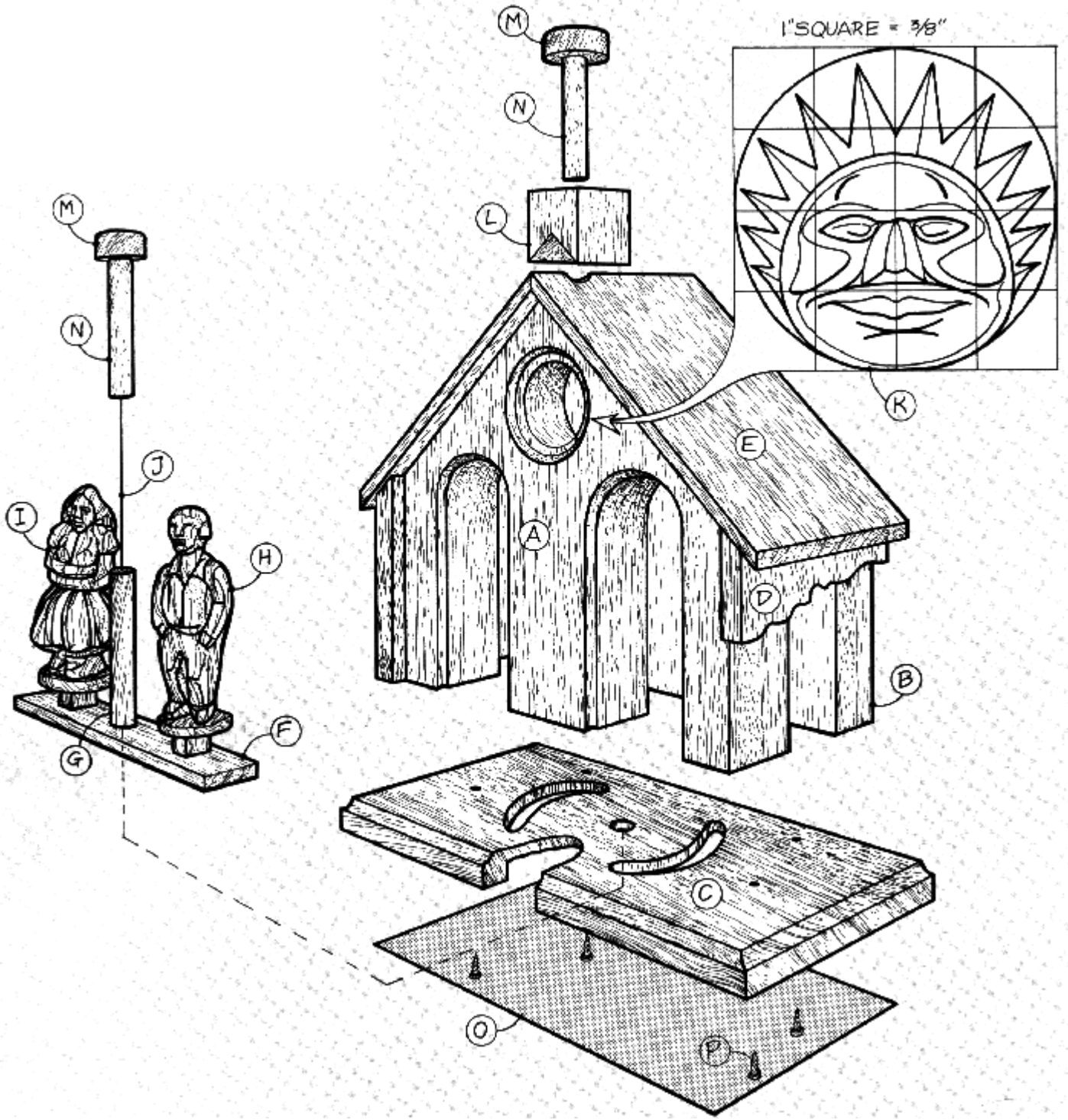
Project 14438EZ:
Old World Weather Forecaster

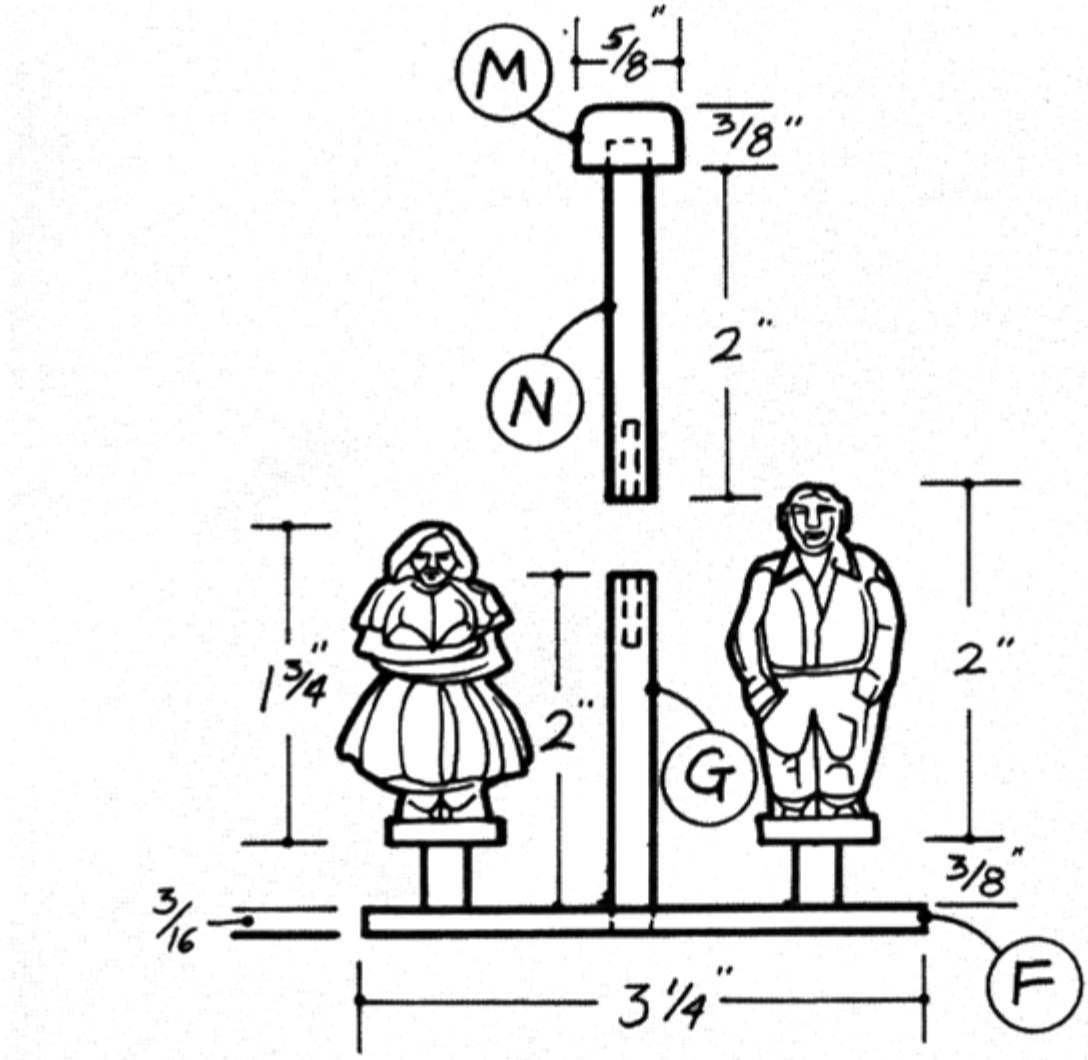
The weather house type of weather forecaster is a very old traditional type that was popular in Europe, especially Germany. Changes in the weather cause a gut string to twist. The string is attached to small figures of a man and a woman. If the woman is outside of the house, the weather will be fair; when the man comes out, stormy weather is predicted. If you like to carve and are interested in the weather, this is a very enjoyable project.

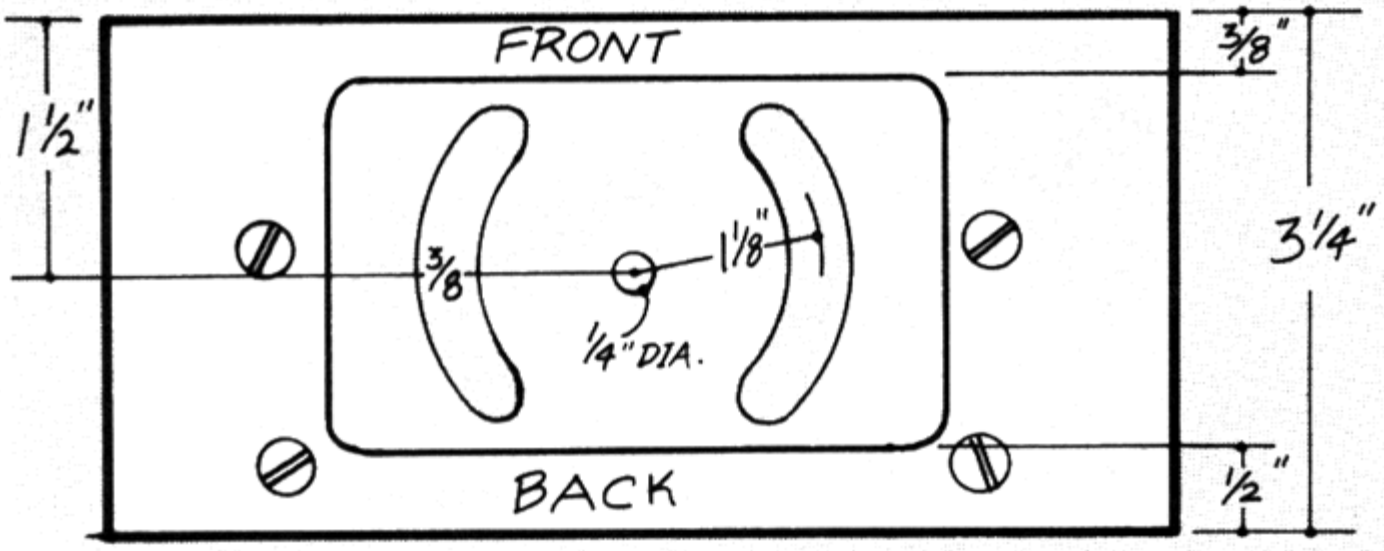
Weather Forecaster Materials List

Part	Description	Size	No Req'd
A	Front	3/4" x 5 x 5-3/8"	1
B	Back	3/4" x 5 x 5-3/8"	1
C	Base	3/4" x 3-1/4" x 6-1/2"	1
D	Side	1/4" x 2-1/4" x 2-15/16"	2
E	Roof	1/4" x 2-3/8" x 4-1/2"	2
F	Pivot Arm	3/16" x 1/2" x 3-1/4"	1
G	Pivot Dowel	1/4" dia. x 2-3/16"	1
H	Man	See detail	1
I	Woman	See detail	1
J	Gut Violin String	"D"	1
K	Sun Carving	See detail	1
L	Chimney	3/4" x 3/4" x 1"	1
M	Setting Knob	3/8" dia. x 3/8" thick	1
N	Setting Dowel	1/4" dia. x 2-3/16"	1
O	Felt Bottom		As req'd
P	Flathead Screws		4

Weather Forecaster Complete Schematic




M
5/8"
3/8"
N
2"
1 3/4"
2"
G
2"
3/8"
3/16
F
3 1/4"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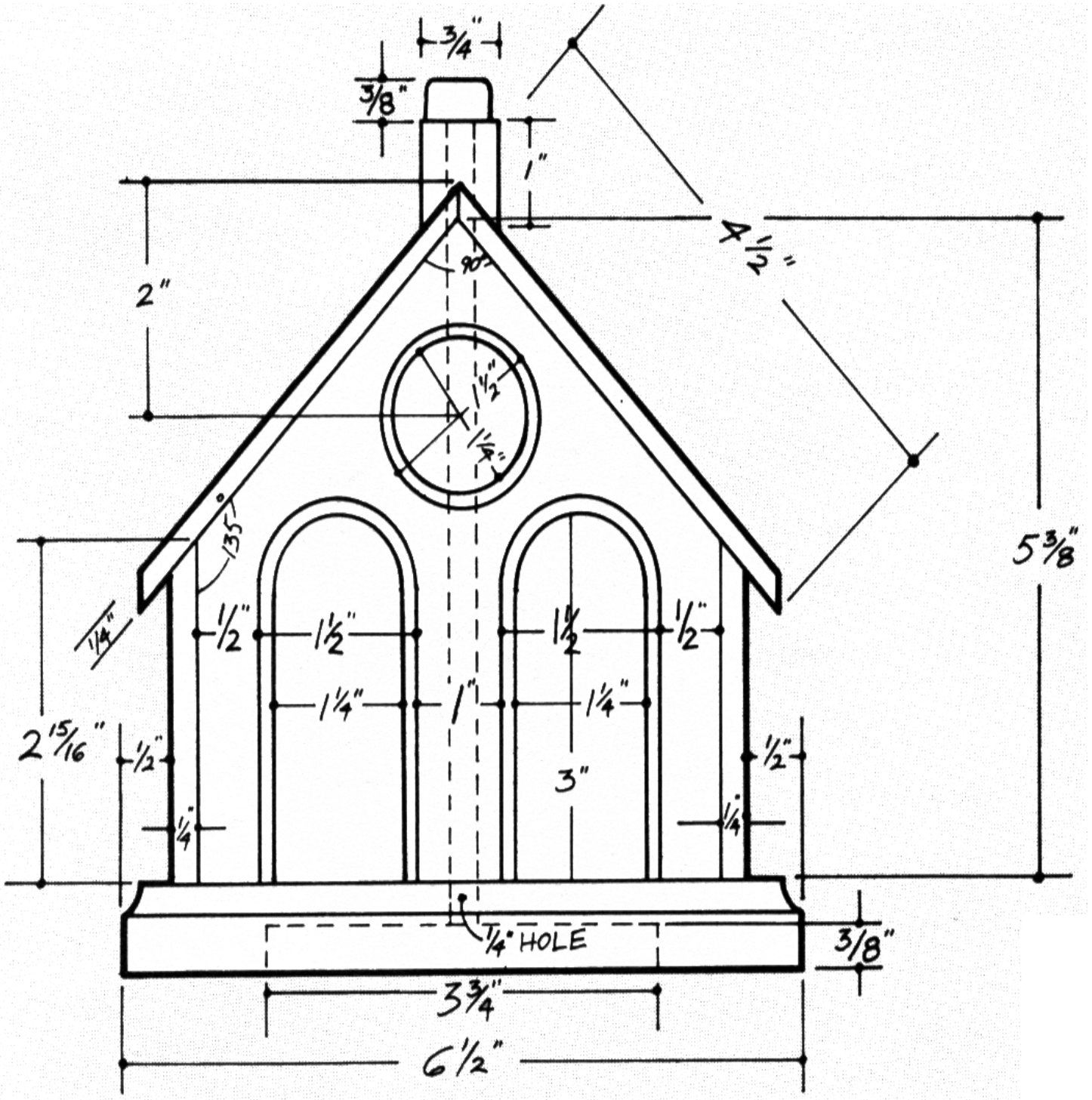
3/8"
3/8
1 1/8"
1/4" DIA.
3 1/4"
BACK
1/2"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3/8"
1"
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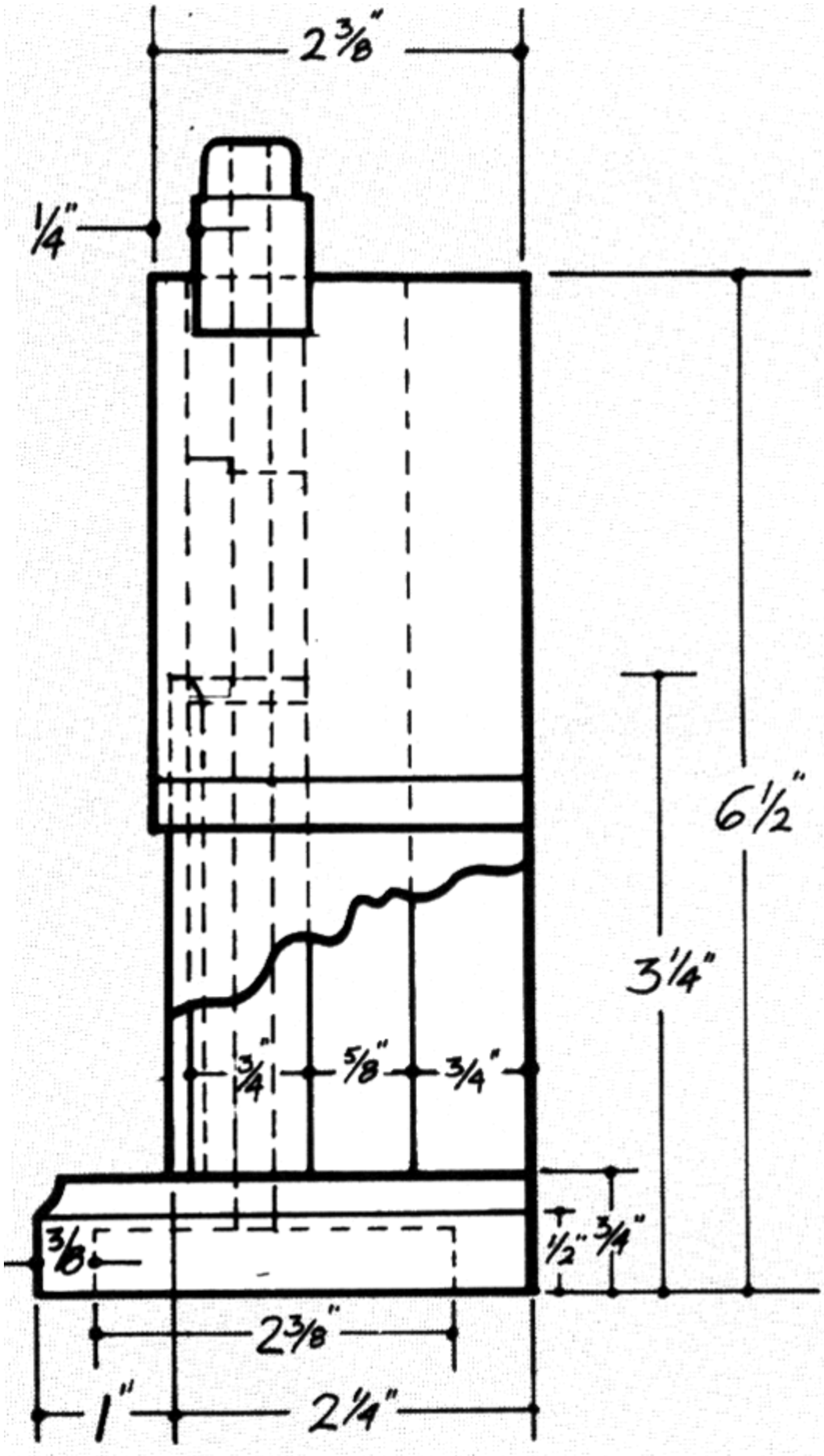
2"
90°
1 1/2"
1 1/2"
135°
1/4"
1/2"
1 1/2"
1 1/2"
1/2"
1 1/4"
1"
1 1/4"
2 15/16"
1/2"
3"
1/2"
1/4"
1/4"
5 3/8"
1/4" HOLE
3/8"
3 3/4"
6 1/2"


2 3/8"
1/4"
6 1/2"
3 1/4"
3/4"
5/8"
3/4"
3/8
1/2"
3/4"
2 3/8"
1"
2 1/4"

Weather Forecaster Step-by-Step Instructions

Step 1: Make the Front and Back

1. Select the stock from which you want to make the forecaster. Mahogany or walnut will work well for this project.
2. Cut the front (A) and the back (B) to the specified dimensions out of a 3/4" thick board.
3. Cut the two arched doors in the front with a coping saw, bandsaw, or jig saw.
4. Use a router with a cove bit that has a pilot to cut the cove around the doors.
5. Use a 1-1/2" spade or Forstner bit to drill a 1/4" hole to start the sun carving (K).
6. Switch to a 1-1/4" bit and finish drilling the hole through the front. **NOTE: This hole is necessary to attach part (J) to part (M) when the house is complete. Using the two drill diameters will form a lip around the hole that will hold the sun carving**.

Step 2: Make the Base

1. Cut out the base (C) according to the specified dimensions.
2. Use a power carving tool or a router to cut out the recess for the pivot arm (F) and the two semi-circular slots.
3. Use the router and cove bit to make the decorative cove around the front and both ends, but **DO NOT** cut a cove along the back.

Step 3: Make the Sides and Top

1. Resaw a piece of 3/4" thick wood to 1/4" to make the sides (D) and the top (E).
2. Cut a standard 45-degree miter on the ends of each roof piece (E) as shown.
3. Cut a 45-degree angle at the top of both sides (D) where they will join with part E).

Step 4: Assemble the House

1. Drill pilot holes where the front and back will be attached to the base with flat head screws. **NOTE: The wood is likely to split if you don’t drill pilot holes, especially on the front where there is only a small section of wood next to the door to screw into.**

2. Attach the front and back to the base with the flat head screws and glue.
3. Countersink the screw heads.
4. Glue and clamp the sides (D) in place so that they are flush with the back and overhand slightly on the front.
5. Allow the glue to dry overnight.
6. Trim the angle on the top of the sides to conform exactly to the angle of the front and back.
7. Glue the roof pieces in place.
8. Clamp the roof pieces with a web clamp, OR position small clamps or spring clamps in the door openings and in the hole for the sun carving.

Step 5: Drill the Inside Hole

1. Drill the 1/4" hole through the base and center divider of the front at the position indicated on the plan.
2. Stop the hole when you see the drill enter the hole for the sun carving.
3. Use the flat edge of a triangular file to flatten the peak of the roof where the 1/4" hole that runs underneath the chimney will go.
4. Drill the 1/4" hole through the peak of the roof to match up with the hole drilled through the base. **NOTE: It's all right if there is a slight amount of misalignment between the two holes because the gut string (J) is flexible and can compensate for some error.**

Step 6: Make the Chimney

1. Cut out the chimney (L) according to the specified dimensions.
2. Drill a 1/4" hole through the chimney center.
3. Fold a piece of fine sandpaper over the peak of the roof with the cutting side facing up so you can get the angle cut in the bottom of the chimney to fit the angle of the roof perfectly.
4. Hold the chimney in place on top of the sandpaper and slide it back and forth across the peak until the sandpaper is cutting evenly across both faces of the cutout in the chimney.

Step 7: Apply Finish to the House

At this point, you can apply a walnut colored Danish oil finish to the house and set it aside to work on the figures.

Step 8: Carve the Figures

1. Select two 1" x 1" x 8" blocks of lightweight wood such as pine or balsa from which to carve the two figures (H and I). **NOTE: The weather sensing gut string doesn't have too much turning power, so if the figures are too heavy they will make the forecaster less sensitive.**
2. Use the extra length of the wood as a handle to hold onto while you carve.
3. Use a jackknife or small carving chisels to carve the figures to completion.
4. Carve a 1/4" diameter pedestal below the feet of the figures that will fit into the slot in the base.
5. Use a fine tooth saw to cut the figures off from the handles.
6. Apply a clear finish to the figures.

Step 9: Drill the Holes for the Pivot Dowel (G)

1. Drill a blind hole in the center of the pivot arm (F) to in which to place the pivot dowel (G).
2. Check to see that the dowel fits loosely into the hole drilled for it in the base of the house; if it binds, sand it down to a smaller diameter.

Step 10: Prepare the Violin String (J)

1. The heart of this weather forecaster is a section of gut violin string (J).
2. Buy a real gut "D" violin string at a music store (one string will give you enough gut to build several forecasters).
3. Unwrap the steel wire and layer of thread that cover the string to expose the bare gut underneath.
4. Cut a section of the string, slightly longer than needed, with wire cutters.
5. Unwrap the steel and thread.
6. Moisten a clean piece of cotton with rubbing alcohol and use it to wipe off the string. This will remove any oils that are on the gut that would prevent it from responding to weather changes.
7. Drill a 1/16" hole about 1/2" deep in the top of the pivot dowel (G).
8. Apply a small amount of glue to the end of the gut string and insert it into the hole.
9. All the glue to dry overnight.

Step 11: Test the Gut

1. Hold the free end of the gut string and let the pivot dowel and pivot arm dangle freely below it.
2. Move the gut close to a flow of steam escaping from a teapot.

3. Watch to see what direction the pivot arm turns. The direction indicates stormy weather. If the arm didn't move, retry cleaning the gut again with alcohol. If it still won't react, get another piece of gut.
4. Mark the end of the pivot arm that indicates stormy weather for later reference.

Step 12: Add the Figure/Pivot Assembly

1. Run the violin string through the hole drilled for it in the house assembly.
2. Position the pivot dowel in its hole in the base.
3. Make sure the string is visible in the hole made for the sun carving.
4. Make certain that the ends of the figures will fit freely into the semi-circular slots in the base.
5. Glue the male figure to the side marked as the stormy side, and the female figure to the opposite end.
6. Rotate the arm to make sure that the figures don't bind anywhere along the slots.
7. Allow the glue to dry.

Step 13: Add the Figure/Pivot Assembly

1. Make the setting knob (M) from a small section of 5/8" dowel.
2. Drill a blind hole in one end to accept a 1/4" dowel.
3. Glue the setting knob dowel (N) into the hole.
4. Round the edges of the knob with sandpaper.
5. Stain the knob to match the rest of the house.
6. Drill a 1/16" hole 1/2" deep into the end of part (N).
7. Insert the setting knob assembly into the chimney.
8. Make sure that you can see the end of part (N) inside of the hole for the sun carving.
9. Adjust the string's length so it will suspend the pivot arm just below the surface of the base when it is fitted into part (N).
10. Apply a small amount of glue to the end of the gut string.
11. Use tweezers to do insert the string into the hole drilled in part (N).
12. Allow the glue to dry.

Step 14: Test the Setting Knob and Make the Sun Carving

1. Place the house upright.
2. Turn the setting knob back and forth to see that the figures move freely in their slots -- if not, make adjustments as needed before proceeding to the next step.

3. Layout out the pattern for the sun carving.
4. Carve the sun carving. **NOTE: If you make the carving carefully, you can get a snug enough fit so you won't need any glue; that way you can remove the carving if you ever need to replace the gut**.
5. Install the sun carving (K) to cover the access hole.
6. Finish the carving to match the rest of the house and press it into place.

Step 15: Cover the Bottom of the Base

Cut a piece of felt to cover the bottom of the base (O). The felt covers the pivot arm recess and also prevents the house from scratching any furniture it is placed on.

Step 16: Use the Forecaster

1. Place the forecaster near a window or door where it will be most likely to get some outside air.
2. Observe what the weather is like outside and set the forecaster by turning the setting knob.
    - If it is stormy, turn the knob until the man is part of the way out of the door.
    - If it is fair, turn the knob the other direction until the woman is part way out of her door.
3. Leave the forecaster set this way for several days and observe the changes.
4. Make further adjustments after you have observed over a period of weather change. If you set the forecaster during stormy weather, the woman should come out as the weather clears. If the man moves back some but not enough for the woman to come out, the initial setting was too far towards the stormy side. Turn the knob back a little so that the woman is slightly out of the door.

After a few such adjustments, you will have the forecaster set so that the first indication of a storm will cause the woman to go inside and the man to come out. You can judge the relative strength of a storm or the length of a fair spell by how far the figures move out of the door.

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