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Connecticut River Valley Highboy

Part 1 Published in *Woodworker's Journal* January/February 1991
Part 2 Published in *Woodworker's Journal* March/April 1991

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Connecticut River Valley Highboy

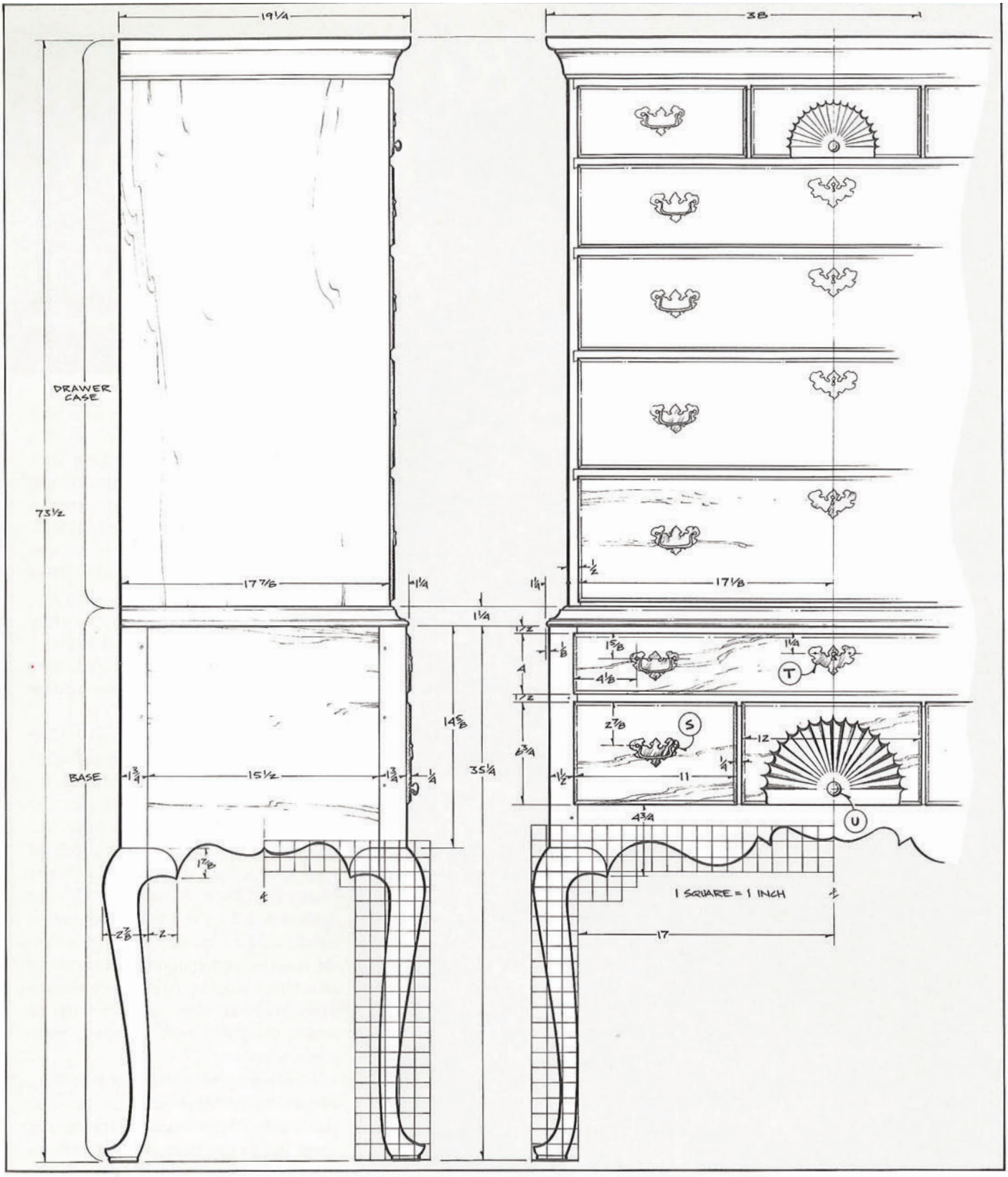
Part 1

Designed and Built by Dennis Preston

The English refer to it as a high chest of drawers; we call it a highboy. By either name it is certainly one of the most distinctive and beautiful pieces of furniture designed in the 18th century. The general style of our piece is representative of the rural Massachusetts or Connecticut River Valley tradition. Crafted in cherry, it features graceful cabriole legs, a deeply scalloped apron, graduated drawers, a flat top with cornice, and carved sunbursts on the upper and lower center drawers.

We've opted for the flat top rather than the bonnet top that's found on some highboys. There are several reasons for this. First, the country cabinetmaker who probably would have built a piece like this would have also likely dispensed with the bonnet top, if for no better reason than his clientele had neither the cash nor desire for artifice and embellishment. But a more important reason is the scale of modern rooms. A bonnet top crowning a highboy of authentic proportions such as ours would hardly fit within the 8-foot high ceilings of most modern homes.

Building a piece of this size may seem like an impossible project; it is not. It is the result of methodically doing the same basic operations over and over. If you can build a dovetailed box, you can build this highboy. For builder Dennis Preston, this highboy was only his second effort at hand-cutting dovetails. To make the project easier to build, but also to enable us to include as much detail as possible, we've broken the highboy into two sections. As in the originals, the upper section is actually a

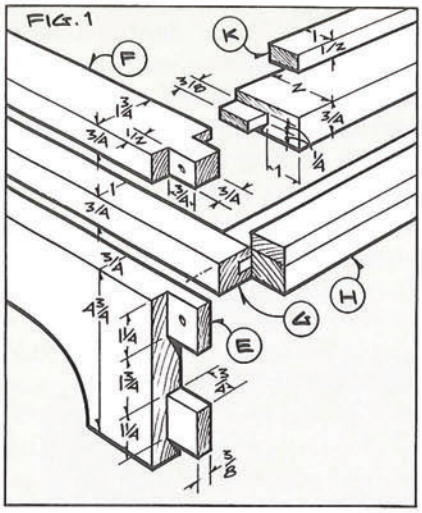


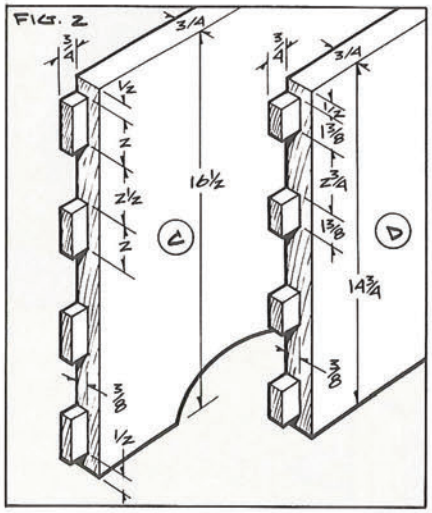
separate drawer case resting on a lower, or base, section. In addition to simplifying construction, this two-part design enables the highboy to be easily moved. We'll cover the base section here, and the drawer case in our next issue (March/April 1991).

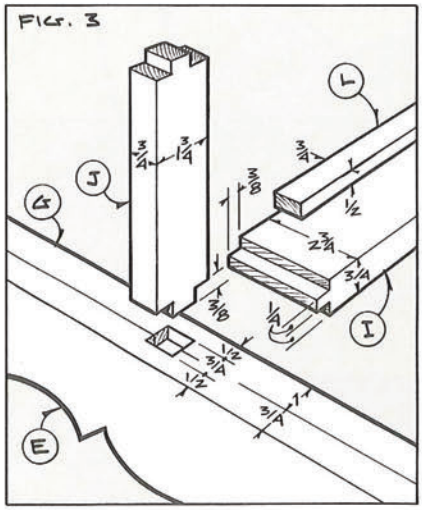
Incidentally, if a highboy is not for you, just build the base section, omit the molding and add a top, and you'll have a handsome lowboy. However, in order for the lowboy proportions to be correct, you should scale down the legs so the overall height of the piece is between 29 in. and 31 in.

The Base

With any large piece, it helps to plan your approach. A good sensible approach with the base is to start by edge-gluing narrower stock to get the widths needed for the wider parts. The wide parts on the base are the sides (C) and back (D). If you build the piece from cherry, as we did, take care to match the grain on the sides carefully and rip away any of the white sapwood. Our highboy







uses cherry only on those parts that are visible from the front and sides. The interior construction, including the back, is a secondary hardwood such as poplar.

While you are waiting for the sides and back to dry, get out stock for the legs (A) and the remaining base parts. We recommend that you first cut all the base parts to size, and next lay out and cut the various mortises in the square leg blanks. It's much easier to cut your mortises while the legs are still square. Then test-fit the entire assembly. The shaping of the legs isn't done until last, after you're certain everything fits as intended. When you are ready to shape the legs, refer to our Special Techniques article, starting on page 23, where the procedure is detailed. Note that the ears (B) are not added until later on.

Joining the legs and sides are an apron (E) and a series of open-ended frames. The upper frame consists of a front stretcher (F) and a pair of side rails (H). The middle frame is identical to the upper frame, but also includes a pair of center rails (I). The lower frame is identical to the center frame, with the exception that a narrow bottom stretcher (G) replaces the wider front stretcher of the two upper frames. The bottom stretcher's 1 in. width, 3/4 in. narrower than the 1 3/4 in. front stretchers, enables it to tuck neatly behind the 3/4 in. thick apron. The frame joinery details and the apron tenon dimensions are shown in Fig. 1. The center rail tenon dimensions are shown in Fig. 3. Although the bottom stretcher shown in both these details is technically an interior part, you should make it from cherry to lend symmetry to the appearance of the three frames (see photo, page 68).

By this time your sides and back should be out of clamps, so you can set about cutting the tenons on the ends of these parts (Fig. 2), and the matching mortises in the leg blanks. With these joints cut and test-fit, lay out for the scroll work that decorates the bottom edges of the apron and sides. The best way to transfer these profiles from the grid patterns shown on the elevations is to make full-size templates and then trace the patterns onto your stock using the templates. The profiles can be cut with a band saw or scroll saw, or with a hand-held jigsaw.

Like the preceding joinery, the mortises for the dividers (J) are cut before any parts are glued and assembled. As shown in Fig. 3, the tenon on the bottom end of the dividers fits into a 3/4 in. square by 3/8 in. deep mortise that's cut on the line between the apron and bottom stretcher. Notch 1/4 in. of the mortise into the apron and the remaining 1/2 in. into the bottom stretcher. Don't neglect cutting the various mortises in the back for the side and center rails. These mortise-and-tenon joints support the frames at the back.

With all the joinery complete, now test assemble the base. Also, cut and fit the four side and two center guides (K, L). Mark each part for ease of reassembly, then take the base apart and cut and shape the legs, as per the instructions in Special Techniques.

Assembly

There are several ways you can handle the final assembly, but here's a method we like that breaks the assembly into sections so you won't be working with too many parts at the same time. Start by gluing up the bottom stretcher and apron. Next, join that assembly to one of the front stretchers with the two dividers. Now take the stretcher/apron/divider assembly and the remaining front stretcher and join the two front legs. As a separate assembly, glue up the back with the two back legs. When these assemblies are dry, lay the back/leg section flat, glue the sides into the back legs and the rails into the back, and then

add the front section. Check the base corners with a square and use clamp pressure or a clamp diagonally across the corners to make any adjustments.

Once the base is dry, add the guides and drill for and insert the pegs that lock the various tenons. With modern adhesives, and assuming accurate joinery, the pegs are little more than a decorative detail. But if your mortise and tenon work leaves something to be desired, the pegs will add an important measure of mechanical strength.

All that remains of the base is the ears, drawers, molding (M) and filler strip (N). We used a 5-step procedure to cut the molding. When cutting complex moldings, it's often easiest to start with stock that's larger than needed and then make ripping cuts to establish final size after the molding steps are completed. The extra stock is for ease of handling and to provide broader bearing surfaces. This makes for safer operations.

Bill of Materials
(all dimensions actual)

Part	Description	Size	No. Req'd.
A	Leg	3 x 3 x 35 1/4*	4
B	Ear	1 1/4 x 2 1/4 x 2 1/4*	6
C	Side	3/4 x 16 1/2 x 17**	2
D	Back	3/4 x 14 3/4 x 35 1/2**	1
E	Apron	3/4 x 4 3/4 x 35 1/2**	1
F	Front Stretcher	3/4 x 1 3/4 x 35 1/2**	2
G	Bottom Stretcher	3/4 x 1 x 34	1
H	Side Rail	3/4 x 2 x 17 1/4**	6
I	Center Rail	3/4 x 2 3/4 x 17 1/4**	4
J	Divider	3/4 x 1 3/4 x 7 1/4**	2
K	Side Guide	1/2 x 1 x 15 1/2	4
L	Center Guide	1/2 x 3/4 x 16 1/2	2
M	Molding	See Detail	About 7 ft.
N	Filler Strip	3/4 x 3/4 x 33 3/4	1

Drawers

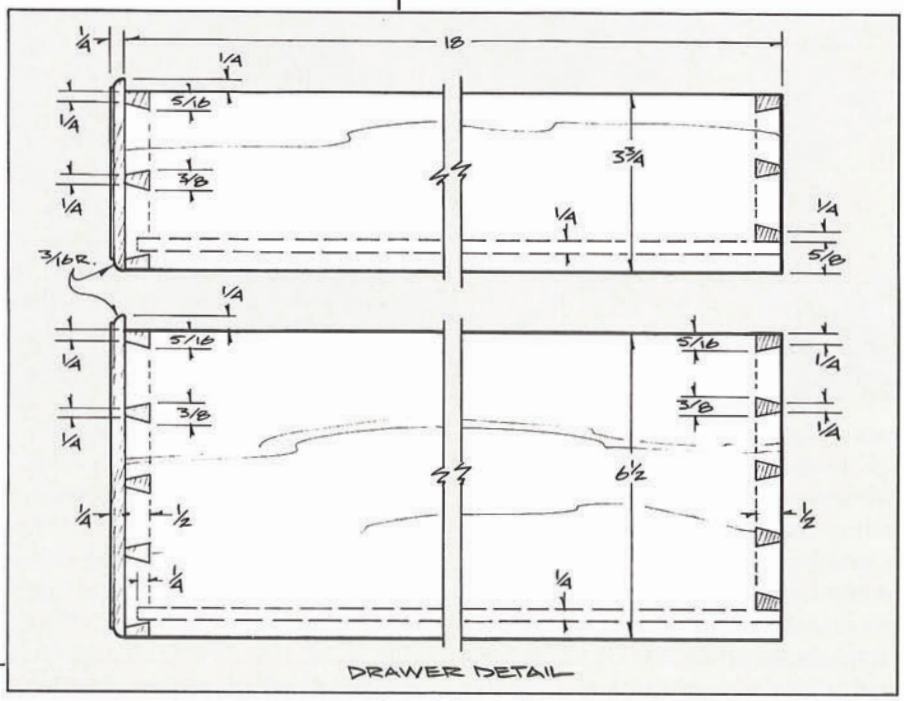
Part	Description	No. Req'd Per Drawer	Top Drawer	Side Drawer	Center Drawer
O	Front	1	3/4 x 4 x 34 1/2	3/4 x 6 3/4 x 11	3/4 x 6 3/4 x 12
P	Side	2	1/2 x 3 3/4 x 18	1/2 x 6 1/2 x 18	1/2 x 6 1/2 x 18
Q	Back	1	1/2 x 3 1/8 x 34	1/2 x 5 7/8 x 10 1/2	1/2 x 5 7/8 x 11 1/2
R	Bottom	1	1/4 x 17 3/4 x 33 1/2	1/4 x 17 3/4 x 10	1/4 x 17 3/4 x 11
S	Chippendale Pull	3 7/16 x 2 (2 1/2 in. borings)***	4		
T	Escutcheon	3 7/16 x 2***	1		
U	Knob	1 dia.***	1		
V	Lock	1/2 x 2 1/2 x 1 7/8 (half mortise)****	1		

* Dimensions are before shaping

** Length includes tenons

*** Pulls, escutcheon and knob (all solid brass) are available from Horton Brasses, Nooks Hill Rd., Cromwell, CT 06416; tel. (203) 635-4400. Order part no. H-34-S for the pulls (specify 2 1/2 in. borings), part no. H-34-SE for matching escutcheon, and part no. K-12 for the knob (specify 1 in. diameter, with machine screw for 3/4 in. thick drawer front). Prices are $6.50 each for the pulls, $5.25 for the escutcheon and $3.75 for the knob, not including shipping. The hardware is available in a choice of finishes, either antique or semi-bright at the prices noted, or bright polished for an additional 20 percent.

**** Brass drawer lock is available from The Wise Company, 6503 St. Claude Ave., P.O. Box 118, Arabi, LA 70032; tel. (504) 277-7551. Order part no. L01E. Price is $14.35 plus $3.50 shipping and handling.

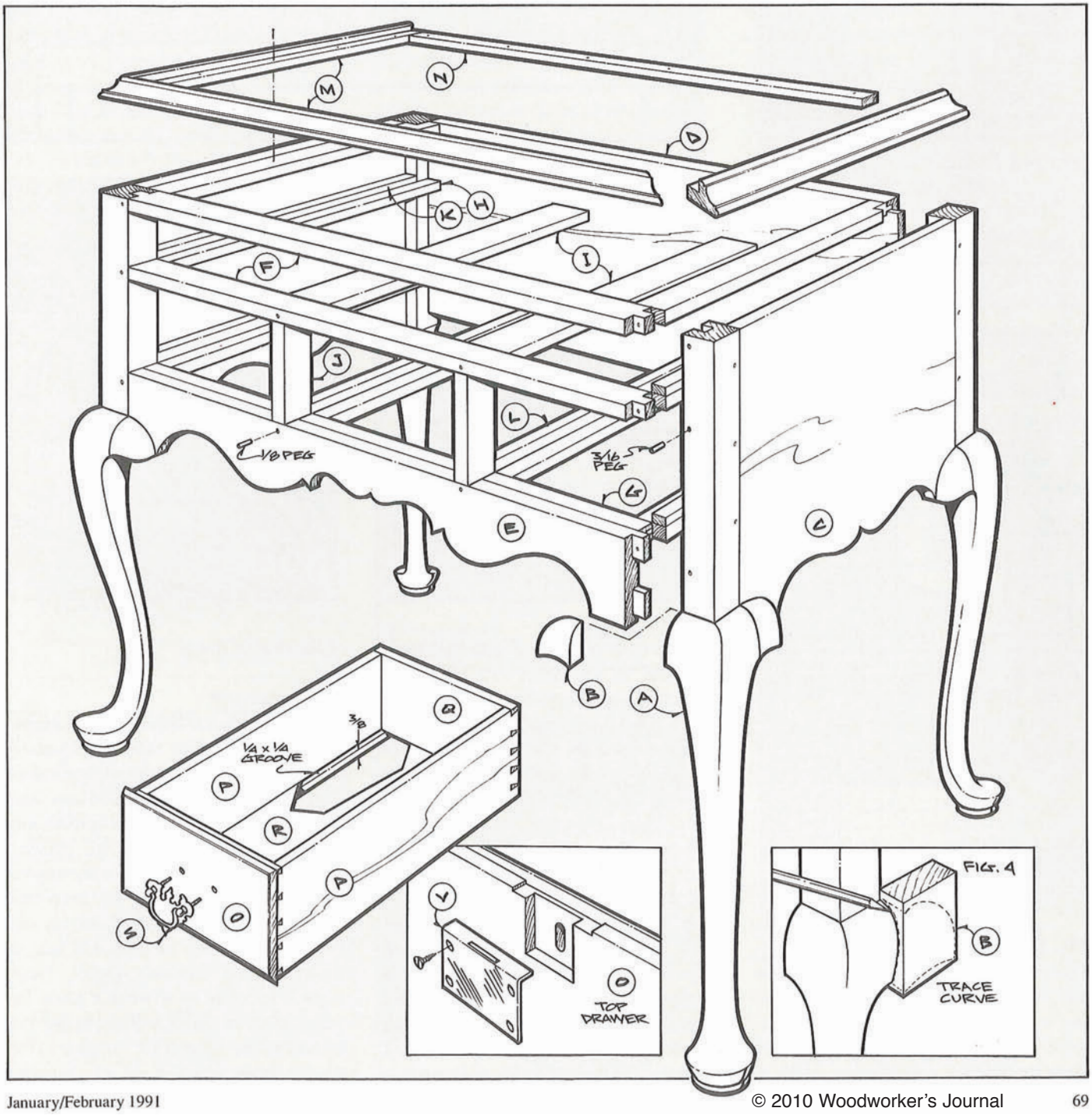


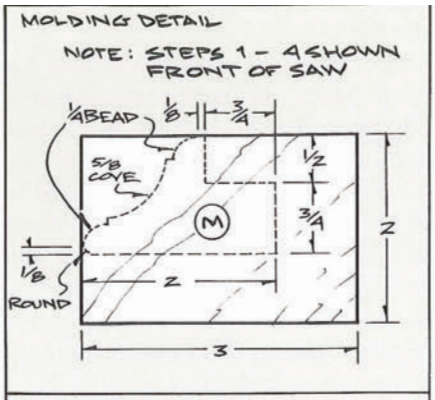
The Molding

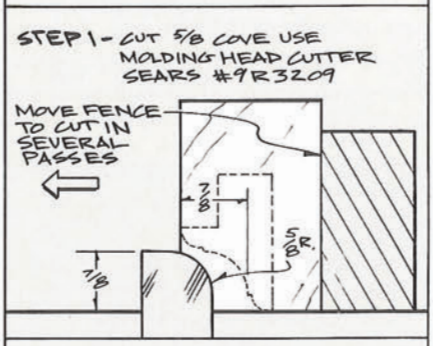
For the molding, start with a board that's 2 in. thick by 3 in. wide. Then, using the molding head equipped with a 5/8 in. radius cove cutter, establish the cove. Start with the fence positioned so that only about 1/4 in. of stock is removed, then readjust the fence several times and make repeated passes until you've achieved the required 7/8 in. depth and width of cut (Step 1). Note that since the stock is trapped between the molding head and the fence, you'll need feather boards to maintain steady pressure. Take extra care with the last pass; you don't want a slip here, since it would ruin the piece. Now switch to a 1/4 in. radius roundover cutter in the molding head, relocate the fence, and establish the 1/4 in. radius roundover at the top of the molding (Step 2). With that cut complete, relocate the fence once more and cut the remaining roundover (Step 3). Switch to the dado head, set it for a 1/2 in. deep by at least a 3/4 in. wide cut, and plow the groove as shown (Step 4). Now all that remains is to make the ripping cuts to establish the final size of the molding (Step 5). Round the bottom edge of the molding, miter the ends, mount it with finishing nails, and then cut and glue the filler strip in place.

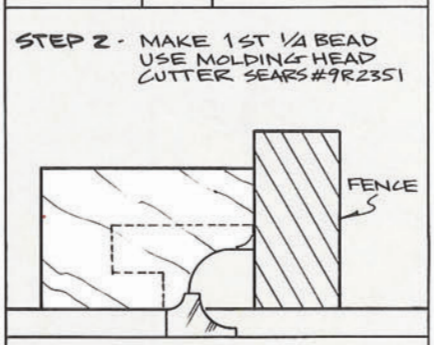
The Ears

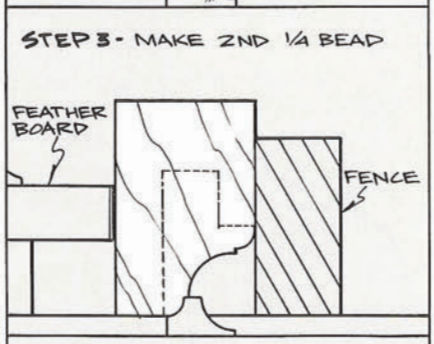
For each ear, start with a 1 1/4 in. thick by 2 1/4 in. square block. Transfer the outside shape from our grid pattern, then hold the block in position against the leg to transfer the side profile (Fig. 4). Now cut and rough shape the ear. Final shaping and sanding is done after the ears have been glued in place. Note that the ears are glued to the legs, but not to the sides or apron. By not gluing the ears to the sides or apron, you allow these parts to respond to seasonal changes without risk of splitting off the narrow cross-grain sections at the bottom of the scroll profiles.

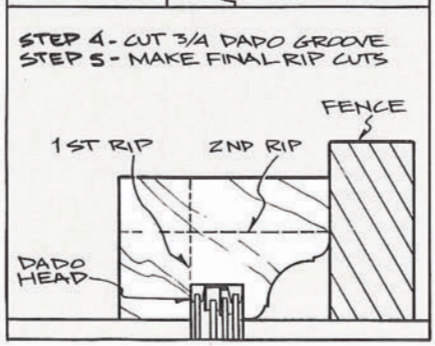


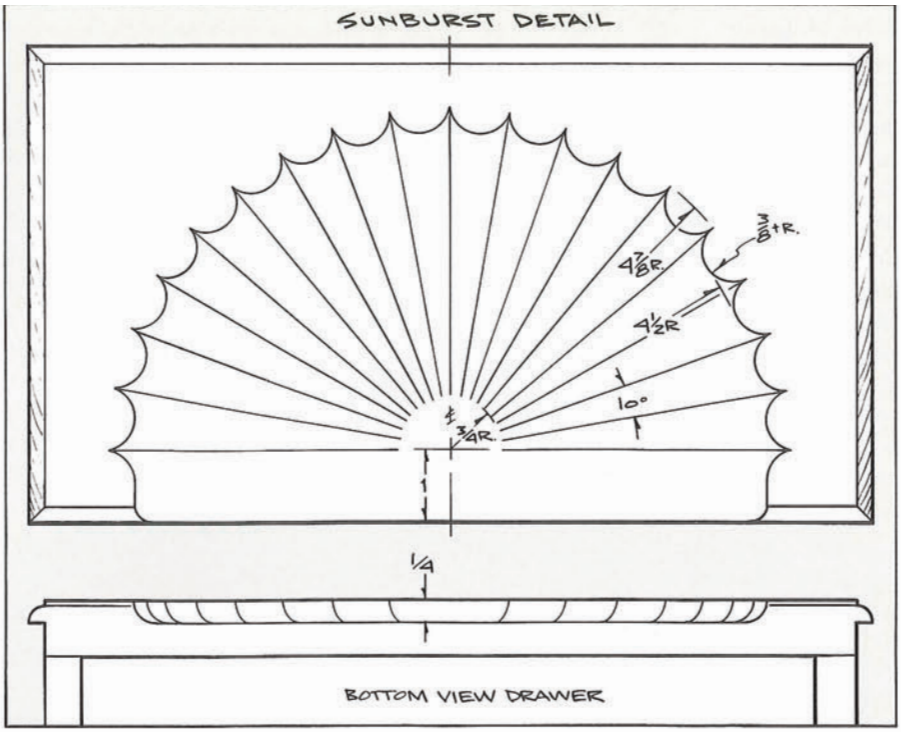


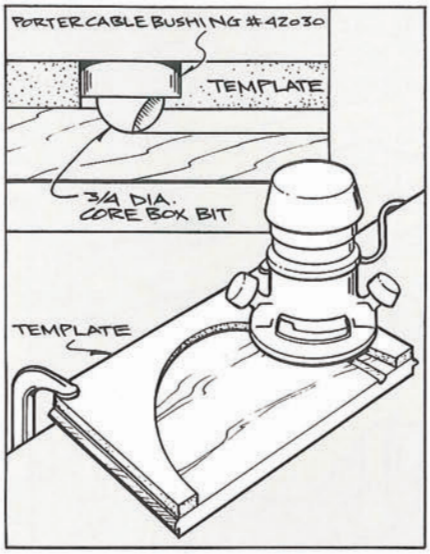


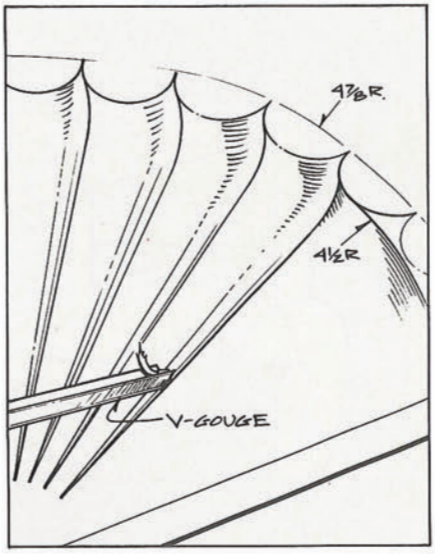










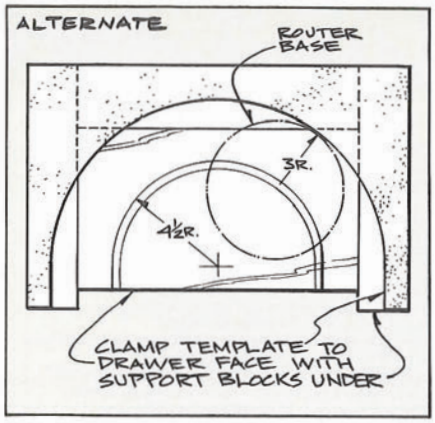


The Drawers

There are four drawers in the base: a full-width top drawer, two side drawers, and a center drawer that sports a handsome sunburst carving. All the drawers show traditional construction, with a molded front (O) joined with half-blind dovetails to the sides (P). Through-dovetails join the sides and back (Q), and a bottom (R) slides under the back into grooves in the sides and front. Since this piece is not an exact copy of a museum original, we've used 1/4 in. thick birch plywood for the drawer bottoms. You could substitute 1/2 in. thick solid stock, beveled on the front and sides. The drawers are all sized to stop 1/4 in. from the inside of the base back, with a 1/4 in. wide lip on the top edge and ends of the drawer fronts serving as the stop. The Drawer Detail shows a suggested layout for the drawer dovetails. Note that a 3/16 in. radius roundover is used to mold all four edges of the drawer fronts.

The Sunburst

The sunburst carving on the center drawer front is done after the dovetails have been cut and test-fitted, but before the center drawer is glued up and assembled. Here's an easy way to do this carving if you don't have any carving experience. With the center point of your compass located 1 in. up from the bottom edge of the drawer front, lay out the two radii, 4 1/2 in. and 4 7/8 in., as shown in the Sunburst Detail. Next, make a template to serve as a guide for your router, so that it will cut to the 4 1/2 in. radius line. Clamp the template to the drawer front, chuck a 3/4 in. diameter



core-box bit in the router, set the bit for a 1/4 in. deep cut, and make several passes along the template edge (see detail). If your router doesn't include a guide bushing to fit a 3/4 in. diameter core box bit, just make a larger template, cut some support blocks, and bear the router base directly against the template (see Alternate). Next, remove the template, switch to a 3/4 in. diameter straight cutter, and waste away the remaining material at the 1/4 in. depth. Just be sure to start your cut at the center and work out toward the edges. You won't have any support for the router when you reach the center if you try working in toward the center from the edges. An oversize clear acrylic router base is helpful when routing large areas where there's not enough support for a normal-sized router base.

Now use scrapers to smooth the bottom of your sunburst. With the bottom reasonably smooth, divide the sunburst into 18 rays. Since the sunburst is essentially a half circle, an easy way to mark out the 18 rays is to just take a protractor and tick off a mark at every 10 degrees. Next, again using the compass, scribe the radii on the outside edge indicating where the rays terminate. The compass setting for these radii should be a little over 3/8 in. Also scribe a 180-degree radius 3/4 in. from the sunburst center point to designate the point where the rays originate.

To create the individual rays, you'll need to use a V-gouge. The technique is simple: just cut to about a 1/8 in. depth between the rays, then round the rays gently to approximate a radius. If you can't follow the ray lines accurately with the V-gouge, use a straightedge and an X-Acto knife to cut a shallow V-shaped guideline along each ray line. Deepen the points between the rays to touch the 4 7/8 in. radius line you scribed earlier, and fair the roundover here to meet the roundover on the rays at the bottom of the sunburst. After sanding you should have a sunburst similar to the one shown.

Finishing Up

For a finish, we like a penetrating or tung oil mixture. No stain is needed as cherry will darken to a deep natural tone after exposure to sunlight over time. Sources for the solid brass Chippendale pulls (S), matching escutcheon (T), knob (U) and lock (V) are listed in the Bill of Materials. Note that you'll have to specify one of three finishes for the brasses (we prefer the bright brass). WWJ

Connecticut River Valley Highboy

Part 2 Designed and Built by Dennis Preston

This upper section completes the Highboy presented in our January/February 1991 issue. If you missed Part 1 (the base section) of the Highboy, it's available as a back issue. Order Volume 15, No 1.

The Case

Start by edge-gluing stock for the drawer case box. It's just two sides (A) with a top and bottom (B), all dovetailed together. The sides are solid cherry, but the top—which can only be seen from above—can be a secondary hardwood such as poplar. The bottom can also be a secondary hardwood, but as indicated in the dovetail layout detail (Fig. 1) you'll need a 1 in. wide strip of cherry along the front edge, to match the drawer frames. The tops of the dovetails are seen from the side, but the use of a secondary wood here won't stand out as a defect, since only about 1/4 in. of the tails is actually exposed when the drawer case is nested into the base.

Once your dovetails are complete, test-assemble the sides, top and bottom. While the dry assembly is together, mount a bearing-guided rabbeting bit in the router and cut the 1/4 in. deep by 3/8 in. wide rabbet for the back (I). Square the corners with a chisel. Then disassemble the case and cut the various mortises for the drawer frame stretchers. Note that a 1/2 in. deep half-dovetail mortise houses the ends of the front stretchers (C), while a 3/8 in. deep mortise is needed for the ends of the back stretchers (D). Appropriately, the front stretchers are 1/4 in. longer than the back stretchers. Note that except for the front stretchers and the two dividers (G), the remaining interior case parts can all be a secondary hardwood.

Now glue up and assemble the sides, top and bottom. When dry, cut and fit the front and back stretchers. Mortise these stretchers to accept the side rails (E), adding the center rail (F) and divider mortises to the two uppermost front stretchers, and the center rail mortises to the two uppermost back stretchers. Joinery details for these mortises and for the tenons are shown in Figures 2 and 3. Test-fit the dividers, but don't cut the side and center rails yet.

Now apply glue to the ends of the two dividers, join the two uppermost front stretchers with them, and glue those stretchers into the case sides. Also glue the three remaining front stretchers in place.

Before you cut your side and center rails to length and tenon the ends, check the length dimensions in the Bill Of Materials. As indicated, the overall rail lengths, including the tenons, are a little shorter than the actual mortise-to-mortise dimension. When you assemble the rails and then add the back stretchers, this allowance should produce a 1/8 in. gap between the rail tenon shoulder and the edge of the stretcher. The rails are *not* glued in place. They must float freely in order to allow for wood movement across the width of the sides. The 1/8 in. gap allows the sides to contract 1/8 in. If the wood you are using is dried to a moisture content that's greater than 7-8 percent, and you are building in the summertime when relative humidity is high, then you should probably increase the allowance for wood movement to about 1/4 in. Don't exceed the 1/4 in. allowance though, or the rails may drop out of the mortises.

With your rails sized, now lay the case face-down, mount the rails in the front stretchers, and add the back stretchers. Cut, fit

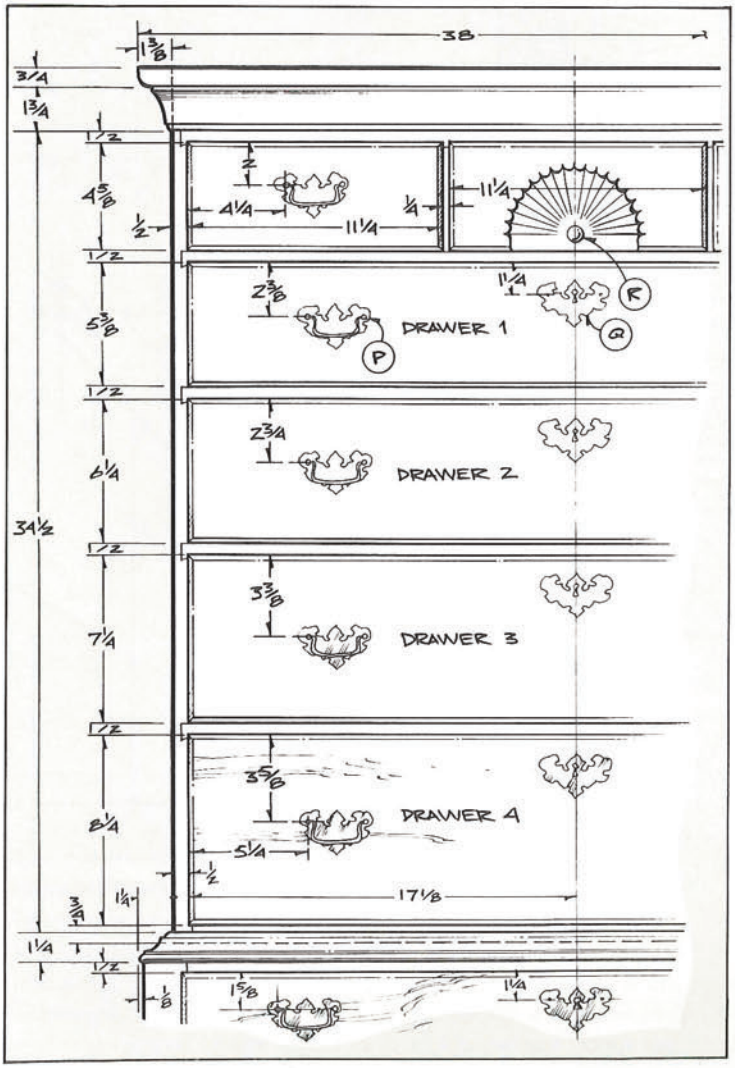
and glue the guides (H) in place, then cut and mount the back (I).

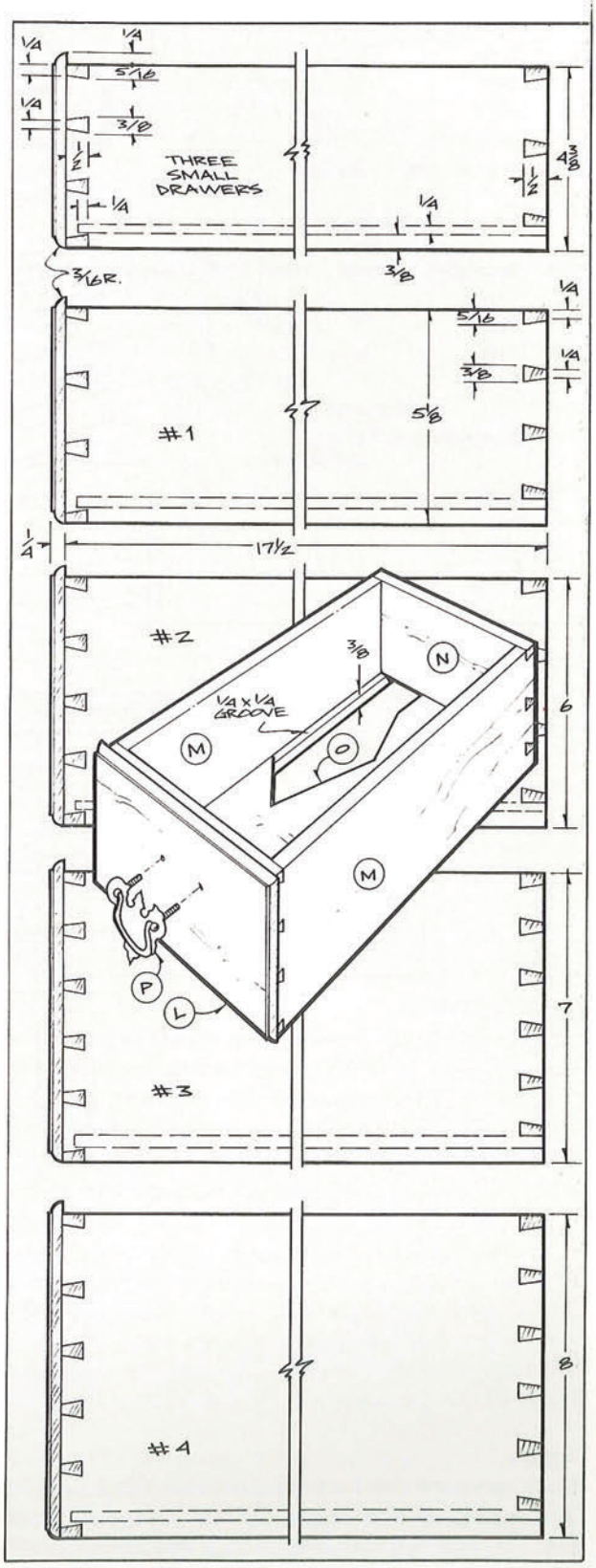
The Molding

Now go to work on the cap and crown molding (J, K). The cap molding is just a length of 3/4 in. thick by 1 3/8 in. wide stock with a 3/8 in. radius applied to one edge (see Molding Detail). For the crown molding, (Fig. 4), start with 8/4 stock, establish the cove on the table saw, and then rip the stock in half. Note that you'll need at least five passes to get the final 7/16 in. cove depth. Anything less and the blade is likely to burn. Also, if you use a blade that's not exactly 10 in. diameter, the angle of your fence must be altered to produce a similar cove. When we tried a 10 in. blade that after several sharpenings actually measured 9 3/4 in. diameter, we found that an adjustment of several degrees in the fence setting was needed to get the same width cove.

Next, use the molding head (Sears cutter no. 9R2351) to mold the 1/4 in. radius roundover. Here's where the extra thickness in your stock really pays dividends, since it provides an ample flat surface to gauge the stock off as you make the cut. Now resaw on the table saw to establish the final 3/4 in. molding thickness.

Now miter and mount the moldings. The front cap molding is glued in place and glue blocks lend support to the front crown molding. Also apply glue at the miters and along the first few inches at the sides. For the remaining side molding you'll need to rely on a mounting system that allows the case sides to expand and contract without restriction. To do this, fasten the rest of the cap molding with finishing nails angled down into the case sides from the top. The side crown molding sections are then glued to the bottom of the side cap moldings—a sound glue joint that doesn't interfere with the sides. Add a few small finishing nails—inserted right at the step of the 1/4 in. roundover—and set and fill them. As always, pre-drill for the finishing nails to avoid splitting the molding.





Bill of Materials
(all dimensions actual)

Part	Description	Size	No. Req'd.
	Case		
A	Side	3/4 x 17 7/8 x 37 1/2	2
B	Top/bottom	3/4 x 17 7/8 x 35 1/4	2
C	Front Stretcher	3/4 x 2 x 34 3/4*	5
D	Back Stretcher	3/4 x 2 x 34 1/2*	5
E	Side Rail	3/4 x 2 x 14 1/4*	10
F	Center Rail	3/4 x 2 3/4 x 14 1/4*	4
G	Divider	3/4 x 2 x 5 1/8*	2
H	Guide	1/2 x 3/4 x 15 1/2	2
I	Back	1/4 x 34 1/2 x 36 3/4	1
J	Cap Molding	3/4 x 1 3/8	7 ft.
K	Crown Molding	See Detail	7 ft.

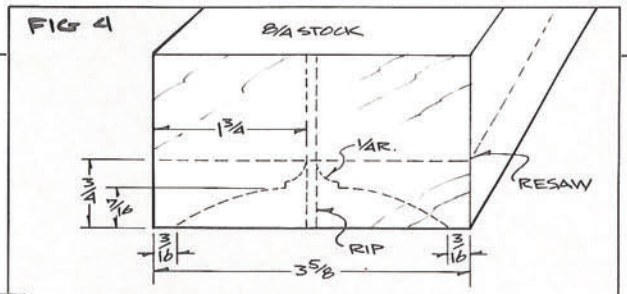
Drawers

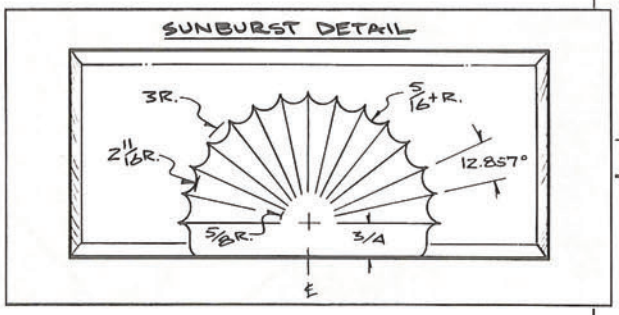
Part	Description	No. Req'd Per Drawer	Three Small Drawers	Drawer 1	Drawer 2	Drawer 3	Drawer 4
L	Front	1	3/4 x 4 5/8 x 11 1/4	3/4 x 5 3/8 x 34 1/4	3/4 x 6 1/4 x 34 1/4	3/4 x 7 1/4 x 34 1/4	3/4 x 8 1/4 x 34 1/4
M	Side	2	1/2 x 4 3/8 x 17 1/2	1/2 x 5 1/8 x 17 1/2	1/2 x 6 x 17 1/2	1/2 x 7 x 17 1/2	1/2 x 8 x 17 1/2
N	Back	1	1/2 x 3 3/4 x 10 3/4	1/2 x 4 1/2 x 33 3/4	1/2 x 5 3/8 x 33 3/4	1/2 x 6 3/8 x 33 3/4	1/2 x 7 3/8 x 33 3/4
O	Bottom	1	1/4 x 10 1/4 x 17 1/4	1/4 x 17 1/4 x 33 1/4	1/4 x 17 1/4 x 33 1/4	1/4 x 17 1/4 x 33 1/4	1/4 x 17 1/4 x 33 1/4
	Hardware						
P	Chippendale Pull	3 7/16 x 2 (2 1/2 in. borings)**	10				
Q	Escutcheon	3 7/16 x 2**	4				
R	Knob	3/4 dia.**	1				
S	Lock	1/2 x 2 1/2 x 1 7/8 (half mortise)***	4				

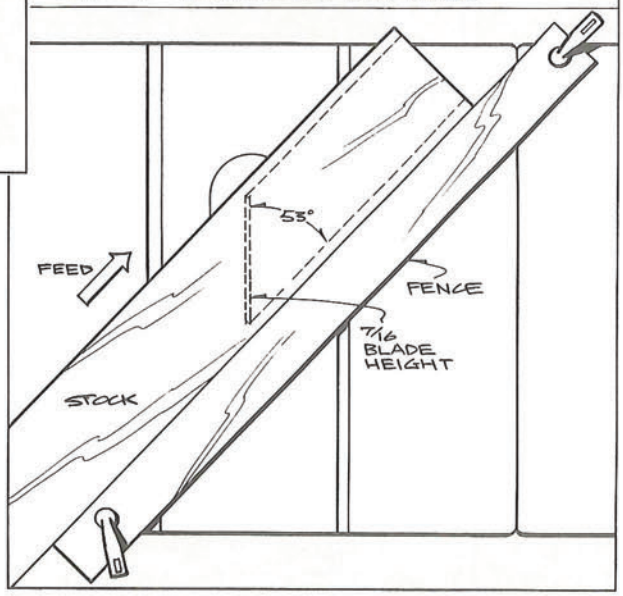
* Length includes tenons or half dovetail. Note that the lengths of the side and center rails are 1/8 in. less than the actual mortise-to-mortise dimension, the extra space being needed as an allowance for wood movement in the sides.

** Pulls, escutcheons and knob (all solid brass) are available from Horton Brasses, Nooks Hill Rd., Cromwell, CT 06416; tel. (203) 635-4400. Order part no. H-34-S for the pulls (specify 2 1/2 in. borings), part no. H-34-SE for matching escutcheons, and part no. K-12 for the knob (specify 3/4 in. diameter with machine screw for 3/4 in. thick drawer front). Prices are $6.50 each for the pulls, $5.25 for the escutcheons, and $3.25 for the knob, not including shipping. The hardware is available in a choice of finishes, either antique or semi-bright at the prices noted, or bright polish for an additional 20 percent.

*** Brass drawer locks are available from The Wise Company, 6503 St. Claude Ave., P.O. Box 118, Arabi, LA 70032; tel. (504) 277-7551. Order part no. L01E. Price is $14.35 plus $3.50 shipping. Lock is not shown on upper section art. Refer to Highboy Part 1 for details.





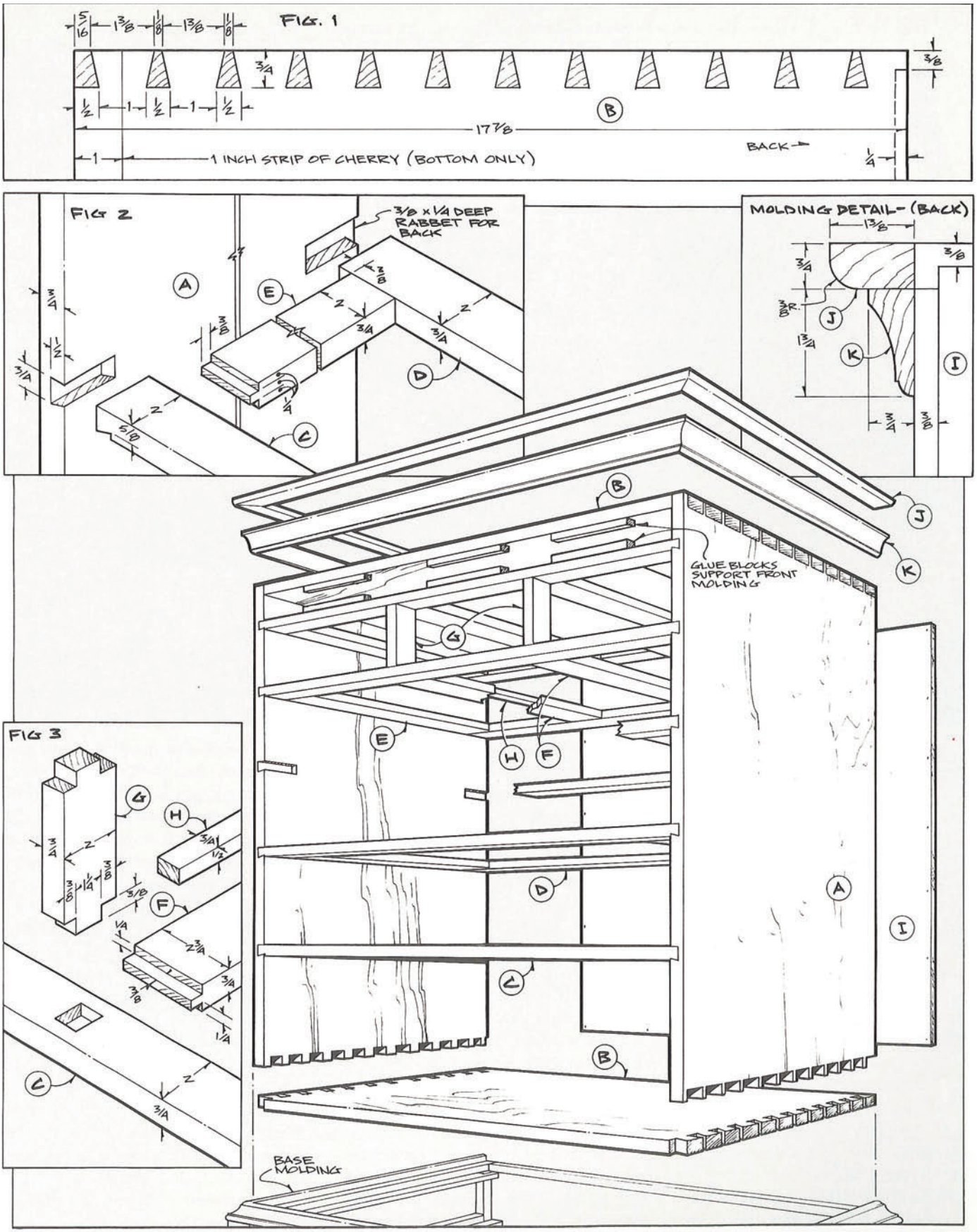


The Drawers

All that's left is the drawers. Each drawer is just a front (L), sides (M) and back (N), joined with traditional dovetail construction. The bottoms (O) are plywood, though bevel-edged solid stock bottoms are another option. Given the experience you've gained from the drawer work in the base, the drawers should be a snap. Suggested dovetail layouts are given in the Drawer Details. The sunburst carving that decorates the center drawer at the top is a smaller version of the sunburst on the center drawer in the base—with one exception. Instead of 18 rays, as the base drawer had, the top drawer sunburst has 14 rays. Use the same technique included with the base how-to, but employ a smaller template. The necessary radii and other dimensions are provided in the Sunburst Detail.

Details

Naturally, your finish for the drawer case will match the base. The hardware is also nearly identical, with the Chippendale pulls (P), matching escutcheons (Q) and locks (S) all sized exactly the same. The only deviation is in the size of the center drawer knob (R)—3/4 in. diameter instead of the 1 in. diameter used on the somewhat larger base center drawer. By the way, if you'd rather not include locks on all four of the full-width drawers, don't. On our highboy, only the two lower drawers in the upper section actually included locks. A slip of black



construction paper behind the escutcheon will pass all but the closest inspection.

Although builder Dennis Preston did not include provision for a secret drawer or storage compartment, like much furniture of the period, there's ample room for these in the area above the top drawers. One option is to add a false top panel above the three top drawers, and incorporate several drop-down compartments. Or, devise a method for the front molding sections to slide up, revealing the hidden storage area and providing front access. If you do include a secret compartment, send us a photo and sketch. We hope to compile reader responses and publish plans for those secret compartments in a future issue.

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