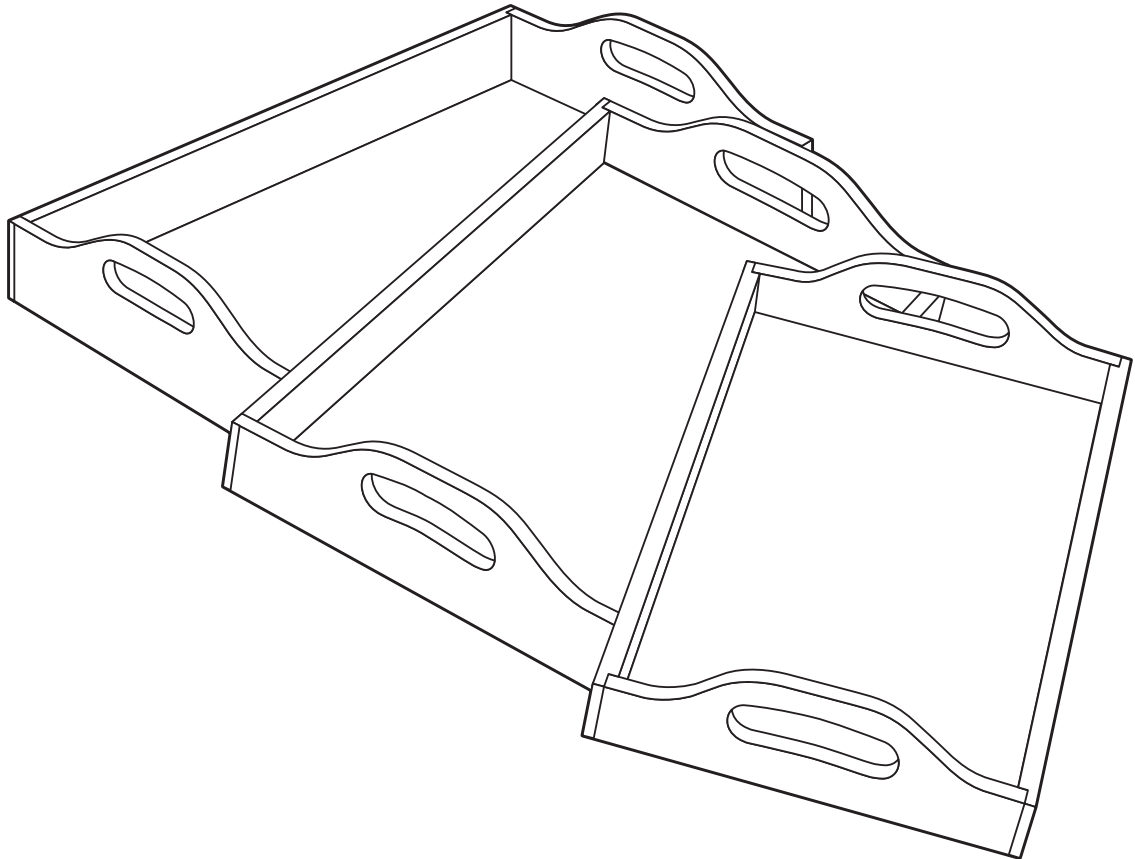




WOODWORKS: BEGINNER PROJECT 2007-2008
NESTING TRAYS



Great for getting organized or serving snacks, these sturdy trays are easy to build, thanks to their simple rabbeted corner joints and template-routed handles. All you need is a table saw with a dado set, a router table and a drill press. You may have saved enough scrap pieces from other projects to build the trays and the jigs, but even if you have to buy lumber and plywood, you can make this trio of trays inexpensively. And when they're all assembled, you'll learn more about applying and using stains and finishes to protect the wood and keep it looking beautiful.

TOOLS REQUIRED

Hand Tools

- Toggle clamps (2)
- Adjustable-jaw clamps (4)
- Mallet
- Chisel

Power Tools

- Table saw with combination rip/crosscut blade and dado blades
- Router table, 3/4" dia. straight-cut bit, flush-trim bit
- Drill press, 7/8"- and 1"- dia. Forstner bits
- Jigsaw
- Oscillating spindle sander or sanding drum for drill press, 3" and 3/4" spindles

Miscellaneous

- Pencil
- Tape measure
- Safety glasses
- Carpenter's glue
- 120-, 180- and 220-grit sandpaper
- Clean, lint-free cloths
- Respirator
- Gloves for finishing
- Mineral spirits (for oil-based stains and finishes)
- Water-filled metal container with tight-fitting lid (for oil-based stains and finishes)
- Minwax® Wood Finish™ Stain Brush or other good quality, natural-bristle brush (for oil-based stains and finishes)
- Minwax® Polycrylic® Brush or other good quality, synthetic-bristle brush (for water-based stains and finishes)

SHOPPING LIST

Recommended wood: Birch

Alternate wood: Pine

1/2" x 5-1/2" birch:	11 lin. ft.
1/2" x 3-1/2" birch:	5 lin. ft.
1/4" birch plywood:	2' x 4' piece
3/4" brads	

CUTTING LIST

Overall Dimensions:

Large Tray	4-1/4" x 13-1/2" x 20"
Medium Tray	3-3/4" x 12-1/4" x 18-3/4"
Small Tray	3-1/4" x 11" x 17-1/2"
Routing Jig	3-1/4" x 10" x 20"

Key	Part	Pcs.	Dimensions
Large Tray			
A1	End	2	1/2" x 4-1/4" x 13"
A2	Side	2	1/2" x 2-3/4" x 20"
A3	Bottom*	1	1/4" x 12-27/32" x 19-11/32"
Medium Tray			
B1	End	2	1/2" x 3-3/4" x 11-3/4"
B2	Side	2	1/2" x 2-1/4" x 18-3/4"
B3	Bottom*	1	1/4" x 11-19/32" x 18-3/32"
Small Tray			
C1	End	2	1/2" x 3-1/4" x 10-1/2"
C2	Side	2	1/2" x 1-3/4" x 17-1/2"
C3	Bottom*	1	1/4" x 10-11/32" x 16-27/32"
Routing Jig			
T	Base	1	1/2" x 10" x 20"
U	Fence	1	1/2" x 5-3/4" x 20"
V	Stop	2	1/2" x 2-3/4" x 3-1/2"
W	Medium end spacer	2	1/2" x 5/8" x 2-1/2"
X	Medium bottom spacer	1	1/2" x 1/2" x 11-3/4"
Y	Small end spacer	2	1/2" x 1-1/4" x 2-1/2"
Z	Small bottom spacer	1	1/2" x 1" x 10-1/2"
* 1/4" birch or maple plywood			

WOOD FINISHING PRODUCTS

Recommended Finish

Prep: Minwax® Water-Based Pre-Stain Wood Conditioner
 Stain: Minwax® Water-Based Wood Stain Spice, Mediterranean Olive, and Parchment
 or
 Minwax® Water-Based Wood Stain™ Accents™ Midnight Blue, Botanical, and English Oak
 Finish: Minwax® Polycrylic® Protective Finish gloss

Alternate Finish

Prep: Minwax® Pre-Stain Wood Conditioner
 Stain: Minwax® Wood Finish™ Dark Walnut/Gun Stock/Puritan Pine
 Finish: Minwax® Fast-Drying Polyurethane gloss
 or
 Minwax® Clear Brushing Lacquer gloss

BEFORE YOU BEGIN

Good craftsmanship begins and ends with good work habits, so make the following steps part of your routine workshop practice. If you have any doubts or questions about how to proceed with a project, always discuss them with your shop instructor.

- Carefully and fully review plans and instructions before putting a tool to the project lumber.
- Work sensibly and safely. Wear safety goggles when doing work that creates flying chips and sawdust; wear the appropriate respirator whenever making sawdust or working with thinners or other solvents.
- At the end of every work session, clean up your shop area and put away all portable tools.

CUTTING AND ASSEMBLY PROCEDURE

1. Cut all the parts on the CUTTING LIST.

Cut the Rabbet Joints

2. Set the height of the router bit (or dado head if you're using a table saw) to 1/4", half the thickness of the material.

3. Set the fence location so the tip of the router bit is 1/2" away from the face of the fence. Make a test cut in scrap and check the fit of the rabbet joint against a tray end. The end should nest perfectly inside the rabbet.

4. Machine the rabbet into both ends of each of the tray sides. Use a piece of scrap to support the piece and hold it square. This also provides backup so the side doesn't chip out as the bit exits the cut. All of these cuts are made with the good (outside) face up.

Make the Routing Jig

5. Refer to Figs. 3 and 4 when making the jig. Use glue and 3/4" brads to fasten the fence (U) and the stops (V) to the base (T).

6. Use the end profile of the large tray (Fig. 4) as a pattern when you make the routing jig (Fig. 3). First, transfer the curved edge profile to the jig's base. Then drill 1"-dia. holes with a Forstner bit to establish the ends of the handle hole. Finish rough-cutting the handle hole with a jigsaw. Then rough-cut the edge profile.

7. Smooth the routing jig's edge profile using an oscillating spindle sander or a sanding drum in your drill press. Install a 3/4"-dia. spindle or drum to smooth the handle hole.

8. Fasten the fence flush with the bottom of the jig's base.

9. Place one of the large end-piece blanks on the jig. The top of the blank should be flush with the top of the jig. Center the blank and then install the stops. Mount the toggle clamps.

Rout the Ends

10. Draw edge profiles and handle holes on all the end blanks after installing them in the jig. Make spacers (W, X, Y and Z, Fig. 3) to position the medium and small blanks.

11. Rough-saw all the curved profiles about 1/16" away from the pattern lines. To rough out the handle holes, drill 7/8"-dia. holes and use a jigsaw to saw out the waste.

12. Rout the edge profiles with a top-bearing flush-trim bit (Fig 5). Then rout the handle holes (Fig 6). Assure the workpiece is securely held. With the router unplugged, center the bit inside the roughsawn opening. Hold the jig steady so the bit spins freely when you power up. Then rout counterclockwise.

Cut the Groves

13. Cut 3/16" deep grooves for the plywood bottoms (A3, B3 and C3) in the sides and ends. Because 1/4"-thick plywood is often undersize, you can't use a dado set. Use your regular blade and make two passes. Adjust the fence between passes to widen the groove enough to allow the plywood to insert easily yet snugly.

Assemble the Trays

14. Assemble the boxes without glue to assure everything fits.

15. Disassemble the boxes for sanding. Finish-sand with 100-, 180- and 220-grit sandpaper.

16. Assemble the trays by brushing glue into the rabbets and into the grooves. Assemble two sides and one end, clamping across the end and insert the plywood (Fig. 7). Use clamping blocks to protect the wood. Insert strips of paper towel between the blocks and the sides to absorb excess glue. Assemble the other end and secure it with another clamp. Check the trays for square after they're clamped and adjust as necessary.

17. After the glue has dried, remove the clamps. Check for any squeezed-out glue and carefully remove it with a chisel. Smooth resulting rough spots with 220-grit sandpaper.

STAINING AND FINISHING

Woodworker's Tip: Though you may be tempted to cut short your sanding, preparation and application time, don't do it. These tasks are very important steps in obtaining a high-quality finish. Remember, it is the finish, just as much as the fit and smoothness of the parts that will have great bearing on how people judge your craftsmanship. To ensure an excellent result, follow the steps listed in this section and also the instructions the finish manufacturer puts on its products.

FINISHING TIPS

- Test the stains and finishes you are planning to use on scraps of wood. On the back of the scrap, mark the stain/finish combination and the type of wood. Allow all samples to dry thoroughly before making your final finish selection. Save your samples for quick reference on future projects.
- All stains and finishes must be allowed to dry thoroughly between coats. Remember that drying times can vary due to humidity and other climatic conditions.
- If you have some leftover stain or finish, wipe the can rim so that stain or finish in the rim won't dry out and prevent the lid from forming a tight seal.

- Brushes used for water-based products, such as Minwax® Water-Based Wood Stains or Minwax® Polycrylic® Protective Finish, must be cleaned with soap and water; brushes used for oil-based finishes must be cleaned with mineral spirits.

18. Finish-sand the corners and any other rough spots with 220-grit sandpaper. Dust off the piece and wipe it carefully with a clean, lint-free cloth lightly dampened with mineral spirits.

Recommended Finish

19. Before applying Minwax® Water-Based Wood Stain to a hardwood or softwood, apply Minwax® Pre-Stain Water-Based Wood Conditioner following the directions on the can. Applying it will help to ensure even absorption of stain and prevent blotchiness that can occur with some woods. After 1 to 5 minutes, wipe off all excess conditioner using a clean, soft cloth. Wait 15 to 30 minutes then use 220-grit or finer sandpaper to sand off any “whiskers” raised by the conditioner. Proceed to the staining within 2 hours.

20. Do the staining in two steps, starting on the interior surfaces and then moving to the exterior surfaces. Apply the Minwax® Water-Based Wood Stain you've chosen to the surface using either a nylon/polyester brush or a cloth. Allow stain to penetrate no longer than 3 minutes. While stain is still wet, wipe off all excess with a clean cloth that's been lightly dampened with stain. Allow the piece to dry for 2 hours before applying a second coat, if desired. Allow the piece to dry overnight before applying the protective clear finish.

Woodworker's Tip: *Minwax® Water-Based Wood Stain is available in 6 wood tones, a White Wash Pickling Stain, 60 custom-mixed colors, and 8 bold Accents™ colors. This means that you are not limited to just traditional wood colors (pine, oak, walnut, etc.). Instead, you can pick and apply a color to complement the décor of the room in which the piece will be placed. For this reason, make sure you look over all of the Minwax® color charts or go to minwax.com before making your final selection.*

21. After allowing the piece to dry overnight, apply Minwax® Polycrylic® Protective Finish following the directions on the can. Stir the can contents thoroughly before starting and periodically repeat the stirring during your work session.
22. Working a small area at a time to maintain a wet edge, apply the first coat. Work quickly and make the final strokes in each newly finished section using with-the-grain brushstrokes.
23. Allow the finish to dry a minimum of 2 hours. Then sand lightly with 220-grit or finer sandpaper wrapped around a soft backup block. Thoroughly dust off and wipe all surfaces with a cloth lightly dampened with water.
24. Repeat steps 21 and 22 to apply the second and final coat.

Alternate Finish

25. Apply the Minwax® Wood Finish™ you've chosen using a natural-bristle brush and a clean, lint-free cloth following the directions on the can. The brush will help you get the stain into the inside corners. Allow

the Wood Finish™ to set for about 5 to 15 minutes, then wipe off any excess. To achieve a deeper color, you may apply a second coat after 4-6 hours, repeating the application directions for the first coat. Allow the stain to dry for 24 hours before applying the protective clear finish.

Woodworker's Tip: *When wiping off stain, make certain that your last wipe with the cloth goes with the grain of the wood. This way, any stain you might miss during wipe-off will be visually minimized by the wood grain.*

Applying Fast-Drying Polyurethane

26. Apply Minwax® Fast-Drying Polyurethane following the directions on the can, stirring it occasionally. Use a good quality, natural-bristle brush. Allow the first coat to dry overnight.

27. The next day, sand all surfaces lightly with 220-grit or finer sandpaper using with-the-grain strokes. Dust off and wipe all surfaces with a cloth lightly dampened with mineral spirits. Apply a second coat of polyurethane and set the piece aside to cure overnight.

28. The following day, sand all surfaces lightly with 220-grit sandpaper. Dust off and wipe the piece with a cloth lightly dampened with mineral spirits and apply the third and final coat of polyurethane.

Applying Clear Brushing Lacquer

29. Apply Minwax® Lacquer Sanding Sealer, if desired, following label directions. Let dry at least 1 hour, then sand with 220-grit sandpaper, moving in the direction of the grain. Remove all sanding dust.

30. Apply Minwax® Clear Brushing Lacquer, stirring it well before and during use to rotate the product from the bottom to the top of the can. NEVER SHAKE.

31. Apply a coat of lacquer using a high-quality natural- or synthetic-bristle brush. Apply sufficient lacquer to seal open joints, edges and end grain.

32. Let the first coat dry at least 2 hours, then apply a second coat.

33. Apply a third coat, repeating the steps above for each coat. Apply a fourth coat, if desired.

34. After the final coat, allow at least 24 hours before using the trays.

PRODUCT SAFETY

For your safety and the safety of those you work with, always read the safety warnings, which manufacturers print on their labels, and follow them to the letter.

WARNING! Removal of old paint by sanding, scraping or other means may generate dust or fumes that contain lead. Exposure to lead dust or fumes may cause brain damage or other adverse health effects, especially in children or pregnant women. Controlling exposure to lead or other hazardous substances requires the use of proper protective equipment, such as properly fitted respirator (NIOSH approved) and proper containment and cleanup. For more information, call the National Lead Information Center at 1-800-424-LEAD (in U.S.) or contact your local health authority.

DANGER: Rags, steel wool, other waste soaked with oil-based stains and clear finishes, and sanding residue may spontaneously catch fire if improperly discarded. Immediately place rags, steel wool, other waste soaked with this product, and sanding residue in a sealed, water-filled metal container. Dispose of in accordance with local fire regulations.

When using oil-based wood finishing products:

CAUTIONS: CONTAINS ALIPHATIC HYDROCARBONS.

Contents are **COMBUSTIBLE**. Keep away from heat and open flame. **VAPOR HARMFUL**. Use only with adequate ventilation. To avoid overexposure, open windows and doors or use other means to ensure fresh air entry during application and drying. If you experience eye watering, headaches, or dizziness, increase fresh air, or wear respiratory protection (NIOSH approved), or leave the area. Avoid contact with eyes and skin. Wash hands after using. Keep container closed when not in use. Do not transfer contents to other containers for storage.

FIRST AID: In case of eye contact, flush thoroughly with large amounts of water for 15 minutes and get medical attention. For skin contact, wash thoroughly with soap and water. In case of respiratory difficulty, provide fresh air and call physician. If swallowed, call Poison Control Center, hospital emergency room, or physician immediately.

DELAYED EFFECTS FROM LONG-TERM OVEREXPOSURE.

Contains solvents which can cause permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling contents may be harmful or fatal.

WARNING: This product contains a chemical known to the State of California to cause cancer and birth defects or other reproductive harm.

DO NOT TAKE INTERNALLY. KEEP OUT OF REACH OF CHILDREN.

CONFORMS TO ASTM D-4326. Contact a physician for more health information.

When using water-based wood finishing products:

CAUTIONS: Use Only With Adequate Ventilation. To avoid overexposure, open windows and doors or use other means to ensure fresh air entry during application and drying. If you experience eye watering, headaches, or dizziness, increase fresh air, or wear respiratory protection (NIOSH approved), or leave the area. Avoid contact with eyes and skin. Wash hands after using. Keep container closed when not in use. Do not transfer contents to other containers for storage.

FIRST AID: In case of eye contact, flush thoroughly with large amounts of water. Get medical attention if irritation persists. If swallowed, get medical attention immediately.

WARNING: This product contains a chemical known to the State of California to cause cancer and birth defects or other reproductive harm.

DO NOT TAKE INTERNALLY. KEEP OUT OF REACH OF CHILDREN.

CONFORMS TO ASTM D-4326. Contact a physician for more health information.

When using lacquer:

CAUTIONS: CONTAINS ACETATES, ALCOHOLS, KETONES AND XYLENE.

Contents are **FLAMMABLE**. Vapors may cause flash fires. Keep away from heat, sparks, and open flame. During use and until all vapors are gone: Keep area ventilated - Do not smoke - Extinguish all flames, pilot lights and heaters - Turn off stoves, electric tools and appliances, and any other sources of ignition. **VAPOR HARMFUL**. Use only with adequate ventilation. To avoid overexposure, open windows and doors or use other means to ensure fresh air entry during application and drying. If you experience eye watering, headaches, or dizziness, increase fresh air, or wear respiratory protection (NIOSH approved), or leave the area. Avoid contact with eyes and skin. Wash hands after using. Keep container closed when not in use. Do not transfer contents to other containers for storage.

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FIG 1. TRAY DETAILS

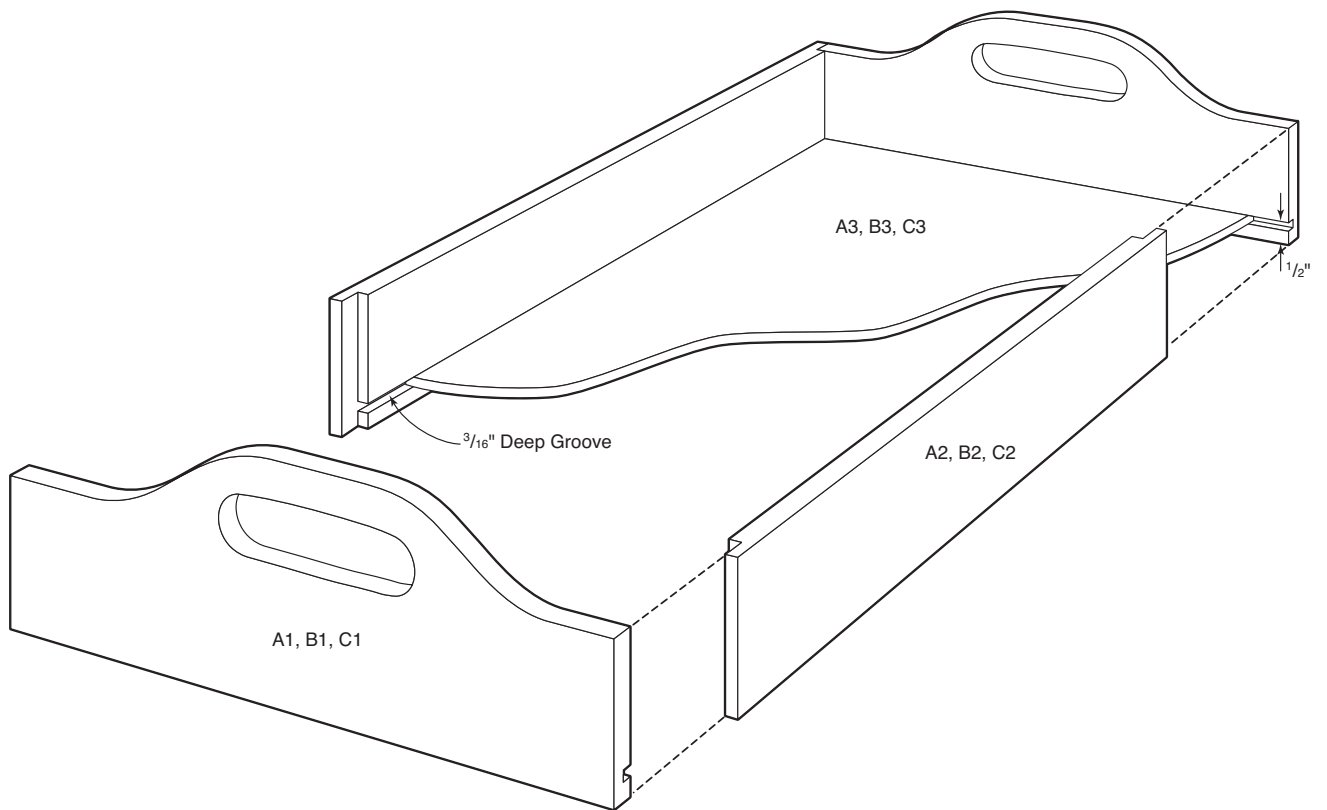


FIG 2. RABBET SIDES

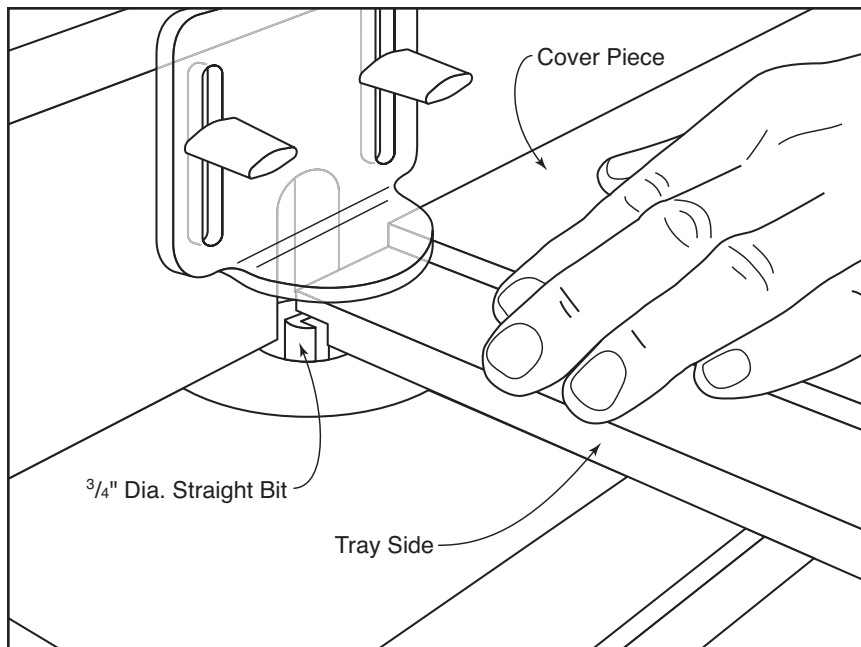


FIG 3. ROUTING JIG

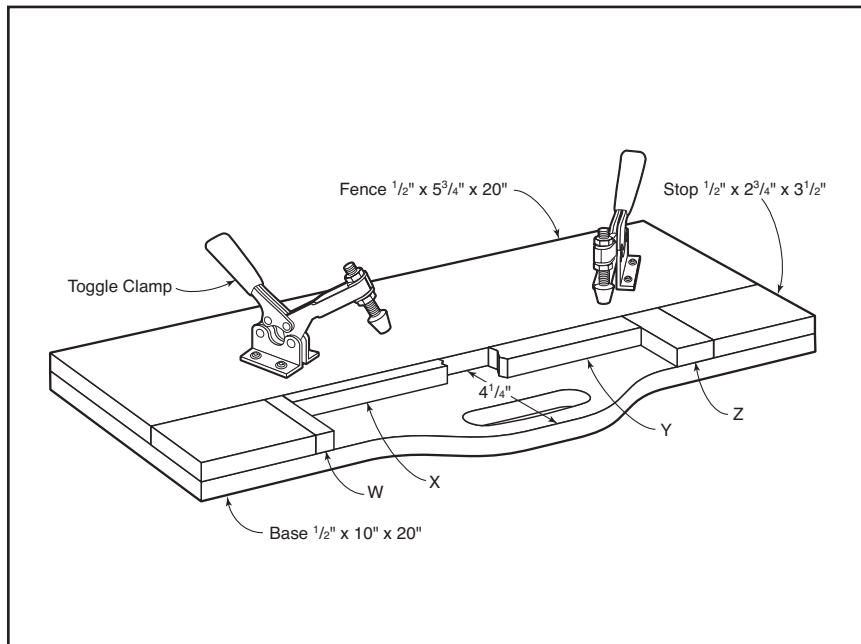


FIG 4. END PROFILE GRID

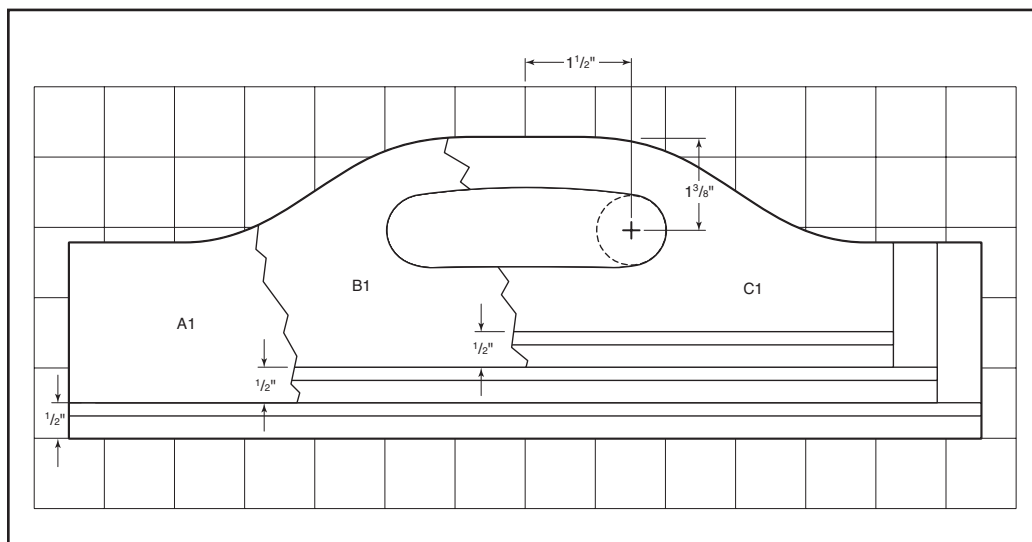


FIG 5. ROUT EDGE PROFILES

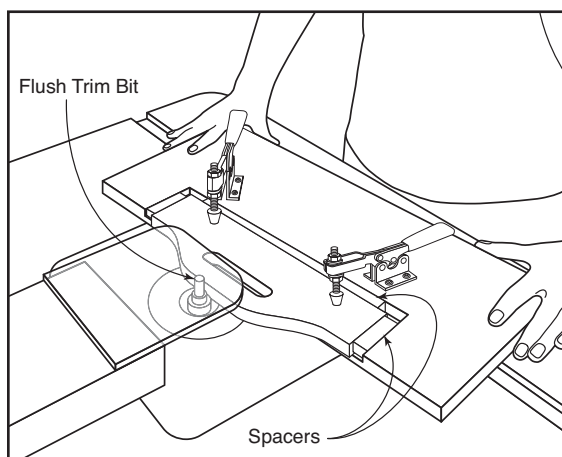


FIG 6. ROUT HANDLE HOLES

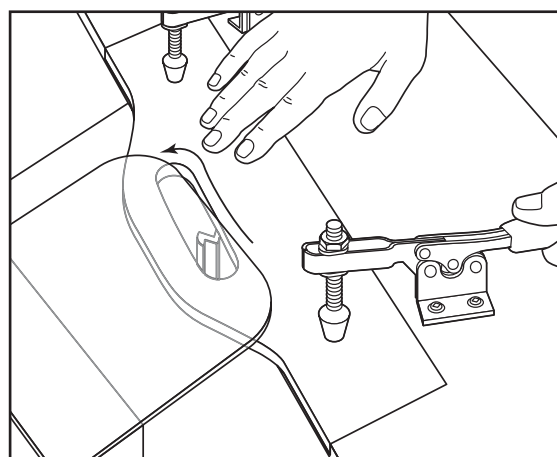


FIG 7. ASSEMBLY

