Pennsylvania Tall Clock

PART ONE

The hood is one-third of this curly maple masterpiece, but it's half the work

BY LONNIE BIRD

With its decorated hood towering above the floor, a tall clock commands attention. Tall clocks, often referred to as grandfather clocks, are among the most elegant forms of 18th-century furniture. You can dress up a tall clock with embellishments, such as a gooseneck pediment complete with carved rosettes and finials, or you can choose to build a more subtle flat-top clock like the one shown here. This tall clock incorporates details found on several clocks fashioned in Pennsylvania during the late 1700s.

Despite its complex appearance, building a tall clock isn't difficult: It's really just three stacked boxes—the hood, waist, and base—and most of the joinery is not complicated. The waist and the base are the simplest to construct. In fact, the waist is just two sides joined to a face frame; it has no top or bottom. The base of the clock has a bottom that is dovetailed to the sides, but it has no top. (I'll talk more about the waist and the base in Part Two of this article, to be published in the next issue.)

Without a doubt, the hood is the most complicated part of the clock. It has an open frame at the bottom that allows the weights and the pendulum to hang into the waist below. The sides of the hood are joined to the bottom frame with through mortise-and-tenon joints, and the top of the hood is joined to the sides with dovetails. The rest of the hood—moldings, pediment board, and columns—are embellishments added on after assembling the hood.

It's always a good idea to start by putting together a cut list of all the parts you will need. The cut list doesn't have to note all of the final, exact lengths of components, but it helps the milling process go more smoothly if you've at least worked out thicknesses and widths. (For a copy of the cut list Bird used to construct this clock, go to www.finewoodworking.com.)

Build the hood around the movement

Before you finalize a design and start building the hood, it's important to pur-

ANATOMY OF AN 18TH-CENTURY TIMEPIECE

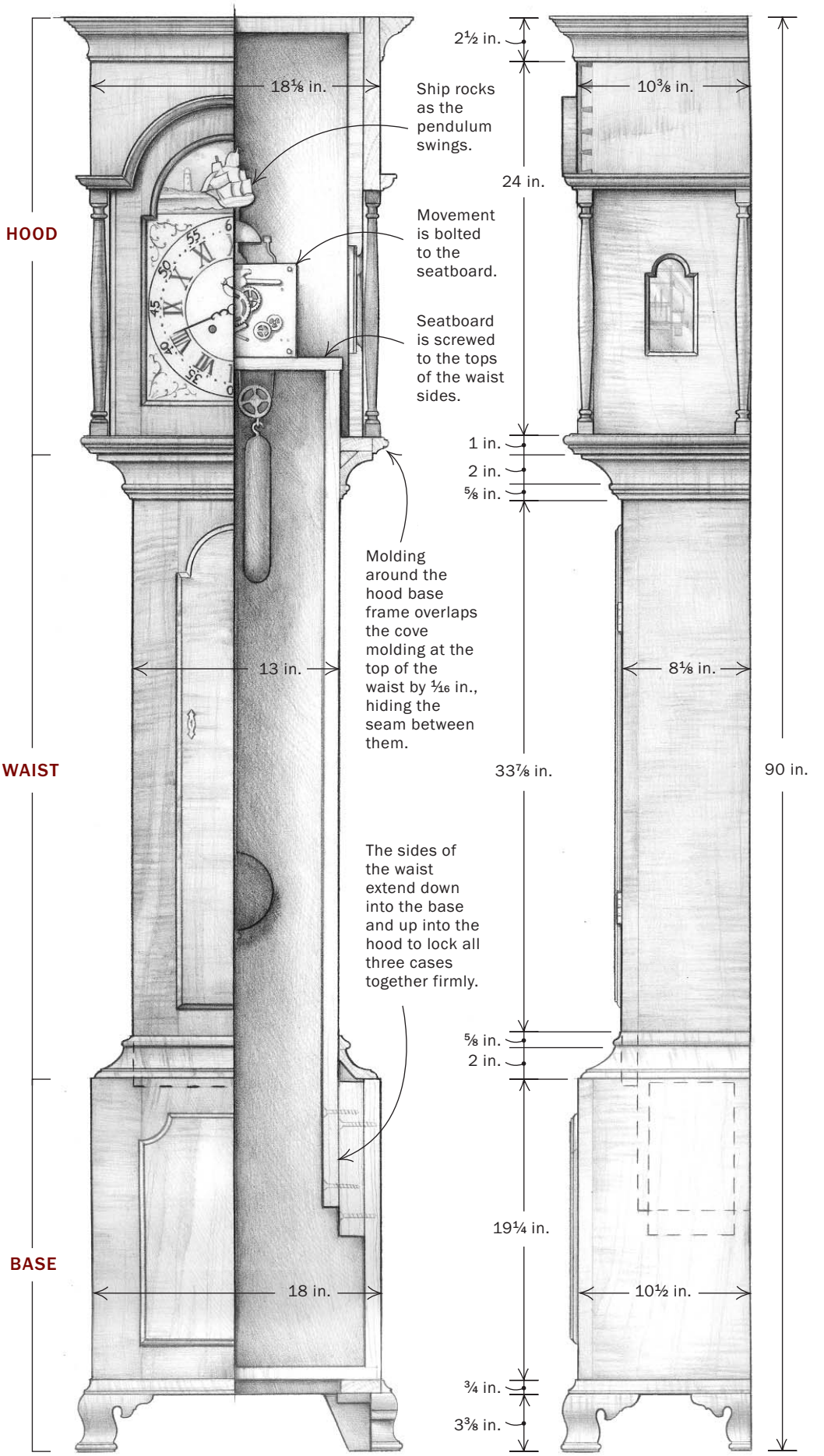
Any survey of antique clocks will reveal a wide variety of style details, but almost all of the tall clocks were made the same way: three simple boxes—base, waist, and hood—stacked together and dressed up with moldings and architectural add-ons. Except for the dovetails in the hood and the base, most of the joinery is not complicated.

Buy the movement first

Traditional clockworks, or movements, in tall clocks are weight-driven. The one I bought for this clock, from the Green Lake Clock Co. (see Sources of Supply on p. 67), cost about $700, which included the movement, the pendulum, the weights, an unpainted steel dial plate, and the hands. I sent the dial plate to an artist to paint the numbered face and a seascape for the rocking-ship movement at the top, which cost another $500.

Two cast-iron weights, one to power the timepiece and the other to power the hourly chimes, hang inside the waist and slowly drop throughout the week. The cast-iron weights drive the swing of the pendulum, which regulates how accurately the timepiece keeps time. The pendulum hangs on a rod, and you can adjust it up or down with a nut to speed up or slow down the clock. When you're buying a movement, look for one with an eight-day cycle. That way, you can get in the habit of winding the clock on the same day each week.

Watch it on the Web For more on tall clocks, go to www.finewoodworking.com.



Photos, except where noted: Rodney Diaz; this page: Mike Siemsen

FIRST, ASSEMBLE THE HOOD CASE

Dry-fit the hood parts before final assembly. *The hood sides anchor to the base frame with two through-mortises per side. Cut the mortises before assembling the three-sided base frame, and test the fit of all the hood pieces before gluing them together.*

chase the mechanical movement, or clockwork, and a dial plate. That way, you can build the hood to fit the dial and make certain that the waist will be large enough to accommodate the swing of the pendulum.

One vital but unseen part of this clock is the seatboard, which is a simple plank of wood to which the movement is secured with two machine screws and nuts. Some suppliers will send you the movement already attached to a seatboard; otherwise, you will have to mill your own. The position of the seatboard is critical because it aligns the movement with the face of the dial. The seatboard rests on the sides of the waist; when you add the large crown molding near the top of the waist, which in turn supports the weight of the hood, you must locate the seatboard position precisely. You can, of course, avoid all this fuss, save a lot of money, and simplify the clock's construction by using a modern quartz movement. But a tall clock fitted with a mechanical movement has a fascinating appeal that is lost when you use a battery-operated quartz movement.

Build the hood from the bottom up

The first component to construct is the hood base frame, which has three sides joined with mortise-and-tenons at the front corners (for a detailed drawing of the hood, go to p. 65). Before assembling the frame, cut the through-mortises in each of the two frame sides that will accept the tenons of the hood sides. After the base frame has been assembled, the molding can be applied to its edges. Note that the molding thickness is slightly greater than the base-frame thickness, creating a small lip, so the hood will overlap the cove molding slightly where it joins the top of the waist.

After milling the stock for the hood sides and top, cut the tenons on the side

Screw the pediment to the hood. *Because of the cross-grain construction, do not glue the pediment assembly to the hood. Instead, use screws through large pilot holes, which will allow some seasonal wood movement.*

Photos, this page: Karen Wales

pieces. Then cut the half-blind dovetails that join the sides to the top. However, don't glue together the hood just yet.

After the joinery has been completed, cut a groove in the hood sides to accept the dial frame. The groove is narrow, just big enough to allow the dial frame to slide in from the top. Next, cut a rabbet in the front edges of the hood sides. The shallow rabbet creates a stop for the hood door. Shape the thin edge that remains with a small thumbnail profile, and then cut a notch in the upper portion of each side. The notches will accept the backing board after the hood has been assembled and will align the backing board with the dial frame.

Finally, cut the arched windows in the hood sides. Rough-cut the windows first using a jigsaw, and then clean them up with a router fitted with a template collar and a jig to guide it. These little windows not only allow you to view the movement in the finished clock, but they also add some interesting visual detail to the hood. To hold the glass, rout out a rectangular rabbet on the inside surfaces of both window openings, which will be glazed to the hood later using colored glazing compound. With the joinery complete, you're ready to glue together the sides, top, and base frame to create a box that will become the hood.

SLIDE THE DIAL FRAME IN FROM THE TOP

Dial-frame joinery. *The stiles and rails of the dial frame fit together as glued half-lap joints. The dial frame, which is hidden from view most of the time by the arched door, slips into the hood from above in grooves that were cut into the sides of the hood.*

Pediment adorns the hood

The pediment consists of six main components: the pediment board, the two side returns, the backing board, the crown molding, and the arched molding above the hood door.

Start by joining the pediment board to the two returns with half-blind dovetails. The position of the dovetails must be precise because, after assembly, the pediment pieces will be slipped into position around the hood. If the space between the returns is too tight, the pediment will not fit over the hood; too loose, and there will be distracting gaps between the returns and the hood sides.

When laying out the dovetails, remember that they will be covered by the moldings at the top and bottom of the pediment. Therefore, it's best to lay out the tails and pins so that the spacing will appear balanced after the moldings are applied.

After you've cut and fitted the dovetails and tested the fit of the backing board, glue it to the inside face of the front pediment board. Then lay out the arch and cut it on a bandsaw. The curve of the arch is determined by the steel dial plate; a 5-in. radius is fairly common for dial plates. Smooth the arch with a scraper and sandpaper, and then glue together the pediment board and the returns.

Once the glue has set, slip the pediment assembly over the hood and fasten it in place with screws from the inside. Don't use glue, because the cross-grain construction between the pediment assembly and the hood could cause the hood sides to split with seasonal changes in humidity.

Dial frame slips in from the top

The next step is to build the dial frame. This simple frame is made from 5/16-in.-thick stock, with stiles and rails joined together with half-lap joints. Despite the cross-grain construction of the half-lap joints, on thin stock such as this you won't have any problems. Orient the joints so that the stiles overlap the rails when viewed from the

SHAPE THE HOOD'S ARCHED MOLDING

Shape the edge of the arched molding first. *After rough-cutting the inside curve of the molding around the arch, use a bearing-guided trim bit against a template to cut the final inside curve (left). Last, cut the outside curve on the bandsaw (center).*

This is not a 45° miter. *Where the curved molding meets its straight return, the bisected angle (53° on this clock) will vary, depending on the radius of the arch.*

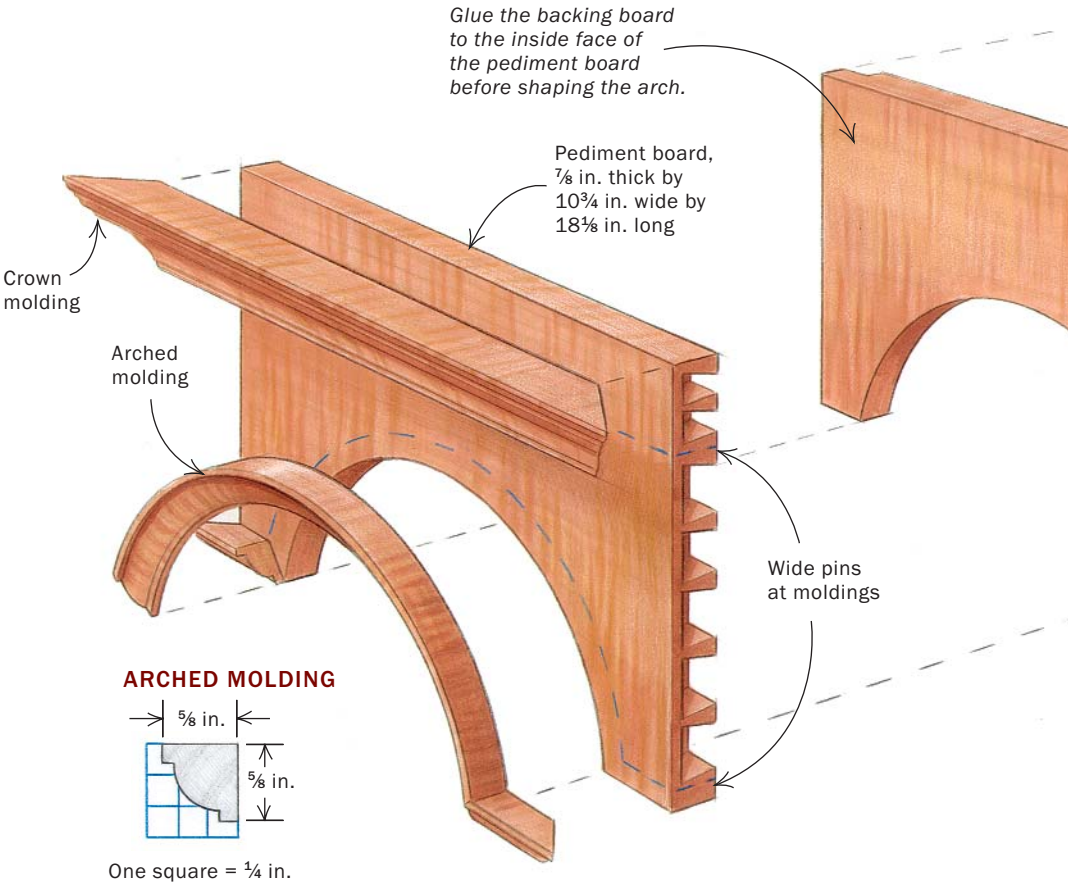
front. Remember, too, the dial frame should overlap the dial on all sides by about ¼ in. Before assembly, shape a small thumbnail profile along the inside edges of the dial-frame members and miter the molding where it intersects at each corner. Then glue together the dial frame, smooth the surfaces, and test-fit it by sliding the frame into position in the hood.

Shape the hood moldings

The next step is to shape the moldings and apply them to the pediment and hood. You can use a tablesaw to shape the cove cut on the crown molding (see *FWW* #168, pp. 68-73). Router bits with an inverted profile (available from CMT; 800-841-1133) set up in a router table work well for shaping the smaller profiles that flank the cove, as well as the stepped roundover molding around the arch, which returns to the bottom edges of the pediment.

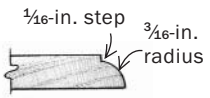
To shape the small roundover molding safely, first rough-cut the inside radius of the arch and trim it with a bearing-guided router bit and a template. Shape the profile and then cut the outer radius very carefully on the bandsaw. You can clean up the sawmarks with a spokeshave. Leaving most of the workpiece intact until after you shape the edge will help keep the weak short grain from breaking.

When you're ready to install the roundover molding, bisect the angle where the arch meets the small return pieces on the front. The miter on this clock worked out to 53°, but if you're building another clock with a different-size arch, the miter angle will vary. To blend the shapes



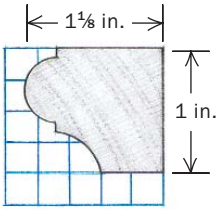
DETAILS OF THE CLOCK'S HOOD

The hood is the most complex part of any tall clock, so it makes sense to build it first. After you have the movement in hand, verify the measurements that locate the center of the dial face and the swing of the pendulum. The molding around the bottom of the hood is thicker than the base frame, so when the hood is installed over the waist, the slight overlap hides the seam between the two cases.

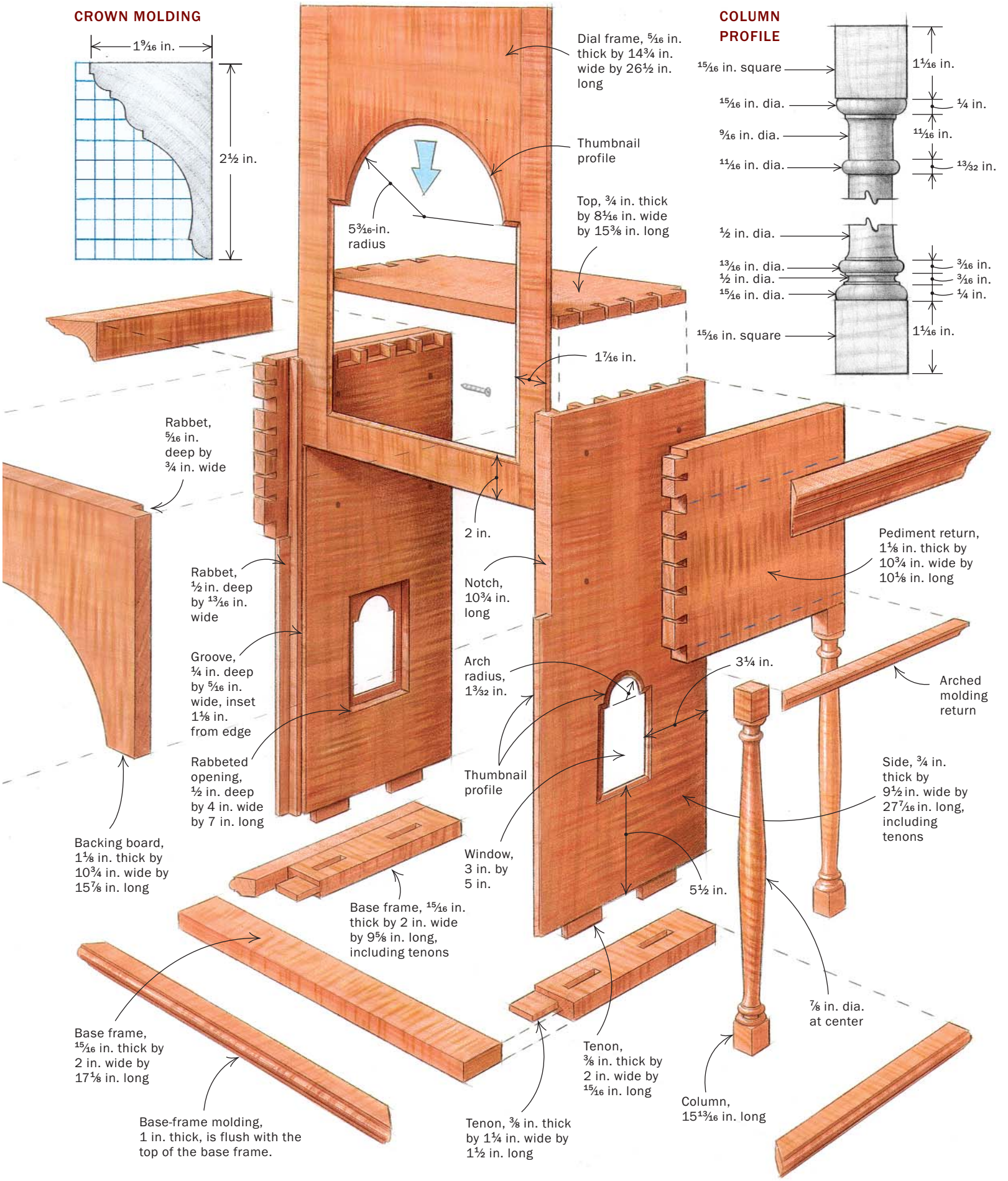


Thumbnail profile

BASE-FRAME MOLDING



Drawings: Bob La Pointe

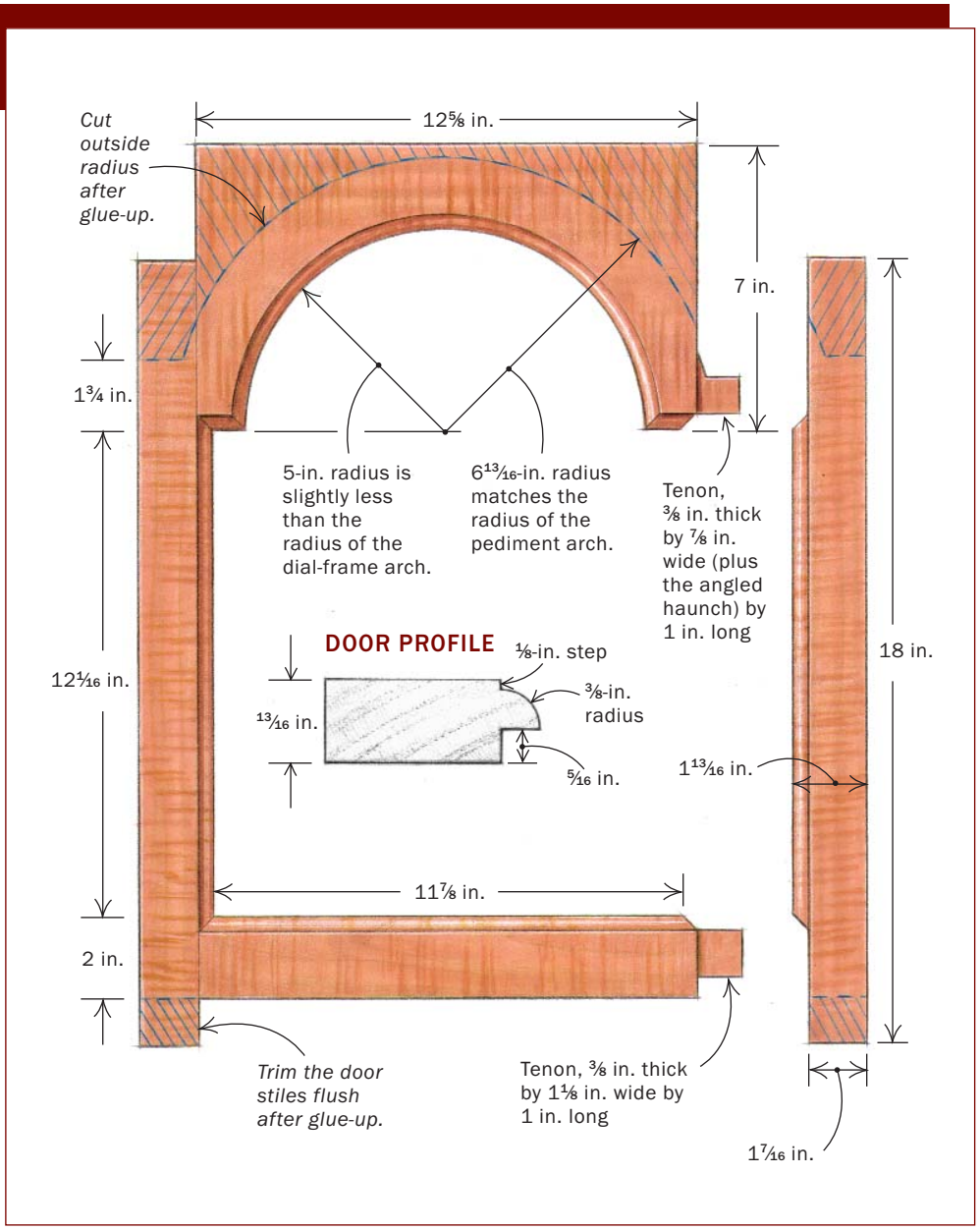

CROWN MOLDING
1 9/16 in.
2 1/2 in.
COLUMN PROFILE
15/16 in. square
15/16 in. dia.
9/16 in. dia.
11/16 in. dia.
1/2 in. dia.
13/16 in. dia.
1/2 in. dia.
15/16 in. dia.
15/16 in. square
1 1/16 in.
1/4 in.
11/16 in.
13/32 in.
3/16 in.
3/16 in.
1/4 in.
1 1/16 in.
Dial frame, 5/16 in. thick by 14 3/4 in. wide by 26 1/2 in. long
Thumbnail profile
5 3/16-in. radius
Top, 3/4 in. thick by 8 1/16 in. wide by 15 3/8 in. long
1 7/16 in.
Rabbet, 5/16 in. deep by 3/4 in. wide
2 in.
Rabbet, 1/2 in. deep by 13/16 in. wide
Notch, 10 3/4 in. long
Pediment return, 1 1/8 in. thick by 10 3/4 in. wide by 10 1/8 in. long
Groove, 1/4 in. deep by 5/16 in. wide, inset 1 1/8 in. from edge
Arch radius, 1 3/32 in.
3 1/4 in.
Arched molding return
Rabbeted opening, 1/2 in. deep by 4 in. wide by 7 in. long
Thumbnail profile
Side, 3/4 in. thick by 9 1/2 in. wide by 27 7/16 in. long, including tenons
Backing board, 1 1/8 in. thick by 10 3/4 in. wide by 15 7/8 in. long
Window, 3 in. by 5 in.
5 1/2 in.
Base frame, 15/16 in. thick by 2 in. wide by 9 5/8 in. long, including tenons
7/8 in. dia. at center
Base frame, 15/16 in. thick by 2 in. wide by 17 1/8 in. long
Tenon, 3/8 in. thick by 2 in. wide by 15/16 in. long
Column, 15 13/16 in. long
Base-frame molding, 1 in. thick, is flush with the top of the base frame.
Tenon, 3/8 in. thick by 1 1/4 in. wide by 1 1/2 in. long

FIT THE ARCHED DOOR TO THE PEDIMENT

Assemble the door first. *After building the door and shaping the inside edges, use the bandsaw to cut the outside radius of the arched top.*

Fine-tune the fit. *Wedge the door against the pediment. Mark the high spots, which should be planed and scraped for an even fit. After that, lay the door in place horizontally, and then use a shim to mark the front face for a consistent gap around the arch.*

Use a gouge on the inside of the rabbeted corner. *Chisel this corner round to prevent a stress crack in the glass panel that will be cut to shape and installed later.*



of the moldings seamlessly where they meet at the miter may require a little tweaking with sharp chisels or sandpaper.

Assemble the hood's arched door

The hood is fitted with a glazed door that provides access to the clock dial for setting the time and cranking up the weights. The door fits flush inside the case sides and requires special hinges with an offset pivot point. The hinges allow the door to open and clear the corner column.

The arch in the top rail of the hood door is cut from a single board. This method creates short grain on each side of the arch, which seemingly would be somewhat weak. However, because the door is open briefly only once a week to wind the clock, it doesn't undergo a lot of stress.

Begin building the door by laying out the mortise-and-tenon joints at each corner. For a precise fit, build the door exactly the same size as the opening; afterward, plane the door to fit and provide 1/32-in. clearance on all sides. After layout, cut the mortises in the stiles, and then cut the tenons for a friction fit within the mortises. Then, with a bandsaw, cut the inside radius of the arch in the top rail. I've found that it's best to wait to saw the outside radius until after the door has been glued together; otherwise, the fragile arch may break during assembly.

The inside edges of the door framework

INSTALL THE COLUMNS AND THE DOOR

Install the columns last. *The turned columns are fastened in place with small trim screws after the finishing is completed, making it easier to apply the finish to the columns and to the hood case.*

Wide-throw pivot hinges for the glass door. *Because the door is set in from the face of the hood and the columns, special offset hinges are required to throw it clear of the columns in the open position. The hinge plates are screwed to the door at top and bottom. Brass escutcheon pins nailed to the underside of the pediment board and to the base frame provide the pivoting action.*

are embellished with a simple thumbnail profile. After shaping the thumbnail, cut a rabbet for the glass. Then miter the thumbnail sticking at each intersection.

Now you're ready to assemble the door. After the glue has dried, cut the outside of the arch using the bandsaw. Smooth away the bandsaw marks with a spokeshave and a chisel, and then carefully fit the door to the opening in the hood. For clearance, the top rail of the door must be beveled back approximately ⅛ in.; otherwise, the offset pivot could cause the back edge of the door to bind.

Install hood columns after finishing

The hood columns appear to support the pediment but actually are just ornaments screwed into the corners. After turning the columns, cut them to length, but don't put them in place until after you've applied a finish to all of the hood components. □

Lonnie Bird teaches woodworking at his shop in Dandridge, Tenn. (www.lonniebird.com).

PART TWO **In the next issue, Bird will build the clock's waist and base, install the movement, and assemble the finished clock.**

SOURCES OF SUPPLY

CLOCK MOVEMENTS AND PARTS

Green Lake Clock Co.
651-257-9166
www.greenlakeclock.com

Merritt's Clock and Watch Supplies
610-689-9541 www.merritts.com

CUSTOM PAINTING FOR CLOCK FACES

Angela Wendling Piacine
215-870-0791
a.wendling@juno.com

Kathi Edwards
770-943-5676 kedh2@aol.com