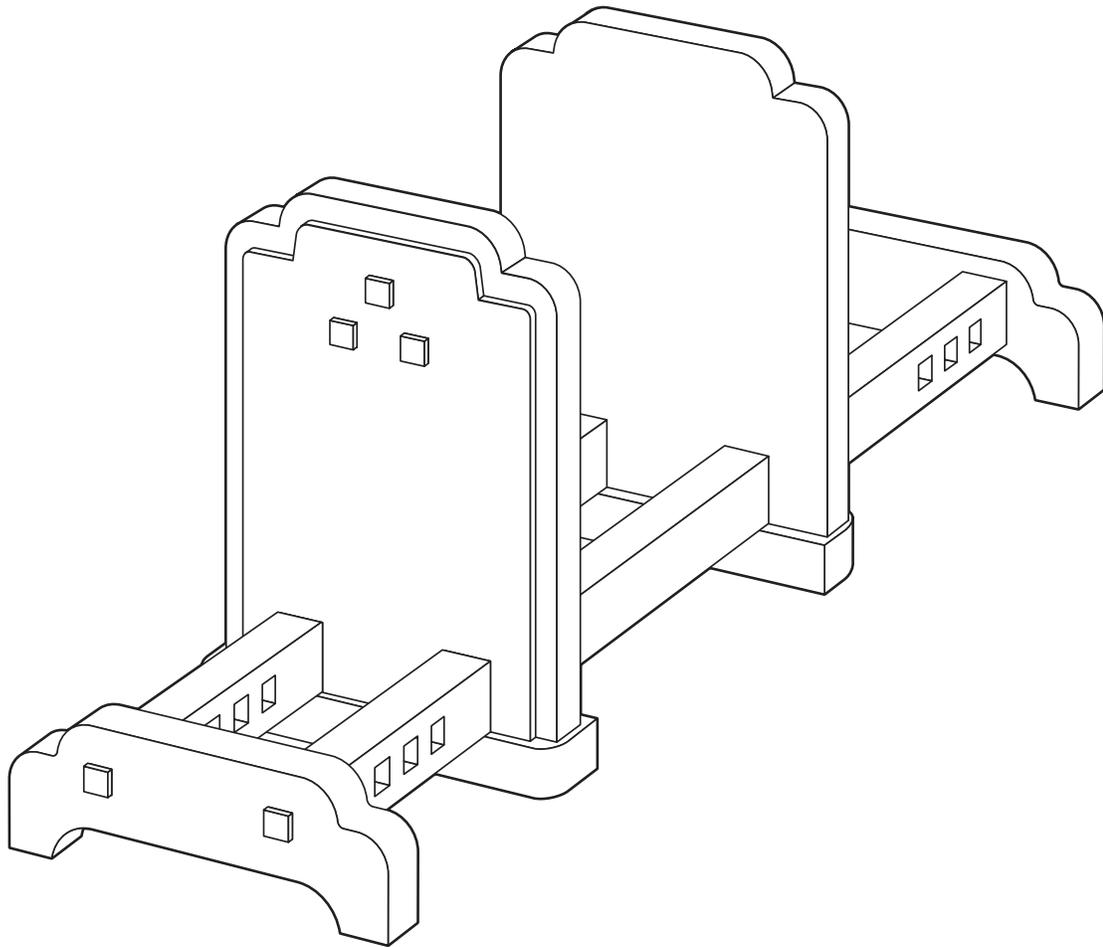




WOODWORKS: INTERMEDIATE PROJECT 2007-2008
SLIDING BOOKRACK



The design of this ingenious book holder was inspired by the work of Greene & Greene, two architects who designed Arts & Crafts homes and furnishings in the early 20th century. Their detailing was exquisite yet they were also quite practical, as with this bookrack, which works simply on friction. The bookends slide on two rails to keep any number of books upright.

In this intermediate-level project you'll be cutting and shaping with a band saw, router, table saw and other tools to create a machine-perfect piece. And when it's all done, you'll learn more about applying and using stains and finishes to protect the wood and keep it looking beautiful.

TOOLS REQUIRED**Hand Tools**

- Mallet
- Screwdriver

Power Tools

- Random-orbit sander
- Router
- Router table with rabbeting bit
- Table saw with dado set
- Band saw or scroll saw
- Mortising machine
- Power planer

Miscellaneous

- Pencil
- Tape measure
- Double-stick tape
- Safety glasses
- Carpenter's glue
- 120-, 150- 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)

WOOD FINISHING PRODUCTS**Recommended Finish**

- Prep: Minwax® Pre-Stain Wood Conditioner
- Stain/
- Finish: Minwax® Polyshades® Bombay Mahogany
- Optional added
- finish: Minwax® Fast-Drying Polyurethane or Minwax® Wipe-On Poly
- Wax: Minwax® Paste Finishing Wax

SHOPPING LIST**Recommended wood:** Oak**Alternate wood:** Pine

1' x 8' oak:	3 lin. ft.
Walnut:	Scrap
#8 x 1-1/2" flat-head screws	

CUTTING LIST

Overall Dimensions: 7-13/16"h x 6-1/8"w x 23-1/2"l			
Key	Part	Pcs.	Dimensions
A	Bookend	2	3/4" x 5-1/2" x 7"
B	Endcap	2	3/4" x 2-1/8" x 6-1/8"
C	Base	2	3/4" x 5-3/4" x 1-1/4"
D	Rail	2	3/4" x 15/16" x 23"
E	Pegs, Walnut	10	3/8" x 3/8" x 1/4"

Alternate Finish

- Prep: Minwax® Pre-Stain Wood Conditioner
- Stain: Minwax® Gel Stain Aged Oak
- Finish: Minwax® Fast-Drying Polyurethane semi-gloss
- Wax: Minwax® Paste Finishing Wax

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

Make the Parts

1. Cut the bookends (A), endcaps (B) and bases (C) to their final size. Cut the rails (D) an extra 1/8" thick. You can cut paired pieces at the same time by holding them together with double-stick tape.

2. Cut the shapes of the bookends, endcaps and bases on the band saw (Fig. 1). Sand the sawn edges progressively using 100-, 120- and 150-grit sandpaper.

3. Rout the bookend profile with a 3/8" rabbeting bit (Figs. 2 and 5). Raise the bit in 1/16" increments to avoid tear-out. Use a chisel to square the rabbet's inside corners. To safely begin the cut, pivot the work piece against a starting pin. Once started, you can ride on the bit's bearing.

4. Cut shallow mortises into the bookends using a mortising machine (Fig. 2). Cut through mortises in the endcaps and rails (Figs. 3 and 4). Some tear-out on the back is inevitable, even with a sacrificial board under the rail, but you'll remove it in the next step.

5. Plane the rails to their final thickness using a power planer. Place the torn-out sides facing up; they'll come out perfectly smooth.

6. Cut tenons on the rails using a dado set (Fig. 4).

7. Make the walnut pegs (E) from 3/8"-thick square blank. Cut the pegs to length with a band saw, Japanese pull saw or dovetail saw.

Assemble the Bookrack

8. Glue and clamp the rails and endcaps. Work on a flat surface. Check the assembly for wobble before you set it aside to dry.

9. Glue pegs (E) into the bookends and endcaps. Leave the pegs proud by at least 1/16". Scrape excess glue from around the pegs before it dries.

10. After the glue is dry, round over the pegs' sharp corners with 180-grit sandpaper in a random-orbit sander.

11. Mark the positions of the bookend slots directly from the rail and endcap assembly. Cut the slots using your miter gauge and a tall auxiliary fence (Fig. 6). Make multiple passes, raising the blade 1/4" with each cut.

12. Pre-drill the bases and bookends. Screw these parts together on the rail and endcap assembly and test their fit. There should be a little play so the bookends will slide. Disassemble the bases and bookends for finishing.

13. Sand with 180- and 220-grit sandpaper to gently round the edges of the bookends, endcaps, rails and bases. Don't sand the bookends' bottom edges. Proceed to the staining and finishing.

14. After the finishing is done, screw the bases to the bookends and load in your books.

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 oil-based products, such as Minwax® Polyshades® or Minwax® Fast-Drying Polyurethane must be cleaned with mineral spirits.

15. Dust off the piece and wipe it carefully with a clean, lint-free cloth lightly dampened with mineral spirits.

Recommended Finish

16. Apply Minwax® Polyshades® following the directions on the can. Use a good quality, natural-bristle brush suitable for use with polyurethane. Stir the can contents thoroughly before starting and periodically repeat stirring during your work session. Allow the first coat to dry overnight.

17. The next day, sand all surfaces lightly with 220-grit sandpaper or very fine (000) steel wool using with-the-grain strokes. Dust off and wipe all surfaces with a cloth dampened with mineral spirits. Apply a second coat of Polyshades® and set the rack aside to cure overnight. To achieve a deeper color, you may apply a third coat after 4-6 hours, repeating the application directions. Allow the project to cure for several days before using it.

18. After the finish is dry, apply a coat of Minwax® Paste Finishing Wax over every surface and rub it out with #0000 steel wool to an even sheen. This is an essential step. The wax lubricates the rails, allowing the bookends to slide smoothly.

Woodworker's Tip: *If you achieve the desired color on the first or second coats of Polysbades®, apply a clear coat of Minwax® Fast-Drying Polyurethane or Minwax® Wipe-On Poly for added protection.*

Alternate Finish

19. Apply the Minwax® Gel Stain you've chosen using a clean, lint-free cloth or natural-bristle brush. Allow the Gel Stain to set for about 3 minutes, then wipe off any excess with a clean, lint-free cloth. To achieve a deeper color, you may apply a second coat after 8 to 10 hours, repeating the application directions for the first coat. Allow the stain to dry for 24 hours before applying the 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.*

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

21. 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.

22. 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.

23. After the finish is dry, apply a coat of Minwax® Paste Finishing Wax over every surface and rub it out with #0000 steel wool to an even sheen. This is an essential step. The wax lubricates the rails, allowing the bookends to slide smoothly.

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 over-exposure, 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.

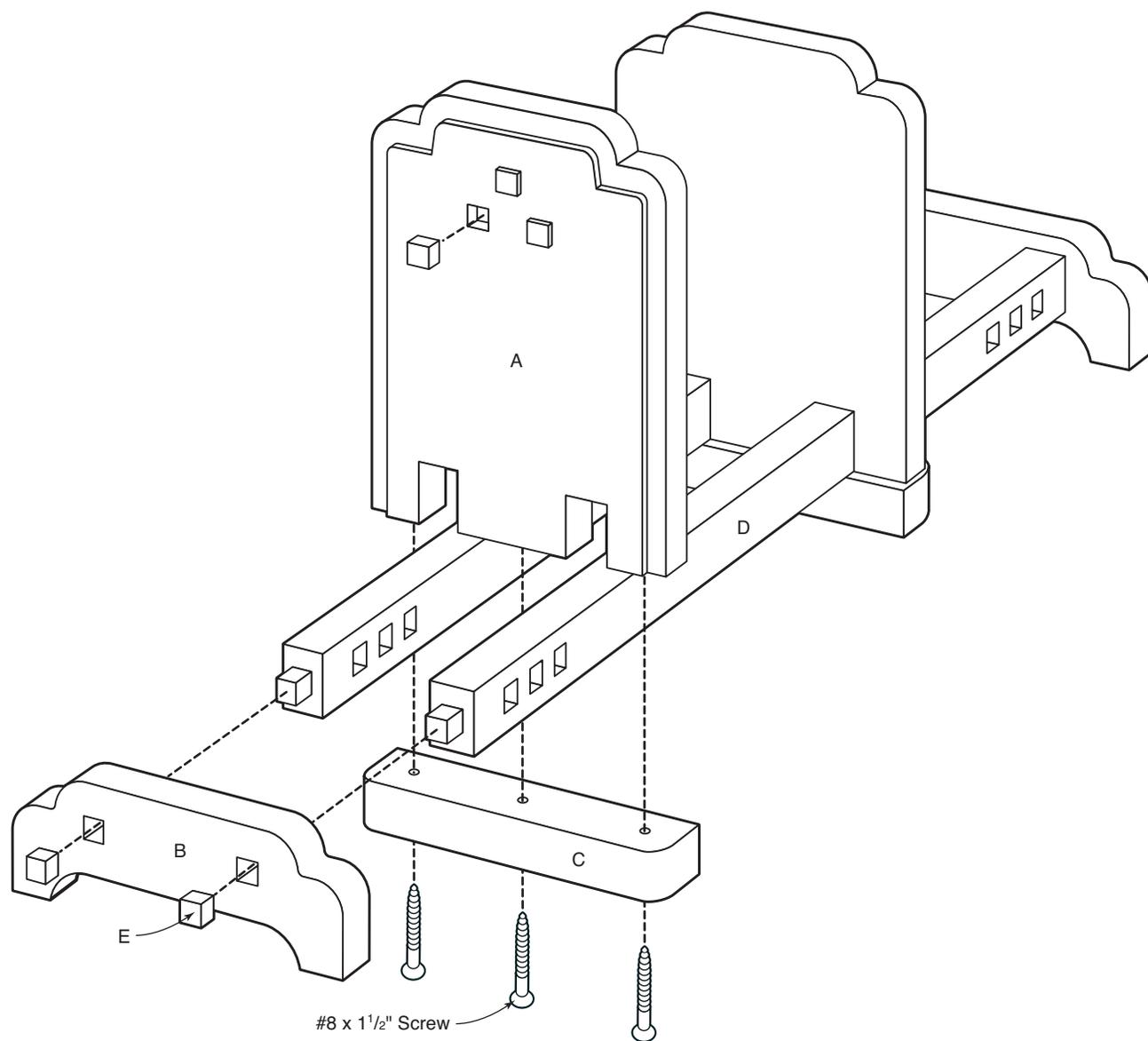
Contains solvents which can cause permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling contents may be harmful or fatal.

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.

FIG 1. BOOKRACK DETAILS



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FIG 2. BOOKEND DETAILS

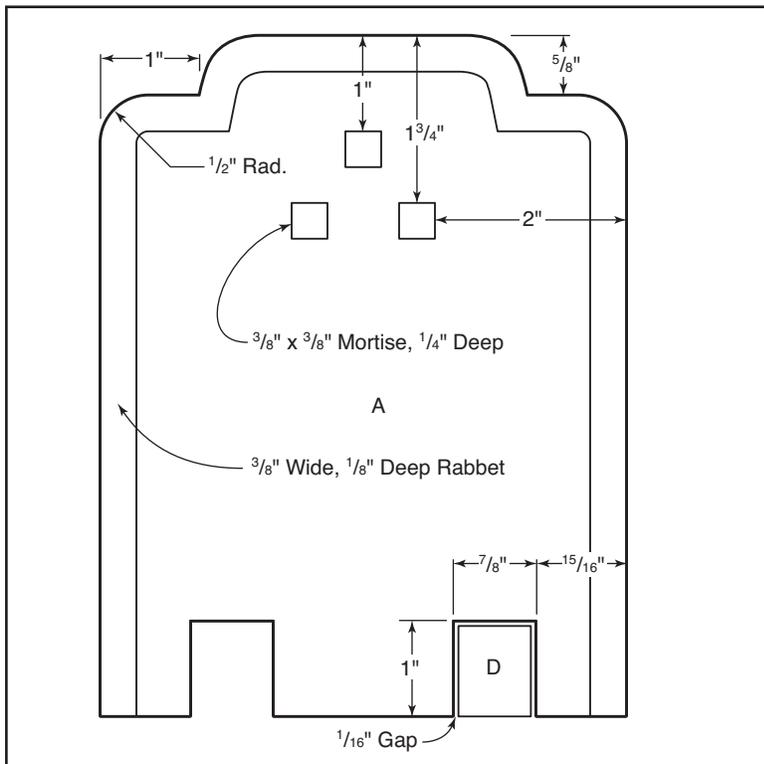


FIG. 3. END CAP DETAILS

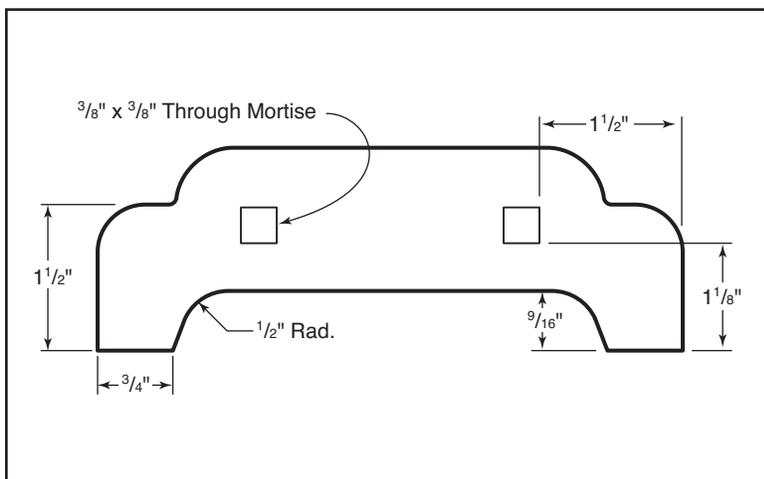


FIG 4. RAIL DETAIL

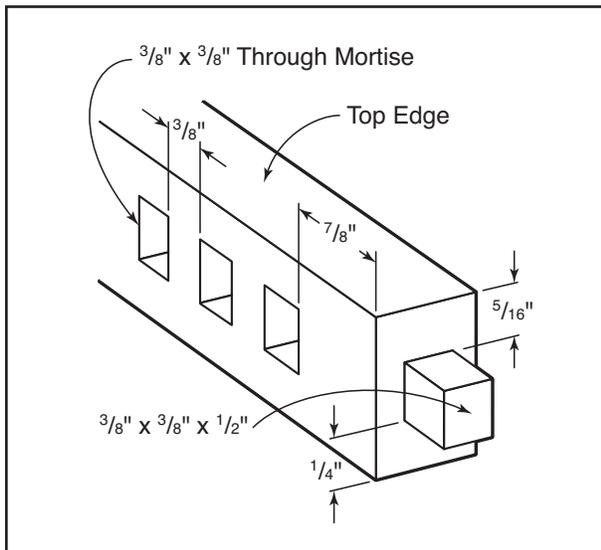


FIG 5. ROUT STEP

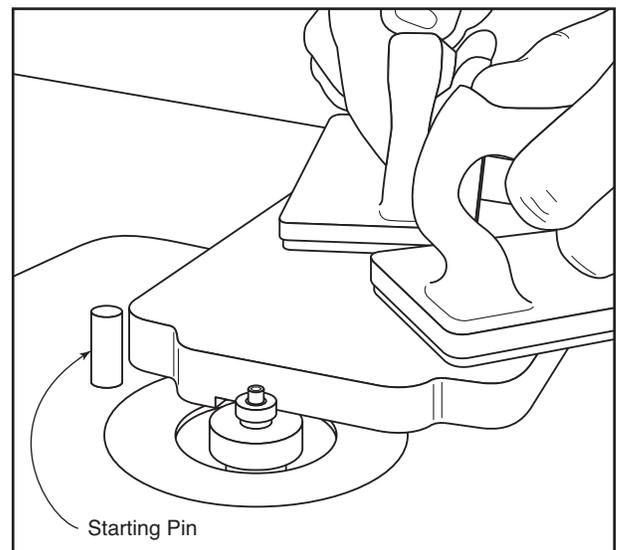


FIG 6. CUT BOOKEND SLOTS

