

## BUILDING AN HEIRLOOM: THE KEEPSAKE CLOCK PLAN GUIDE

Thank you very much for choosing this Murray Clock plan. 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 and have fun doing it.

### 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 thing that really 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, you'll still need a well-lit shop equipped with a tablesaw, table-mounted router, a hand-held sander (a 5" random orbit model is best), a variable-speed electric drill, a jigsaw, a 24" carpenter's square, and the usual assortment of hand tools required for general woodworking. A 3/8" diameter spade bit and 1/16" diameter twist bit are also needed at various stages of construction, too. Better get three or four of these tiny twist bits because they break easily.

Ideally, your workbench should be as long as your clock is tall. In this case, that's about 81 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, especially if stain is applied. The trick is to use just enough glue for strength, with minimal squeeze out. When excess glue does ooze out (and it's almost inevitable), 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 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 and band clamps may also be handy because they can hold large items, though these aren't essential. A roll of 1-inch wide masking tape is always useful, too, for holding small parts under minimal pressure.

Start work by reading all the instructions and identify the main parts according to the materials list. If you're new to the craft, cut and fit things together temporarily, without glue, as you progress. This may seem like a waste of time, but there are two good reasons to consider it. 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 ON THE SIDES

The first step is to construct the two side frame assemblies that form the angled facets of the main case. This clock is actually a kind of corner cabinet, and depends on the same angled work you'd apply to any similar cabinetmaking job.

Each side frame is made of horizontal parts (called rails) and vertical members (called stiles), as shown on page 2 of the plans. Start by cutting the front and back stiles, and the top, middle and bottom rails (parts# 14, 15, 16, 17 and 18), then lay them face-down on your workbench. These need to be joined with dowels, biscuits, pocket screws or interlocking routed

profiles into frameworks that form the side frame assemblies. These parts all need rabbet grooves cut in their back faces, to accommodate the panes of glass you'll be adding later. The plans also show how tongues of wood are needed along the bottom edges, to interlock later with grooves in the bottom mouldings. Look for details on page 2 of the plans.

When the side frames are dry, add the back mirror stiles (parts# 19) to the back edges of the back stiles (parts#15), forming a long 45-degree mitre joint at that place. The plans show #20 biscuits used to reinforce this joint, but 5/16" dia. x 1 1/2"-long fluted dowels work fine, too, and all you need is a hand drill and some dowel centers to install them.

Now's the time to join the two side frames using the front bottom rail and the front top pediment members (parts#24 and 25), plus the top, upper and back rails (parts#32, 33 and 34) as the connecting links. These join to the edges of the side frames using reinforced butt joints. Page 3 shows details. The whole arrangement is best held together with band clamps or masking tape across the front faces of the parts while the glue is wet. The trick at this stage is to set the frames aside to dry in the right orientation. You want the whole arrangement to match the shape of the base assembly you haven't yet built. That's why you should cut the bottom panel (part# 13) ahead of time, to use as a gluing guide for the parts now sitting on your bench. When the framework is set up correctly and drying, turn your attention to the base assembly on page 4.

## BUILDING THE BASE

Prepare and assemble the bottom front, side and end mouldings, plus the bottom back rail and bottom panel (parts# 9, 10, 11, 12 and 13) into a six-sided moulding frame. The groove you'll need to cut in the top of these parts must align with the tongues present along the bottom edges of the frame you just glued up. Be careful. There's not much room for error here. Use glue and screws (driven from the underside of the mouldings) to hold the moulding frame to the growing clock frame assembly. You'll notice that the side and face frame assembly will get much stronger after the moulding frame has been attached. Next, flip the clock over and fasten the back panel (part#35)

There are lots of ways you can put the remaining part of the clock base together, and one option begins by joining the base front, side and end mouldings, and the base back rail together (parts#5, 6, 7 and 8). Next, add the base front, side and end rails (parts#2, 3 and 4) to the budding assembly, followed by both of the base feet (parts#1A and 1B).

Grandfather clocks should sit plumb and wobble-free, even if the floor they're resting on isn't perfectly level or flat. 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 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.

## TURN TO THE TOP

Now's the time to add the front, side and end crown mouldings (parts#37, 38 and 39) to the top of the growing clock case. Since these parts are curved, they're the trickiest pieces of this project to make. That's why we make them available ready-made along with other hard-to-build components. Call 1-800-268-3181 for details.

Next, flip the case upright onto the floor and screw the dial panel stiles (part#27) to the inside of the face frame. The movement panel and cleats (parts#28 and 29) come next. Assemble these now, as shown on page 7 of 9, then fasten the assembly into the clock case with screws. If you'll be installing mirrors in the back of your clock, measure the openings and have them cut. The mirrors fit into the rabbet grooves cut in the back of the clock case before the end stiles (parts#31) are screwed in place from the back.

## THE DOOR

There are several ways to make your clock's main and side doors. The approach shown in the plans uses matching routed profiles. 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 and shape is correct, anything goes.

## HARDWARE

Now's the time to install hinges, lock 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. Next, position the lock mechanism 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 the spot, then remove enough wood to create a pocket for the hardware, using sharp chisels. 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.

The instructions that came with your clock movement will offer specific installation tips that vary depending on the model you chose. Whichever you use, install and test all clockworks before removal and finishing.

## 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?

## THE KEEPSAKE CLOCK PARTS PLANS LIST

Part#	QTY	Description	Size
<b>FOR THE BASE</b>			
1A	2	Front feet	3/4" x 3 7/16" x 6 1/16"
1B	2	Back feet	3/4" x 3" x 7 15/16"
2	1	Base front rails	1 1/4" x 2 1/2" x 16 5/16"
3	2	Base side rails	1 1/4" x 2 1/2" x 12 1/8"
4	2	Base end rails	1 1/4" x 2 1/2" x 5 5/8"
5	1	Base front moulding	3/4" x 5 1/4" x 5 3/8"
6	2	Base side moulding	3/4" X 5 1/4" x 11 1/8"
7	2	Base end moulding	3/4" x 5 1/4" x 5 1/8"
8	1	Base back rail	3/4" X 3 1/2" X 30"
9	1	Bottom front moulding	3/4" x 2 1/2" x 15 1/16"
10	2	Bottom side moulding	3/4" x 2 1/2" x 10 7/8"
11	2	Bottom end moulding	3/4" x 2 1/2" x 5"
12	1	Bottom back rail	3/4" X 1 3/8" x 25 7/16"
13	1	Bottom panel	1/4" x 9 9/16" x 26 3/16"*

### FOR THE SIDE FACE FRAME ASSEMBLY

14	2	Front stile	3/4" x 2" x 70 1/8"
15	2	Back stiles	3/4" X 1 3/4" x 65 3/16"
16	2	Top rails	3/4" x 7 5/8" x 8 3/8"
17	2	Middle rails	3/4" x 2 1/4" x 7 5/8"
18	2	Bottom rails	3/4" x 2 1/8" x 7 5/8"
19	2	Back mirror stiles	3/4" x 4 11/16" x 65 1/8"

### FOR THE DOOR FRAME

20	2	Door stiles	3/4" x 1 9/16" x 64 3/4"
21	1	Door top rail	3/4" x 6 1/8" x 11 25/32"
22	1	Door middle rail	3/4" x 2" x 11 25/32"
23	1	Door bottom rail	3/4" x 2" x 11 25/32"

## FOR THE FRONT FACE FRAME ASSEMBLY

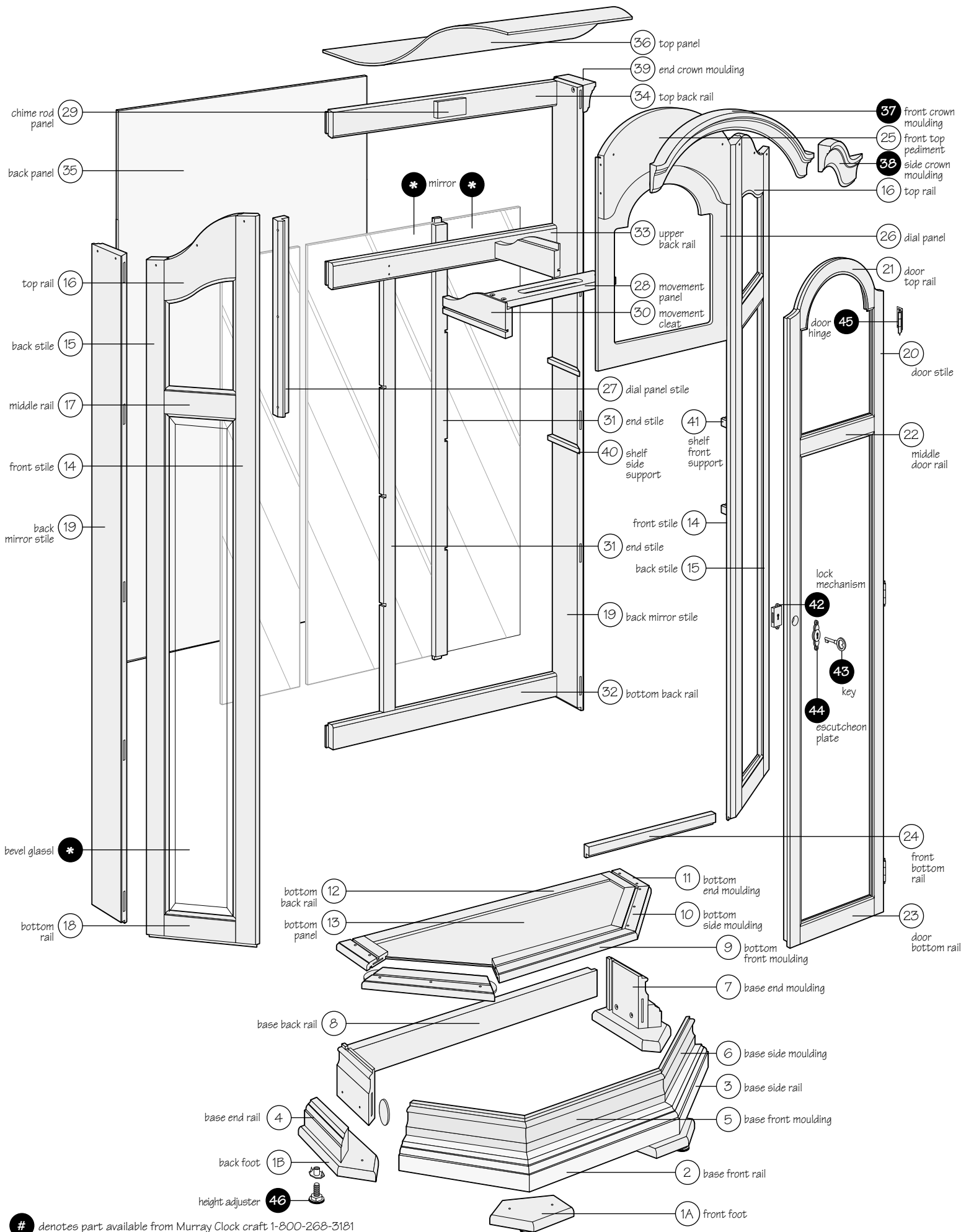
24	1	Front bottom rail	9/16" x 1 1/16" x 13 5/8"
25	1	Front top pediment	3/4" x 9 1/2" x 13 5/8"
26	1	Dial panel	1/4" x 13 5/8" x 19 3/4" 8
27	2	Dial panel stiles	7/8" x 1" x 19 3/4"
28	1	Movement panel	3/4" x 2 7/8" x 13 3/4"
29	1	Chime rod panel	1/2" x 3 1/2" x 6 1/2"
30	2	Movement cleats	3/4" x 3 7/8" x 9 5/16"
31	2	End stiles	5/8" x 1 1/2" x 48"
32	1	Bottom back rail	3/4" x 3" x 28 1/16"
33	1	Upper back rail	3/4" x 3 1/2" x 28 1/16"
34	1	Top back rail	3/4" x 3 7/8" x 28 1/16"
35	1	Back panel	1/4" x 28 3/4" x 64 15/16"*
36	1	Top panel	3/32" x 13 3/8" x 29"*

## FOR THE CROWN ASSEMBLY AND SHELVES

37	1	Front crown moulding	1 3/8" x 5 5/8" x 15 7/8"
38	2	Side crown moulding	1 3/8" x 3 5/8" x 12 5/8"
39	2	End crown moulding	1 3/8" x 2 1/8" x 5 5/16"
40	8	Shelf side supports	1/2" x 1/2" x 4 9/16"
41	6	Front supports	3/4" x 3/4" x 7/8"

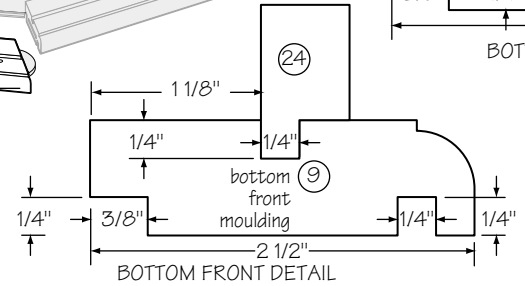
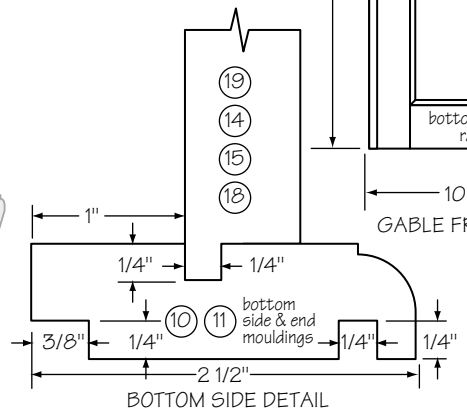
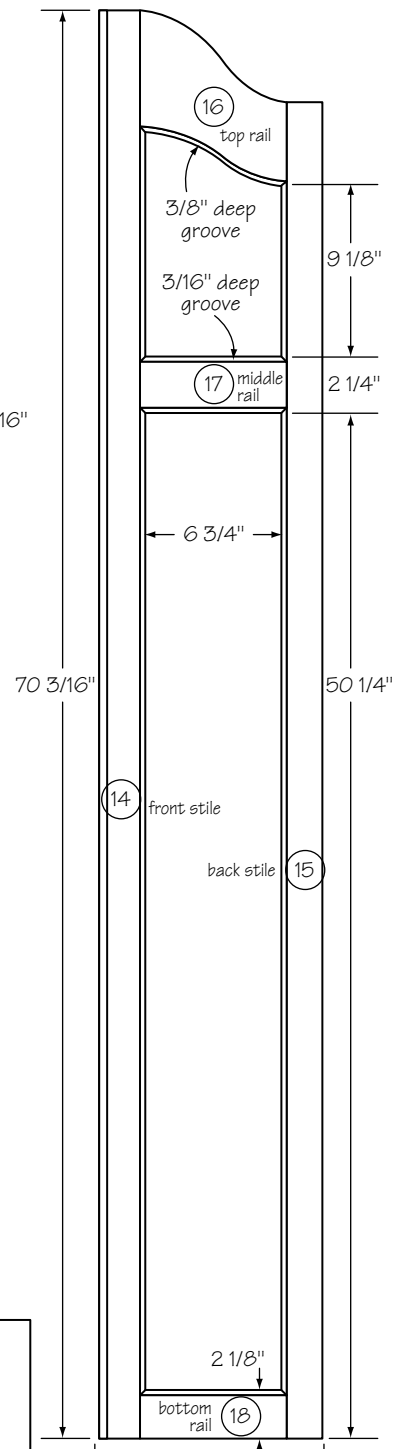
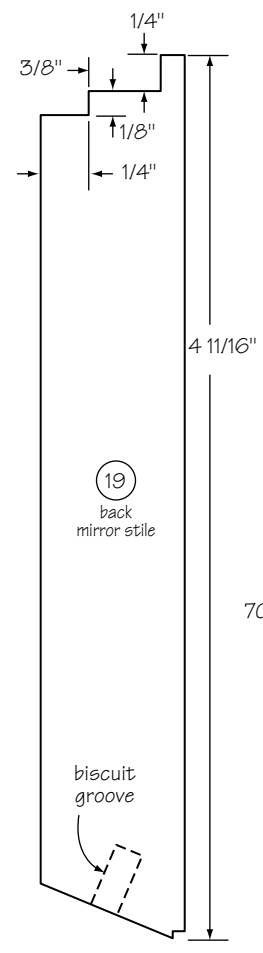
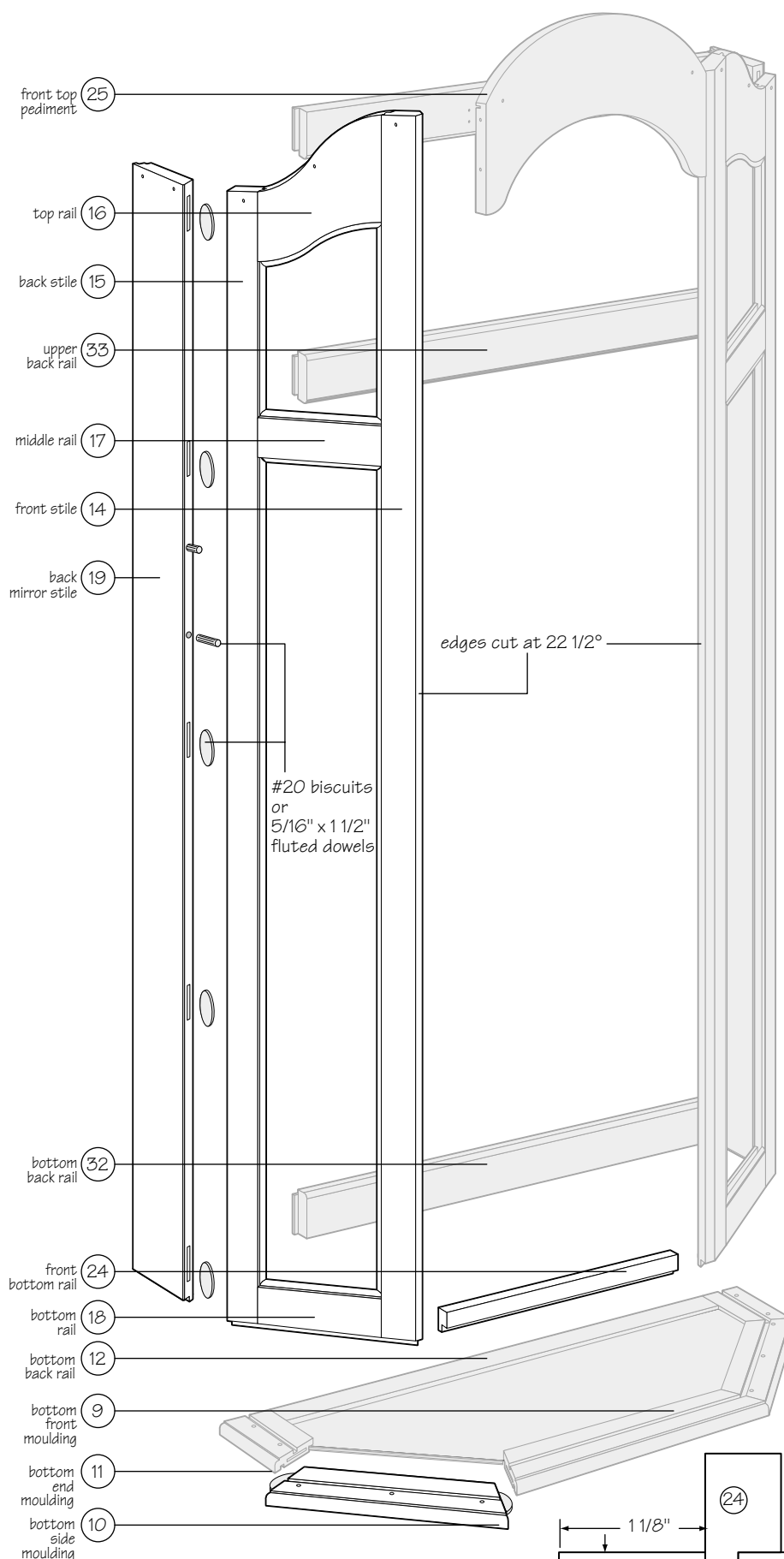
## HARDWARE

42	1	lock mechanism	
43	1	key	
44	1	escutcheon plate	
45	3	door hinges	
46	4	height adjusters	
47	1	glass retainer strip	

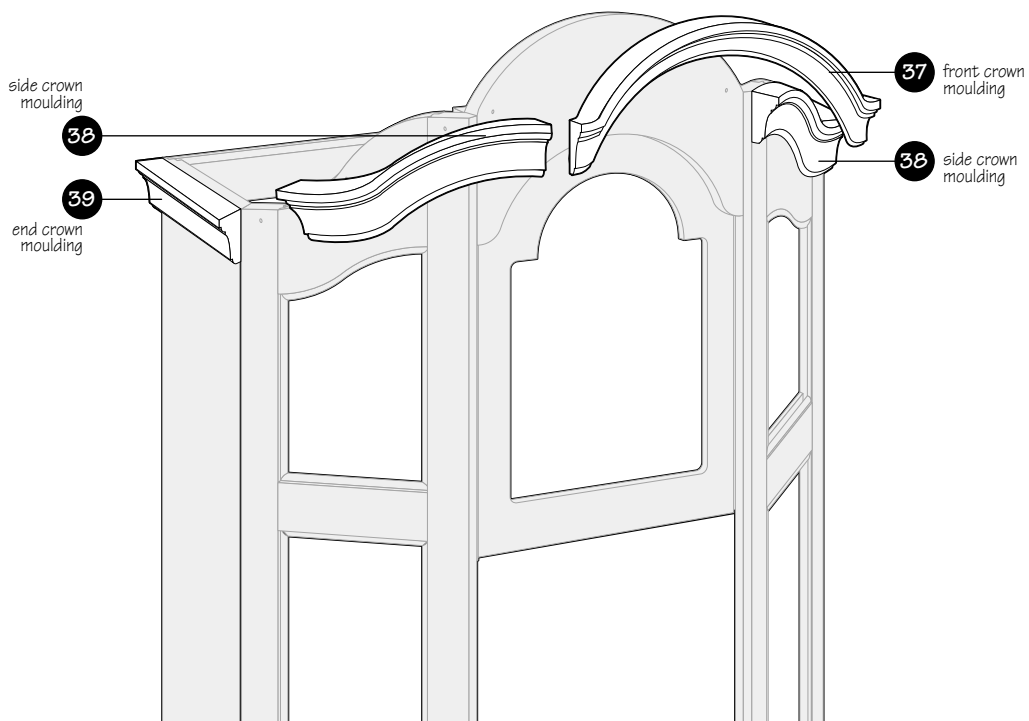
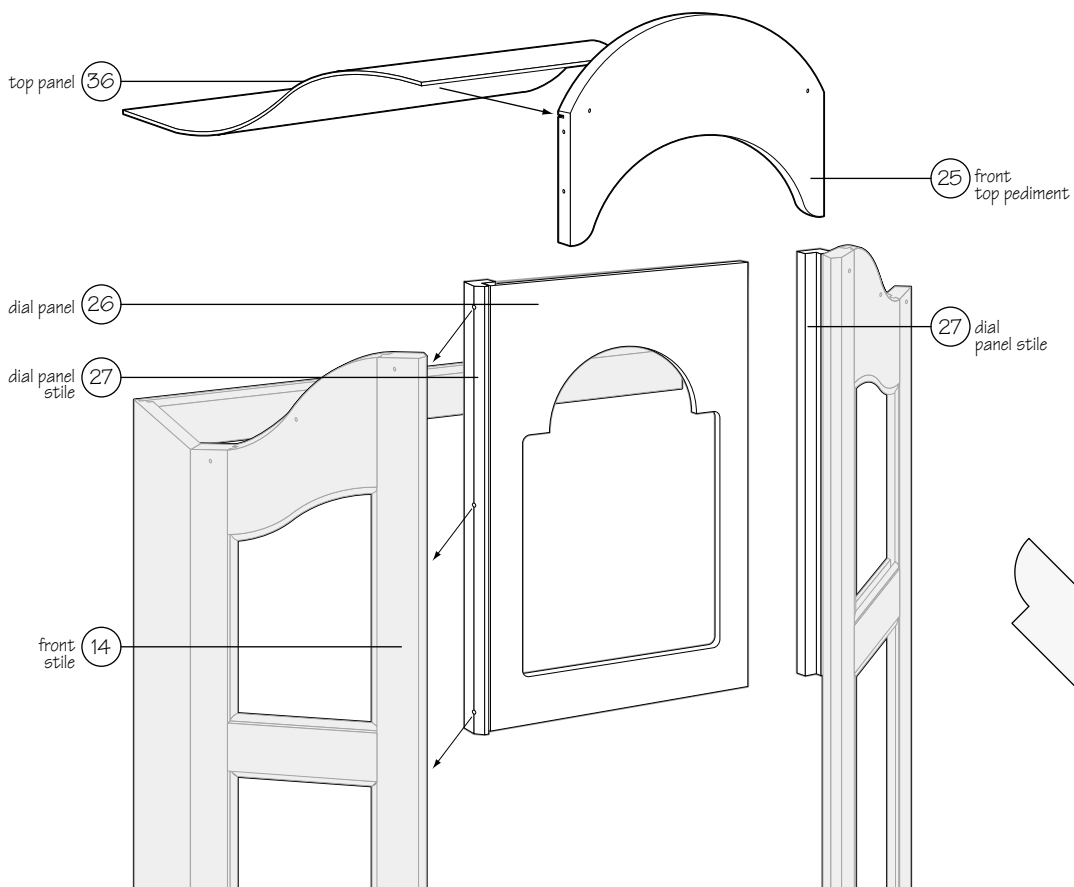


# denotes part available from Murray Clock craft 1-800-268-3181

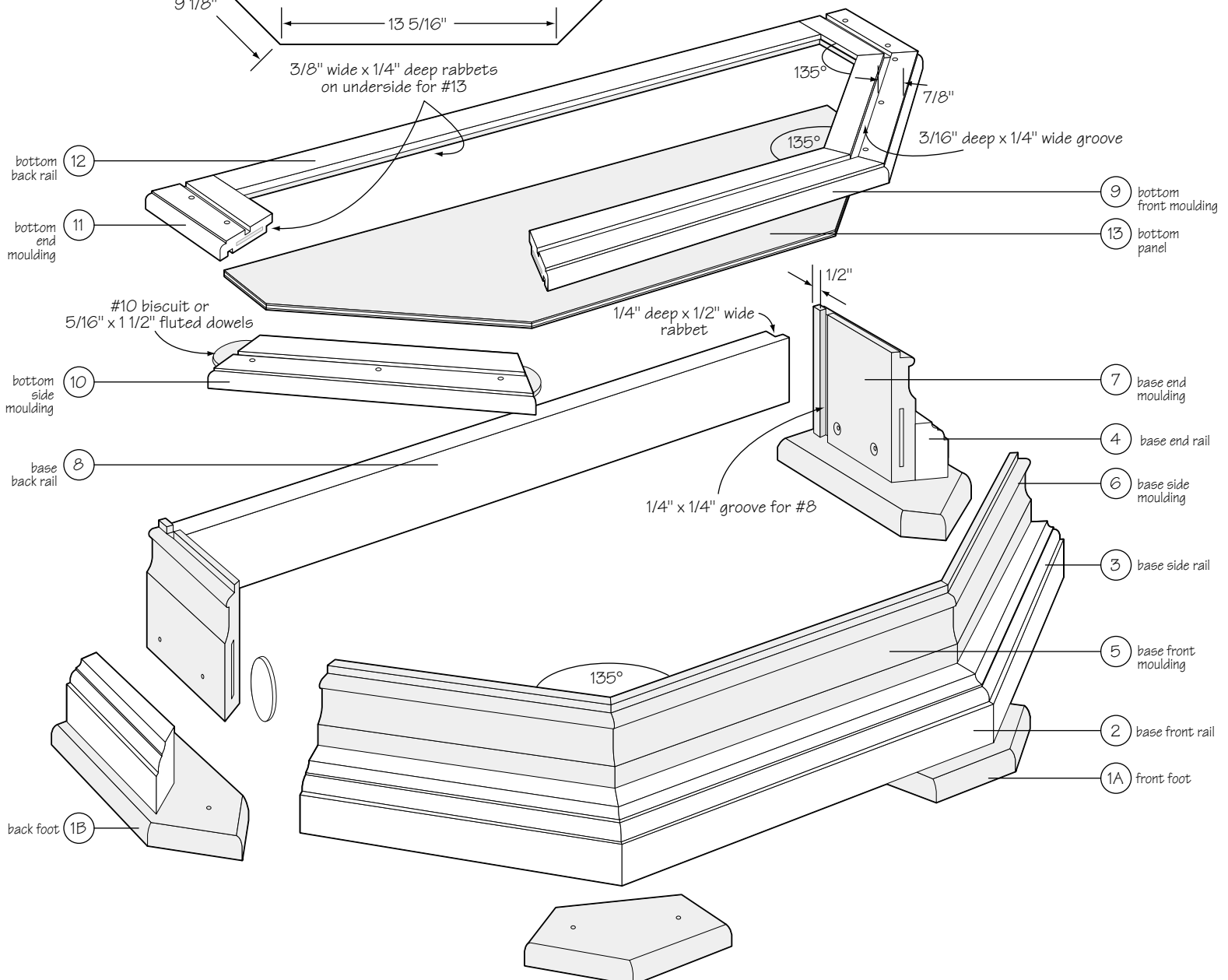
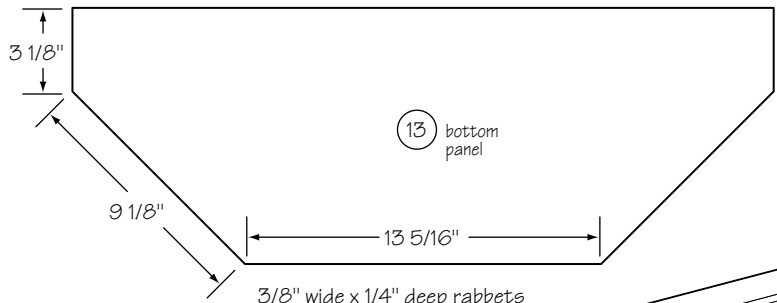
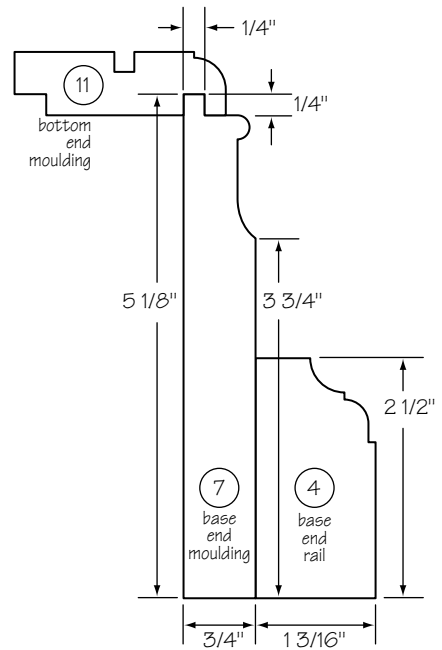
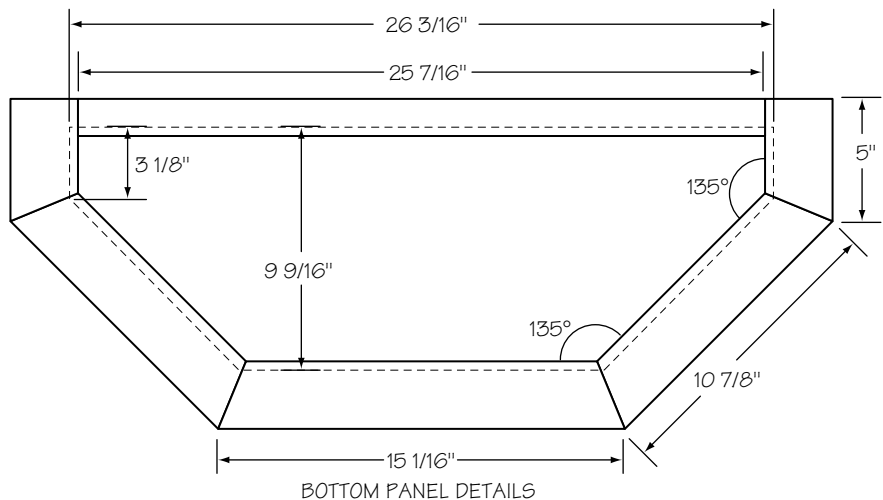
## THE KEEPSAKE: MAIN PLAN



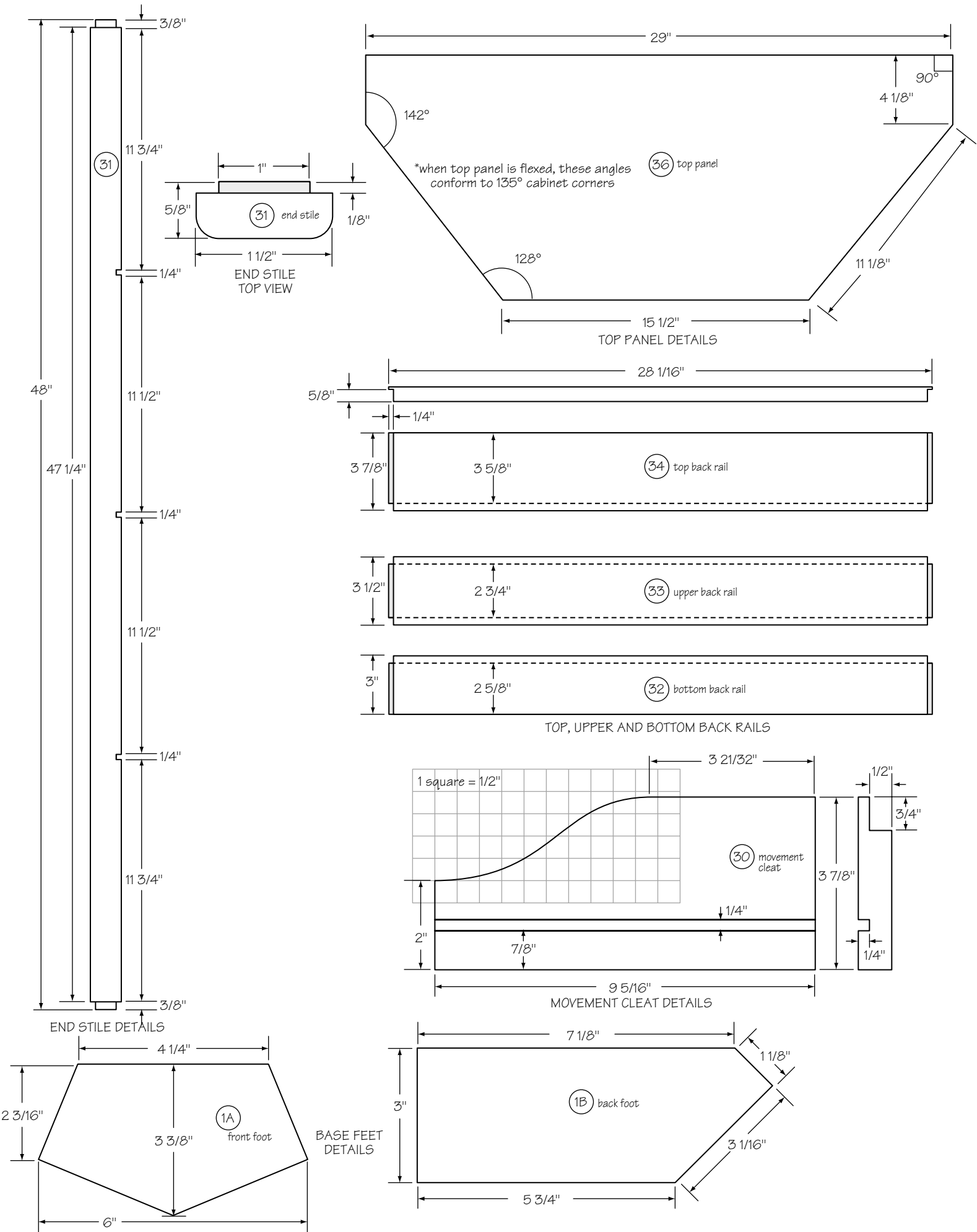
**THE KEEPSAKE: GABLE FRAME AND BASE DETAILS**



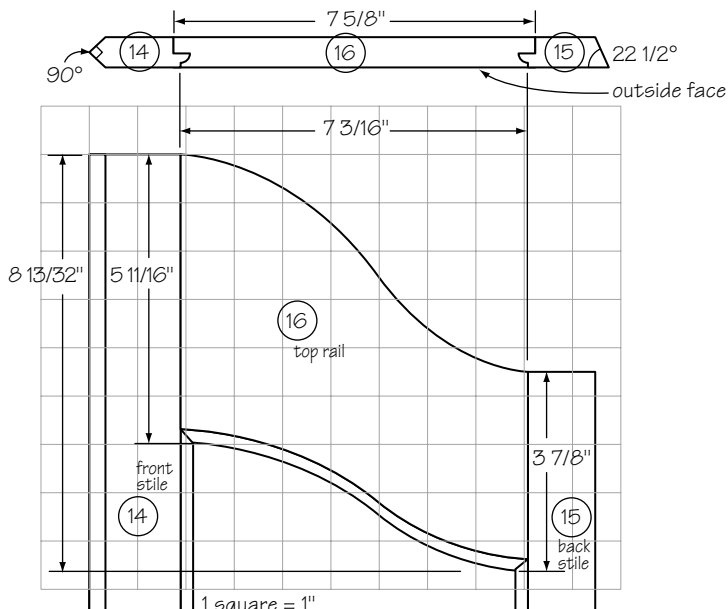




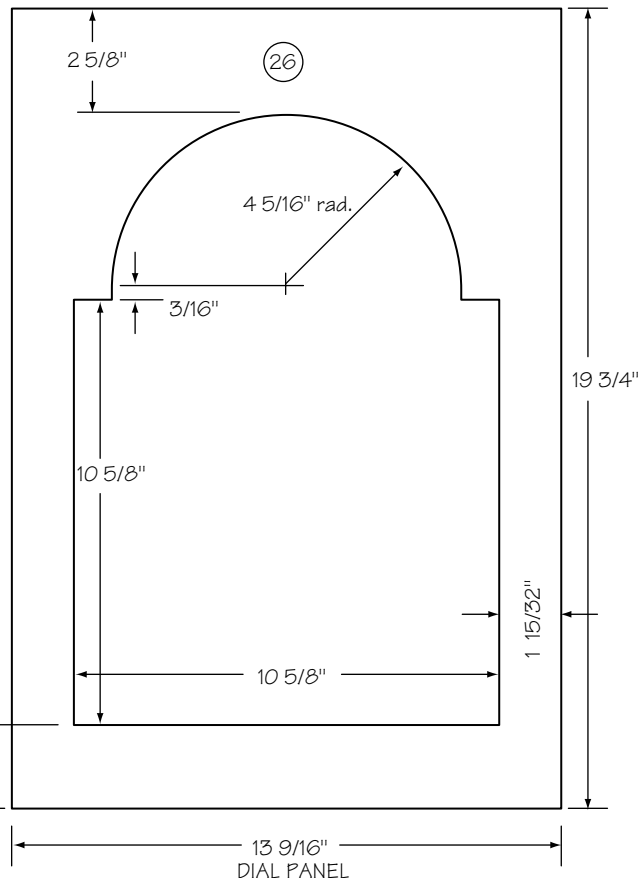
THE KEEPSAKE: BASE DETAILS



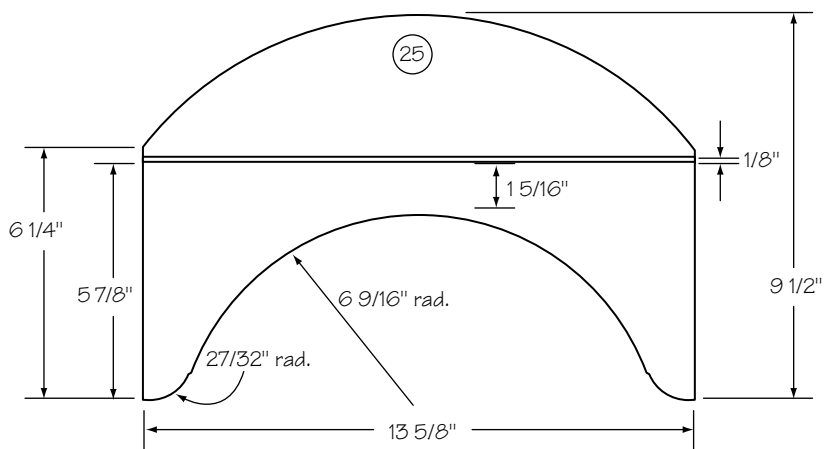
**THE KEEPSAKE: BASE, BACK AND TOP PARTS**



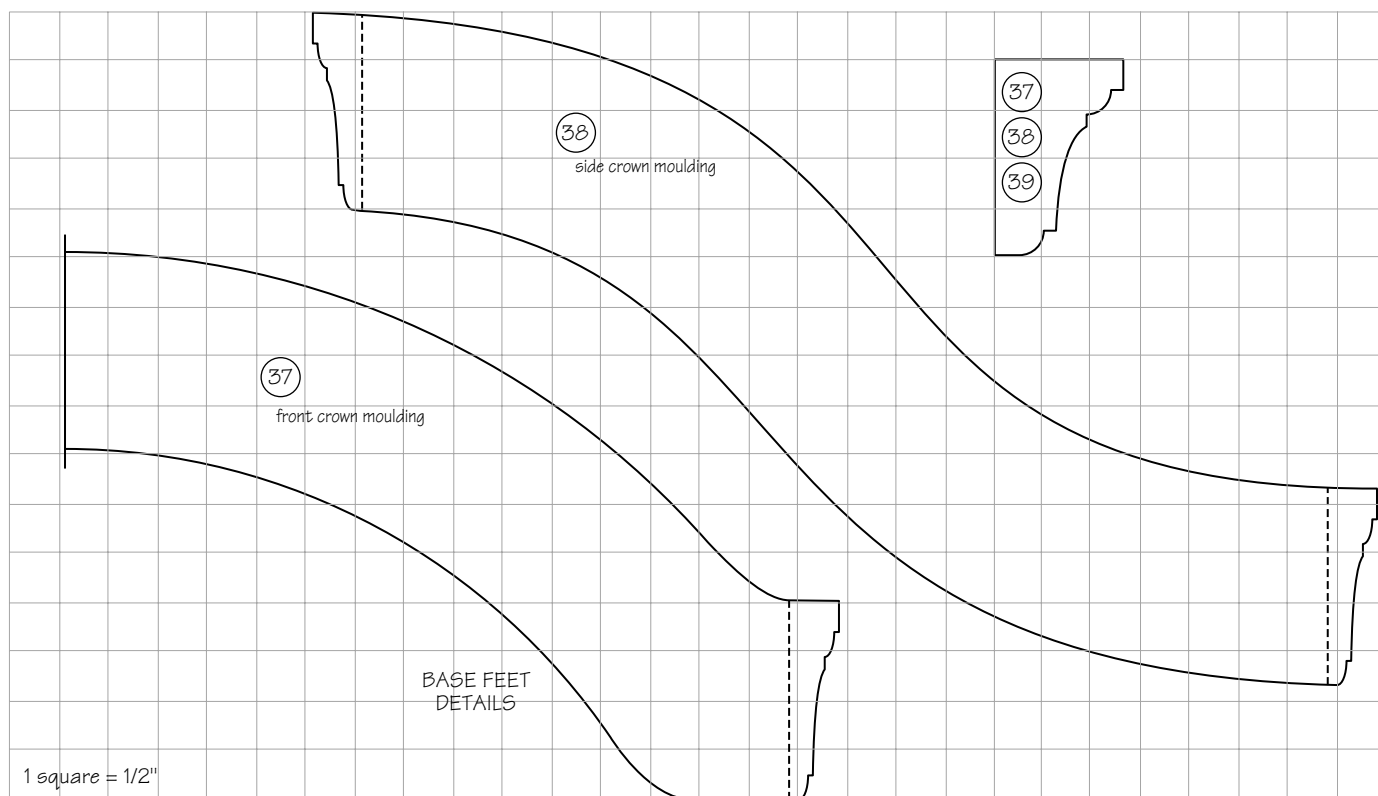
SIDE FRAME TOP DETAILS



DIAL PANEL

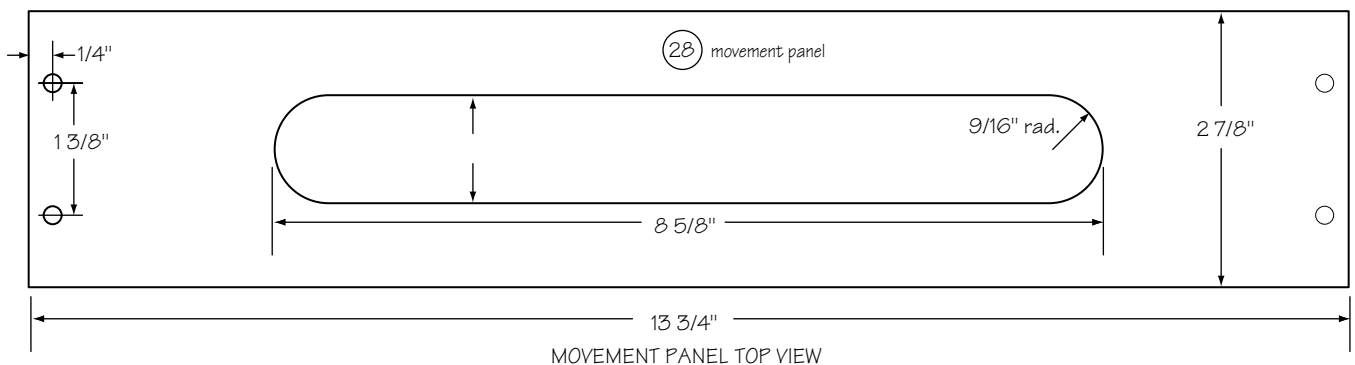
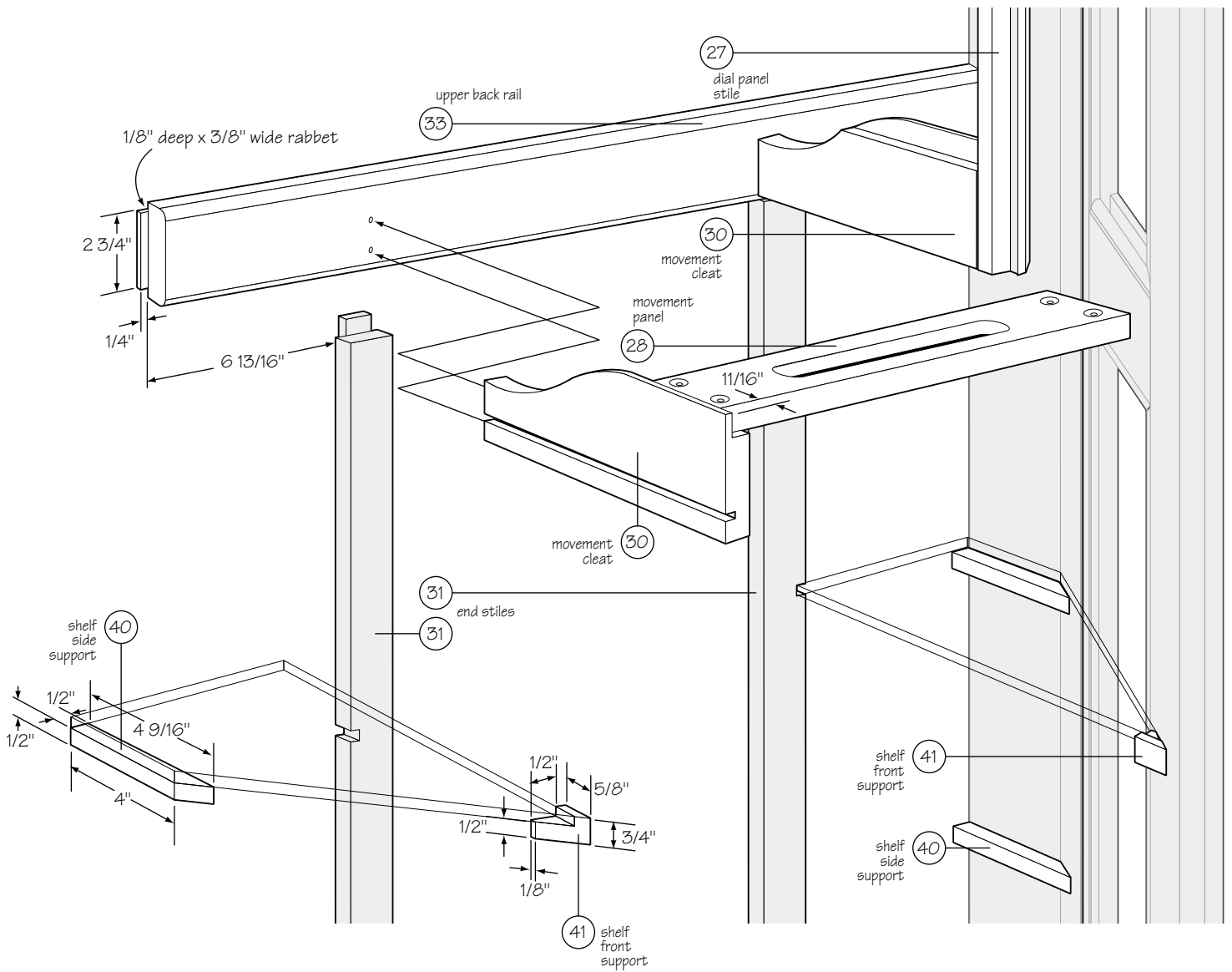


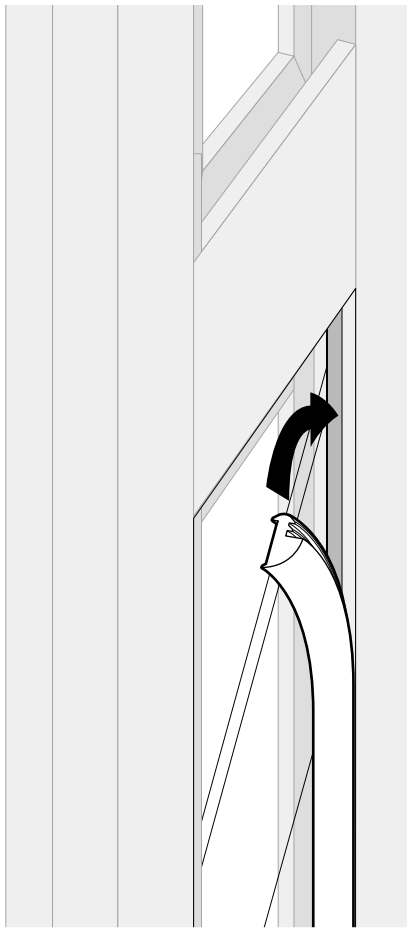
FRONT TOP PEDIMENT



see page 9 of 9 for full size outlines

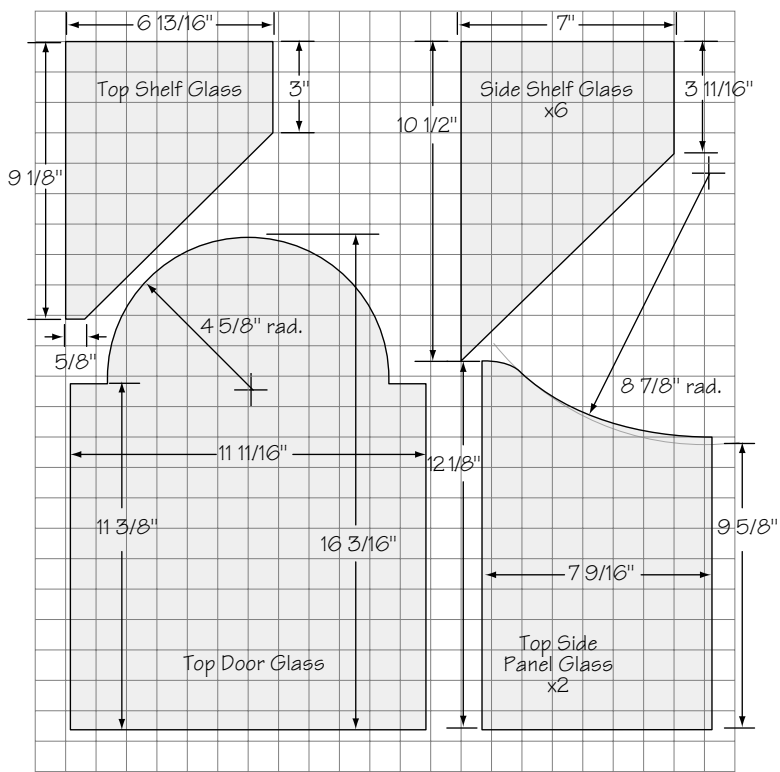
# THE KEPSAKE: UPPER DETAILS



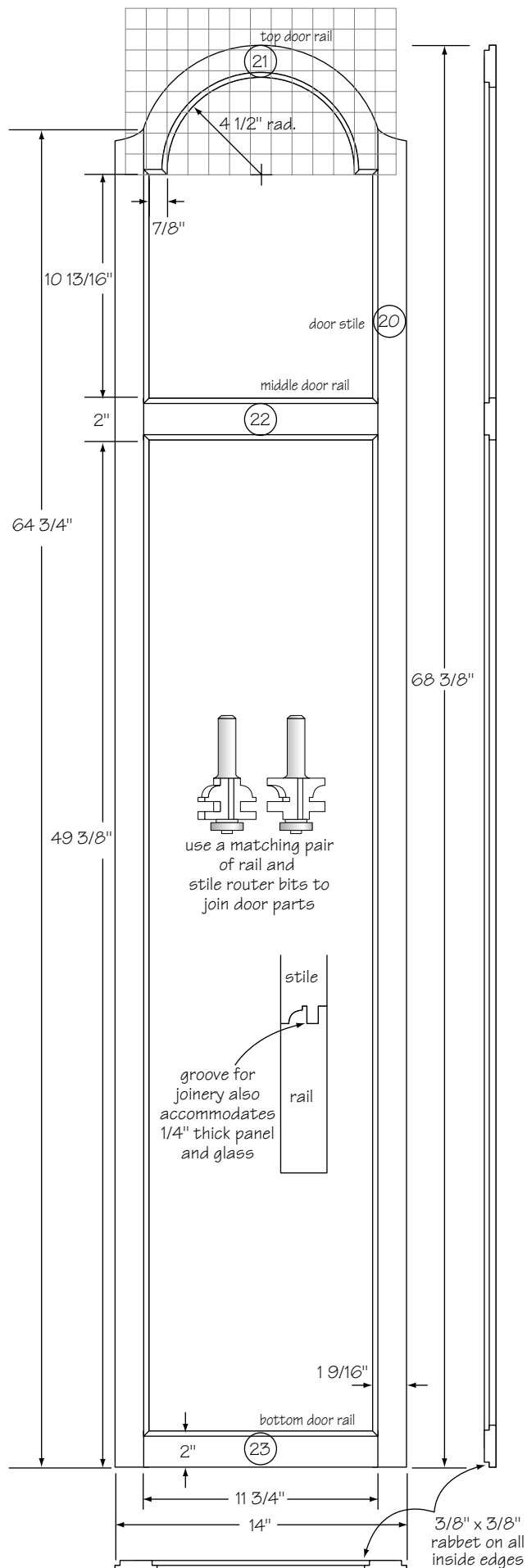


Glass Retainer Strips

\*bevelled glass, glass shelves, dial glass, glass retainer strip, and pre-cut mirror is available from Murray Clock Craft 1-800-268-3181

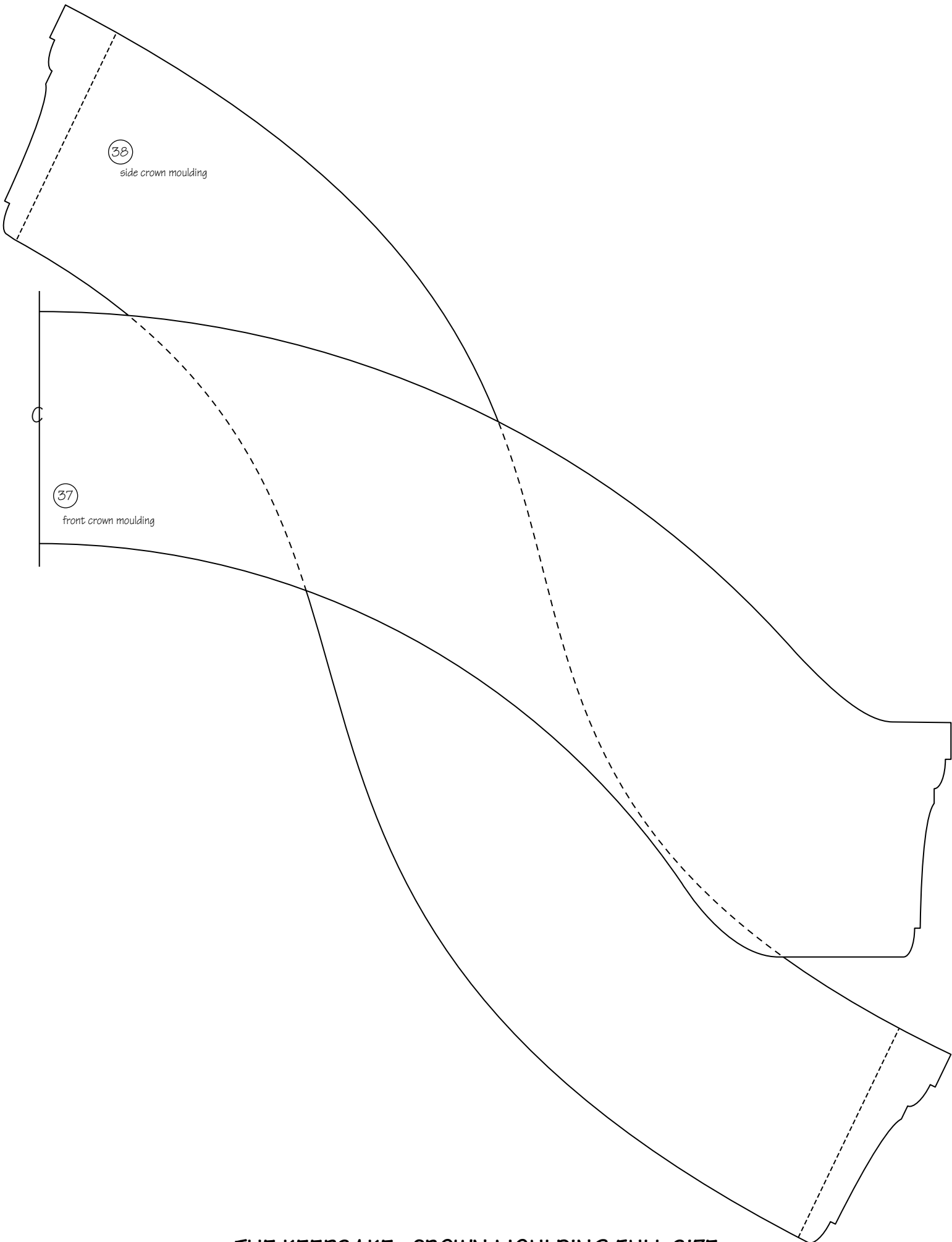


1 square = 1"



FRONT DOOR DETAIL

# THE KEEPSAKE: DOOR AND GLASS DETAILS



38

side crown moulding

37

front crown moulding

C