

The Covered Wagon Toy Box



Its canvas-like top “corrals” a bunch of toys out of sight while its large diameter wooden wheels make it easy to move from room-to-room.

Here’s a replica of an early settler’s covered wagon that any child would enjoy having to store away their favorite toys and “private” possessions. It’s sturdy enough for the heaviest loads of toy cargo and with the top removed, it can serve double-duty as a pull-along wagon. It makes a great heirloom-quality Christmas gift, as well...so get started early and it’ll be done in plenty of time for the Holidays. For best results, we suggest that you review **all** of the instructions before getting started. We made ours with solid red oak sides, wheels and handle and an oak veneer plywood bottom for the perfect combination of beauty and durability.

1: Cut all of the lumber for the Sides, Ends, Bottoms and Cleats to size. If you’re starting out with rough lumber, be sure to plane all of your wood for these pieces to the same thickness at once. The slightest variance in thickness will make it difficult to square the project properly. When making your sizing cuts, be sure to cut the pieces to length first, then rip them to width.

2: Slightly round over the edges of the Sides and Ends. We used a *Radi-Plane* to make simple work of this job. Round-over the 5-3/4” and 2” wide stock to eliminate all sharp edges. When using this tool, first make a test pass on a piece of scrap wood to set the cutters to your desired depth.

3: Temporarily hold the Sides and Ends together using bar clamps. Position a clamp at each end of your stock, open-side up...with your stock face side down...and a third clamp across the center. This will help to keep the surfaces flush and make it easier for you to mount the 2” wide vertical Braces on the ends of the Sides. Hold an end Brace (D) in position temporarily to ensure the proper alignment of the two end Braces (B) during assembly as shown in Figure 1. Drill 7/64” screw pilot holes and use a countersink to allow the screw heads to sit flush with all board surfaces. Use six 1-1/4” x #8 wood screws and glue to hold each end Brace in position.

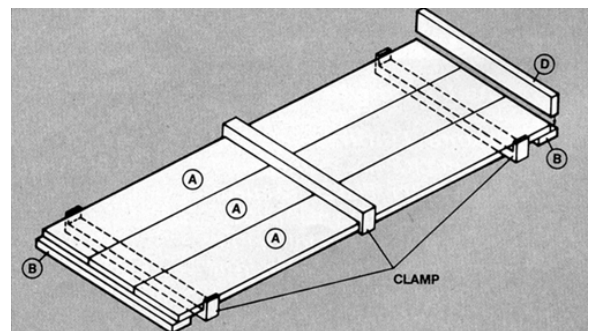


Figure 1

4: Following a similar procedure to that described in #3 above, mount the two center Braces, 14-1/8” in from each of the attached end Braces (See exploded diagram). Again, use six 1-1/4” x #8 wood screws and glue to hold each center Brace in position. Don’t forget to drill pilot holes first and countersink your screw heads.

5: Mount the Cleats (F & G) to the Bottom (E) using glue and wood screws driven down from the top surface of the bottom into the cleat strips. Be sure to countersink for the screw heads to keep the screw heads from scratching your children’s treasured toys. Cleats should be mounted flush with the outside edges of the Bottom (see exploded diagram).

6: Use bar clamps to temporarily hold the assembled Box Sides (A) and Ends (C) in position while you screw the four corners together as shown in the exploded diagram. You can either countersink your screw heads as in the previous steps...or counterbore them and conceal the screw heads with matching wood plugs.

If you choose the latter, you'll need to drill 5/16" deep by 3/8" diameter counterbores at each screw position first, then drill your 7/64" pilot holes in the centers of these counterbores. Use a 3/8" Plug Cutter to create your plugs from a piece of scrap stock that matches your wagon wood. Remember that if your plugs are to go into the face grain of a board, they should have face grain at their tops. Likewise, if they are to go into end or edge grain wood, they should be cut accordingly for the best match.

7: Turn the assembled Box over with its top side sitting on your bench. Drop the Bottom (with attached cleats) into the Box with the cleats up, toward you. Use small C-Clamps or Handscrews to temporarily hold the bottom in position while you drill your 7/32" screw pilot holes through the Cleats and into the Box Sides and Ends as shown in the exploded diagram. Be sure to drill at a slight angle so you can easily get a grip on your screwdriver during assembly. Again, countersink all holes for the screw heads, then assemble.

8: Size your stock for the Bottom Wheel Supports (H), Front Wheel Pivot (I) and Axle Supports (J).

9: Drill a 1/4" deep by 3/4" diameter counterbore into the top center of the Front Wheel Support (H). Using the centerpoint of this counterbore as a guide, drill a 1/2" diameter through hole in this same board...and another 1/2" diameter through hole in the center of the Front Wheel Pivot as shown in the exploded diagram.

10: Draw an arc on each end of the Pivot Board, then cut on your Bandsaw and sand smooth on the Disc Sander.

11: Make the Axle Supports (J) from 1-1/2" thick stock...or from two pieces of 3/4" stock, laminated together. If you choose the later option, it would be a good idea to add some wood screws to help hold these laminations together.

NOTE: Be sure to position these laminating screws so they won't interfere with the locations of the axle or the screws that mount the Supports to the Front Wheel Pivot or Rear Wheel Support.

Remember to make the two front Supports (J) 7/8" shorter than the back ones (K) to compensate for the thickness of the Front Wheel Pivot and pivot washer. When cutting these Supports, attach each pair (front & back) together temporarily with Double Stick Tape so the profiles and hole locations will match-up perfectly.

Mount the Front Axle Supports to the Front Wheel Pivot...and the Back Axle Supports to the rear Bottom Wheel Support with three wood screws and glue. Be sure to countersink the screw heads a little deeper than normal so the screw heads on the Front assembly won't rub on the front Bottom Wheel Support when the wagon is steered.

12: Cut out the Pull Handle Stem (S) and Pivot Block Stem (R) as described in the List of Materials. As with the Axle Supports, these can be made with 1-1/2" thick stock or with two pieces of 3/4" stock laminated together. In fact, we recommend that you use this lamination procedure when making the Pivot Block Stem (R)...alternating the grain directions of the two layers for added strength.

Cut out the front joint and rear pivot bolt cutout on the Pivot Block Stem (R) using your Bandsaw. Be sure to leave enough clearance to get a socket wrench around the Pivot Bolt Nut.

Insert and glue the cross dowel (T) to the Handle. Insert the Joint Dowel (Q) through the Pivot Block Stem and Handle and glue **just the ends**...being careful not to get any glue on the dowel where it passes through the Handle.

13: Cut and assemble the parts for the Canopy Frame (O & P). Cut the Canopy Lattice Slats (N) and place them in a shower with hot running water for about 15 minutes to soften them up. Attach the Strips to the assembled Frame with screws (**NO GLUE**) as shown in the exploded view and allow to dry thoroughly for 24 to 48 hours.

14: Make the wheels. Begin by laminating and gluing four pieces of stock together for each wheel as shown in Figure 2. It's best to use pieces of stock that are no wider than 6" and position your pieces with their grain running in alternating directions. **NOTE:** The wheels need to be made from laminated stock to provide thickness and strength, as well as to prevent warpage.

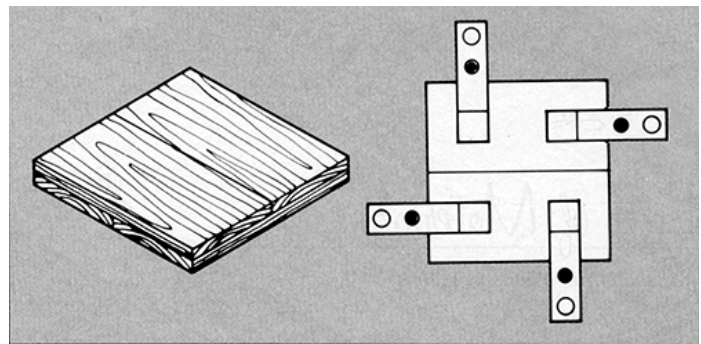


Figure 2

Once your glued-up wheel stock has dried thoroughly, use your Bandsaw with a Circle-Cutting Jig to cut out the 11-1/4" diameter wheels. Use a similar setup to disc sand the wheel edges.

Drill a 3/8" diameter center hole through each wheel for the axles. When drilling, remember that it's best not to drill all the way through in a single pass. Rather, drill through from one side until the tip of your brad point bit just begins to penetrate the opposite side. Then turn the wheel over and finish your holes from the opposite side to eliminate any possible tear-out.

Once the wheels are cut, use an old bicycle innertube or a Shopsmith Bandsaw Tire to cover the wheel edges.

15: Apply the stain of your choice plus a protective cover coat to all wagon parts and allow to dry thoroughly before assembly.

16: Assemble the front end as shown in the exploded drawing. Use a large diameter Fender Washer with a 1/2" through-hole between the Front Wheel Pivot (I) and Front Wheel Support to minimize friction and make the Wagon easy to steer. We recommend the use of a Nylock locking nut for the pivot bolt

17: Attach the completed front end and rear wheel assemblies to the box bottom with wood screws as shown in the exploded drawing.

18: Mount the Axles and Wheels to the Wheel Assemblies. Again, we recommend the use of Nylock Axle nuts...or castle nuts with cotter pins to prevent the nuts from loosening during play.

19: Make the Canopy out of canvas or an old bed sheet soaked in brewed coffee for a half an hour or so. Sew slip-through Lattice Slat pockets on each end...remove the Lattice Slats and install the Canopy.

FOUR PROJECT TIPS:

1. Dip all wood screws in paste wax or soap prior to assembly. This will allow the screws to go in much easier without danger of screw breakage.
2. Use Phillips head screws instead of straight slot screws. They'll drive easier with a power screwdriver and won't strip out as easily.
3. Prior to staining, apply a thinned coating of polyurethane or varnish to all end grains and allow to dry thoroughly prior to applying the stain of your choice. This will help the stained end grain color to match your face grain color more closely.
4. Before driving tight-fitting dowels into position, place them in a 400-degree oven for about 7 to 10 minutes. This will remove any moisture from the dowels and cause them to shrink slightly. Once you've removed them from the oven, glue them into position fairly quickly or they will swell back up.

List of Materials

(finished dimensions in inches)

Sides

A 3/4 x 5-3/4 x 45 (6)

B 3/4 x 2 x 17-1/4 (8)

Ends

C 3/4 x 5-3/4 x 21 (6)

D 3/4 x 2 x 17-1/4 (4)

Bottom

E 3/4 x 21 x 43-1/2 (oak plywood) (1)

F 3/4 x 1 x 19-1/4 (cleats) (2)

G 3/4 x 1 x 43-1/4 (cleats) (2)

Bottom Wheel Supports

H 3/4 x 4 x 19-5/16 (2)

Front Wheel Pivot

I 3/4 x 4 x 19-1/8 (1)

Axle Supports

J 1-1/2 x 4 x 7-7/8 (front) (2)

K 1-1/2 x 4 x 8-3/4 (rear) (2)

Dowel Plugs

L 3/8 dia. x 1/2 long (12)

Canopy

M Canopy (1)

Lattice Slats

N 3/16 x 1-3/8 x 45 (3)

Canopy Frame

O 3/4 x 1-1/2 x 19-3/8 (2)

P 3/4 x 1-1/2 x 43-1/4 (2)

Handle

Q 1/2 dia. x 4 long (Dowel) (1)

R 1-1/2 x 4 x 10 (Pivot Block Stem) (1)

S 1-1/2 x 2 x 30 (Stem) (1)

T 1/2 dia. x 7 long (Dowel) (1)

Wheels

U 11-1/4 dia. x 1-1/2 (4)

Hardware

#8 x 1-1/4" Phillips Head Wood Screws	(150 – includes some spares)
#6 x 3/4" Wood Screws (for Canopy Lattice)	(12)
#10 x 1-1/2" Wood Screws (for Axle Supports)	(12)
2" long x 1/2" dia. Carriage Bolt Pivot	(1)
Large diameter (1/2" through-hole) Fender Washer	(1)
Small diameter (1/2" through-hole) Washers	(2)
1/2" diameter through-hole Lock Washer	(1)
1/2" Nylock Lock Nut	(1)
3/8" dia x 20" long (16-pitch) Threaded Axles	(2)
3/8" dia. x 16-Pitch Nylock (Or Castle) Lock Nuts	(4)
3/8" dia. through-hole Washers	(8)

