the layout line. File or sand any differences between the strip and the drawer side until you get a good fit. Glue the repair into place, sand the edges and finish or wax as needed.

*Bill Flemming
Beaver Dam, Wisconsin*

Today's Woodworker pays \$30.00 for all Tricks of the Trade published. Send yours to Today's Woodworker, Dept. T/T, Rogers, MN 55374-0044.

CLAMPING MITERED JOINTS

By Bruce Kieffer

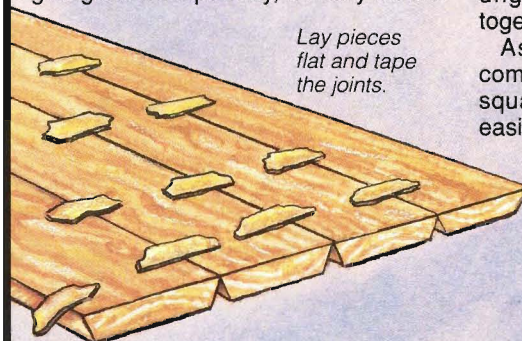
As is the case with any problem, the simpler the solution is, the better it is, as long as the end results are satisfactory. Recently I built six painted plywood pedestal plant stands for a client. The design incorporated a 6" square by 30" long mitered tube as the pedestal, with the top and bottom pieces cut to 12" by 14" and screwed to the ends of the tube.

I started the construction by cutting all the plywood pieces for the tubes and mitering their edges. There I was looking at a pile of 24 pieces of plywood ready to be assembled into six tubes, with no idea of how to do it quickly. So I backtracked a bit and mitered some scrap wood for testing.

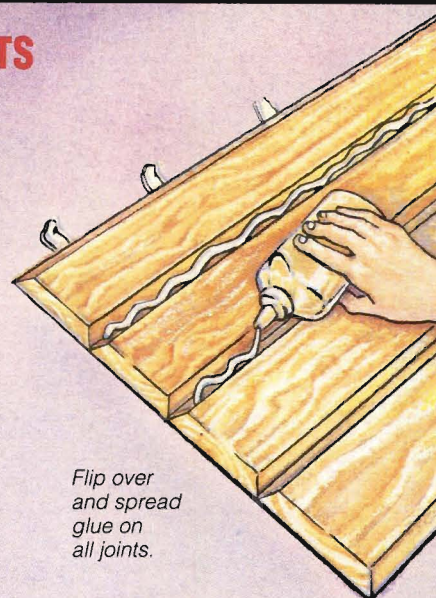
I knew I could clamp them together with band clamps, but I had only enough band clamps to glue one tube at a time. This meant I'd be clamping and unclamping for at least a day, so that idea was eliminated without another thought.

My next thought was to nail the joints together with my nail gun. This seemed like a good idea, but in practice, the joints slid apart from the pressure of the penetrating nails, and nailing the pieces together made tubes that were more diamond shaped than square.

After another failed attempt, this time giving bar clamps a try, it finally hit me.



Masking tape! It was so simple it made me laugh. Here's how it's done. Lay the four plywood pieces edge to edge with their faces up. Then place 5" long pieces of masking tape at 3" to 4" intervals along the three edges being joined, applying adequate pressure to insure good adhesion. Flip the four taped boards over and apply glue to all the mitered edges. Now simply roll the plywood pieces into a tube and apply tape to the remaining untaped joint.



Be sure to remove the masking tape just as soon as the glue has cured, because the longer the tape is on, the harder it is to get off.

I've since used this technique to glue together picture frames, mitered corners of cabinets, and even some hexagon shaped tubes. When my pieces are larger and require more strength from the tape, I use 2" wide packing tape which has more grab.

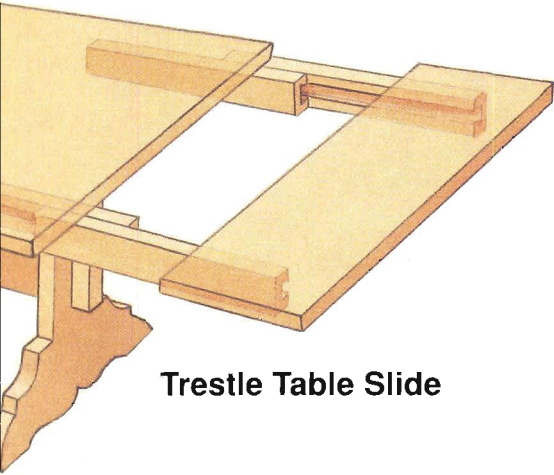
If you plan to use this technique, I suggest you practice with scrap wood. And if you have a larger project requiring a lot of gluing, do a few joints at a time, let the glue cure, open up the unglued joints and then glue them together.

As far as I'm concerned, when it comes to fast, simple, tight joints for square tubes, it just doesn't get any easier than this.

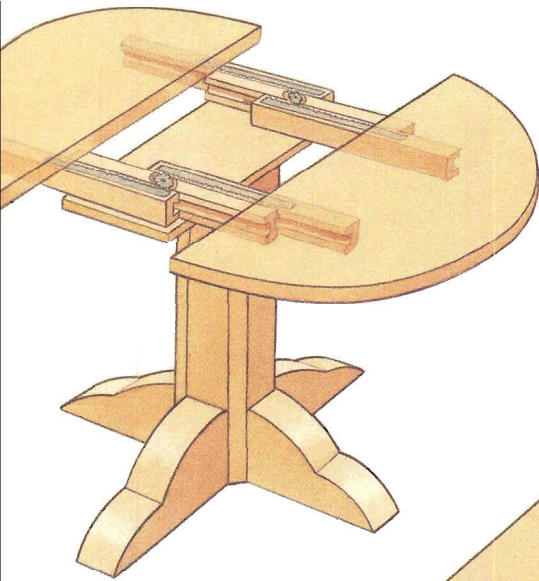


Making Room at the Table

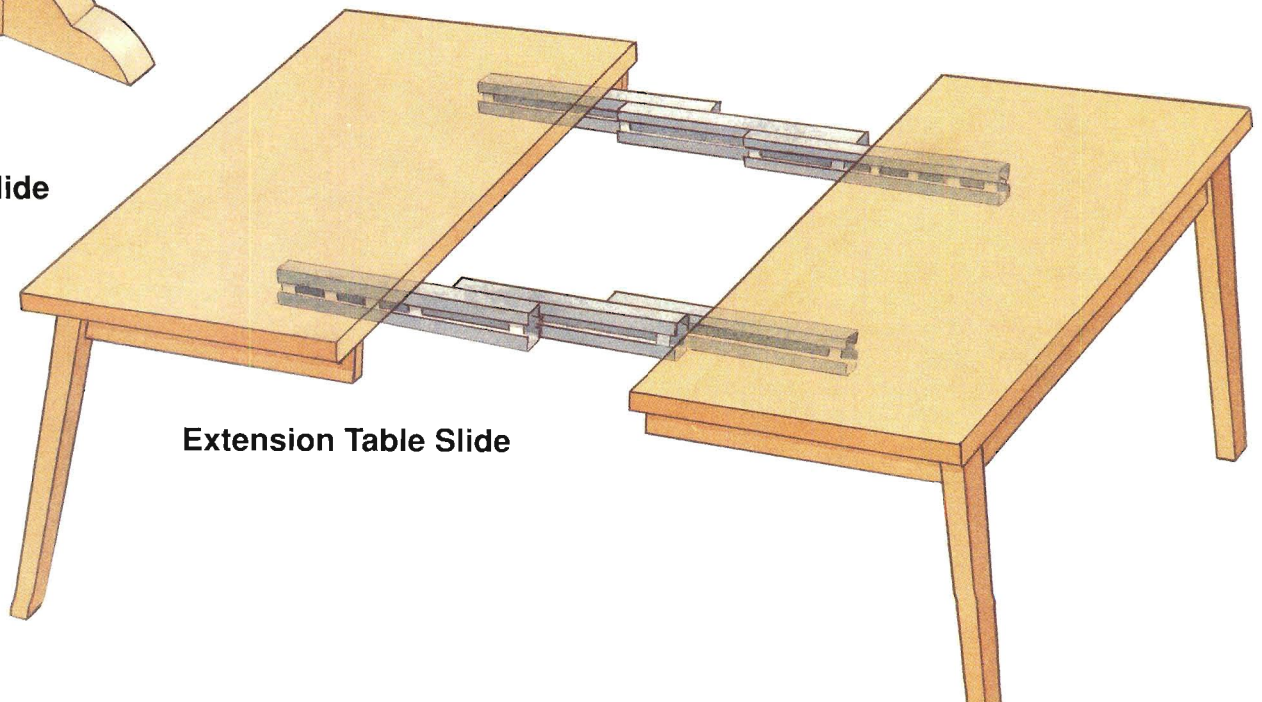
By Spence Cone



Trestle Table Slide



Pedestal Slide



Extension Table Slide

Every household needs at least two tables—one for daily use and another to occasionally seat eight or ten people. Unfortunately, most of us only have room for one, and we have to find a way to make this table work for every situation without filling too much space. The solution to this dilemma is to design a suitable extension table. There's hardware available today to expand virtually any type of table, including trestle, pedestal, drop leaf, flip top, four legged, and more.

With the variety of table shapes and sizes that are possible, the first step is to consider the room's size and shape. If the room is narrow, then a rectangular table makes sense. A trestle table, for instance, fits quite nicely into a long, narrow area. A square room is more suited to a pedestal table, where access is open on all sides. A second design consideration is determining how you will use this table. Do you typically entertain a dozen dinner guests or are you more comfortable with small, intimate gatherings? The answer to this question will help you decide how much expansion capability you need.

If you extend your table only at the holidays, a lighter duty extension will suffice, whereas frequent use of your table at full capacity requires a slide that can handle more weight, greater opening spans, and more abuse. Finally, you should consider if you will have help when opening and closing the table. One person can easily open a pedestal table, but to operate a four legged extension table properly requires one person at each end.

Before you design a table you will also want to know a few basic size and space requirements for comfortable seating. According to Thomas Moser's excellent book *Measured Shop Drawings for American Furniture*, (Dover Publications, New York, NY), the standard height for a table top is 30" above the floor. An apron should not exceed 4" in width, allowing a minimum vertical clearance space of 25" for drawing your chair into the table. Each person sitting at a table needs between 24" and 30" of body space and elbow room. A typical place setting reaches 16" to 18" into the table, and remember to figure in the space needed for serving dishes. For accessibility, a table should have

at least three feet of walking space surrounding it when fully extended.

Begin to draw out your ideas for a table that meets your requirements, but once you know what kind of table you want, stop. Check your sources for supplies to make absolutely certain that the extensions and all related hardware are available. This is important. Too often a design is conceived, the project is built, and the hardware can't be found to complete the job. Buying your hardware before you ever cut a board will save you from frustration and disappointment later on.

Extension Options

Table extension devices are designed for a number of different operations and are made of various materials. Wooden slides offer centuries of tradition behind them. They are quiet and dependable if given an occasional coating of paste wax, and are unobtrusive. However, wood will swell and shrink with seasonal humidity changes, which may affect the smoothness of opening and closing the table. Steel slides are very strong, thus minimizing sag and wear, and will always stay straight and true, regardless of the season. Steel is slightly noisier than wood during its operation, and some woodworkers find steel aesthetically unappealing.

Another choice is between steel channel slides and ball bearing steel slides. The ball bearing slides provide friction free action for easy table operation, and are rigid enough to support moderate gap openings. Since these slides have only two sections they will not carry significant loads without sagging, which is the problem that steel channel slides specifically address. Channel slides have a number of overlapping beams, giving them tremendous strength and the ability to span very large openings. As the opening span increases more beams are added to maintain a very

level table surface. Combining the load capabilities of steel channel slides with their smooth working qualities makes them ideal for heavy duty applications.

The extension slide options discussed above are designed to work with the most common of table designs, the four legged variety. This type of table requires two people to operate it. Pedestal tables, on the other hand, offer the great advantage that one person can conveniently extend the table. One track of a steel ball bearing slide is equipped with a cable, which forces the far side of the table away in direct proportion to the side being pulled. The second slide is a slave to the cable side. A very similar system is available on a wood slide, incorporating a steel gear and a cog to move the table halves together or apart from a single operating position.

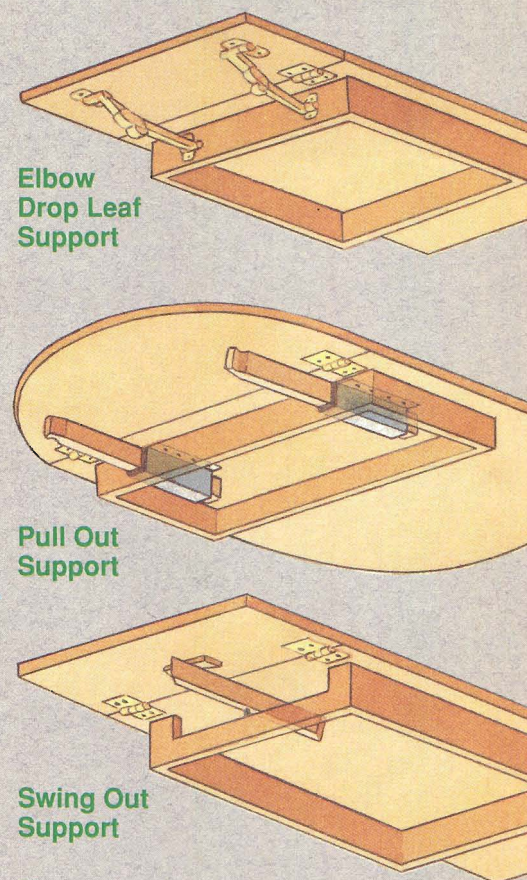
Trestle tables are one of the oldest design styles and are traditionally a fixed length. However, wooden glides can be installed at each end of the table to allow the addition of new sections and small leaves. This slide can be easily adapted to completed tables, whereas other extension systems involve more conversion work.

Drop leaf tables (see box) offer significant advantages over other designs when you're dealing with tight spaces or frequent use.

Once you have resolved your design questions and have decided on the style of table that appeals to your woodworking sensibilities, you will have reduced the options considerably. There really is a slide for most any need, and the versatility that they offer will be appreciated during a candlelight dinner for two or a buffet for two dozen.

Spence Cone, co-owner of Vertex Exhibits in St. Paul, Minnesota is a contributing editor with Today's Woodworker.

THE VERSATILE DROPLEAF



Drop leaf tables combine convenience and easy use with distinct space saving advantages. They fit snugly against a wall or into a corner, and narrow versions can even slip behind a door. Typically, a drop leaf table has two half round leaves that are hinged to the long sides of the rectangular top. Special hinges have been designed with extra wide leaves to offer superior strength across this joint. Two hinge types are available—one for a butt joint and another for a rule joint.

Several different drop leaf supports are available, and various designs can be custom made for a table. The traditional support is a narrow board that slips through a hole in the apron, sliding under the leaf. One or two of these are needed for each leaf, depending on the size. A second variation is a swing out board that becomes part of the apron when it's closed. This board is pinned to the apron at its center and pivots out under the leaf when support is needed. A more modern mechanism is a metal elbow support that braces the leaf weight against the table apron. This support pivots at three points to allow the leaf to drop out of the way when it isn't needed. The principal advantage of the drop leaf table is that the extensions can be raised or lowered many times a day with little inconvenience.

MODERN PEDESTAL TABLE

The author's modern variation on a popular turn of the century design eliminates the lathe and elaborate laminating jigs from the construction process. And when company arrives, two leaves stand ready to make room for everybody.

By T. Martin Daughenbaugh



Shown here set for six, the author's expandable pedestal table easily seats eight. As noted in *Hardware Hints* (see page 6), the slides with this type of table only require one person to operate.

The classic oak pedestal table, so popular with antique collectors these days, presents a couple of challenges that many home woodworking shops are simply not equipped to meet. Cutting a round table top from glued up boards presents no particular problem, but turning an oversized pedestal on the lathe and working with elaborate laminating jigs for the aprons certainly can.

With this in mind, I decided to pursue a modern variation of the pedestal table that eliminates both the turning and laminating. Fortunately, an octag-

onal shape takes care of both problems. Stave construction and spline joinery replaces turning and laminating and brings the project within the reach of many more woodworkers.

You will need to construct a simple router table jig (See box, page 9) for routing the grooves for the splines, but otherwise this is a very straightforward project. With the exception of the top plate (piece 1), all pieces are solid wood. When you're ready to glue up the panel for the top, be sure to refer to the September/October issue of *Today's Woodworker* (See "Gluing Up Panels" on page 5).

Five Easy Pieces

Essentially, there are five major components to this table: the top (pieces 8), the leaves (pieces 9), the apron (pieces 5, 6 and 7), the pedestal (pieces 3) and the legs (pieces 2). The table will be assembled from the bottom up, and as mentioned, the key to success is to build the router jig shown on the next page. You'll need about 13 board feet of 7/4 white oak and another 37 board feet of 3/4" white oak. Remember to add 15% for waste (which you can use to make your splines). Depending on how fast you work, plan to spend about 55 hours on this project and roughly \$375.00 for all the material.

Gluing the Top and Leaves

To assemble the top (pieces 8) you'll need eight 61/4" x 49" pieces of 3/4" oak, four for each half. After checking the quality of the stock, joint the edges and lay all the pieces on the floor, alternating end grain directions while keeping an eye out for grain pattern and color. Now draw a 48" octagon on the boards (See **drawing, page 12**), and mark the edges of the boards for glue dowel placement. You'll need fourteen glue dowels (pieces 16) for each half of the top. Be careful to stay two inches inside the lines of the octagon (See **Figure 1**), and drill your holes, using a doweling jig for accuracy. Don't get carried away and drill holes on the inside piece of each half—remember, this is an extension table. Once all your dowels are in place, use eight clamps to glue each half of the table top together, four on top and four on bottom with equal pressure to allow the two panels to dry up nice and flat.

While you're at it, use the same procedure to glue up the two 12" leaves (pieces 9), each consisting of three 41/8" wide pieces. Use ten glue dowels for each leaf.

Prior to the turn of the century, a likely place to find a pedestal table would have been in the parlor—not the dining room. Finished on all sides, these pieces were often the focal point of the room and, not surprisingly, were called center tables.

By the start of the 20th century, the form found its way into the dining room, often featuring a round expandable top, cylindrical pedestal and shaped legs.

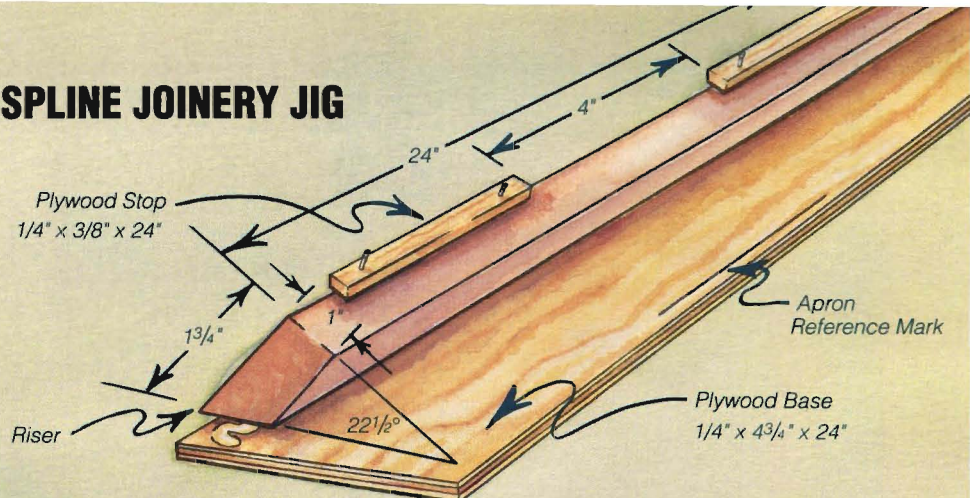


Making the Aprons

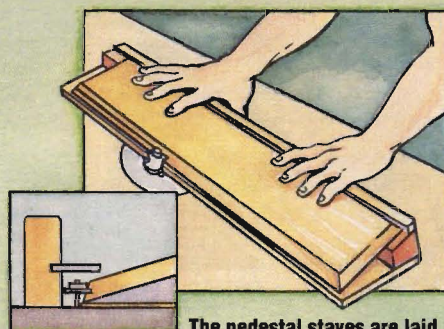
There's three different lengths used for the table aprons (pieces 5, 6 and 7), but all should be machined to four inches wide to start with. Once that's done, set your saw blade to $22\frac{1}{2}$ degrees. Measuring from the toes (See Figure 2), cut both ends of the six full size aprons (pieces 5) to $19\frac{1}{2}$ " in length. Now cut one end of each of the four split aprons (pieces 6) at the same angle and trim the other end square to a length of $9\frac{3}{4}$ ". Finally, cut the four leaf aprons (square) to 12" in length.

Now that all your aprons are cut to the exact length and width, you're ready to use your router jig to cut the $\frac{1}{4}$ " wide grooves for the splines on the mitered edges. Cut the grooves $\frac{5}{16}$ " deep to allow for glue relief. The $\frac{1}{2}$ " splines used in this project, for both the pedestal and the apron, were made from waste stock. (NOTE: Make sure that the grain of the spline pieces is parallel with the grain of the pieces into which they will be glued.) After your spline grooves are cut you'll need to cut another $\frac{1}{8}$ "

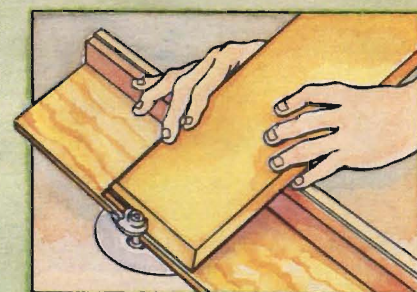
SPLINE JOINERY JIG



After cutting the three pieces (riser, base and stop) that make up this jig, glue the freshly beveled edge of the riser to the back of the plywood base. Clamp and let dry. Then tack the plywood stop to the back edge of the riser and cut out a 4" space close to the middle.



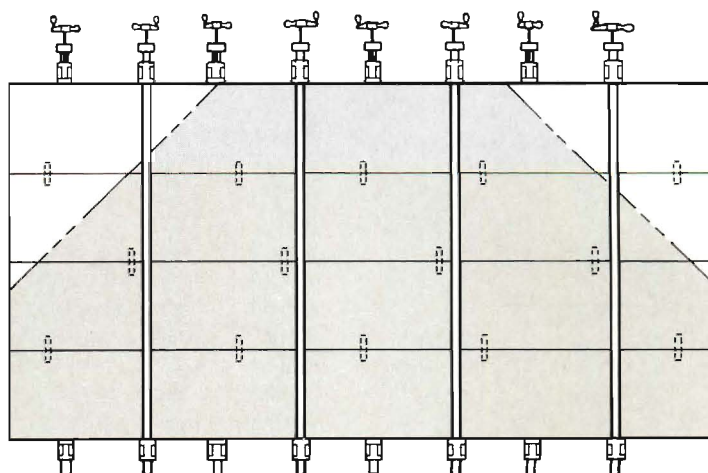
The pedestal staves are laid on the jig lengthwise and held against the stop while cutting. Sandpaper can be glued on the top of the riser to prevent slippage, and a guard (left) should be used for safety.



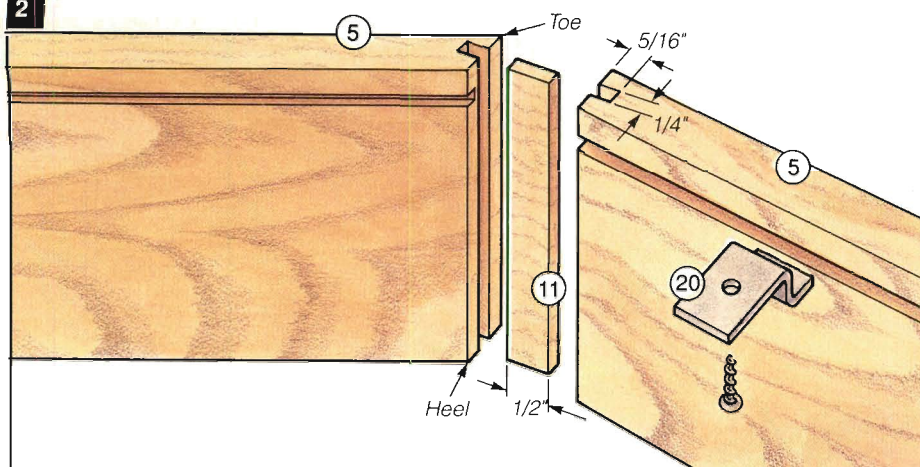
The apron sections are laid in the jig through the 4" gap in the stop. Draw a line on the base piece $\frac{1}{32}$ " from the front of the base as a reference for positioning and hold firmly while cutting.

The spline grooves on the apron sections and pedestal staves are cut on the router table with a $\frac{1}{4}$ " slot cutting bit on a $\frac{1}{4}$ " arbor. Use the dimensions shown above to build your jig, making sure that the bevel on the piece of hardwood is exactly $22\frac{1}{2}$ °. Once the jig is assembled, it's a simple matter of laying each pedestal stave lengthwise in the jig and holding firmly while routing the grooves. The apron sections are a little trickier, but should present no problem if you use the reference mark and hold each section firmly while you route. During this router operation I used a guard on my router table fence to shield the bit and prevent injury.

1



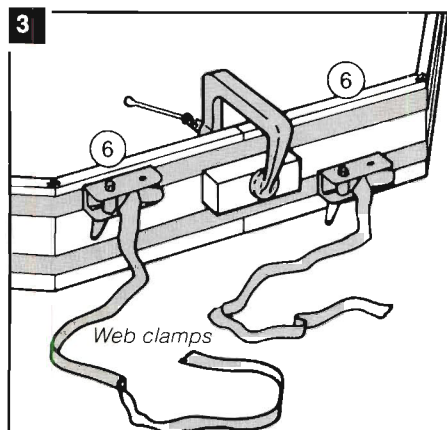
After marking the top with a pencil, use a doweling jig to make your dowel holes. Be sure to stay two inches from the octagon's edges. Glue and clamp—alternating the eight clamps.



The six full length apron pieces (19 1/2" from toe to toe) get a groove at each end. The split aprons are only grooved at the beveled ends, while the leaf aprons require no grooves. Only the full length aprons require the 1/8" kerf cut for the tabletop fasteners.

groove, (a saw kerf width will usually do the trick) 1/2" from the top edge of the six full size aprons (pieces 5). Make the groove the full length and a 1/4" deep on the inside of these pieces, as shown in **figure 2**. These grooves will be used when attaching the apron to the top with the table top fasteners (pieces 20).

That takes care of the machining, now it's time to glue the apron up. You'll need to start with two C-clamps and four small pieces of scrap wood to hold the four split aprons (pieces 6) together, as shown in **Figure 3**. Once that's taken care of, insert your splines and use two web clamps to pull all the joints tight and check for fit. If everything is satisfactory, remove the web clamps, make sure the 1/8" grooves for the table top fasteners are positioned correctly and apply your glue. I used G-2 epoxy, manufactured by Industrial Formulators of Canada, Ltd. for both the



Two C clamps are used to keep the split aprons lined up while gluing and clamping the apron together.

apron and pedestal. This epoxy takes 24 hours to dry so before it starts to cure be sure to measure from point to point and make any necessary minor adjustments to get a true octagon.

Assembling the Pedestal

The assembly of the pedestal is actually quite similar to the apron. You'll use the same jig and the same gluing technique. Start by making sure that the pedestal sections (pieces 3) are cut to their exact length. Now set the saw blade to 22 1/2 degrees and rip a miter on both edges. Each piece should measure 4" at the toe. Following the instructions on page 9 (See Box), use the router jig to cut the grooves for the splines. Insert the pedestal splines (pieces 10) and dry clamp the pedestal together with five web clamps. If the fit is satisfactory, glue the pedestal together and let it dry for 24 hours. Make sure all eight sections stand level, since there will be no final trimming on this sub-assembly — 23 5/8" is the final length.

Making the Legs

The eight pieces that make up the legs (pieces 2) are cut from pretty thick stock. When gluing up the two pieces for each leg you'll want to be sure to use as many clamps as you can fit. It takes a lot of pressure to get a good bond on pieces this size. Before gluing, however, start out by planing one face of each board flat to provide a good glue surface. Glue

two pieces face to face and let the four legs dry for at least 24 hours. After the clamps are removed, scrape off the glue squeeze-out and joint one edge on all four legs. Next, trim one end square with that jointed edge. Now transfer the pattern shown in the elevation drawings (page 12) and carefully cut out the legs on a band-saw. Flatten out any rough spots with a file or card scraper and sand smooth.

To attach the legs to the pedestal, measure up 2 inches and 5 inches on center from the bottom of each leg (See Elevation Drawings). Mark these spots with a center punch and drill 1/2" holes 1 1/2" deep at the 5" marks and 1/4" holes 1 1/4" deep at the 2" marks. Cut four 2" pieces of 1/2" dowel (pieces 12) and glue them into the 1/2" holes on the four legs. These leg pins are used for locating purposes. Now screw four 5/16" hanger bolts (pieces 23) into the 1/4" holes, using a little wax, two 5/16" nuts and a socket wrench. That completes the legs, which can be laid aside for now.

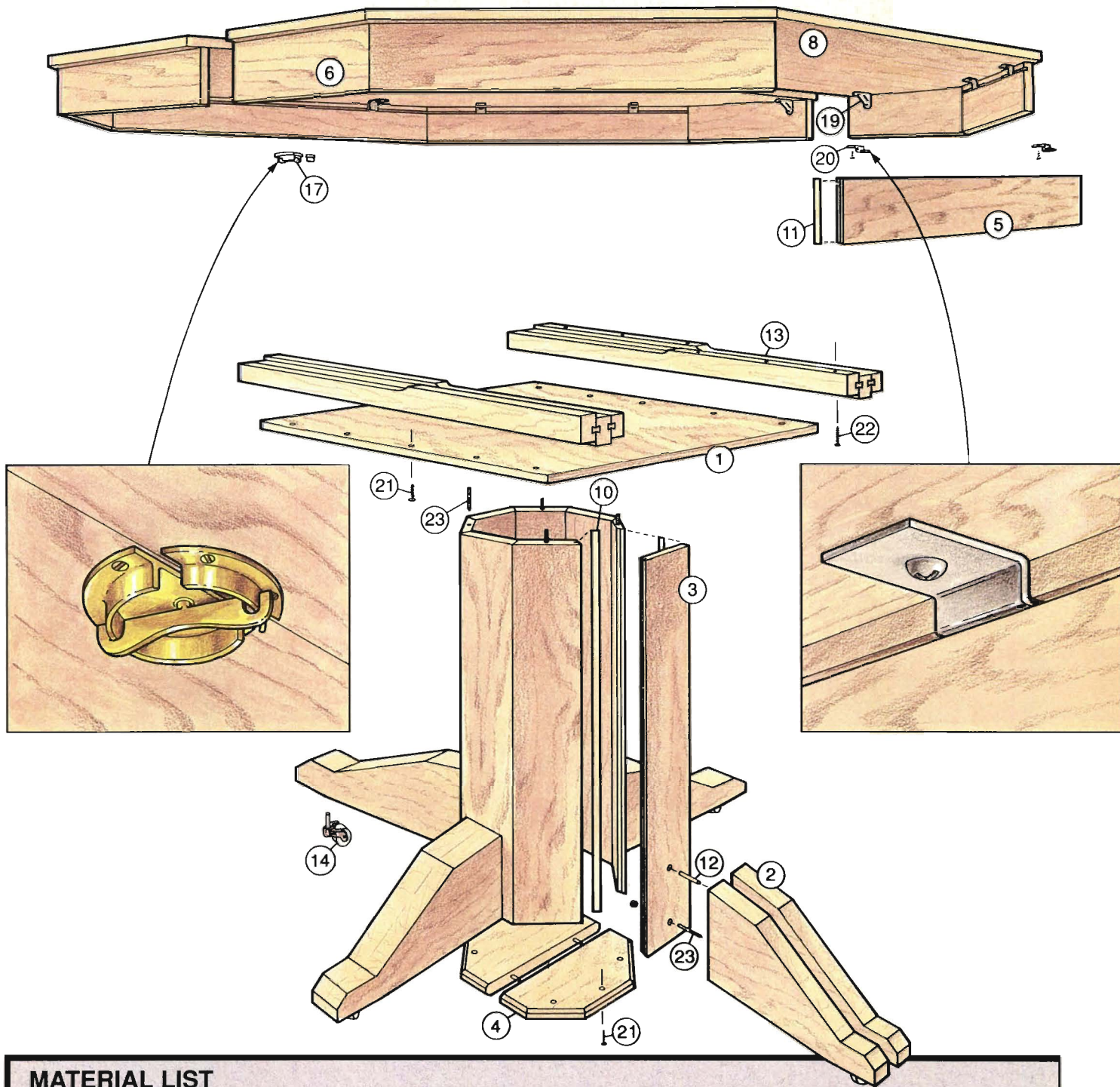
Bottom Cap

The bottom cap (pieces 4) mirrors the table top, except it only requires two pieces to be glued up, with two glue dowels. Once this piece is dry, sand and cut out your 10 1/2" octagon, as shown in the elevation drawings on page 12. Finally, use a piloted chamfer router bit on both the top and bottom of this piece.

Final Assembly

Now that your five major components are together, it's time to move into the final assembly stage. First, however, you'll want to sand the glued up panels and pedestal. As mentioned, this table is assembled from the bottom up. Get started by measuring up two inches and five inches on center from the bottom edge of every other pedestal stave. Drill a 3/8" hole at the two inch mark and a 1/2" hole at the five inch mark. With the pedestal assembly upside down, carefully attach the four legs, using 5/16" washers and nuts (pieces 24 and 25). Screw the bottom plate on, using eight screws (pieces 21). To complete

The materials in this project are available from: Garrett Wade, Dept. TW, Classic Hardware III, 161 Avenue of the Americas, New York, NY 10013; or The Woodworkers' Store, Dept. TW, 21801 Industrial Blvd., Rogers, MN 55374.



MATERIAL LIST

PLYWOOD/HARDWOOD

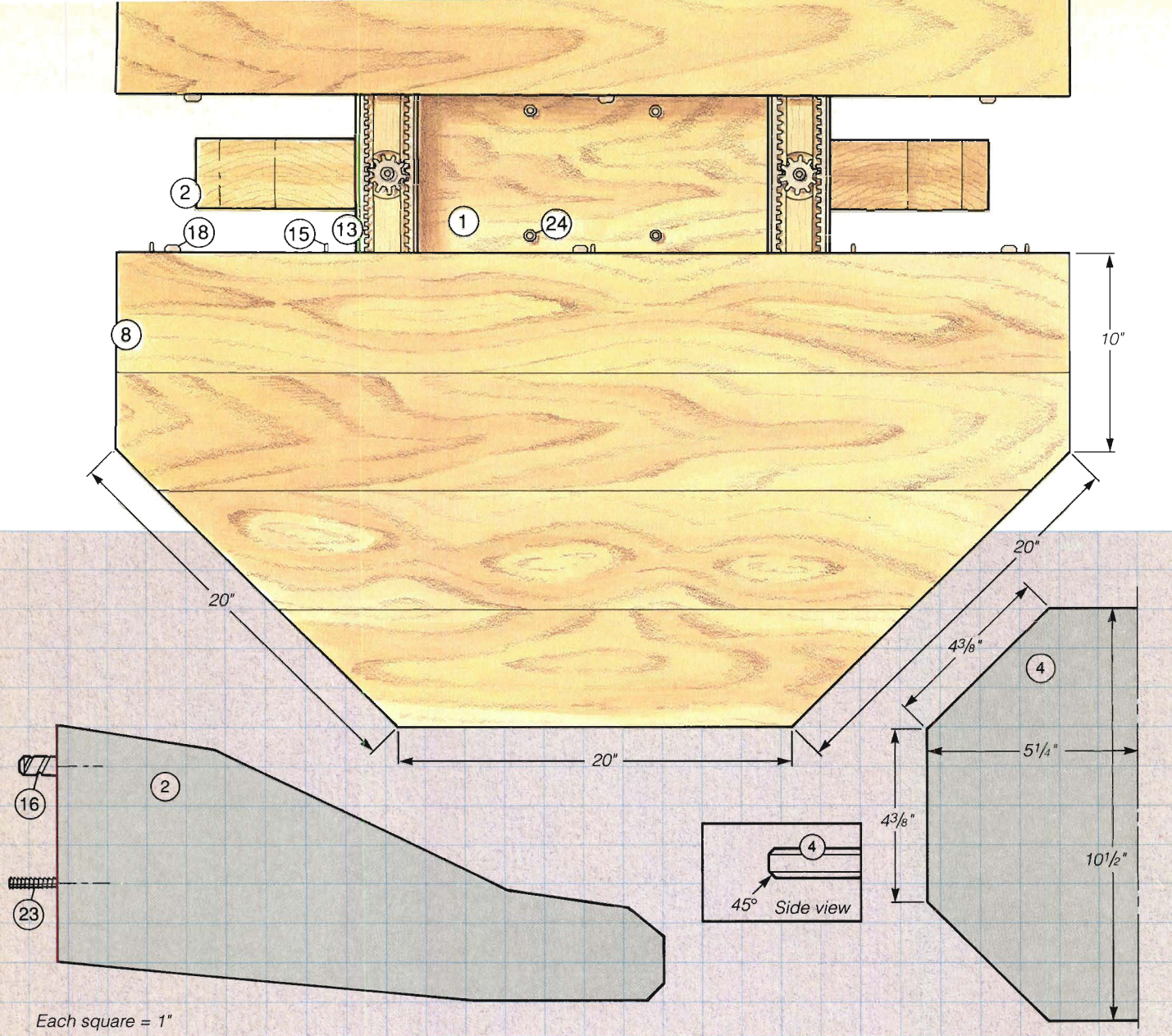
T x W x L

1	Top Plate (1)	3/4" x 24" x 24" (Oak Plywood)
2	Legs (8)	1 3/4" x 7 1/4" x 15 1/4" (Oak)
3	Pedestal (8)	* 3/4" x 5" x 23 5/8" (Oak)
4	End Cap (Bottom) (2)	3/4" x 5 1/4" x 10 1/2" (Oak)
5	Full Size Aprons (6)	3/4" x 4" x 19 1/2" (Oak)
6	Split Aprons (4)	3/4" x 4" x 9 3/4" (Oak)
7	Leaf Aprons (4)	3/4" x 4" x 12" (Oak)
8	Table Top (8)	* 3/4" x 6 1/4" x 49" (Oak)
9	Leaves (6)	* 3/4" x 4 1/8" x 49" (Oak)
10	Pedestal Splines (8)	1/4" x 5/8" x 23 5/8" (Oak)
11	Apron Splines (8)	1/4" x 19/32" x 4" (Oak)
12	Leg Pins (4)	1/2" x 2" (Dowel)

HARDWARE

13	Table Slides (Set)	28" Wood Equalizer
14	Casters (4)	1 1/8" dia. x 1/2" w (Porcelain)
15	Table Pins (15)	3/8" x 7/16" (Brass)
16	Glue Dowels (50)	3/8" x 1 1/2" (Hardwood)
17	Table Locks (2)	2" dia. (Brass Cam.)
18	Leaf Levelers (9)	3/4" w x 13/4" L (Steel)
19	Corner Brace (16)	1 3/8" x 1 3/8" (Steel)
20	Table Top Fasteners (12)	(Steel)
21	Screws (18)	2" x #10 (Flathead)
22	Screws (12)	1 1/2" x #8 (Panhead)
23	Hanger Bolts (8)	5/16"-#18 x 2 1/2"
24	Nuts (8)	5/16" - #18
25	Washers (8)	5/16"

*The width on these pieces allows for waste during the jointing process.



the bottom part of the assembly drill 1/4" holes 2 1/4" on center from the end of each leg. Insert the porcelain casters (pieces 17) to check for fit. Remove them for the rest of the assembly.

Turn the pedestal over to its feet. and drill a 1/4" hole in the top of every other stave, on center. Now place 1/4" dowel centers into these four holes. Place the top plate (piece 1) on top and carefully center it over the top of the pedestal. Once it's positioned perfectly, give it a good rap with a hammer so the dowels leave center marks on the bottom of the plywood. Before taking this piece off, make a reference mark on the pedestal and top plate so it's easy to realign the two pieces later. Find the dowel marks on the bottom of the plate and drill 3/8" holes through the

plywood. Now remove the dowel centers from the top of the pedestal and wax and insert the remaining 5/16" hanger bolts.

Before cutting the octagon shape on the top, it's a good idea to insert the table pins along the three edges—between the two halves of the table and between the two leaves themselves. This will keep everything lined up when making the final cuts. Lay out the table top with the two leaves in position between the two halves. Carefully mark five lines across the three where the pieces meet, making sure the lines are straight and square. I recommend starting with the center line and moving out in eight inch increments. Now use a doweling jig and drill your 3/8" matching holes for the table pins (pieces 15), and lightly tap both

halves into place.

Remove the leaves, flip the two table top pieces over and carefully center your two apron pieces on the bottom, making sure the 1/8" grooves for the table top fasteners are correctly positioned. Align the split apron sections (pieces 6) with the split of the table top and install four corner braces (pieces 19) one inch from each split. Next attach the table top fasteners (pieces 20) using the 1/8" groove you made earlier and the table locks (pieces 17) following the manufacturer's instructions.

You're just about ready for final assembly, but there's one more critical piece of hardware to install. The pedestal slides (pieces 13) must be attached to the table top exactly 24" apart, measuring from the outsides of the slides. In other words, the outside

edge of each slide is 12" from the center of the table. Secure the slides with twelve panhead screws (pieces 22). Now attach the top plate (piece 1) to the slides, making sure that the reference marks you made earlier run parallel with the slides. Use flathead screws (pieces 24) to secure the plate to the stationary beams of the slides.

Flip the table top right side up, spread the two halves apart and line up the 3/8" holes you drilled in the plate earlier with the four hanger bolts protruding from the pedestal. Use four washers and four nuts (pieces 24 and 25) to hold the top in place and use a saber saw to cut the octagon shape out of the square top, leaving an 1/8" for final trimming.

To trim the top, clamp a piece of 1/2" hardwood scrap, 4" wide by 22" long to one of the aprons. Using a router and flush trim bit, trim the top to final size, moving the scrap piece as you work your way around the top. Add one leaf, using the pins to line them up with the top and repeat the trimming procedure. The scrap piece is long enough to bridge the gap between the split aprons. After trimming to final size, attach the leaf aprons to the leaves with corner braces, three on each side. Finally, place three leaf levelers (pieces 18) on each half of the table (make sure they don't line up) and three more on one leaf.

Conclusion

Now, that the table is assembled, do a final sanding through 120 grit. I used four coats of polyurethane to finish, spraying the last coat. After drying for a couple of days, put on a light coat of paste wax. Remember, with polyurethane it takes four to six weeks for the finish to totally harden. During this time the finish can be nicked or dented very easily.

In retrospect, there's only two things I would do differently if I made this table again. First, I would stick with wood table pins instead of the brass pins. The brass pins do not allow any room for error. Second, a true period reproduction of this table would have called for quarter sawn white oak for its dramatic beauty and stability.

T. Martin Daughenbaugh is a professional woodworker in Minneapolis, Minnesota.

A SIMPLE SALAD SERVER

By Mary Redig



You've suddenly remembered you need one more gift, your budget has burst its seams, and you have two days left to get something in the mail. Here's the perfect solution. In one evening you can create this unique and useful utensil that will brighten anyone's holiday.

Selection, Cutting and Sanding

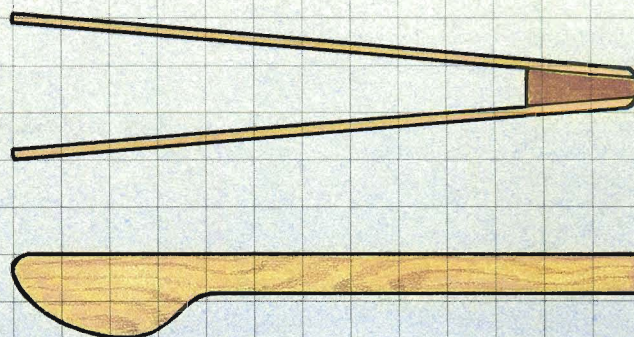
First, decide on the type of wood you would like for the tongs and then pick a contrasting piece of wood for the wedge. Fine grain woods work best. Buy 1/8" thick wood or plane your stock down to 1/8" thickness. Transfer the template (below) and cut out the tongs and the wedge on a bandsaw or jig-saw. Use a small piece of double-sided tape to hold the tong pieces together at each end while sanding to make sure the pieces match. Round the edges just slightly so they are not sharp. Next, sand the

wedge to shape, leaving the back square. Judge the length of the wedge by the piece of wood available—a little longer or shorter does not matter.

Gluing and Finishing

Before gluing, make sure all sanding dust is removed from the wood pieces. You can use a wood glue or a fast drying glue (five minute epoxy). If a wood glue is used, you might want to cut two more wedges out of scrap wood to be used as clamping pads. If a fast drying glue is used, just hold everything together for a few minutes until the epoxy sets. After letting it dry overnight, sand the back round. Finish the tongs with mineral oil or a salad bowl finish and your gift is ready for the mail!

Mary Redig is the president of the Minnesota Woodturners Association.



Each square = 1"

LONESOME DOVETAIL

This is one rocking horse kids will have a tough time “breaking.” Sliding dovetail joinery will keep Lonesome Dovetail steady on her feet long after the children have moved on to less imaginative modes of transportation.

By Rick White

How many toys can you think of that have really stood the test of time? In this fast paced age of electronic gizmos it sometimes seems that anything over a year old is outdated. Generation after generation of children, however, have thrilled to the ride of the rocking horse, a standard since the 17th century, when the first crude British originals were made. And it's little wonder. What other toy offers children a ride through the forests of Nottingham, a gallop across the plains of the wild west or a chance to show off before the cheering crowds of the Big Top?

If ever there was a project calling for sturdy, durable joinery, this is it. Kids will knock it down, turn it over, double-up on the saddle and gallop for hours on end. Five minutes later they'll be back, expecting a fresh mount with steady legs.

With that in mind, I designed Lonesome Dovetail for the long ride. Sliding dovetail and lap joints are used at all the major stress points, and the whole project requires only three screws—two to hold the tail in place and one for extra support on the head. Walnut and maple were selected for strength and to give the rocking horse a little more personality.

Expect to spend the better part of two weekends on this project and \$40 to \$50 for the ten board feet of maple and three board feet of walnut. It's not absolutely necessary, but a router



Ride'um cowgirl! For years, little boys and girls have been fascinated by the rocking horse. This one features interlocking joinery that will stand the test of time.

table certainly will make the machining go a lot easier on this project.

Start With The Templates

If you're like me, you'll probably end up making more than one of these rocking horses, so the first step is to transfer the scale drawings on the next page onto 1/4" hardboard templates. Be sure to double check all your measurements, because a good pattern transfer is one of the real keys to success with this project. After you've cut your templates to size, spend a little extra time sanding them so all the curves are nice and smooth. Once you're satisfied, trace their outlines onto your stock and transfer all the joint positions. At this

stage you would normally cut out your shapes, but in this case that will have to wait for a while. You'll find that cutting the joints for this project is a lot easier to do while the pieces are still square.

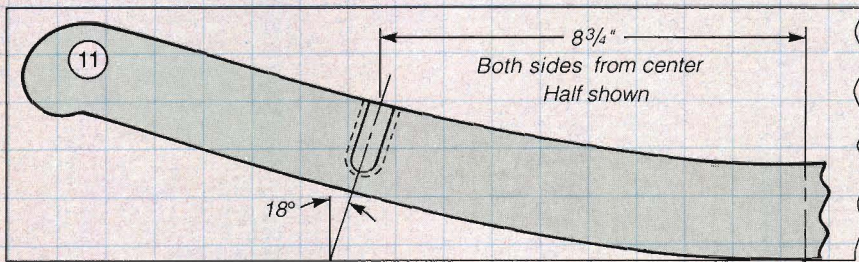
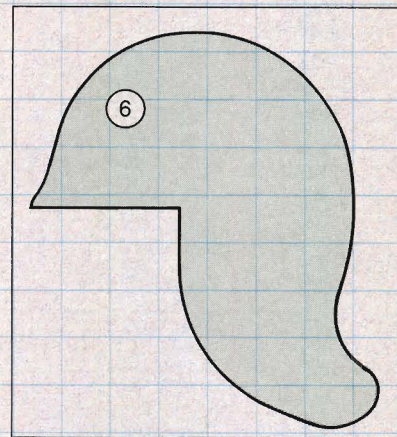
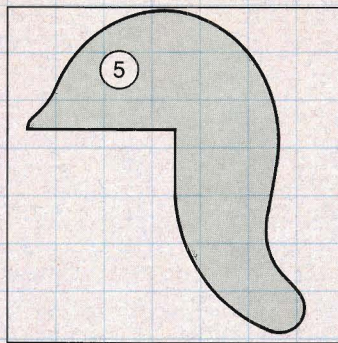
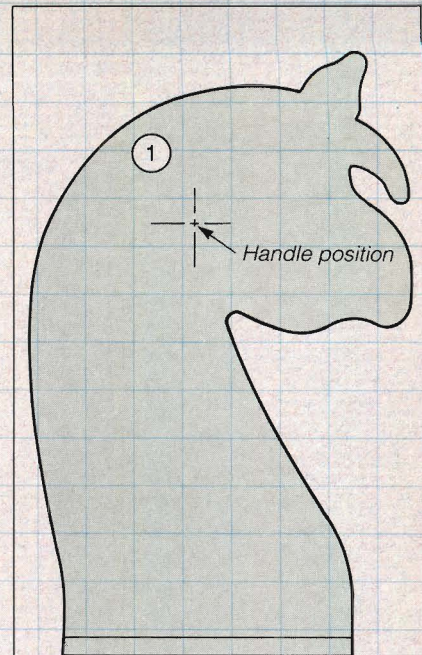
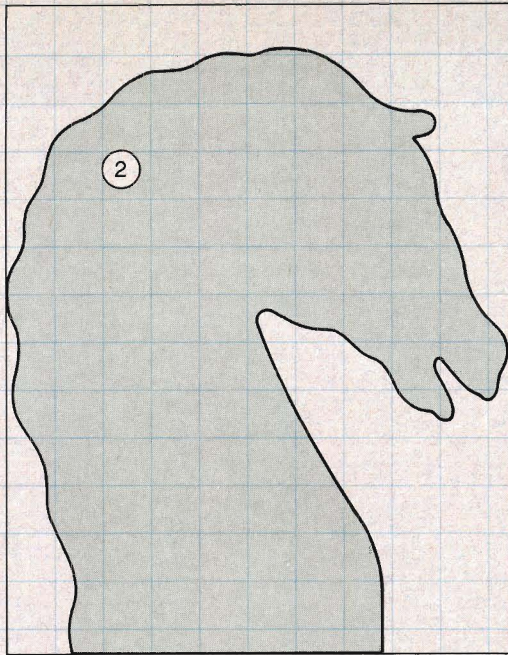
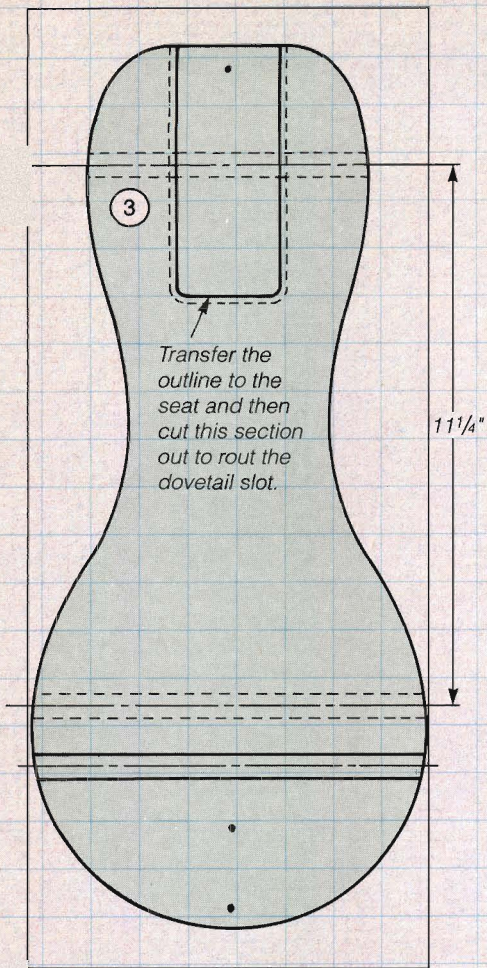
Before moving on to the joinery, take the legs (pieces 7 and 8), the saddle (piece 4) and the chest (piece 9) to the table saw for some preliminary cutting. First, set the miter gauge to 18° and cut the chest to length, as shown on the next page. Now, adjust the blade to cut 18° bevels and cut the tops of the legs and the bottom of the saddle.

Cut Your Tails

The dovetails for this project are intentionally left very large to create strong joints. As a result, cutting the dovetail slots will require two passes

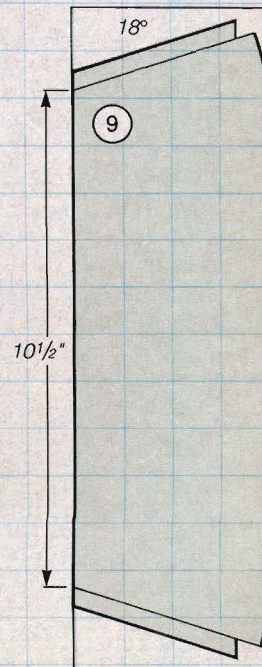
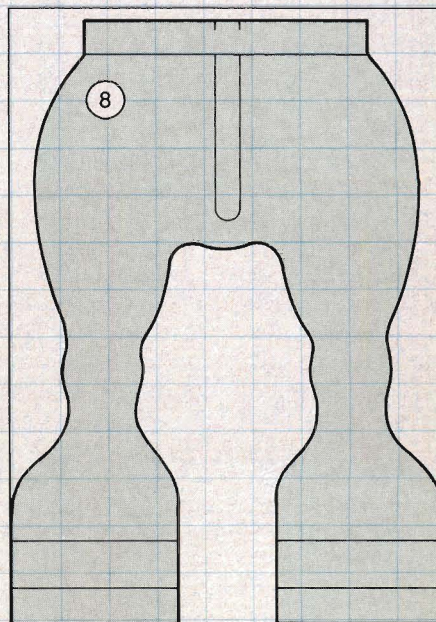
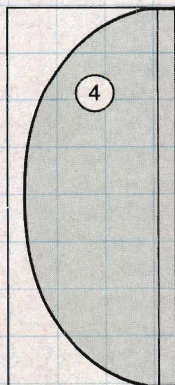
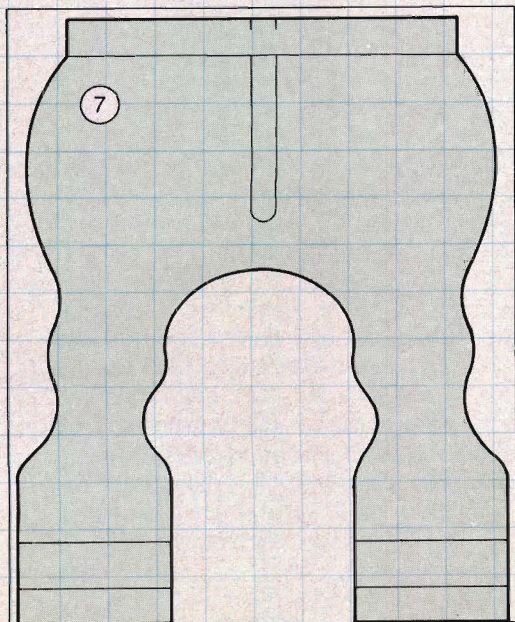
with the router to provide the extra width for the “fat” tails.

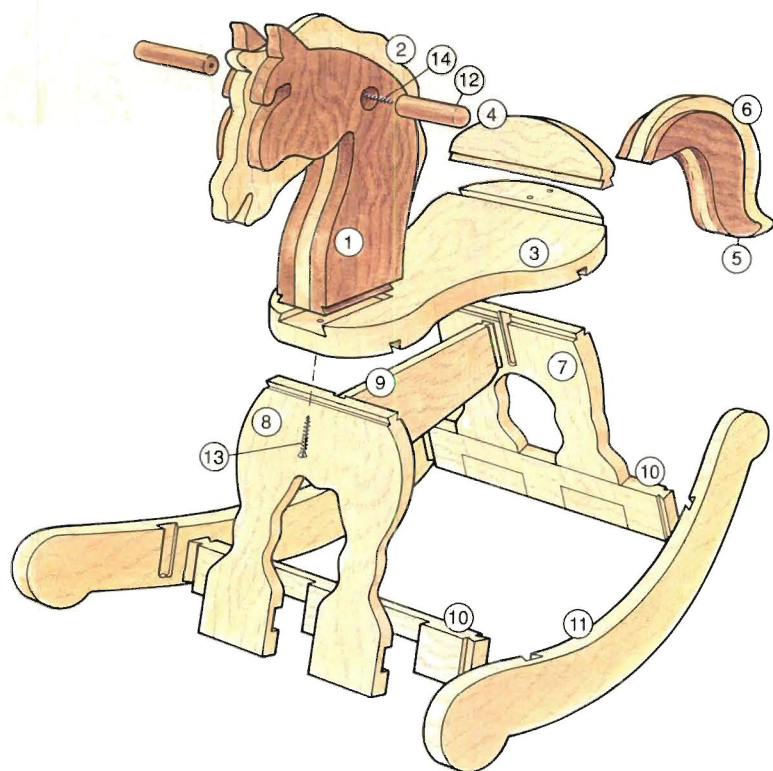
Start out by chucking a standard 1/2" dovetail bit into your router table. Set the height at 3/8" and straddle the fence over the bit so that a little less than half of the bit is exposed on the cutting side. Now cut half a tail on the outside of both outside heads (pieces 1). These two pieces will later be glued together (with the inside head in the middle) to form a full dovetail. Next cut the tails on both ends of the stretchers (pieces 10) and the chest (piece 9), taking two passes on each end. There's only three more tails to cut, but you'll require a little jig for these. Since the tops of the legs and the bot-



Each square = 1"

Stretcher not shown;
see figure 5.





MATERIAL LIST

T x W x L

1	Head (Outside) (2)	3/4" x 8 1/2" x 13" (Walnut)
2	Head (Inside) (1)	3/4" x 10 1/2" x 13" (Maple)
3	Seat (1)	5/4" x 8 1/4" x 20" (Maple)
4	Saddle (1)	3/4" x 3 1/2" x 8" (Maple)
5	Tail (Outside) (2)	1/2" x 7" x 7" (Walnut)
6	Tail (Inside) (1)	3/4" x 8" x 9" (Maple)
7	Back Legs (1)	3/4" x 10 1/2" x 13" (Maple)
8	Front Legs (1)	3/4" x 9" x 13" (Maple)
9	Chest (1)	3/4" x 4" x 14" (Maple)
10	Stretchers (2)	3/4" x 1 3/4" x 12 3/4" (Maple)
11	Rockers (2)	3/4" x 5 1/4" x 33" (Maple)
12	Handle (2)	3/4" Dowel x 3 1/2" (Walnut)
13	Screws (3)	2 1/2" x #8 (Flat-head)
14	Iron Dowel Screw (1)	5/16" x 2"

The materials in this project are available from: The Woodworkers' Store, Dept. TW, 21801 Industrial Blvd., Rogers, MN 55374; or Bob Morgan Woodworking, Dept. TW, 1123 Bardstown Rd., Louisville, KY 40204

tom of the saddle are beveled to 18°, you'll have to angle these pieces as you cut their tails (See Figure 1). The key is to keep the beveled ends flat on the table as you make the cuts.

Cut Your Dovetail Slots

Now that the tails are cut, it's time to move on to the dovetail slots. Start with the seat (piece 3), and cut the dovetail slot on the top for the saddle (piece 4). Now flip the seat over and cut two more slots for the legs (pieces 7 and 8). These are through cuts, so you'll only require a good fence and a straight 3/16" spacer to make the cuts, (See Figure 2). Clamp the spacer to the fence and run the seat through for the first half of the three dovetail slots. Remove the spacer and make your second pass with the end of the seat right against the fence. While you're at the router table, cut the two stopped dovetail slots into the two legs (pieces 7 and 8). Since Lonesome Dovetail's chest is 4" deep, use a stop on the router table so your cut is only 3 1/2" long, as shown in figure 2. Use your spacer as you did earlier to cut the two sides of these slots. Later, when the tails on the chest are inserted, you'll use a dovetail saw and chisel to nip off the ends of the dovetail for a perfect fit.

Now clamp your seat template onto the seat to cut the large slot for the head's "fat" dovetail (See Figure 3).

Remove the router from the router table and use a straight bit with a rub collar to eliminate most of the wood. A dovetail bit with the rub collar will finish the cut, using the hardboard as a guide.

With the router out of the table, cut the four stopped dovetail slots on the rockers. Here you'll need a straight hardboard fence, since the cuts are not square to the edge of the stock. Clamp one of the rockers to your work surface and then clamp the hardboard fence to the rocker (the appropriate distance away from your joint line), along with a spacer. You'll also have to install a stop block so you only cut an 1 1/4" into the rocker (See Figure 4). Cut one half of the slot, then remove the spacer to cut the other half. Repeat this procedure for the other three slots.

Cutting the Lap Joints

Believe it or not, you're through the tough part already. For extra strength, the legs are attached to the stretchers with lap joints. Install a dado blade in the tablesaw and cut a 1" wide by 3/8" deep dado on the inside surface of both legs, 3/4" from the bottom. Now move to the bandsaw and cut the legs to their final shape. To make the two dado cuts on the stretchers (pieces 10), I recommend using the legs themselves for establishing position. Center them on

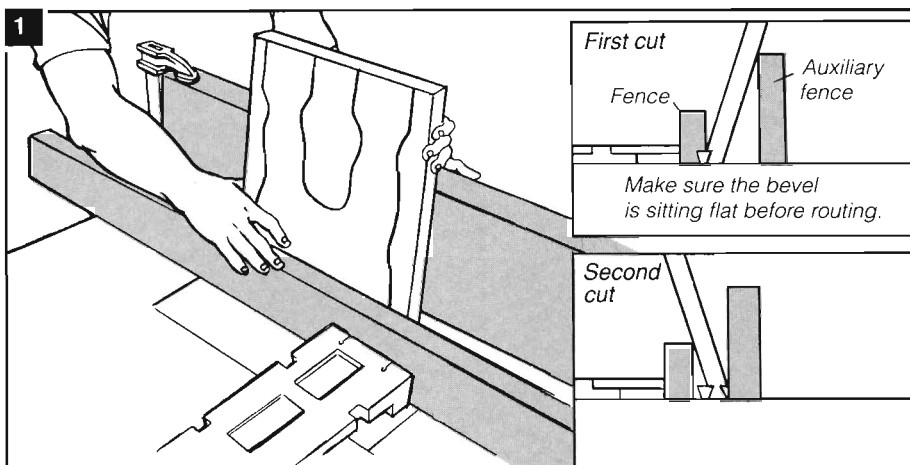
their respective stretchers and mark the width for you dado cuts. Now cut a 3/8" deep dado on the surface of the stretchers, reset the blade to 3/4" depth, and cut the second dado on the edge, as shown in Figure 5.

Assembly

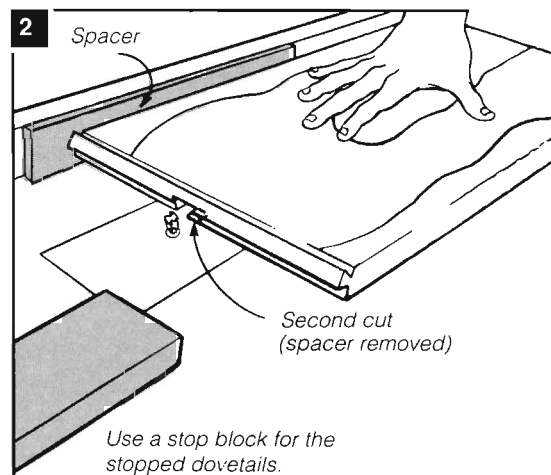
Once you have a nice tight fit with the legs and stretcher, it's time to move to the bandsaw and cut everything to final shape. Sand to your lines and chuck a 3/16" roundover bit into the router. Round over the legs and stretcher while they're still dry fitted, move to the rockers, the bottom of the chest, both sides of the seat and saddle and the outside edges of the tail (pieces 5) and head (piece 1).

Be sure you don't roundover the inside head (piece 2) or the inside tail (piece 6). This will be softened with sandpaper on final assembly.

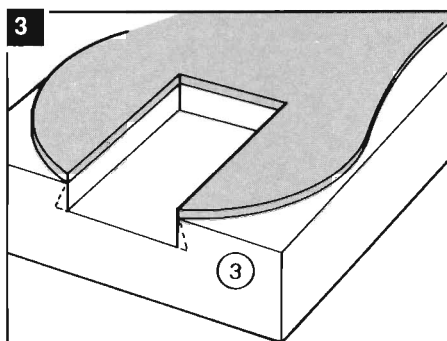
Now dry fit all your pieces together, sanding and filing your joints as necessary. You'll notice right away that the top of the chest piece will not drop flush to the top of the legs. Remember that on the stopped dovetails the slots were made shorter than the piece which fits into them. To find out just how short, it's a simple question of measuring the exposed part of the dovetail and removing that exact amount from the other end. Follow this same procedure to nip off the ends of the stretcher dovetails where



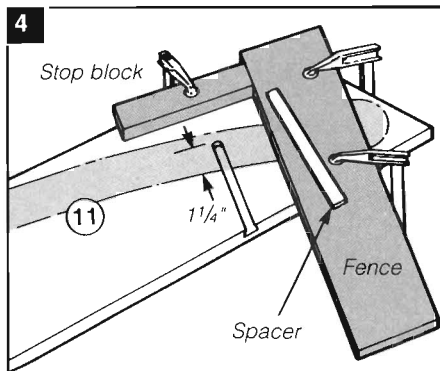
To cut the dovetails in the beveled tops of the legs and bottom of the saddle, lightly clamp a 2 x 8 auxiliary fence on the router table and move it in slowly until the beveled end sits flush on the table. Tighten the clamps and rout the first half with the pieces leaning against the auxiliary fence. To cut the other half of the dovetail, move the auxiliary fence in and use your permanent fence to lean your piece on, as shown above. The key is that the beveled ends be flat on the table while cutting.



For the dovetail slots, use scrap wood to make a 3/16" wide spacer. With the spacer clamped to the fence, cut the first half of the groove. Remove the spacer and cut the second half.



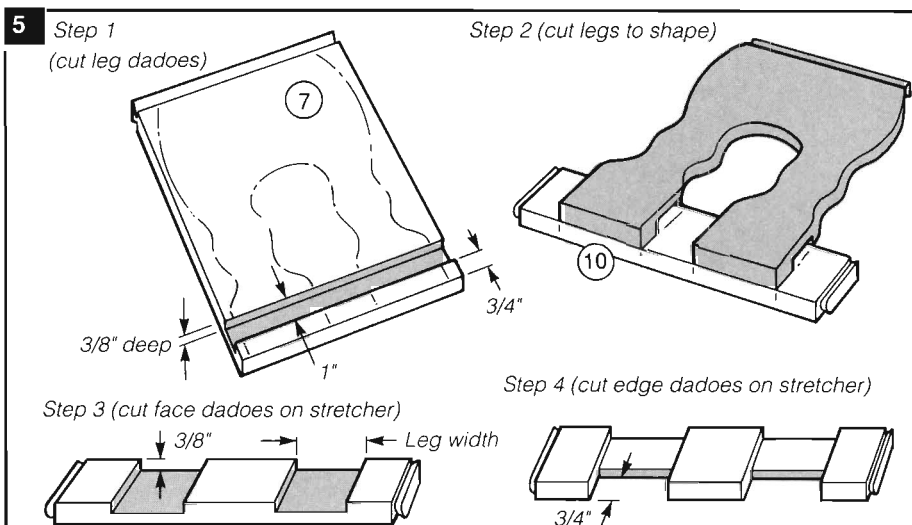
The seat template is clamped to the seat while cutting the slot for the head's "fat" dovetail. A straight bit with a rub collar eliminates most of the wood and a dovetail bit is used to finish the cut.



The stopped dovetail grooves on the rockers are cut from the top. Make a fence and spacer, and use a stop block to keep from cutting through.

they meet the rocker. Likewise, the head will not fit all the way into the seat, but wait until the three head pieces are glued before shortening these dovetails.

Complete your dry assembly, using a file and sandpaper to smooth over any points where roundovers meet. Now glue the head pieces and tail pieces together and lay them aside.



There are four steps to cutting the lap joints. First, cut a 1" dado across the inside of both legs, 3/8" deep and 3/4" from the bottom. Second, cut the legs to shape so you can use them to establish the position for the stretcher cuts. Third, cut two 3/8" deep dados (the width of the legs) into the face of each stretcher, reset the dado blade depth to 3/4" and cut two more dados on the stretcher's edge.

While they're drying, drill three 1/4" holes in the seat for the tail and head screws (see elevations). When the head and tail are dry, slide the head into its dovetail groove, measure the overhanging dovetail and trim the other end until the outside is flush with the seat. Use a scratch awl to mark the screw positions for the head and tail and drill out with an 1/8" bit.

Before gluing the head to the seat, install the handle. Drill a 5/16" hole through all three head pieces (see elevations for position) and then drill a 3/4" hole through the walnut piece on each side of the head. Now drill a 9/32" hole in the end of each handle, insert an iron dowel screw (piece 14) in one side, apply a little glue in the hole in the head, and hand screw the

two handles together.

Apply glue to the dovetail groove for the head and saddle and slide these pieces into position, using one screw for added strength with the head. Finish the top assembly by gluing and screwing the tail in place.

Complete gluing up, but be sure to follow this sequence: First, glue the chest to the legs. Next glue the legs to the stretchers and the stretchers to the rockers (all at once). Now glue the seat assembly onto the legs. Let dry, sand to 220 grit and apply a durable finish, such as lacquer or polyurethane

Rick White, a professional woodworker, serves on the editorial advisory board of Today's Woodworker.



TURNING TO THE HOLIDAYS

Here's a project idea that will make your holiday seasons extra special—a tradition that can be passed from one generation to the next.

By Tim M. Cartwright

My first memories of happy and joyful Christmas holidays are from my youth, living with my parents in central Ohio. Every year we trimmed a beautiful tree with glass and tinsel ornaments. When I started my own family I wanted to add to this rich tradition, so I decided to create my own ornaments each year.

Many woodturners will tell you that the greatest joy of working on the lathe is creating the designs. I let my imagination go to work to find fun and interesting shapes, and in ornament making there are no hard and fast rules you need to worry about.

Woodworkers prefer different woods, but mainly I like tight grained woods for the small size of these ornaments. My favorite wood is probably holly, although I use all the different species, and I also laminate different species together or add strips of veneer for interesting highlights. I limit my use of exotics since I can generally achieve similar results with a little stain and imagination. Most of my ornaments are made using standard lathe chucks, although I do use a precision combination chuck with a

miniature adapter that is ideal for these small turnings. The combination chuck allows you to work around the tip of the piece without any obstructions. I have designed a homemade chuck that accomplishes the same purpose, discussed in an earlier issue of *Today's Woodworker* (See March/April '89 issue, page 5).

After the ornament blank is centered on the lathe, start turning it into a cylinder. Use slow speeds at the beginning for removing the waste material with a 3/4" roughing gouge. Next, turn the cylinder down to a diameter of 1 3/4" and lay out your index or pattern lines. Working toward the tail stock, begin cutting and designing the bottom of the ornament. The finer the line and shape of the ornament, the more it will stand out. Leave a 1/4" of waste at the end for the final shearing.

For something different I use colored plexiglass dowel rods in my turnings. These are easy to add and contribute a dramatic touch as light passes through the translucent plexiglass plugs. You can purchase colored plexiglass rod at plastic supply houses. I prefer 5/16" diameter rods

for most of my ornaments and glue them into the turning blank with epoxy. Be sure to slow the lathe down to work on pieces containing plexiglass. By grinding a steep bevel on a shallow spindle gouge, and leaving the burr, you create a "high shearing tool" that is very good at cutting the wood and plexiglass areas. Place the tool rest above center and ride the gouge at an angle.

I don't sand very much since it tends to tear the grain. A fine burr on a scraper will leave a nice finish, which I then follow with a high gloss oil modified polyurethane. To brighten the finish try rubbing the ornament with extra fine steel wool and rottenstone.

Adorning my family tree with handmade heirlooms that will be cherished for generations gives me a feeling of great satisfaction. I have made hundreds of these woodworking treasures to give to family and friends, helping to make our holiday seasons special and memorable times.

Tim M. Cartwright is a third generation woodworker, an active woodworking instructor, and an avid woodturner.

A Big Time Small Router

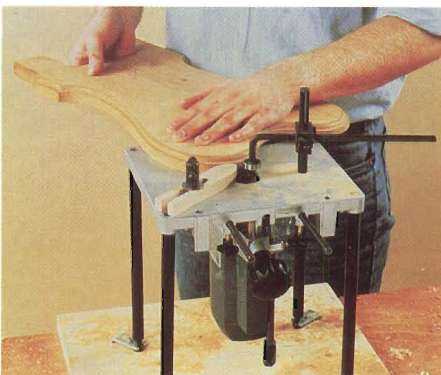
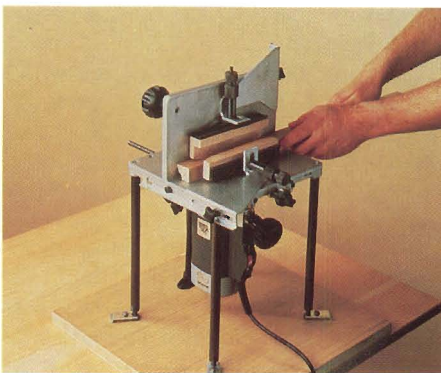
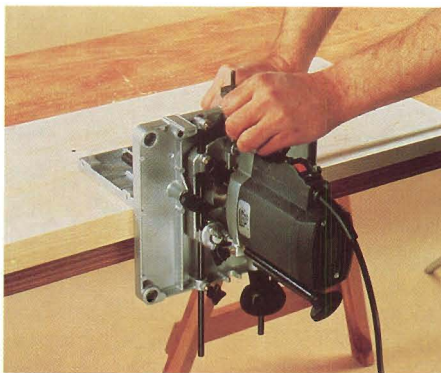
By Hugh Foster

Here is a tool I love. Usually I try to show you tolerable bargains in this column, but this is expensive, so expensive that you might not have heard of it, and I still love it. The Elu 3304 1/4" plunge router costs about \$190.00 on the discount market, and the very useful accessory package will set you back another \$135.00. We haven't even bought any bits yet. A competent plunge router can be had for a little more than a third of this cost, and three horse power 1/2" behemoths sell for about the same price. But this Elu is far more than just competent and none of these other routers offer the precision of this one horsepower model.

The 3304's electronic motor control offers three features that a standard motor can't offer. First, the router accelerates smoothly to the speed you've selected rather than trying to jerk itself out of your hand when you turn it on. Second, the router won't bog down under load. By running at a constant speed it gives your routed work a finer, more consistent finish. Finally, the router runs at any speed from 8,000 to 24,000 rpm, giving greater control in all routing situations. Depending on the speed, the tool runs at only 70-92 decibels, making it by far the quietest router on the market. As soon as you've experienced these features, routers without them will seem second rate.

The router has a plunging range of 1¹⁵/₁₆", and a maximum bit diameter capacity of 1³/₁₆". The 750 watt motor is sufficient to drive such a large bit at the slower speed settings, especially if you use the three position depth stop to take a series of shallow cuts. The plunge feature locks by twisting the right handle. In fact, all the controls can be operated without taking your hands off the handles.

At first, the major component of the 40900 accessory kit looks like little more than a router table that's too small to be useful. At 8³/₈" long by



Where most router accessory packages are limited to a straight edge guide and maybe a trammel circle cutting guide, the Elu 40900 kit supplies a unique table and fence arrangement capable of performing a wide variety of operations.

9¹/₂" wide, it might be described as positively diminutive, but it's large enough for most fine work. That this tiny table's top stands 11" above your

usual work height is a plus: all the better to see what's going on! There's a 9¹/₂" x 5⁵/₈" fence with a 1¹/₁₆" x 1" high guarded cut-out. Opposite this fence one can put a spring clamp which holds small work firmly in place for fine shaping. In similar fashion, curved work can be routed quite precisely by using the bearing guide and wood block supplied (see photo). There's no better way to make small moldings for your projects. A pair of 2" capacity clamps are supplied that enable the user to clamp the base for use as the fence on a larger table, or you can use the fence as the table and pick up the router by the handy knobs. The latter method positions the router between 2⁷/₈" and 5³/₈" above the larger table for precise work on longer boards. Lastly, there's a 13¹/₂" trammel point for doing round work. Both the horizontal position of the cutter and depth of cut adjustment are carefully controlled on the accessory table.

On the downside, the two page "manual" supplied with the accessory kit is virtually useless. The most useful statements direct us to photos on the carton that illustrate how to use the accessories. Setting up the accessory table and using it the first few times will require a bit of thought. A well-illustrated twenty page manual would not only make the tool accessible to more woodworkers, but also help to raise the quality of their woodworking. Although I'm using, at best, half its potential, this tool has improved the quality of my precision routing enough to make it a necessary part of my woodworking arsenal. While its price and complexity insure that it's not a tool for everyone, precision-minded woodworkers shouldn't settle for less.

Hugh Foster is an English teacher, furniture builder and freelance writer based in Manitowoc, Wisconsin.

Discover the Scratch Bearer

By John Goff

Yesterday's woodworker didn't have the luxury of ordering tools from mail-order catalogs nor did he have ready made tools available from a near by tool store. So, the adage that "necessity is the mother of invention" was often the rule of the early furniture maker.

One tool that is not commercially made today, but still fills a need for today's furniture maker is the scratch bearer. I first became aware of the scratch bearer several years ago when making a bow front chest of drawers for my daughter. The picture of the chest of drawers I was reproducing had a delicate bead on each edge of the drawer dividers that could not be produced using the router bits that were available commercially. The cost of having a router bit specially ground to the profile I needed was prohibitive.

I knew from my study of antique furniture that beads on both straight and curved edges could be found on furniture built before and during the 18th century, long before the invention of the shaper or router. Further research of the tools used during this period led to my "discovery" of the scratch bearer. After seeing a picture of a scratch bearer, I thought if ever there was a tool invented out of necessity, this had to be it. It is very easy to make, serves a very limited function, and it's obvious that little experimentation or development went into its design. Simply, it is a block of wood shaped to provide two reference edges while holding a metal cutter in place. Being a saver of things, I still have my first scratch bearer and have made several others. I have found that once the cutter is set in place and working properly, it is easier and quicker to make a new scratch bearer than to change cutters for a different profile.

The first step is to make the wooden block. Try to select a hardwood that

is dense in structure and free of defects.

The first scratch bearer I made was from a piece of quarter sawn cherry and has held up very well. The last one I made was from a piece of ebony left over from a job. It has produced over 100 lineal feet of beading and shows little wear on the bearing surfaces. Mahogany and walnut are not good choices because of the porous nature of their grain.

Lay out the periphery of the wooden block. Its size should be large enough to hold the metal cutter securely and be comfortable to use.

Next, lay out the center slot that will hold the cutter. Make sure the slot is long enough to allow adjustment of the cutter. Cut the slot on the bandsaw first, then cut the block to shape. I round the ends and edges as shown to make the tool more comfortable to use.

Lay out the holes for the carriage bolts as shown. They should be as close to the metal cutter as possible to provide maximum holding strength, but should not be in the way of the adjustment of the cutter. I use a 1/4" chisel to make a small square cut-out for the head of the carriage bolt. This is required because of the denseness of the wood.

The metal cutters I use are made from worn out 1" bandsaw blades. The length of the cutter should be sufficient to accommodate the desired profile and provide a good clamping area in the wooden block. Lay out the cutter by using a black or dark purple magic marker to color the area to be ground. Next, use a metal scribe to draw the lines of the profile. A clean, crisp layout here will make the job easier and will ensure the accuracy of the finished shape. I



There simply are no router bits available that can produce the delicate beads possible with a scratch bearer.

rough out the profile on an electric bench grinder while holding the cutter with vise grips. Quench the cutter in water often to prevent it from overheating and annealing the metal. Be sure to wear eye protection and observe all safety precautions during this operation. I finish grind the cutter by using a grinding stone in my drill press. Run the drill press at high speed and shape the stone to size using a square dressing stick. With a few passes across a water stone I remove the remaining burr. I have found that a sharp square edge on the cutter produces the best results.

Locate the cutter in the wooden block and tighten the wing nuts. Try it out on a piece of scrapwood to make sure it's set properly. If not, loosen the wingnuts slightly and reposition the cutter.

The scratch bearer can be used in both directions by pushing or pulling, as dictated by the grain of the wood being worked. Use a light touch at first until the cutter is established in the work piece. With a little practice, you will find this tool will produce excellent results today just as it did many years ago.

John Goff is a professional furniture maker with a special interest in antique reproductions, particularly work produced in the Townsend/Goddard School in the 18th century.

Mixing Your Own Finishes

By Jerry TerHark

Calling yourself a woodworker means being a problem solver, and no aspect of this craft is more challenging than matching a new finish to an existing piece of furniture. Maybe a new top must be made for a dresser, or you need to fix a chair leg, or a special piece has caught your eye and you want a copy for yourself. Whatever the case, the mystery of finding the correct stain color can be confusing and exasperating. Part of this confusion is created by stain manufacturers who often use the same names for products that are different colors. I've had the experience of buying six different brands of fruitwood, applying them all to the same piece of wood, and ending up with six different shades of supposedly the same color.

Matching stains consists of more than just finding the right color. Many things have to be considered, including the species of the original piece and that of the matching sample, grain patterns, porosity, exposure to light and the wood's age. These features will all affect the matching process. Additionally, planed boards will take stain differently than sanded boards, and a coarsely sanded piece will absorb more stain than one that is finely sanded. A general rule of thumb is the finer the sanding the less the stain will be absorbed. This is one of the reasons uniform sanding is so highly stressed by woodworking experts.

Pick Your Pigments

Manufacturers of stains create their colors from basic raw earth pigments. To make my job easier I use these same pigments to mix my own stains to carefully match previously finished work. These concentrated pigments are available from a number of manufacturers including the "Japan Colors" line manufactured by H. Behlen Co.

Seven pigments make up nearly all the conventional stains on the market. Raw umber, burnt umber, raw sienna,

burnt sienna, Van Dyke brown, white and black. I've made sample boards of birch, maple, oak and other common woods that are stained with these seven pigments. These boards become my "artist's palette" that I use to determine the color ingredients in the stain on a finished piece. I hold my palette up to the piece I want to match, and by comparing the two I can find a base color that comes close to the original stain.

If the stain is predominantly red I know that the main concentrated pigment is burnt sienna, if it is yellow the right starting point is raw sienna, green is raw umber, reddish-brown is burnt umber and a chocolate brown color is generally Van Dyke brown.

Once I determine the basic color, I make an educated guess as to the next bit of tint to shade my stain slightly. Usually stains are three parts of the base pigment and one part of a second pigment. This can vary, of course, and to get the match exactly takes patience and careful recording of the combinations you try. If your piece has dark highlight grain, you'll probably want to try adding a little black. If, on the other hand, there's a cloudy cast, you'll want to add a touch of white. If the hue seems very close but the density is lighter the stain may be matched by reducing it with a bit of naphtha or mineral spirits.

Use syringes and small paper cups to mix the concentrated pigments. I measure everything in cc's to make my record keeping of these formulas very accurate, as well as making it easier to mix large or small batches of stain. To get you started, here's a few of my favorite recipes: light oak is 3cc raw sienna with 1cc raw umber. Dark oak is achieved by combining 2cc raw sienna, 1cc burnt umber and 1cc of burnt sienna. A common tone of fruitwood results from mixing 3cc of Van Dyke brown and 1cc of burnt umber. Of course these are basic ideas and the options for original stainmaking are limitless.

While the set-up costs on this system will be higher than buying a single quart of a brand name stain, the chances of accurately matching a finish are greatly increased. You can control the subtle shadings needed to compensate for age or light exposure, and in the long term you will save the money you would have spent on some commonly named stains that don't even come close to the color you're trying to match.

Jerry TerHark, who lectures nationwide on wood finishing, studied under master finisher George Frank. Jerry is the head of Dakota County Technical Institute's wood finishing program in Rosemount, Minnesota.



Exciting New Tools In 1989

By Roger W. Cliffe

As old as the field of woodworking is, it always surprises me how many new products continue to be developed and marketed. This year, many exciting new tools and accessories for the professional and amateur woodworker have been introduced.

Stationary Tools

The hottest stationary power tool to hit the market this year is the Powermatic (Dept. TW, Morrison Rd., McMinnville TN 37110) 10" Contractor's table saw. This saw answers the concerns woodworkers have expressed for years—the quality of the fence and the ability to collect dust at the source.

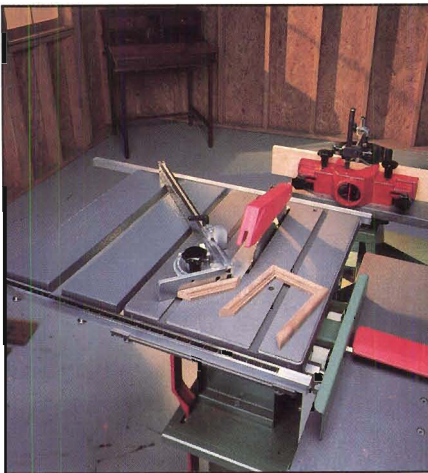
The fence is actually a Vega retrofit fence. This durable fence is easy to use and adjust, and there are several safety oriented accessories that may be used with it. The fence is an improvement from the standard equipment offered by some manufacturers.

The dust collection system is an integral part of the saw. This is a refreshing change from what we normally see. Instead of buying and installing additional parts to collect dust, all you do is hook up a hose between the saw and the dust collector. In light of the fact that wood dust has been linked to cancer and respiratory problems this just makes good sense.

Benchtop Tools

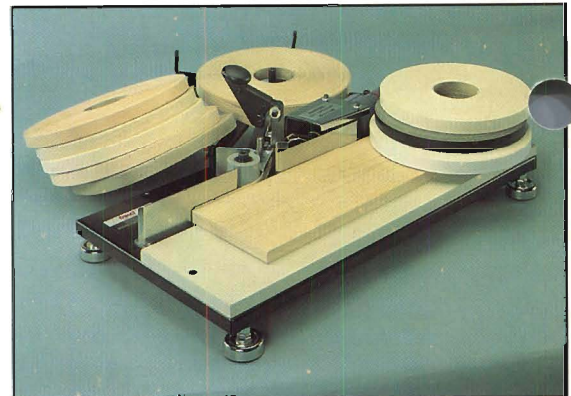
In the benchtop tool category, two innovative and exciting tools are entering the market. First, the Freud Edge Bander (Dept. TW, PO Box 7187, High Point, North Carolina 27264) brings edgebanding to the home shop and small cabinet shop. By using hot air to melt the adhesive the unit can accommodate any type of edgebanding used on larger systems. The unit applies all types of hot melt material efficiently and quickly.

This edgebander is really well suited to short lengths, such as shelves



This Powermatic tablesaw (top) addresses a couple of age old woodworker concerns—an accurate fence and integrated dust control.

Few safety accessories are as functional in every day use and as unobtrusive as this Farris miter gauge (left).



Freud's innovative edgebander brings production efficiency down to scale for the small shop. And their new safety dado is successfully tackling every kind of difficult material without chipping or tear out, and with greater control.

and cabinet sides. There is a built in knife to cut the edge banding material when a side is completed, reducing waste and speeding up the edgebanding process. Start up and shut down procedures are quick, and there is no clean-up required. The tool takes up about three cubic feet of space so storage is not a problem.

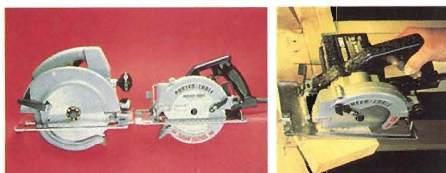
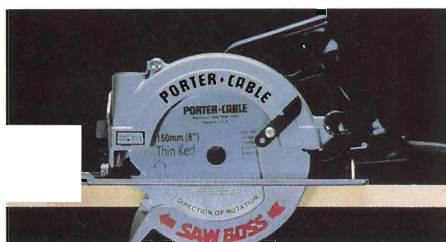
The second benchtop tool that I see as a hot product for 1989 is the Delta Plate Joiner (Dept. TW, Delta International Machinery Corp., 246 Alpha Drive, Pittsburgh, PA 15238). This tool is actually a stationary plate joiner. It clamps to your workbench and allows two handed control of the



Biscuit joinery makes yet another advance into the woodshop, fast becoming a staple production tool as this Delta benchtop model will attest.



Try a blade that stays sharp longer than conventional carbide blades. The author says this Dyanite tipped saw blade, manufactured by DML Inc., is tougher and lasts longer than anything he's seen.



The new "Saw Boss" from Porter-Cable will show you that little is sometimes better, and without losing big saw capabilities.

workpiece. To cut a kerf in the workpiece, you simply step on a foot pedal. Depth of cut is fully adjustable, and there is a clamp that holds the stock in position while the cut is made. The Delta Plate Joiner also has a miter gauge and tilting table, allowing cuts in compound miters. The miter gauge can function as a stop when locked into position for cutting miters.

The Delta Plate Joiner makes production work possible in the home shop and small cabinet shop. When the job is done, the tool can be removed from the bench and stored. It takes up about the same amount of storage space as a small router table.

Portable Power Tools

One exciting portable power tool this year is the Saw Boss™ by Porter-Cable (Dept. TW, Youngs Crossing at Highway 45, PO Box 2468, Jackson TN 38302). This light (8 lbs.), com-

pact portable circular saw has a plunging action that allows it to make this cut safely. I've used the plunging action on the Saw Boss™ for floor and roof repairs. I've even used it to cut in roof vents. The plunge stop limits the depth of cut, reducing the chance of cutting the framing members under the floor or roof sheathing. The Saw Boss™ uses a 6" diameter, thin kerf blade and will cut through 2" material at a 45° angle. If you just want to use it as a conventional saw it's got enough power for all but the heaviest jobs. The light weight and compact size reduces fatigue on the job.

Blades and Dado Heads

The most exciting news in saw blades this year is the Golden Eagle™ blade by DML Inc. (Dept. TW, 1350 So. 15th St., Louisville KY 40210). The carbide tips have been replaced with an alloy called Dyanite. It is an alloy that is tougher than carbide and more acid resistant. The resistance to acid keeps the cutting edge from breaking down when the blade is exposed to highly acidic woods such as oak. Dyanite can be resharpened in the same way as standard carbide blades.

Freud has come up with the most exciting dado head to hit the market in years. It is the Safety Dado. This stack type dado head has a chip limiter behind the carbide tips on both the cutters and chippers. This shoulder limits the bite of each tooth to .2 mm. This small bite means there is little chance of kickback or climbing. Unbelievable control was maintained when dadoing on the radial arm saw.

In use this dado head is almost unbelievable. I tried it on every difficult material I could find and the results were excellent. The dados were square and clean —no tear-out on either side. This was true of tests done on both the table saw and radial arm saw.

The carbide on the safety dado has also been improved to resist acids in the wood. The dense carbide tips on the safety dado are hard enough to resist wear and tough enough to absorb shock.

The finger joint miter gauge distributed by Farris Machinery (Dept.

TW, 309 North Tenth, Blue Springs MO 64015) is the safest miter gauge available for cutting finger joints on the table saw. The miter gauge comes with metal guards that attach to the tongue of the miter gauge. These guards actually house the dado head or blade while the finger joint is being cut. The guards act as a barrier between you and the cutter. The finger joint cutting operation brings your fingers very close to the blade or dado head when using a standard miter gauge —one slip could cause a mishap. This miter gauge makes the operation much safer.

Another exciting accessory this year is a new shaper jig. This device is designed to make shaping of cabinet doors safer, more accurate, and more efficient by controlling the rails, stiles and raised panels during the cutting process. The jig is known as the Panelcrafter by Reliable Grinding (Dept. TW, 145 Hillcrest Ave., San Bernadino, CA 92408) or the Shapermaster by L.A. Weaver (Dept. TW, 1108 So. 37th St., Kansas City KS 66106). The two jigs are very much alike. The jigs contain a template which rides against a rub collar on the shaper spindle to control the cut. The work is clamped in the jig with pneumatic pressure. The cutter shapes the desired pattern while the operator's hands are about one foot away from the spindle.

Both jigs have two pneumatic cylinders which clamp the work after it is centered. The cylinders let a little air leak out through the bottom of the jig. This allows the jig to float on a cushion of air. The floating action makes the jig easier to control and reduces operator fatigue.

These door jigs keep the operator clear of the cutterhead at all times, give the operator extra leverage, and put about 50 pounds of metal between the operator and the cutterhead. When shaping door parts these shaper jigs become a safe, accurate, labor saving accessory.

Dr. Roger Cliffe is the author of "Table Saw Techniques" and "Radial Arm Saw Techniques", published by Sterling Publishing Co. of New York, New York.

Northwest Gallery of Fine Woodworking

The Northwest Gallery of Fine Woodworking (202 1st Ave, So., Seattle, Washington 98122), is a cooperative formed 10 years ago to promote the interest in and production of fine contemporary woodworking. Its thirty-three members form a base of work representing furniture, sculpture and woodturning.

This year, due to the demand for fine work, the Northwest Gallery of Fine Woodworking opened a second location in a renovated barn in Gilman Village (317 Gilman Blvd. #35, Issaquah, Washington 98027).

The Children's Furniture and Toys show at Gilman Village, running through the end of December, will feature the delightful creations of regional and national artists. The pieces shown on this page are a preview of this holiday presentation.



Cradle
(Mahogany)
Jonathan Cohen



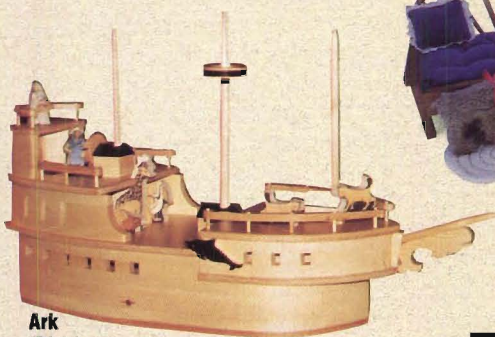
Bison
(Walnut, Icelandic Sheep)
James and Lea Reed



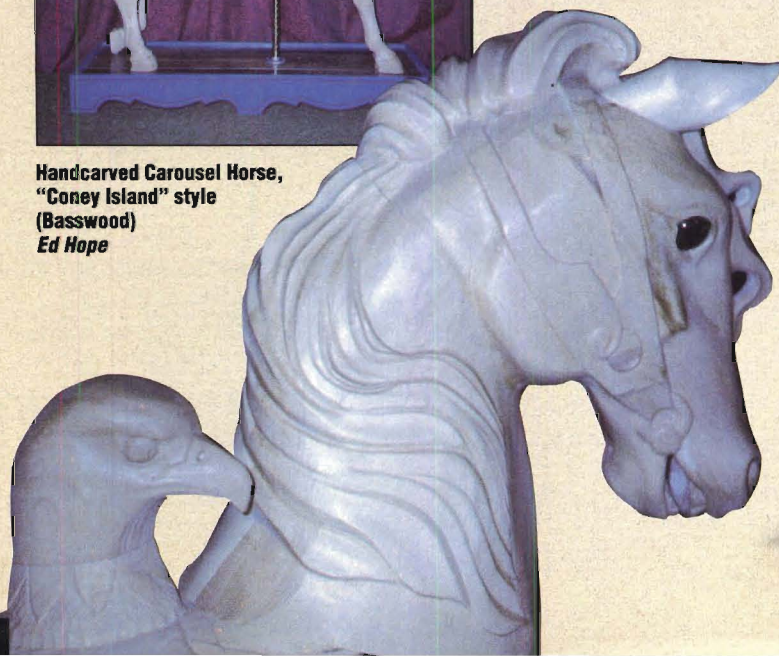
Bed and Settee
(Laminated cherry and maple)
M.S. "Eddee" Edson



Handcarved Carousel Horse,
"Coney Island" style
(Basswood)
Ed Hope



Ark
(Pine)
Jerry and Odene Conrad



NEXT ISSUE

If you liked the Rolling Tool Center featured in Volume 1, Number 1, you'll really enjoy our lead project in the next issue —also designed for the workshop. Look for a turning project, a clever bandsaw box and the breakfast tray shown below as well.

