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Dave Campbell
Editorial Content Chief, *WOOD* magazine

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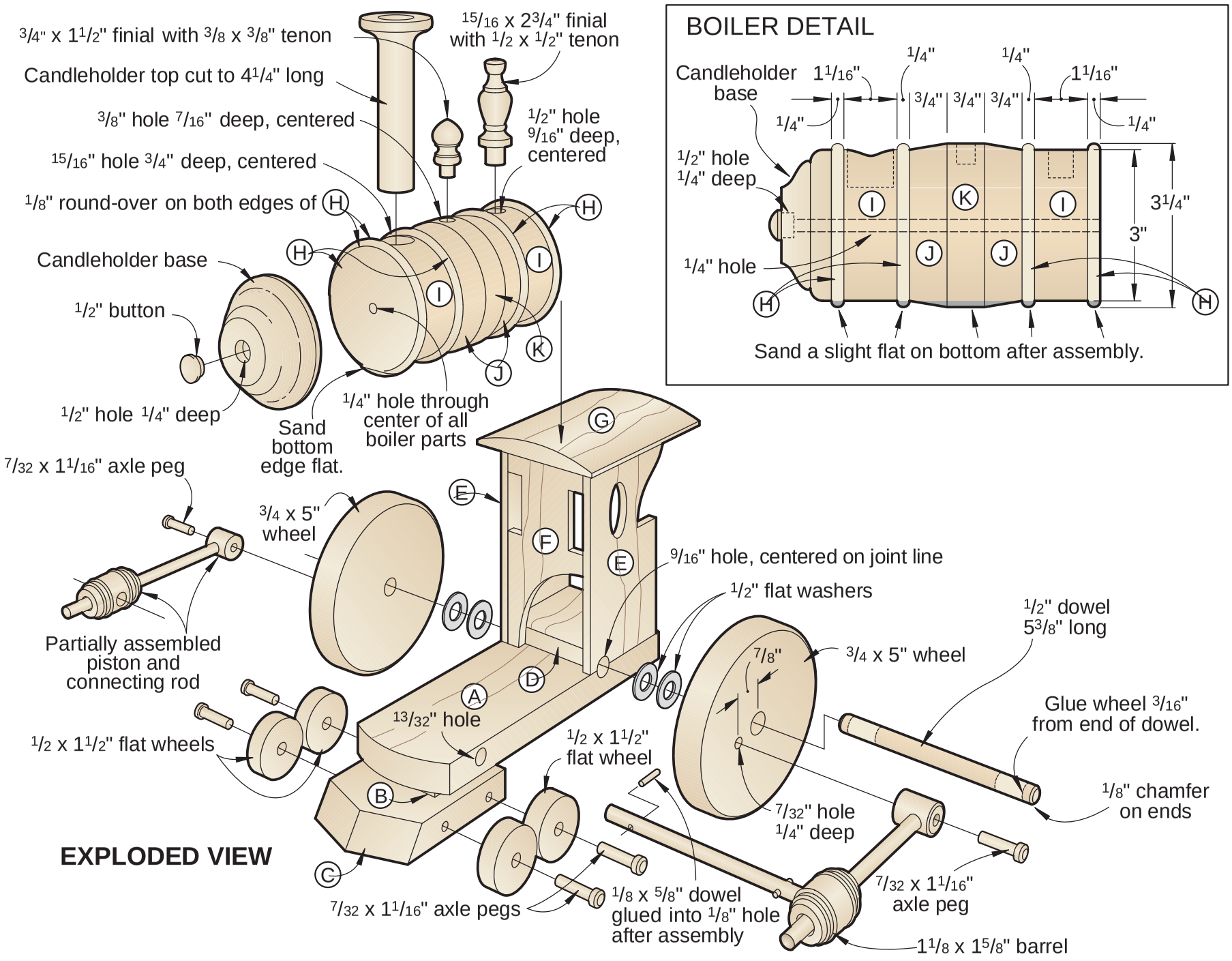
CHUBBY CHOO-CHOO

More than 25 years ago, WOOD® magazine reader Wayne Edwards of Ridgeland, South Carolina, built the original version of this stout little locomotive for his two-year-old son. Today, Wayne's grandchildren are putting the same toy through the rigors of child's play. If it can stand up to 25 years of use in the Edwards household, we'll bet it will last you for a few decades, too.

DP-00127



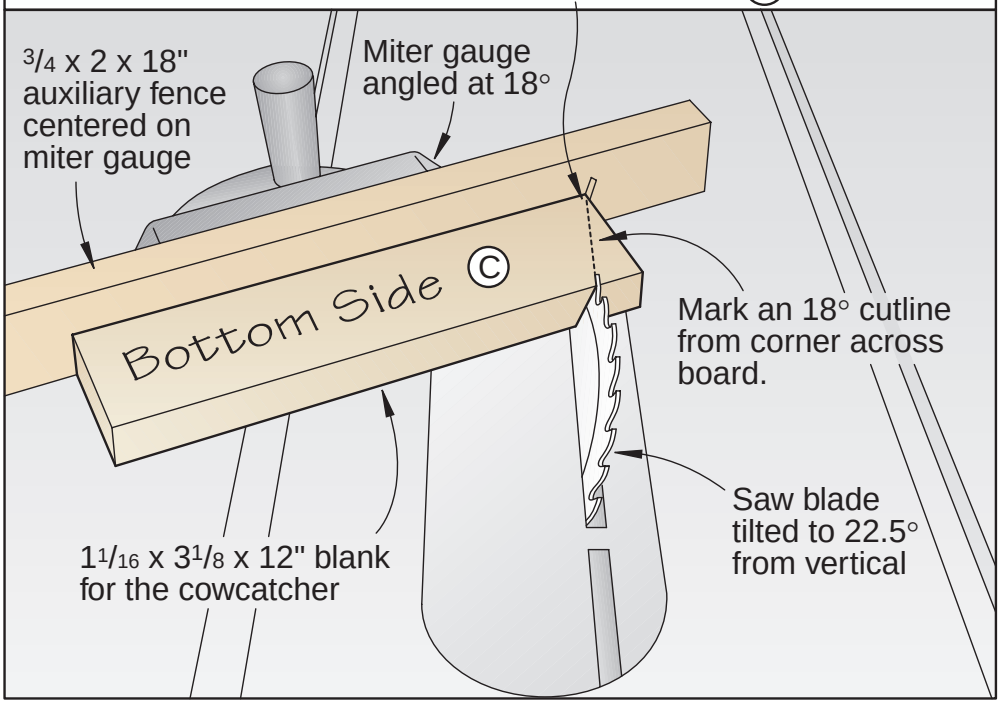
EXPLODED VIEW

BOILER DETAIL

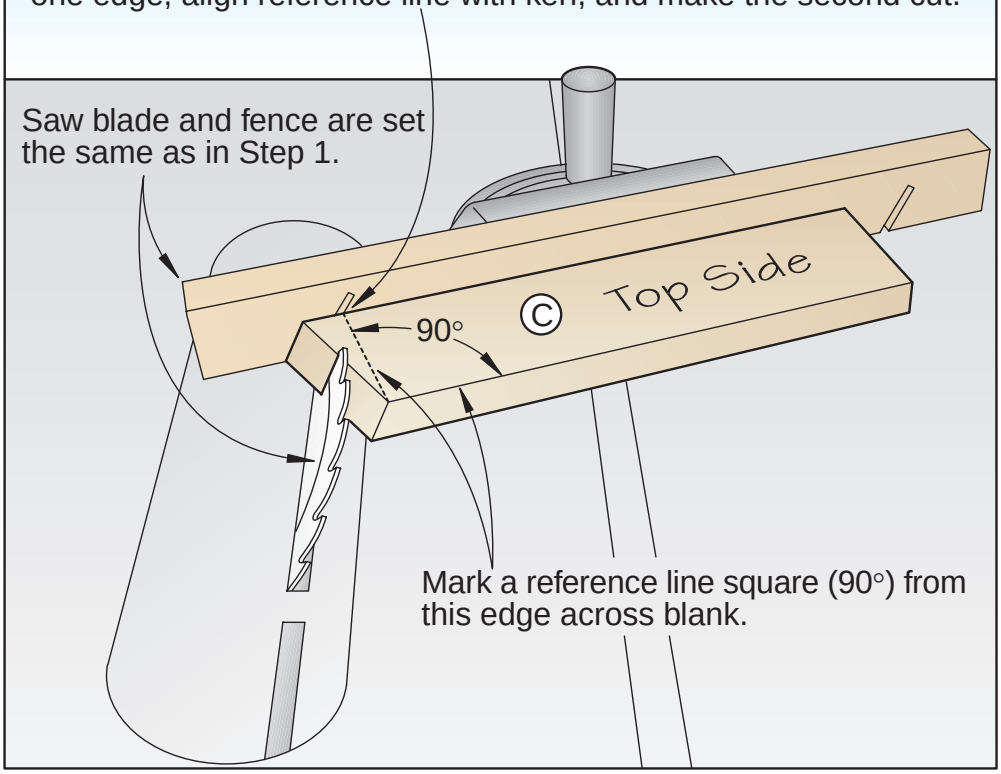
CUTTING THE COWCATCHER

STEP 1 Angle miter gauge and saw blade, and then cut through the auxiliary fence.

STEP 2 Mark a cutline on the bottom side of Ⓒ. Align marked cutline with kerf cut in fence, and make the first cut across Ⓒ.



STEP 3 Switch miter gauge to the slot on the left-hand side of the blade, and cut through the fence. Mark a reference line square to one edge, align reference line with kerf, and make the second cut.



Bill of Materials

Part	Finished Size T	W	L	Matl.	Qty.
CHASSIS ASSEMBLY					
A chassis	¾"	3⅛"	9½"	W	1
B spacer	¼"	2"	2"	W	1
C* cow-catcher	1 1/16"	3⅛"	4⅛"	W	1
CAB					
D floor	½"	2⅝"	2¾"	W	1
E sides	¼"	3¼"	5¾"	W	2
F front	⅜"	2⅝"	5¾"	W	1
G roof	½"	4"	5"	M	1

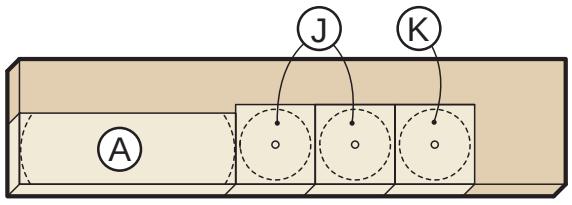
Part	Finished Size T	W	L	Matl.	Qty.
BOILER					
H* bands	¼"	3¼" dia.		M	4
I* discs	1 1/16"	3" dia.		W	2
J* discs	¾"	3¼" dia.		W	2
K* disc	¾"	3¼" dia.		W	1

*Initially cut parts marked with an * oversized. Trim to finished size according to the instructions.

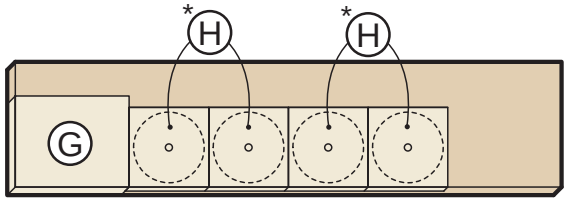
Materials Key: W–walnut, M–maple

Supplies: ⅛", ⅜", ½", and ¾" dowel stock, 4–½" flat washers, clear finish.

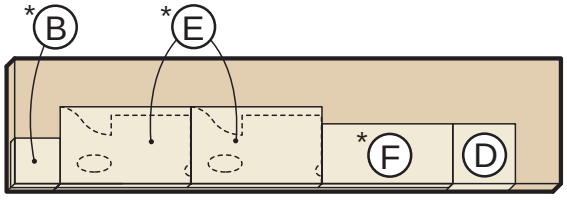
CUTTING DIAGRAM



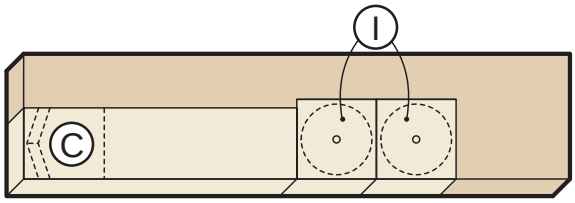
3/4 x 5 1/2 x 24" Walnut



1/2 x 5 1/2 x 24" Maple



1/2 x 5 1/2 x 24" Walnut



1 1/16 x 5 1/2 x 24" Walnut

Let's get things rolling with the walnut chassis assembly

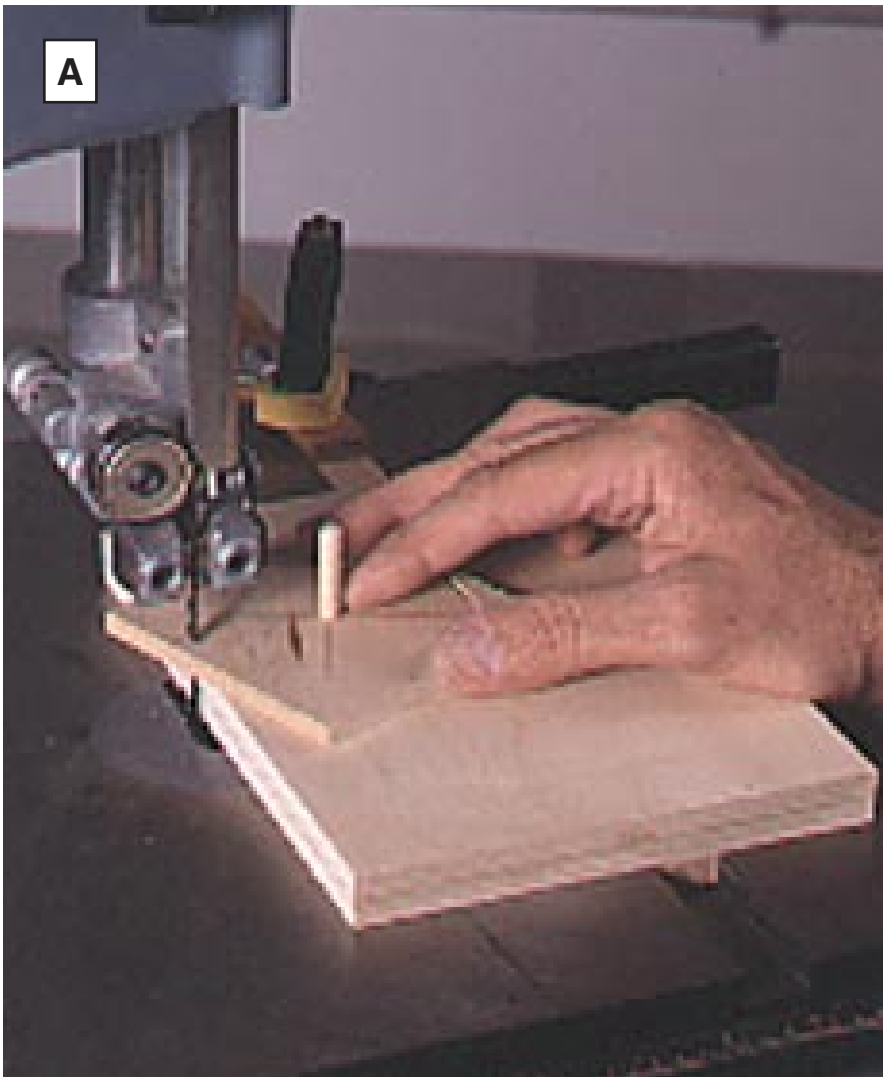
1 From ¾" walnut, cut the chassis (A) to the size listed in the Bill of Materials. Mark a 3" radius on each end of the chassis, where shown on the chassis (A) pattern on *page 10*. Bandsaw the ends of the chassis to shape. Then, sand the ends smooth to remove the saw marks.

2 Cut the spacer (B) to size from ¼" stock. (We resawed this piece from ½" material.), and glue it to the bottom of the chassis where shown on the full-size chassis pattern on *page 10*.

3 Cut the cowcatcher (C) to size, but to 12" in length. The extra length is necessary when cutting the beveled front end to shape.

4 Cut the front end of the 1⅛"-thick cowcatcher (C) to shape as illustrated on the Cutting the Cowcatcher drawing on *page 3*. Also, see the full-size cowcatcher pattern on *page 11*.

5 Crosscut the cowcatcher to final length (4⅛"), and glue it to the bottom of the spacer (B), where shown on the full-size cowcatcher pattern. Keep the back end of the cowcatcher flush with the back end of the spacer.



With the square boiler-band blank mounted on the dowel in the jig, slide the jig until it hits the stop, and bandsaw the disc to shape.

Add a cab to house the conductor

1 Cut the cab floor (D) to size. Glue and clamp it to the top of the chassis (A), where located on the full-size chassis pattern.

2 Cut the cab sides (E) to size from ¼" stock. Use double-faced tape to adhere the pieces face-to-face, with the edges and ends flush. Transfer the full-size side pattern from the pattern on *page 12* to the taped-together pieces. Drill a ¼" blade start hole, and cut the window to shape. Then, cut and sand the back edge of the cab sides to shape. Separate the pieces and remove the tape.

3 Cut the cab front (F) to shape. Lay out the notch locations along the edges, and cut them to shape.

4 Glue and clamp the cab sides (E) and front (F) to the floor (D).

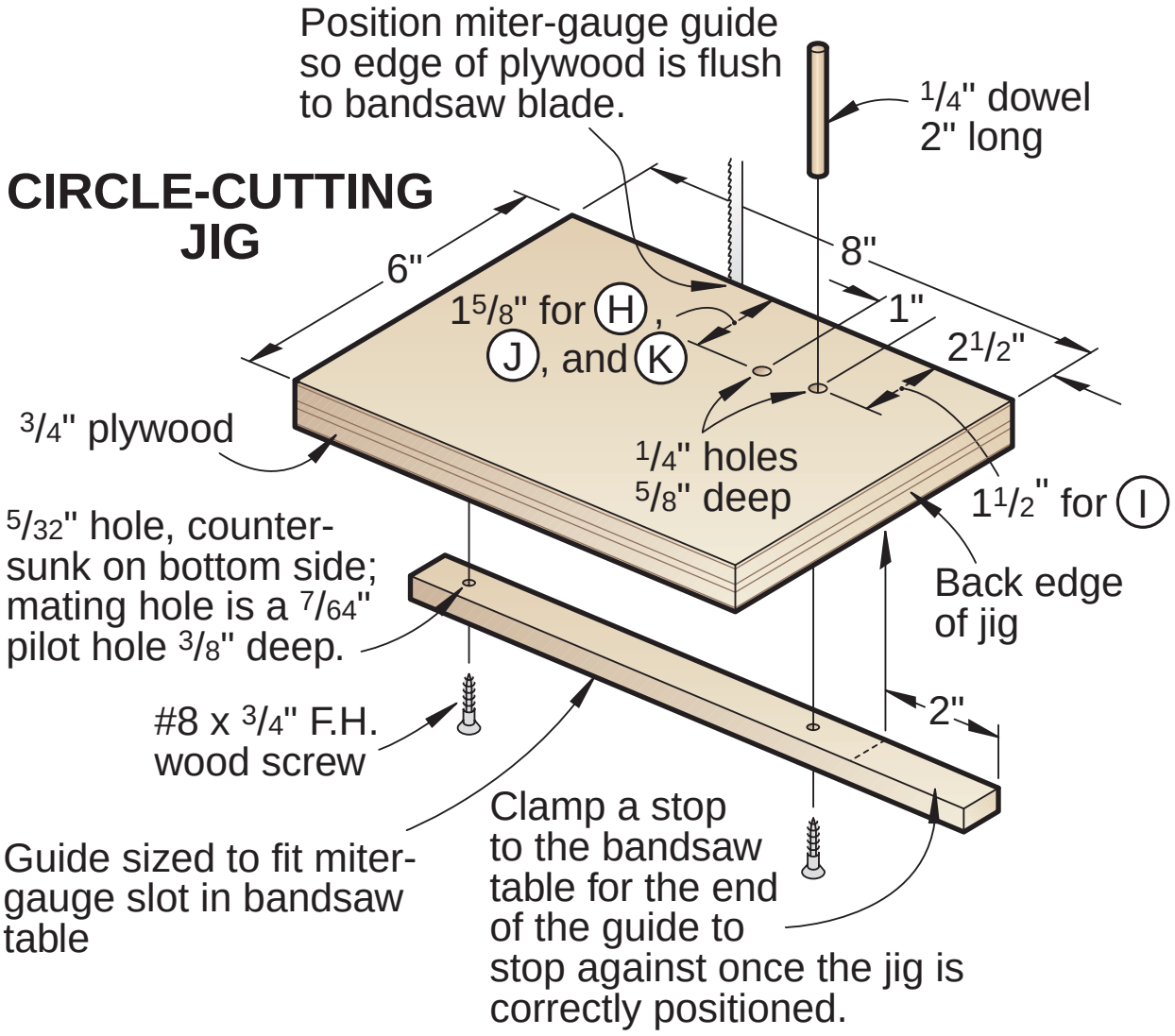
5 Carefully lay out the hole centerpoints on the chassis sides (A, C) where dimensioned on the Chassis/Cab drawing on *page 7* page and on the full-size pattern. Drill the holes where marked. (For support and consistent placement, we used a fence on our drill-press table when drilling the holes. A vernier caliper came in handy when checking the depth of the 7⁄32" holes in C.)

6 Cut the cab roof (G) to size. Sand the top to the shape shown on the pattern, being careful to keep a ⅛" flat area along the edges. (We used double-faced tape to adhere the roof to a 2x4 to act as a handle when sanding.)

7 Center the cab roof side-to-side on the cab assembly, with a ½" overhang over the front edge. Glue and clamp (or tape) the cab roof in place until the glue dries.

A boiler gives this engine power to spare

1 To form the boiler bands (H) and discs (I, J, K), you can cut the discs freehand or build a circle-cutting bandsaw jig like the one shown on the Circle-Cutting Jig drawing. Cut four pieces of ¼"-



thick maple to 3½" square for the boiler bands (H). Draw diagonals to find center. Drill a ¼" hole at the marked center of each piece.

2 To use our handy jig to cut the discs to near-perfect shape, position the jig on your bandsaw table so the center of the hole being used in the jig is directly across from the center of the blade. (We recommend a ¼" bandsaw blade.) Without moving the jig, clamp a stop in the miter-gauge groove directly behind the jig. Mount one of the square boiler-band blanks on the ¼" dowel in the jig. Start the saw, and push the jig until it comes in contact with the stop. When doing this, you'll have cut into the square blank. Now, rotate the blank to finish cutting the disc as shown in *Photo A*. Turn the saw off, and remove the disc from the jig. Repeat to form the other three boiler bands.

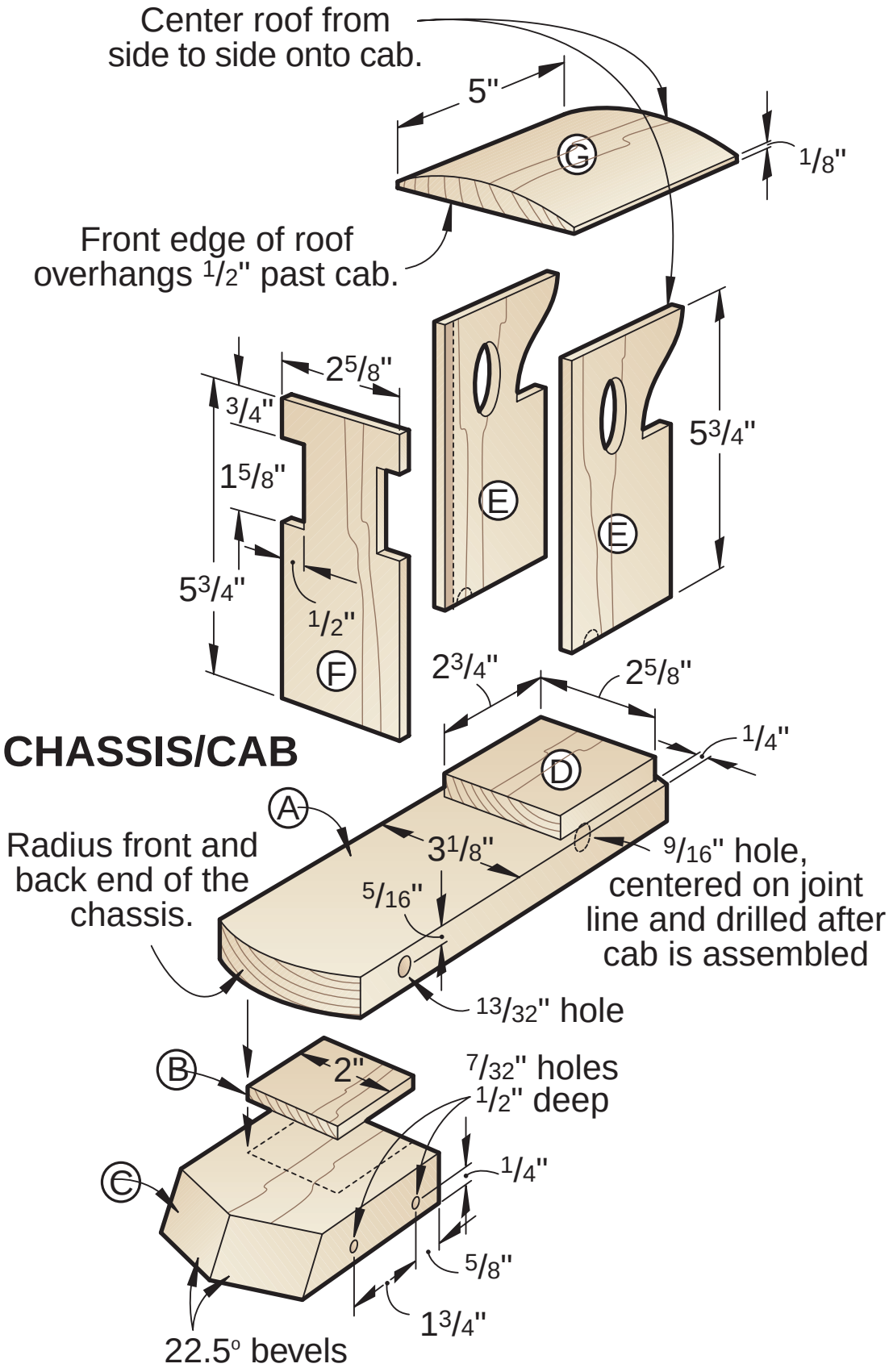
3 Using ¾" stock and the jig's 3¼"-diameter setting, bandsaw the boiler discs (J, K) to shape. Then, move the ¼" dowel to the other hole in the jig, and cut the I parts to 3" in diameter. Note that the I parts are cut from 1⅛" material.

4 Fit your table-mounted router with a ⅛" round-over bit and a V-notched fence, and rout the edges of the boiler bands (H).

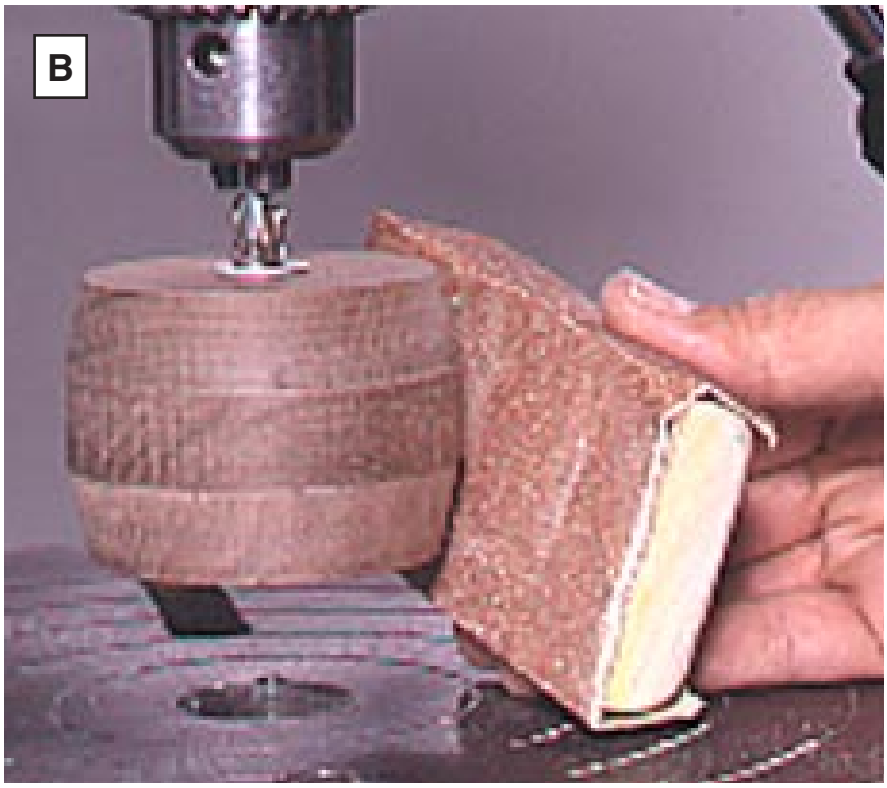
5 Using a ¼" carriage bolt 4" long with a washer and wing nut, glue and clamp the three inner discs (J, K) together. The carriage bolt allows you to clamp and align the three pieces at the same time. Later, remove the bolt, and use a disc sander, with the table tilted to 12° from horizontal, to sand the edges of each J.

6 To finish-sand the edges of the center section (J, K), remount it to the carriage bolt, and chuck the threaded end of the carriage bolt into your drill-press chuck. Start the drill, and sand the edges smooth, as shown in *Photo B*. Repeat the process on your drill press to sand the edges of the front and rear discs (I) smooth.

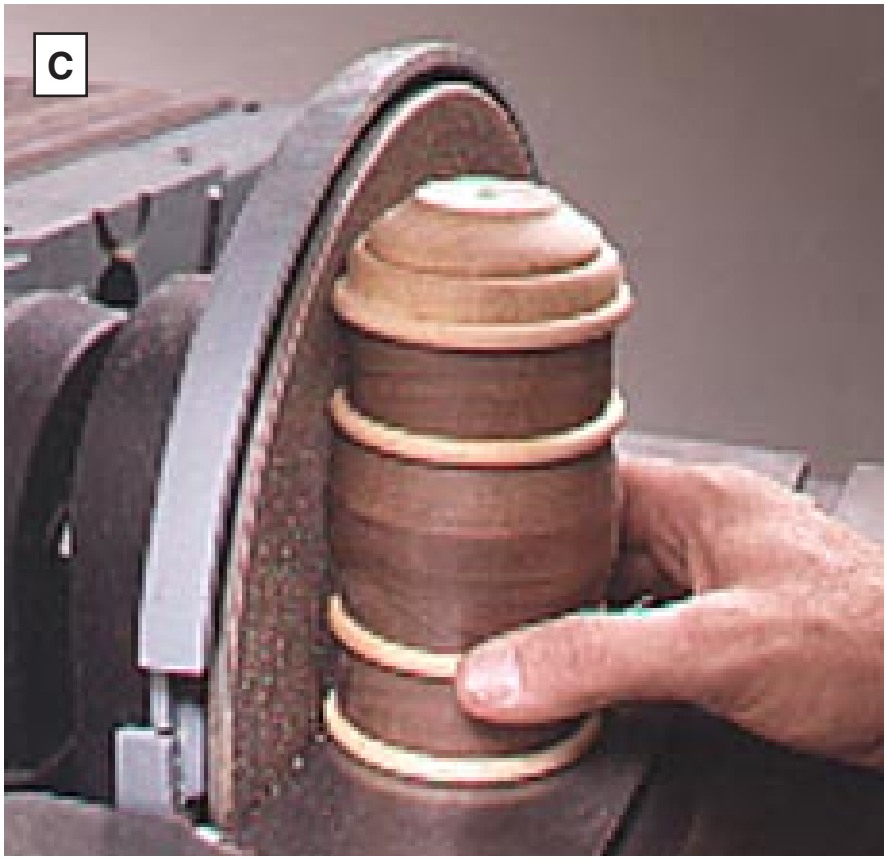
7 Drill a ½" hole ¼" deep centered in the front end of the candle-holder base piece used to form the front of the boiler. See the


Center roof from
side to side onto cab.
5"
G
1/8"
Front edge of roof
overhangs 1/2" past cab.
2 5/8"
3/4"
1 5/8"
5 3/4"
1/2"
F
E
E
5 3/4"
2 3/4"
2 5/8"
1/4"
D
A
3 1/8"
5/16"
9/16" hole,
centered on joint
line and drilled after
cab is assembled
13/32" hole
Radius front and
back end of the
chassis.
B
2"
7/32" holes
1/2" deep
C
1/4"
5/8"
1 3/4"
22.5° bevels

CHASSIS/CAB



Chuck the threaded end of the carriage bolt into your drill press, and sand the center boiler section smooth.



Use a disc sander to sand a flat area on the bottom of the boiler for mounting the boiler to the chassis later.

Boiler detail for reference. Then, drill a ¼" hole through the center of the ½" hole.

8 Using a 12"-long piece of ¼" all-thread rod, glue and clamp the remaining boiler pieces H, I, and the candleholder base to the center boiler section (J, K). Immediately remove any excess glue with a damp cloth.

Finish forming the boiler and add it to the chassis

1 Flatten the boiler bottom by holding it against a disc sander and sanding a slight flat area as shown in *Photo C*. See also the Boiler detail accompanying the Exploded View drawing.

2 Drill the three holes for the candleholder top and finials centered in boiler parts I and K, where shown on the Boiler detail.

3 Clamp the candleholder top in your woodworker's vise or in a handscrew clamp. Then, use a handsaw to crosscut the bottom flanged end off the candleholder. Glue the finials and candleholder (smokestack) into the boiler.

Add the piston/connecting rod assembly

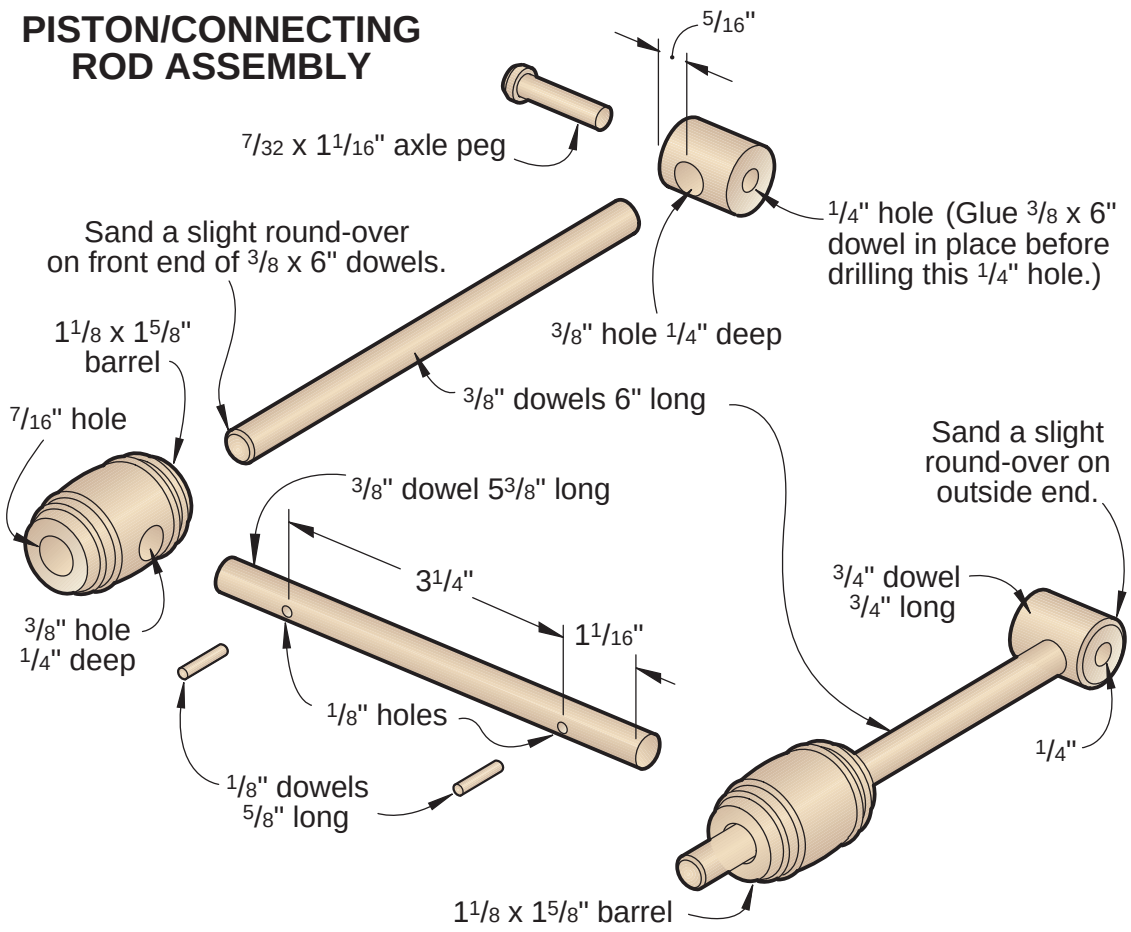
1 Cut the ⅛", ⅜", and ¾" dowels to the lengths noted on the Piston/Connecting Rod Assembly drawing on *page 9*.

2 Sand a slight round-over on one end of the ¾×¾" dowels and one end of the ⅜×6" dowels.

3 Using the same drawing for reference, drill a ⅜" hole ¼" deep into the ¾×¾" dowels. Now, glue the ⅜×6" dowels into the ⅜" holes in the ¾×¾" dowels. Later, using the 6"-long dowels as handles to steady the small dowels, drill a ¼" hole centered through the end of each ¾×¾" dowel.

4 Drill a pair of ⅛" holes through the ⅜×5⅜" dowel, where shown on the drawing. (To support the ⅜×5⅜" dowel when drilling the ⅛" holes, we used a V-block jig.)

5 Drill a ⅜" hole ¼" deep into the edge of each toy barrel. Then, drill



a 7⁄16" hole centered through the end of each toy barrel.

6 Drill a 7⁄32" hole ¼" deep in the outside face of each rear wheel where shown on the Exploded View drawing.

7 Sand all the parts. Glue and clamp the boiler to the chassis/cab assembly. Add the finish to the chassis/cab, wheels, dowels, and toy barrels now. To enhance the beauty of the walnut, we used an oil finish.

8 Glue the 7⁄32×1 1⁄16" axle pegs in place to secure the four 1½"-diameter front wheels to the chassis.

9 Glue one 5"-diameter rear wheel to the ½" dowel, leaving 3⁄16" of the dowel protruding from the outside surface of the wheel. Slide the dowel through a pair of flat washers and through the 9⁄16" hole in the chassis and another pair of washers. Then, glue the other rear wheel to the dowel, *keeping the 7⁄32" holes in the wheels directly across from each other*. Aligning these holes keeps the connecting rods (⅜×6" dowels) from binding in the toy barrels.

10 Glue one toy barrel and one ⅛" dowel onto one end of the front ⅜×5⅜" dowel. Slide this dowel through the 1 3⁄32" hole in the front of the chassis. Then, glue the opposite ⅛" dowel and barrel in place, keeping the barrels aligned with each other.

11 Push the connecting rods (⅜×6" dowels) through the holes in the toy barrels, and pin the opposite end to the rear wheels with the axle pegs. If you've built this for a child, consider adding a screw eye with cord attached to the top edge of the cowcatcher for pulling the locomotive.

Buying Guide

Hardwood kits. All the toy parts (candleholder base, candleholder, finials, 2 barrels, 4–½×1½" front wheels, 2–¾×5" rear wheels, and 6 axle pegs). Kit no. W951. The second kit includes all the toy parts plus all the individual pieces shown on the Cutting Diagram cut oversized from the thickness and species listed in the Bill of Materials. Kit no. W952. Heritage Building Specialties, 205 North Cascade, Fergus Falls, MN 56537. Call 800/524-4184 for current price or to order.

Produced by Marlen Kemmet
Project Design: Wayne Edwards
Illustrations: Kim Downing; Lorna Johnson
Graphic Design: Jamie Downing
Photographs: Bill Hopkins

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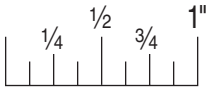

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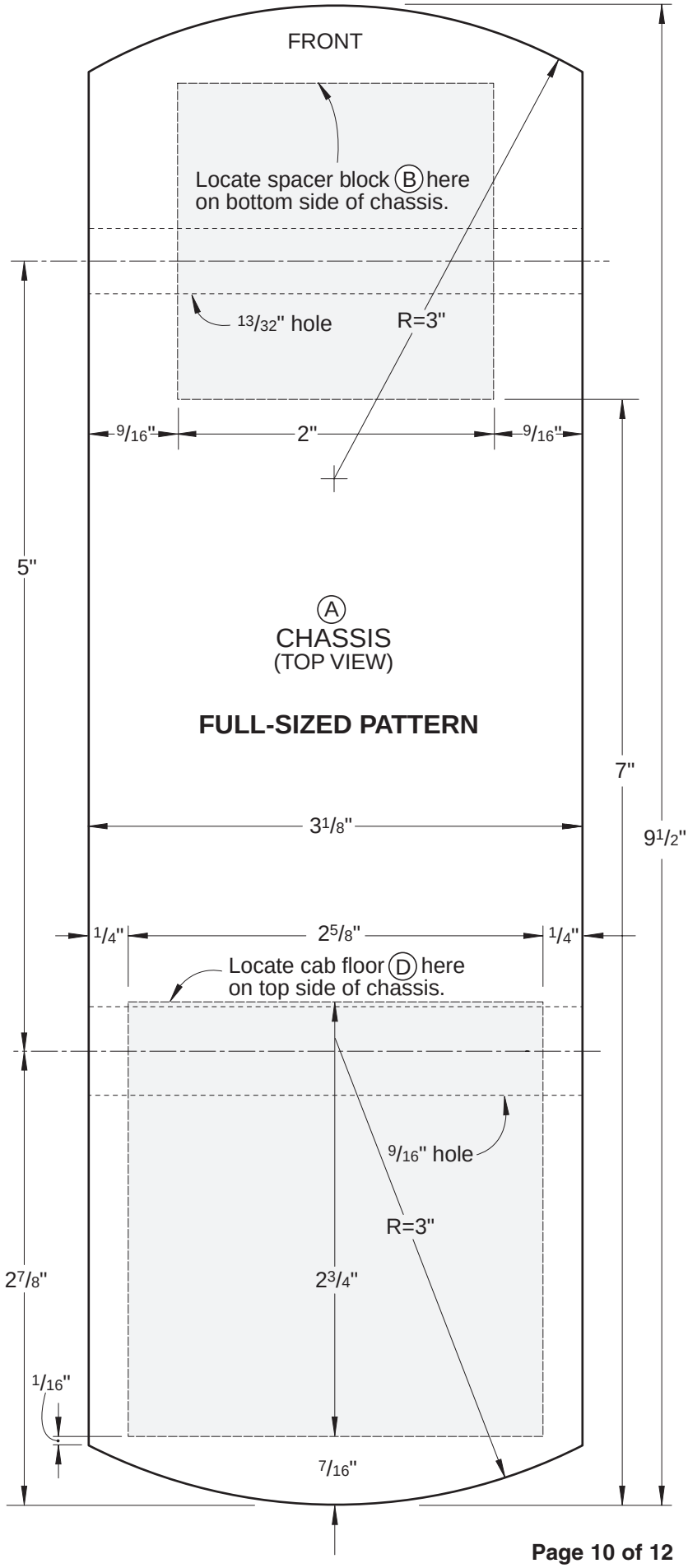
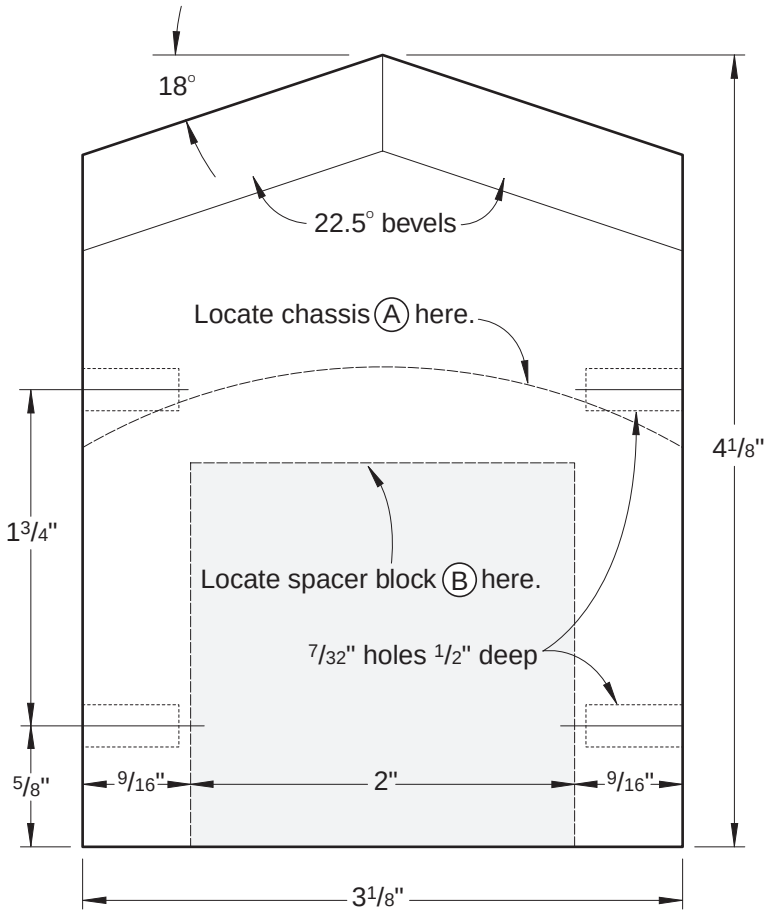
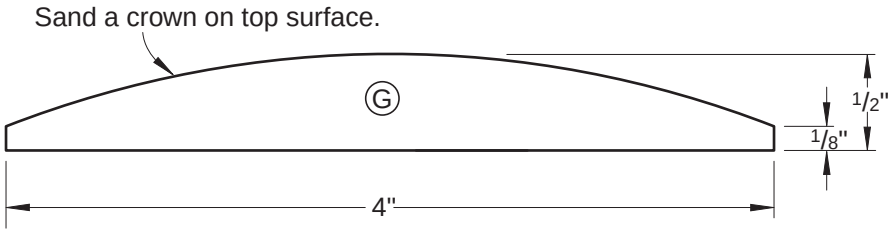




Ⓒ
COW CATCHER
(TOP VIEW)

FULL-SIZED PATTERNS



ROOF
(END VIEW)

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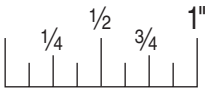

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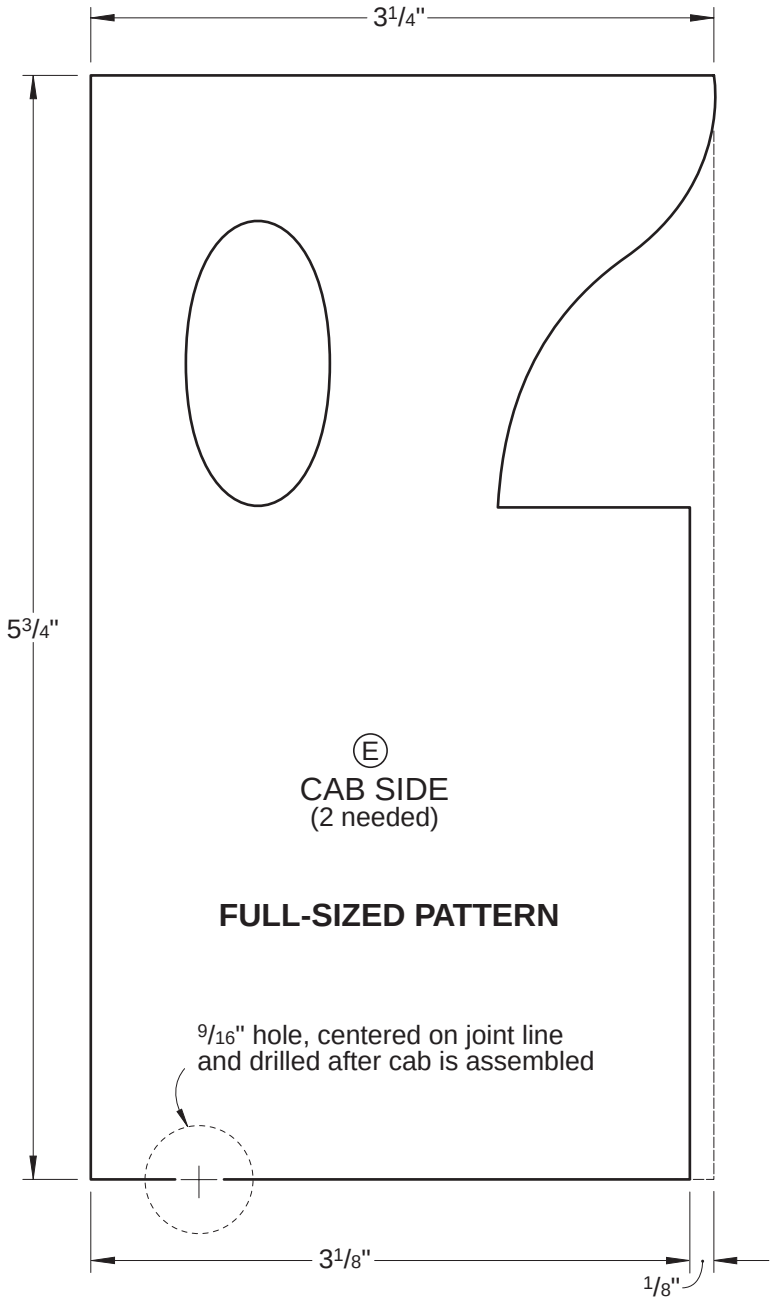

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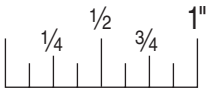

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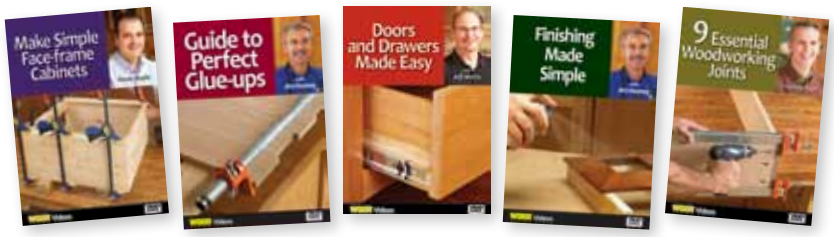

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