



Murray Clock Craft

The Clock Builders' Choice Since 1968

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Clock Plans F9

Assembly plans for the kits are included with the kit. However if you're like many of our customers who find great pleasure and satisfaction in building from scratch these plans are for you. We also sell hard to make parts and beveled glass for these clocks (order glass before you make the parts!)

Send us a picture of your finished project and we will add it to our customer showroom on the www.murrayclock.com web site.

Building An Heirloom: The F. William Murray Clock Plan Guide

Thank you very much for choosing Murray Clock plans. All of us on the design and construction team have worked hard to bring you what we believe is the finest product of its kind anywhere. We also believe that you have high expectations for an heirloom-quality finished product. Why else would you begin such a project? These instructions and plans are designed to guide you through all crucial steps, in a way not usually found in other plans. We want you to succeed. Grandfather clocks are all about beauty, precision and the enduring value of craftsmanship. Our aim is to help you achieve all these things while you have fun.

Some Important Suggestions

Before you begin, you must adopt a meticulous attitude. This is fundamental because all the care and attention to detail you'll need to lavish on your clock ultimately comes from this source. Nobody's going to marvel at how fast you put your clock together, or how it only took you a day to slap on some varnish. The only thing that matters in the end is quality. And that depends on you.

Although there are ways to minimize the tools you'll need to build this project (more on that later), you will still need a well-lit shop equipped with a tablesaw, table-mounted router, a hand-held sander (a 5" random orbit machine is best), a variable-speed electric drill, a jigsaw, a 24" carpenter's square, and the usual sorts of hand tools. A 3/8" diameter spade bit and 1/16" diameter twist bit are needed at various stages of construction, too. Better get three or four of the smaller bits because they break easily. Pocket holes are used extensively in the kit version of this clock, though you can substitute biscuits, dowels or externally-plugged screws if you'd rather not buy the jig required.

Ideally, your workbench should be as long as your clock is tall. In this case, that's 85 inches, though you can make-do with a smaller work surface if necessary. You'll also need a carpenter's square, and some white, yellow or brown wood glue. Any formulation is more than strong enough to hold your clock together forever, but there's something you need to understand.

Whenever excess glue gets squeezed out of a wood joint during assembly, you've got to be careful. Any amount of glue residue will always leave ugly marks on wood after finishing. The trick is to use just enough glue for strength, with minimal squeeze out. When excess glue does ooze out, don't wipe it off immediately! That just drives the glue deep into the wood pores, even if you use a damp rag. Instead, wait an hour or two until the glue has formed a skin, then pare off the half-hard residue with a sharp chisel. Skillfully dealing with glue squeeze out is one of the most important things you need to master to get a blotch-free finish on your clock.

You also need to think about clamps. At a minimum you'll need about half a dozen, medium-sized C-clamps. Another kind of clamp, called the Quick-Grip, is also ideal for this project because it includes rubber-padded jaws that can be tightened with the same hand you're holding the clamp with. Pipe clamps may also be handy because they can hold large items, though this isn't essential. A roll of 1-inch wide masking tape is always handy for holding small parts under minimal pressure.

Start work by reading all the instructions and preparing the main parts according to the materials list before fitting them together temporarily, without glue. This may seem like a waste of time, but there are two good reasons for this step. First, the experience builds your confidence for the occasion when glue is applied during final assembly. Practice makes perfect. A dry run also lets you learn how best to arrange clamps where needed for an optimal fit. Whatever you do, don't skip the dry-fitting stage.

Start in the Middle

The first step is to construct the main case frame. It's made of horizontal parts (called rails) and vertical members (called stiles) as shown in the plans. Start by cutting the front stiles, front top rail and front bottom rail (parts# 1, 2 and 3), then lay them face-down on your workbench. These need to be joined with dowels, biscuits or pocket screws into a framework that forms the main case frame. Next, prepare the side front and back stiles, side top rails, middle rails, and side bottom rails (parts# 4, 5, 6, 7 and 8) then join these into two frames in the same way, each the mirror image of the other.

By now you've probably noticed that the front frame requires tongues of wood that extend from the outside edges of each stile. These fit into matching grooves in the side frames. Rout these features now, dry-fit the parts to be sure all is well, then assemble permanently with glue and clamps. Use your carpenter's square to check that the front and side frames are arranged at 90-degrees to each other.

The top and bottom back cleats (parts# 13) can be positioned now, as shown in the plans, and screwed in place using 1 1/4"-long screws driven into pocket hole, securing them to the back of the main case. Though small, you'll find these strips add a lot of support to your growing clock case.

Next comes the bottom and top panels (parts# 14 and 42). These are made of veneered plywood and add even more strength to your project. Just remember that the bottom panel (part#14) needs to have an equal amount of overhang on each side of the main case frame as it's installed, so the grooves in both short foot moulding pieces (part#19) will fit over its ends. In fact, you should temporarily place these moulding parts over the plywood, just to be sure you've located the bottom panel properly.

The middle back cleat (part#43) is up next. It fastens to the inside of the main case with glue and pocket screws, dowels or plugged screws driven from the outside. The plans show exactly where the part goes. This cleat's job is to cover the gap between the back panel (part#41) and top back panel (part#46) that covers the back of the clock. Cut and install back panel #41 now, using #6 x 3/4"-long screws. Although you'll want to take it off later for finishing, fastening this panel now adds strength and keeps the cabinet square. Just be sure to drive the screws into 1/16" diameter pilot holes pre-drilled into the side stiles to prevent splitting.

The Base Comes Next

Cut and fasten the base front (part#9) to the front of the main case, at the bottom, using glue and five #8 x 1 1/4" screws driven from inside. The plans show how the bottom of the base front must be flush with the bottom

of the main case stiles. This is one of those times when you've got to be especially careful about any glue squeeze out that appears, since it would be hard to remove and disappointingly prominent.

The long foot moulding (part#18) comes next. It's a single piece of wood that fastens to the base front (part#9), using more glue and three #8 x 1 1/4" screws. But before you actually do this, line up the short foot moulding (parts#19) with the long foot molding, positioning the parts so the 45-degree miter joints at the corners are tight. The plans show how each miter should be reinforced with a #20 biscuit or several dowels. Even after the foot moulding parts are joined with mechanical reinforcement, you'll find that the joints can often be tightened with clamping pressure across the parts if necessary. Let the parts dry for at least several hours before moving on to the next stage. Finish up this area by adding both base sides (part#10), secured with glue and screws from inside the cabinet as you've done before. The front and side base mouldings (parts#11 and 12) can be cut and fastened now with glue and finishing nails. Just go easy on the glue. It doesn't take much here, and squeeze out would be hard to remove invisibly.

Turnings and Columns

These parts play an important role in making your growing cabinet into something special, and many woodworkers don't have the experience or equipment to make them. That's why we offer these and other hard-to-make mouldings in ready-to-use form. Call 1-800-268-3181 or visit www.murrayclock.com for more details.

Once you've made or bought the bottom turnings, columns, middle turnings and top turnings (parts#26, 27, 28 and 29), then dry-fit them onto the front of the main case as it sits back-face down on your workbench. The edges of the columns should be about 3/16" in from the outside edge of the case, but you can adjust this a little bit either way to suit your eye. Temporarily fasten the columns and turnings using clamps, then measure the space to make sure there's enough room for the door that will fit there later. If everything looks good, fasten the columns and turnings permanently with screws driven through the pre-drilled holes in the front

stiles of the main case. It's important that you drill 1/16" pilot holes in the back of the turnings and columns to prevent splitting. Here's how: Drive screws partially through holes in the front stiles so their points are sticking up just slightly above the surface. Arrange the columns and turnings to your liking, then push them down onto the screw points. When you remove them from the clock, the back surfaces of the parts will be marked in the precise spot for drilling.

The Clock Top

The F. William Murray clock has what's called a bonnet top, and once again, this can be a difficult part to make. That's why we make a ready-made version of this part available. Join the top front filler rail (part#21) and the front pediment panel (part#22), using glue and screws driven from behind. Next, attach this assembly to the main case using more glue and four #8 x 1 1/4" screws. The top side panels (part#23) can go on now, too, also with glue and screws driven from inside. Just be sure the bottom edges of the top side panels align with the routed edge on the bottom of the front pediment panel. It's important that this decorative profile continue smoothly all around the clock, across all three parts.

Prepare and install the front pediment moulding and top side mouldings next (parts#24 and 25). As usual, use glue and screws, but be especially careful to avoid squeeze out. Even if you worked hard to remove it, glue stains would be all-too obvious after a finish was applied, especially if you'll be applying a wood stain as well as a sealer. And besides, all it takes is a little glue to do the job here anyway.

The Door

There are several ways to make your clock's main and side doors. The approach shown in the plans uses mitred corners, with biscuits for reinforcement. Depending on your equipment, you can use more traditional stile-and-rail joinery, with mortise and tenons or dowels. As long as the overall door size is correct, anything goes.

Hardware

Now's the time to install hinges, lock, knob, door catch and other hardware parts, though you'll need to remove them later before finishing. Start with the door hinges. The plans show how three are required along the right-hand side of the main door, one each 2" from the top and bottom ends of the door, and one hinge in the center. Next, position the lock on the back of the door, trace it, then drill the keyhole opening. Next, place the key through the hole into the lock, then push both to the top of the hole in the door. This locates the lock mechanism properly for installation. Mark screw hole locations, then use a 1/16" drill bit to create pilot holes for the lock mounting screws. The metal part that covers the key hole on the outside of the door is called an escutcheon plate, and although it may be tempting to put it on now, better wait until you've applied a finish. Since it's held on with small nails, it's hard to get off again.

Next, fasten a pair of hinges to each side door, then place them on the clock case and lightly trace the hinge outline onto the wood. Remove the doors, replace the hinges in their old spots, then mark where you need to drill 1/16" pilot holes in the case for the hinge mounting screws.

Grandfather clocks should sit straight and wobble-free, even if the floor they're resting on isn't perfectly level. That's why your clock should be fitted with four height adjusters. You'll need to drill a 3/8" dia. hole at each of the four corners of the base to install these. The plans show location details, but there's something else you need to know. The best adjusters thread into what are called T-nuts. These have small spikes around the outside that hold them to the clock, and you should pre-drill 1/16-inch pilot holes for these to avoid splitting the wood. You may also want to apply 5 minute epoxy glue around the outside of each T-nut, so there's no chance they'll come out.

Mount the Clockworks

It's now time to work on the parts that will support your clock movement. It's best to install these temporarily until the movement has been placed in position and tested. It's important that the clock face, the dial frame panel (part#37) and the chime rods of the clock movement all line up properly. Start work by cutting and fastening the dial frame cleats (parts#36) to the

inside of the front stiles (parts#1). These cleats should be pushed up tight against the underside of the top panel (part#42), with their grooves facing inward. Dial frame panel (part#37) can be added later, after the movement has been positioned.

The clock movement itself sits on a kind of shelf made of three parts: the movement mount, and the upper and lower side cleats (parts#38, 39 and 40). Assemble these parts into a single unit called the movement shelf, then fasten it to the inside of the clock case. Depending on the movement you're using, the position of the movement shelf varies. For the Hermle 8-day Triple Chime Cable Drive (item#HCL3T) the shelf must be positioned 5/16" down from the top of the middle rails (part#7). The Hermle 8-day Triple Chime Chain Drive (item#H3T) and the Hermle 8-day Westminster Chime Cable Drive (item#HC3) require this dimension to be slightly lower, 7/16" down from the top of the middle rail. In all cases, the movement shelf should be 1 1/4" back from the front stiles (part#1).

The chime panel and chime panel side cleats (parts#44 and 45) hold the chime assembly, and now's the time to secure these parts to the top back panel (part#46). This is where some trial fitting comes into play. Start by positioning the clock movement in place, with face attached. This will allow you to position the Chime Rods onto the chime block assembly in the appropriate location so they get struck properly by the hammers at the back of the clock movement. The dial frame panel (part#37) should be fastened temporarily in place now using four #6 x 3/4" screws to center the movement. The top back panel (part#46) can now be temporarily fastened using eight #6 x 3/4" screws to position the chime rods and chime rod panel. The instructions that came with your clock movement will have more detailed installation tips.

Finishing

The quality of finish you apply to your clock is crucial. You can do a great job with everything else, but if the finish is rough and ugly, the result is spoiled. Start by removing all hardware, clock works and the clock face, before giving everything a final hand sanding. Use 150-grit paper on oak and 180-grit if your clock is cherry. You'll find a sharp chisel handy for

removing blobs of stray glue you missed earlier. Vacuum all parts thoroughly and your surrounding work space. Everything must be surgically clean for best results.

Although there are many ways to finish your clock, urethane is one of the most popular options for people working in their homes. All major wood finishing companies have produced oil-based formulations for years, but waterbased versions are gaining in popularity. Besides the fact that they clean up easily with water before they're dry, waterbased products also remarkably low in odour and fast drying. But rapid drying speed leads to trouble with brands that form bubbles as they're brushed on. It's possible these bubbles will harden in place and degrade your results. A slow, not-too-energetic brushing action is one solution to the problem, but an even better one is to use one a foam finishing applicators. These typically have a wooden or plastic handle with a porous foam head instead of bristles. The foam kicks up fewer bubbles than an ordinary brush. Some brands of urethane are also considerably more bubble-prone than others. In shop tests published in a leading woodworking magazine, two brands of waterbased urethanes stood out from the rest: ICI Quick Drying Varnish (available at Glidden paint stores) and the Flecto line are considerably less likely to form hardened bubbles than other brands.

The single most important step to finishing wood successfully is to sand lightly between coats. You can do everything else correctly, but if you don't sand between coats you'll get rough results. Use 240-grit sandpaper for flat surfaces and a fine-grade, 3M rubbing pad for curved mouldings, columns and turnings. After applying three coats of urethane, use #0000 steel wool to hand-rub your clock as a final step. This will create a matte finish that's very inviting to the touch. If you prefer the high-gloss look, rub some more with a white-colored, super-fine 3M rubbing pad. Finish up by reinstalling the hardware and clock movement, then move your masterpiece into its final position. We can supply you with one of several kinds of custom-engraved makers' plates, including your name and the year of completion. Call 1-800-268-3181 for details.

Thank you again for choosing these Murray clock plans. We hope you've enjoyed putting your heirloom together. Who knows how long the effort you've invested in its careful assembly will continue to provide timeless satisfaction for you and your family?

F. William Murray Clock Parts List

Part#	QTY	Description	Size
1	2	Front stiles	13/16" x 2 1/2" x 69 1/4"
2	1	Front top rail	13/16" x 6 5/16" x 14 1/4"
3	1	Front bottom rail	13/16" x 2" x 14 1/4"
4	2	Side front stiles	13/16" x 2" x 69 1/4"
5	2	Side back stiles	13/16" x 2" x 69 1/4"
6	2	Side top rails	13/16" x 5" x 7 1/4"
7	2	Middle rails	13/16" x 5 1/16" x 7 1/4"
8	2	Side bottom rails	13/16" x 5 1/16" x 7 1/4"
9	1	Base front	1 1/16" x 8" x 20 5/16"
10	2	Base sides	7/16" x 6" x 11 5/8"
11	1	Front base moulding	7/8" x 2 1/16" x 22 5/16"
12	2	Side base moulding	7/8" x 1 1/16" x 12 5/8"
13	2	Bottom and top back cleats	3/4" x 3/4" x 18 11/16"
14	1	Bottom panel*	3/16" x 11 7/16" x 20 13/16"
15	2	Base pilasters	7/8" x 4 9/16" x 6"
18	1	Long foot moulding	1 3/4" x 7" x 23 7/8"
19	2	Short foot moulding	1 3/4" x 7" x 13 5/16"
21	1	Top front filler rail	1" x 6 1/8" x 20 5/16"
22	1	Front pediment panel	3/4" x 14 11/16" x 21 13/16"
23	2	Top side panels	3/4" x 6" x 12 1/8"
24	2	Front pediment moulding	1 3/4" x 9 3/4" x 25 7/16"
25	2	Top side mouldings	1 3/4" x 2" x 13 15/16"
26	2	Bottom turnings	1" x 2" x 3 3/4"
27	2	Columns	15/16" x 1 3/4" x 35 1/2"
28	2	Middle turnings	1" x 2" x 3 1/8"
29	2	Top turnings	1" x 2" x 12 5/8"
30	2	Door stiles	1 1/16" x 1 5/8" x 53 1/2"
31	1	Door top rail	1 1/16" x 6 1/8" x 14 5/8"

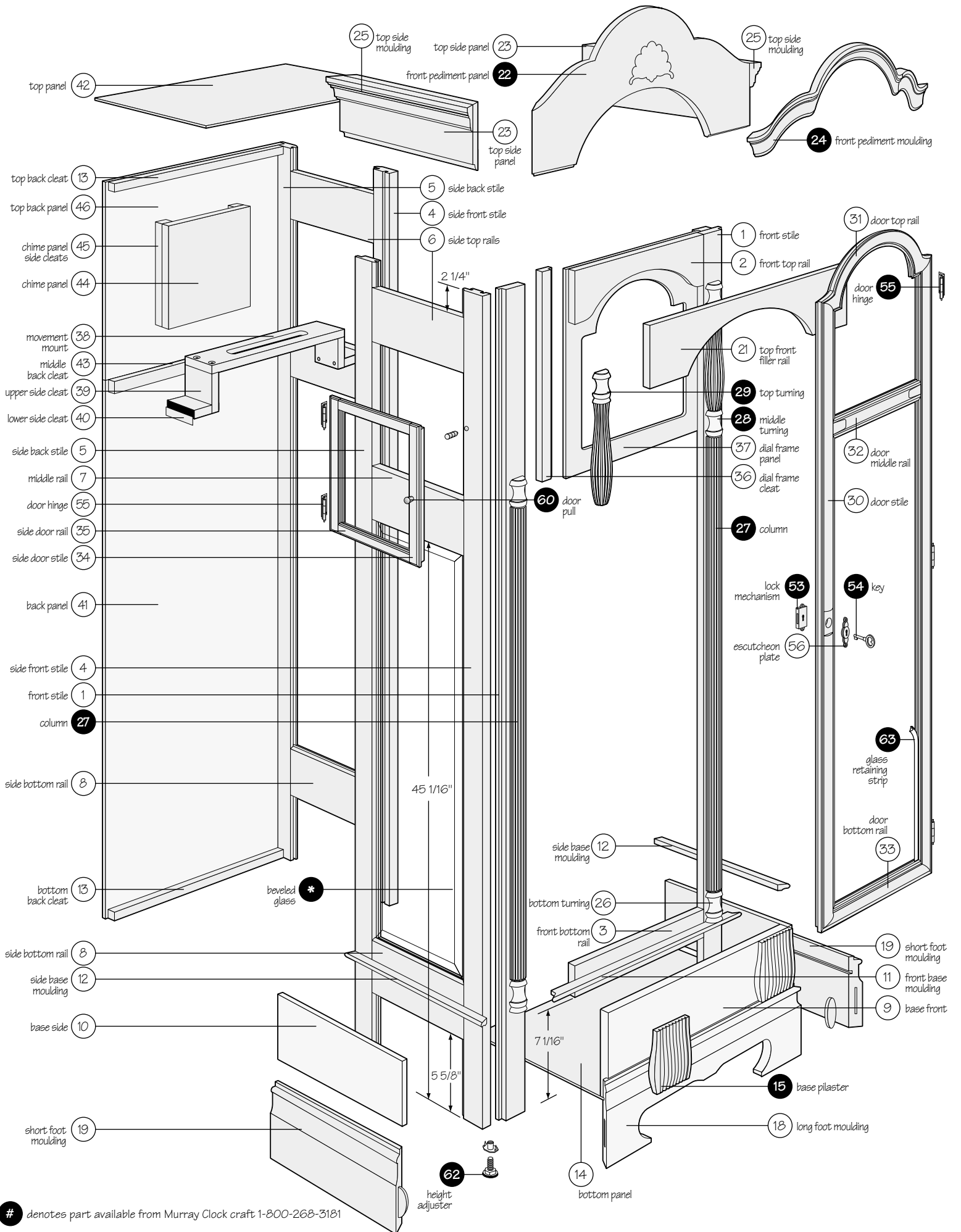
32	1	Door middle rail	13/16" x 1 5/8" x 11 15/16"
33	1	Door bottom rail	1 1/16" x 1 5/8" x 14 3/4"
34	4	Side door stiles	13/16" x 1 1/2" x 12 1/4"
35	4	Side door rails	13/16" x 1 1/2" x 5 1/2"
36	2	Dial frame cleats	7/8" x 1 9/16" x 16"
37	1	Dial frame panel*	7/32" x 14 1/4" x 20"
38	1	Movement mount**	3/4" x 2 5/8" x 15 3/4"
39	2	Upper side cleats	15/16" x 2 5/8" x 3 1/4"
40	2	Lower side cleats	15/16" x 1 1/2" x 3 1/4"
41	1	Back panel*	1/4" x 19 1/2" x 69 1/2"
42	1	Top panel*	1/4" x 10 7/16" x 20 1/4"
43	1	Middle back cleat	3/4" x 1 1/2" x 18 11/16"
44	1	Chime panel*	1/4" x 8" x 10"
45	2	Chime panel side cleats	7/8" x 1 1/4" x 10"
46	1	Top back panel	1/4" x 19 3/4" x 21 1/2"

Parts marked with * are made of veneered plywood

Part marked with** is made of medium density fiberboard (MDF)

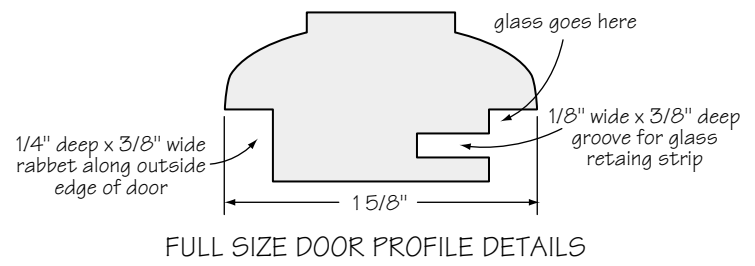
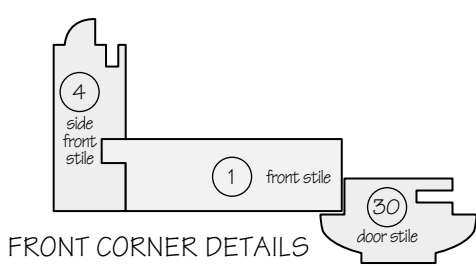
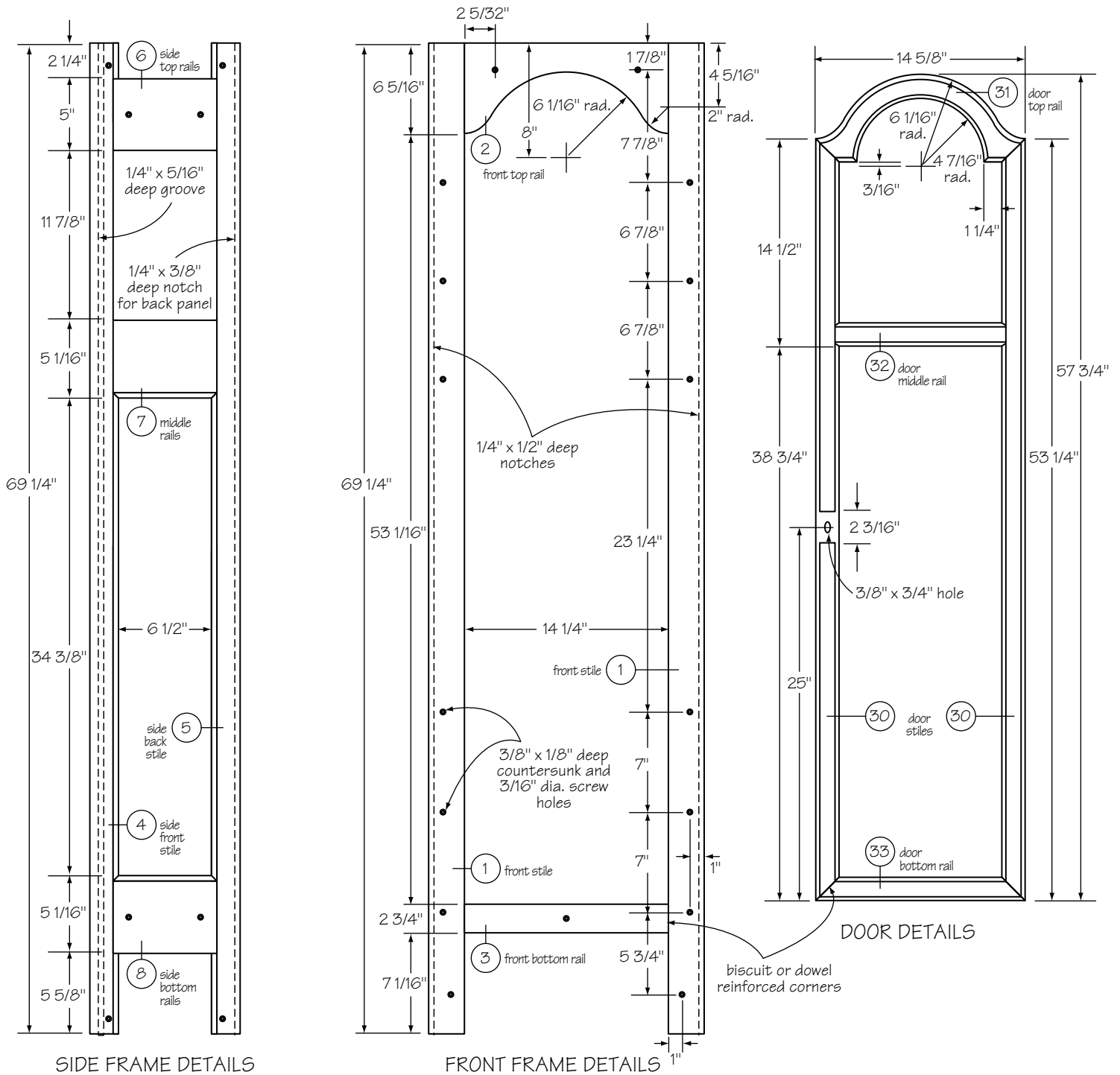
Hardware

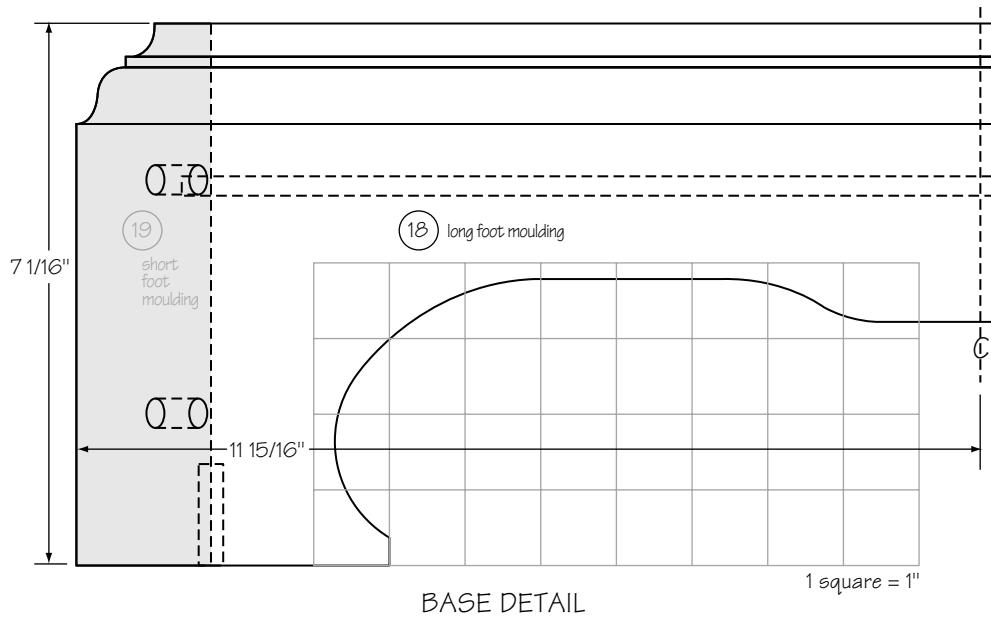
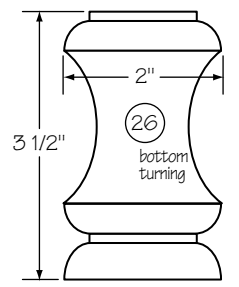
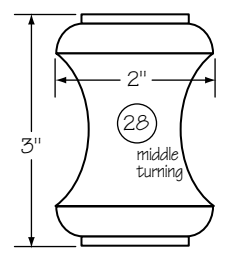
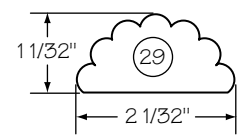
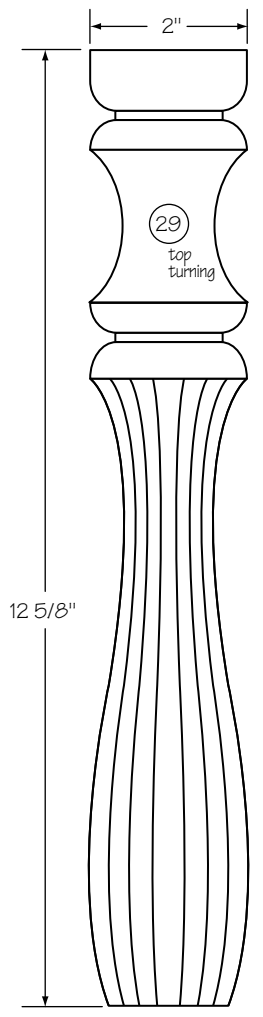
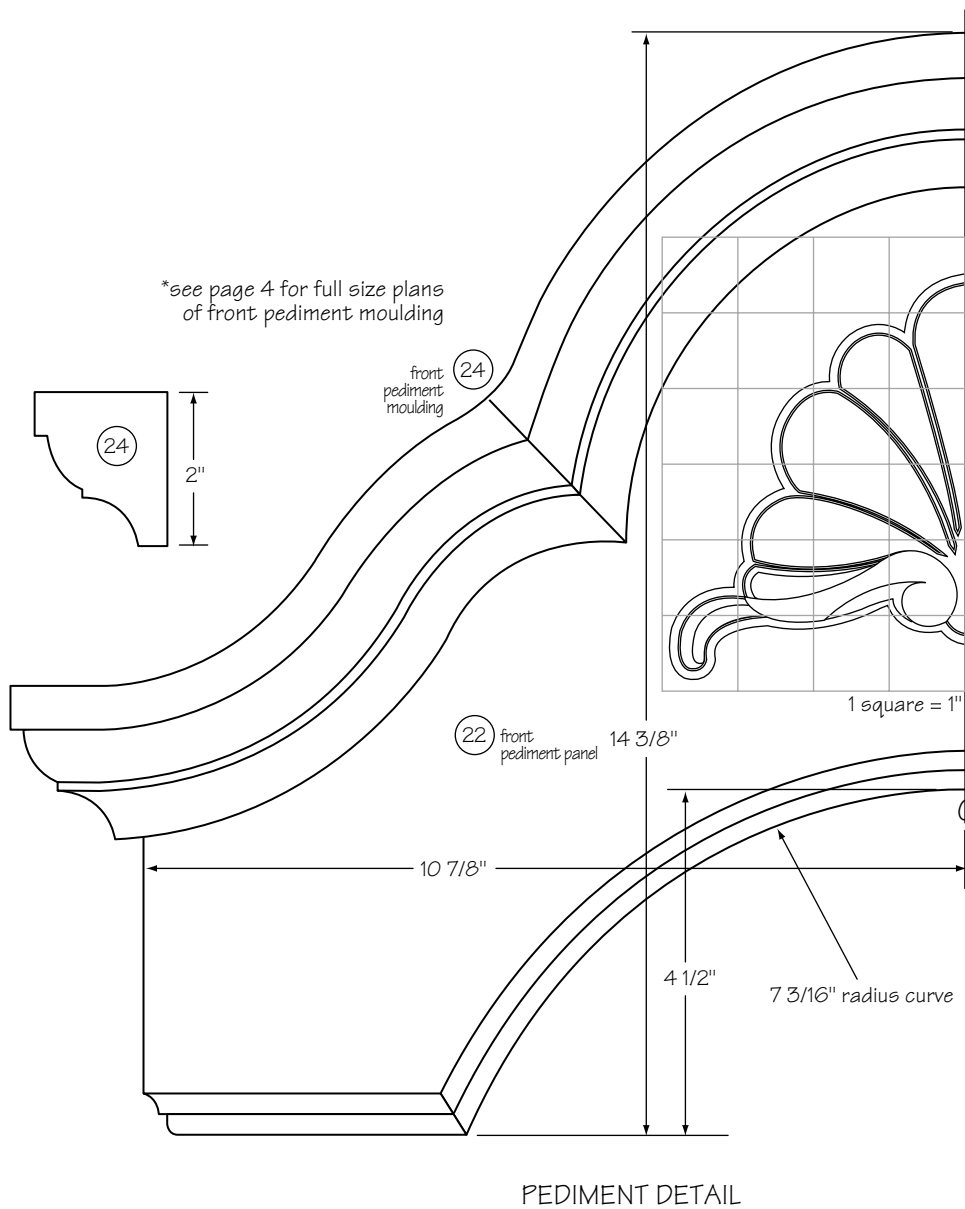
51	64	#8 x 1 1/4" wood screws
52	20	#6 x 3/4" wood screws
53	1	lock mechanism
54	1	key
55	7	3/8" inset overlapping hinges with screws
56	1	escutcheon plate & nails
57	12	#8 x 1 1/4" pocket hole screws
58	24	3/4"-long finishing nails
59	2	#20 oval wooden biscuits
60	2	1/2"-diameter solid brass door pull
61	2	double-bullet catch
62	4	height adjusters
63	38-feet	push-in glass retainer strip



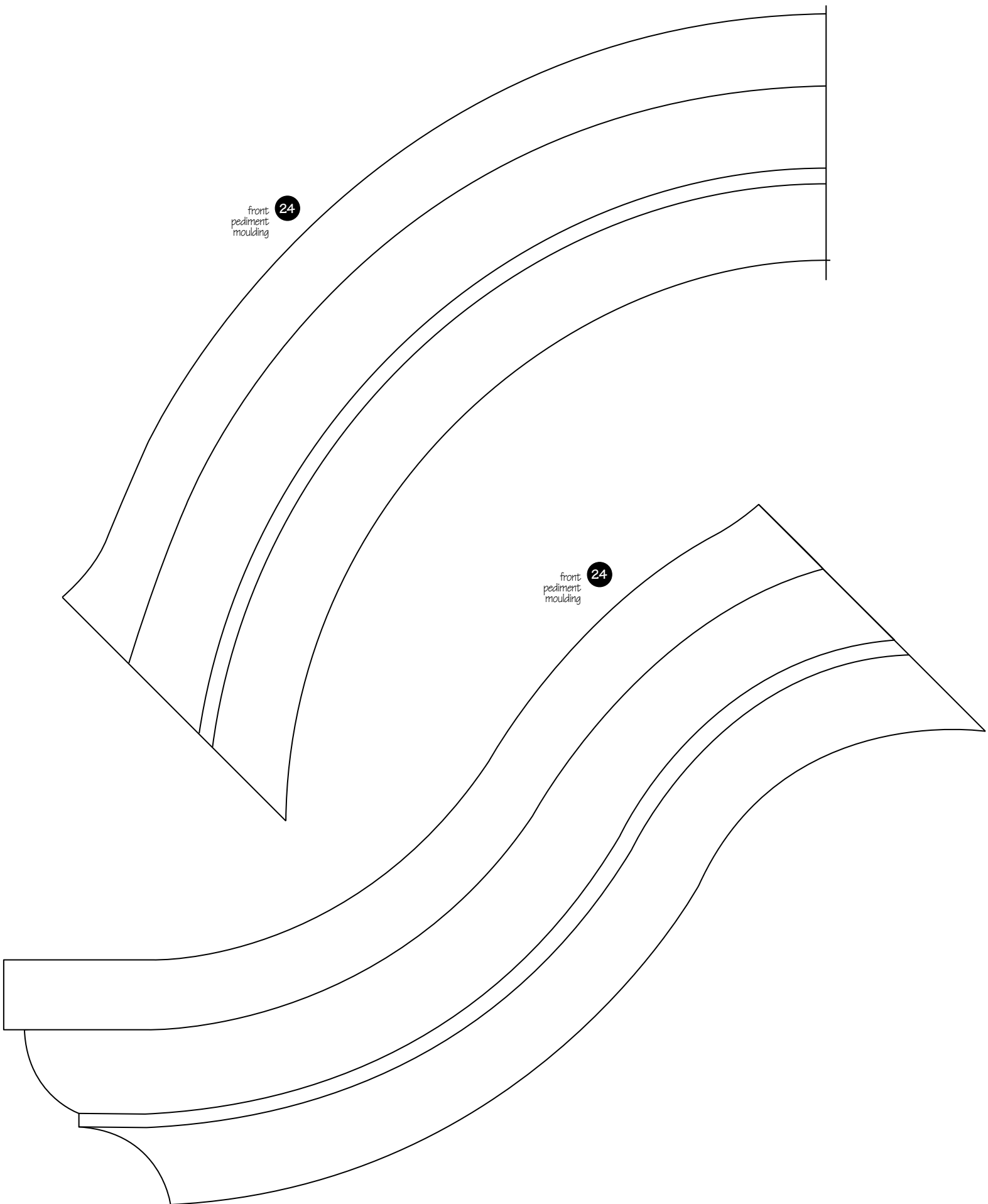
denotes part available from Murray Clock craft 1-800-268-3181

F. WILLIAM MURRAY: MAIN PLAN





F. WILLIAM MURRAY: BASE, PEDIMENT and COLUMN DETAILS

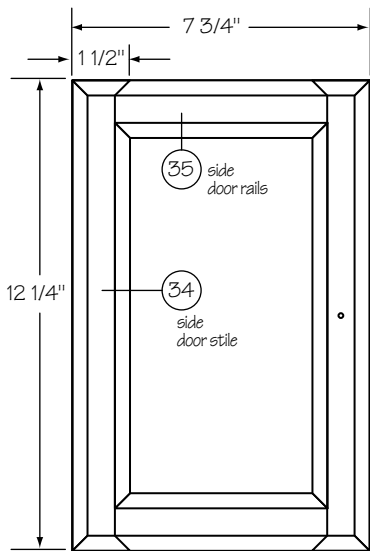


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moulding 24

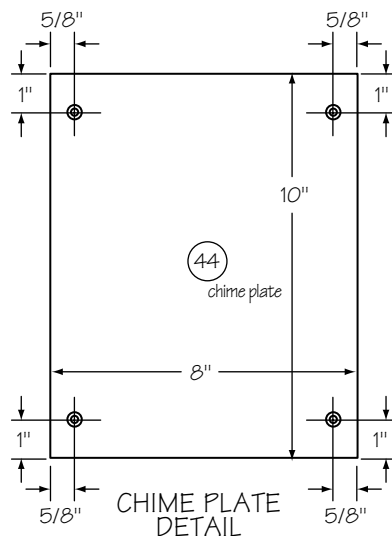
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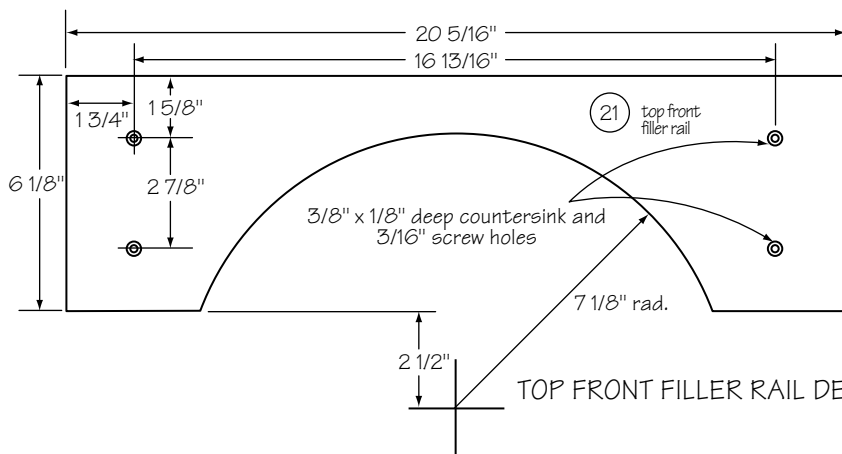
F. WILLIAM MURRAY: PEDIMENT MOULDING DETAILS



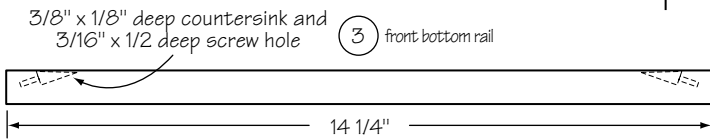
SIDE DOOR DETAILS



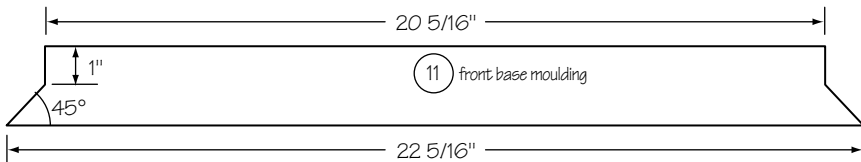
CHIME PLATE DETAIL



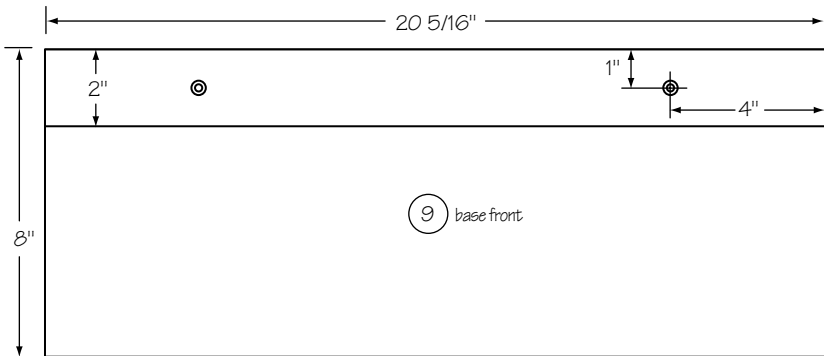
TOP FRONT FILLER RAIL DETAIL



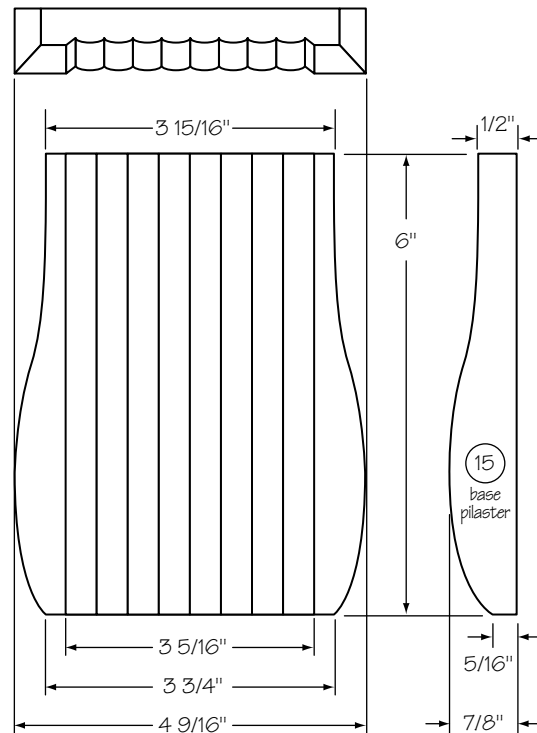
FRONT BOTTOM RAIL DETAIL



FRONT BASE MOULDING DETAIL

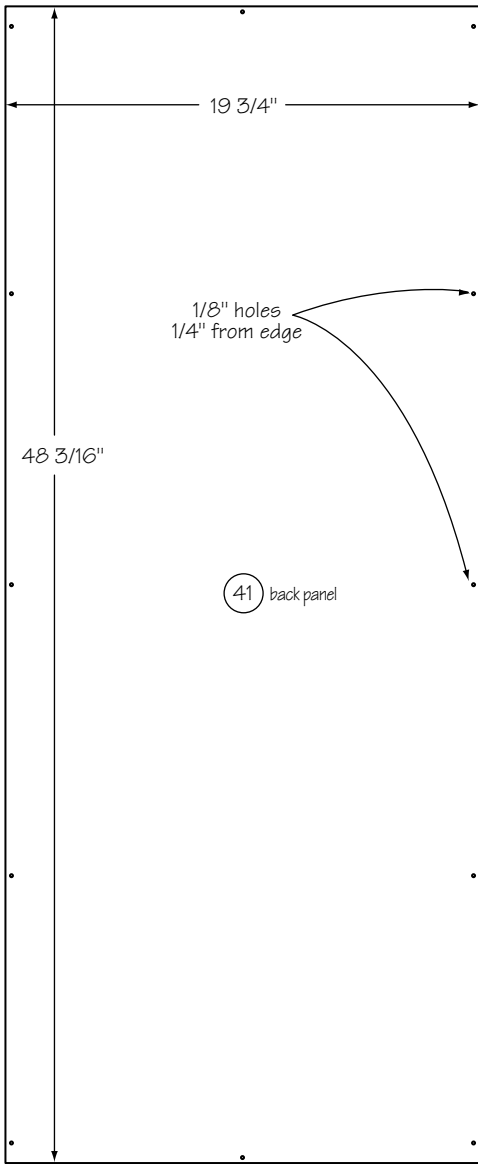


BASE FRONT DETAIL

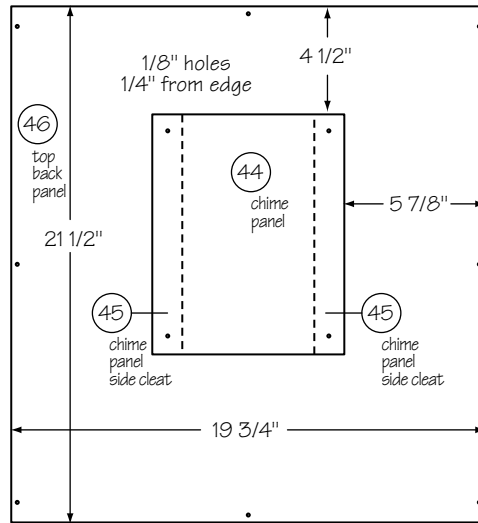


BASE PILASTER

F. WILLIAM MURRAY: BASE, TOP and SIDE DOOR DETAILS

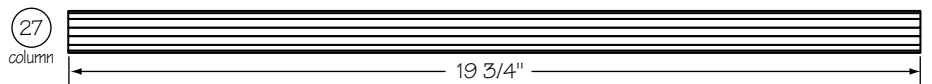
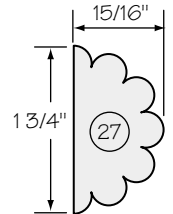


BACK PANEL

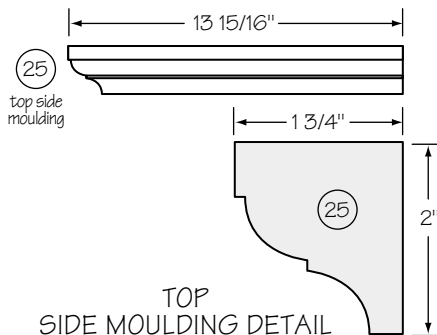


CHIME PANEL & TOP BACK PANEL

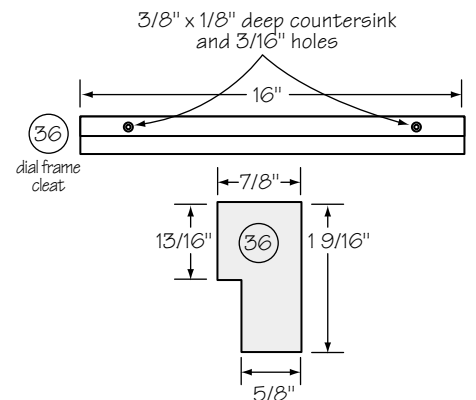
COLUMN PROFILE



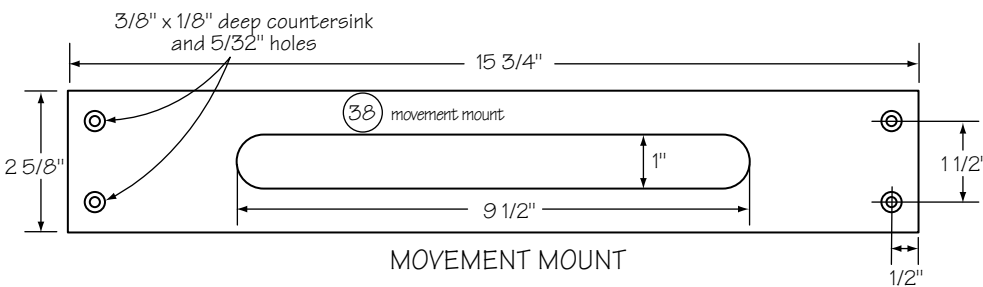
COLUMN: FACE VIEW



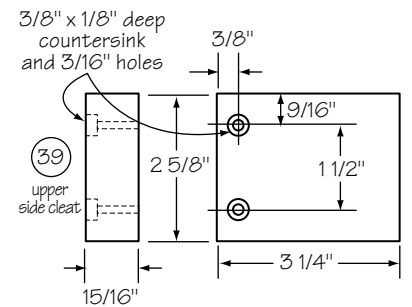
TOP SIDE MOULDING DETAIL



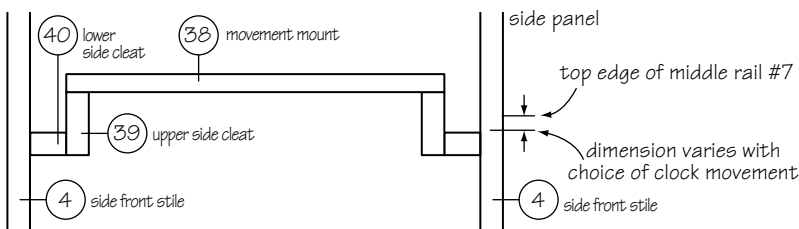
DIAL FRAME CLEAT DETAIL



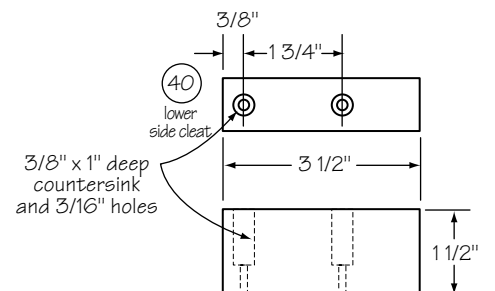
MOVEMENT MOUNT



UPPER SIDE CLEAT DETAIL



MOVEMENT SHELF DETAIL



LOWER SIDE CLEAT DETAIL

F. WILLIAM MURRAY: MOVEMENT MOUNT, BACK and TOP DETAILS