Ray-O-Vac No. 9303

Making a replica 45 Volt 'B' Battery

© 2014 by: Robert Lozier

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What references exist?

- A vintage battery. Date unknown.
- One advertisement of a similar battery.

Scan & Photograph the original.

- Scanning is the ‘gold standard’ for accurate retouching or recreation of graphics.
- Photos (that include isometric views) are also required for fabrication details.

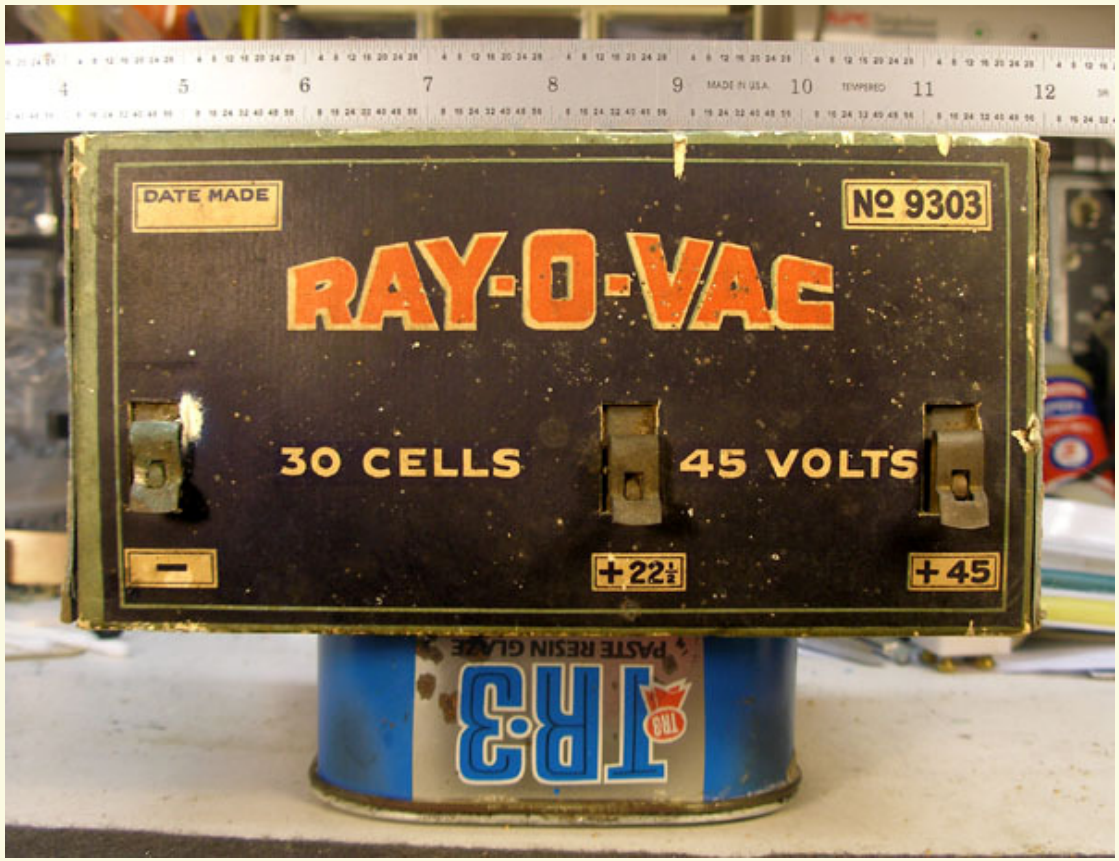
- When scanning, always have a ruler & strip of bright white paper visible on the image. (When manipulating the image later, you may accidentally alter the image size or proportions.)
- Scan at 600 d.p.i.
- Don't worry about color so much; set for best contrast.

If you don't have a scanner…

- Use a setup like this.

Sure can’t scan this top….

Note some fish-eye distortion. You will need to replace these features with drawn lines. It is not bad enough to worry about on the logo.

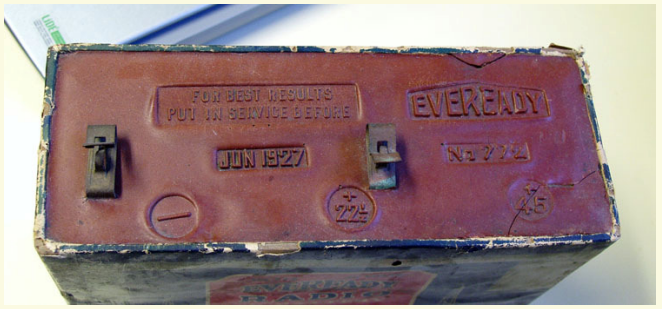


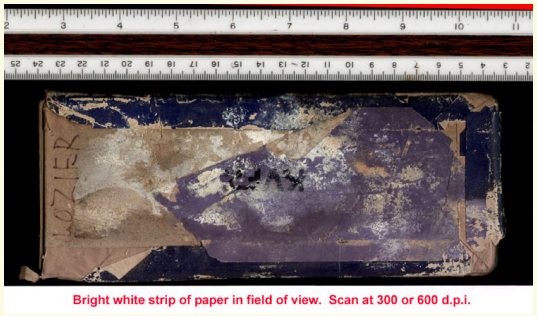
The isometric views…

- These views tell you the placement of panels & details you cannot scan.

Isometric View # 1

Isometric View # 2





Even the bottom…

The bottom will give clues as to how the cover was fabricated. (Thickness of material, glue seams, etc.)

Make a color check layout.

- After your initial clean-up assemble a test page like this. I can get a 11”x17” color laser print on plain paper done for just 99 cents. Note similar color splotches to help fine tune your color choices.

The graphic won't fit the paper!

- The way this box is made, it wraps from bottom flap to front side, to top, to back side and finally to another bottom flap. The side panels are separate items. That means I need a sheet about 21" long. Too long for common printers.
- Here is my solution for this particular graphic.

- A second page gives me plenty of room to print the bottom end flaps.

Every page should have a measured reference to make sure the printer operator has not altered the image size.

It is best to have both a ‘X’ & ‘Y’ dimension reference since some poorly adjusted printers can slip while feeding the paper thru the process.

Bottom flap #1

Bottom flap #2

- Use Elmers Permanent Bond Glue Stick to make the lap seams.

Laminate your laser prints to standard weight poster board (dull surface) using Scotch 77 spray contact adhesive.

- Boxes are made from a wide range of card and pasteboard stock thicknesses. This battery has pasteboard end caps that are 1mm thick.

With some boxes, this thick pasteboard has V trenches cut in the back side so it can be bent without tearing the graphic. I simulate this by using a small router to cut the trenches.

Once you know you have a viable graphic, time to build a box.

- Don’t skimp on wood.
- Use real 3-ply plywood.
- Use kiln dried white wood for your frame.
- Take extra time to make your cuts very accurate & SQUARE!
- True wood box dimension is 7.62” W x 6.52” H x 3.94” (accurate to +/- 1/16” – 1.5mm)
- A graphic like this will not wrap correctly around a cocked box assembly.

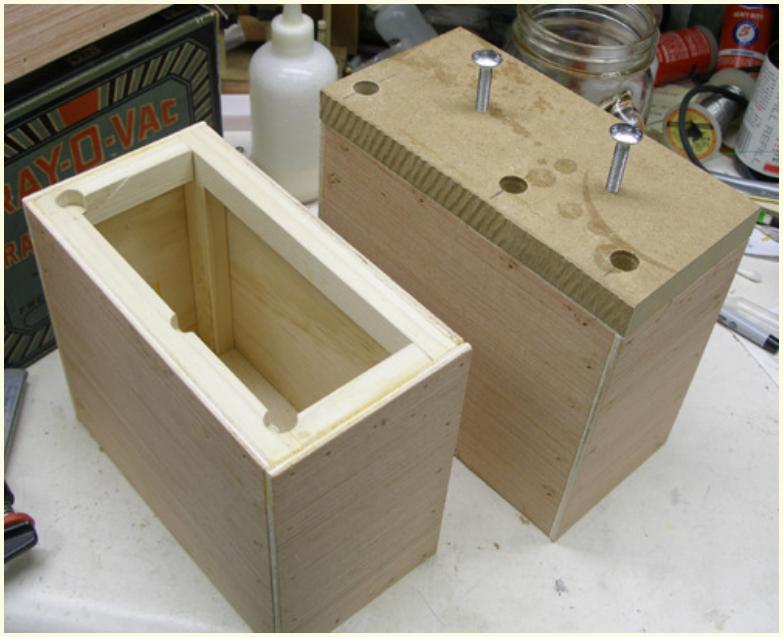
- You do not need an air powered nail gun for assembly. An Arrow brand T50R.E.D. hand nail gun would work just as well.

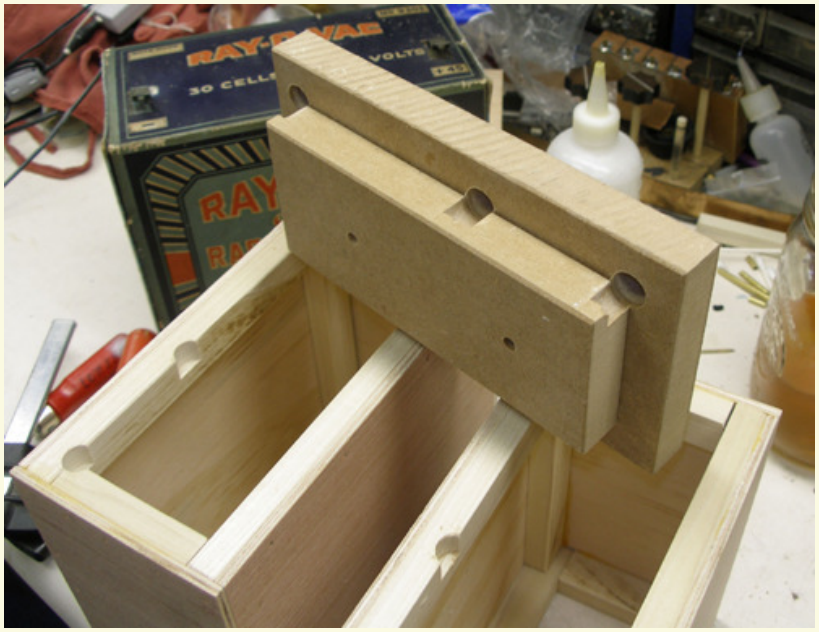
Use ½” x ¾” white wood for all box frames.

Apply glue to all nailed joints.

KEEP IT SQUARE!

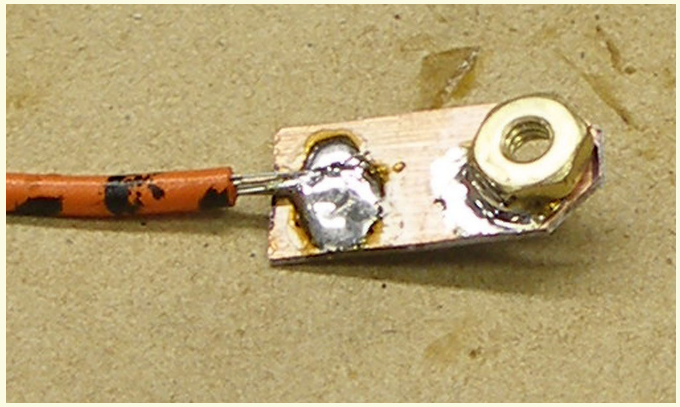
- The mounting holes for the Fahnestock clips are too close to the edges of the box frame but there is an easy solution to make clearance holes.
- This jig is simply two rectangles of MDF board. It provides easy guidance for a 1/2” Dia. Forstner bit. Just be sure you have not driven brads into the area that would damage your drill bit.

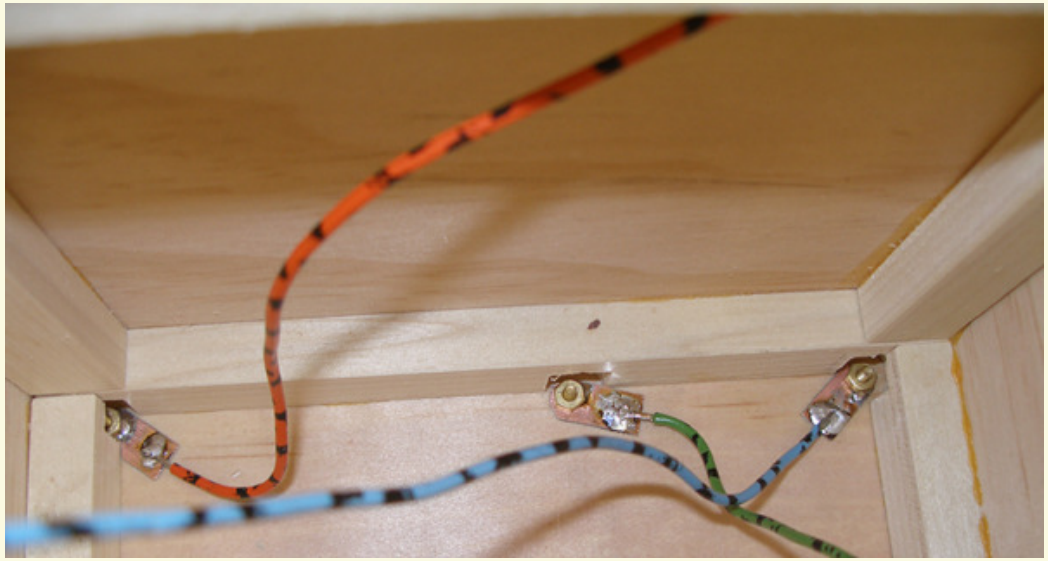




- Mounting the Fahnestock clips before attaching the top of the box makes other steps more difficult. You really do want to install the wires after the box is built.

- You can certainly order terminals threaded with a 4x40 or 3mm hole. However, it is easy enough to take a thin piece of scrap PCB and punch a 1/8” hole. Use a flat head screw to hold a brass nut in place and apply a small amount of solder to tack the nut to the PCB. Do not apply excess flux and use a fairly large iron to insure quick heating of the joint. Otherwise solder may wick into the threads.

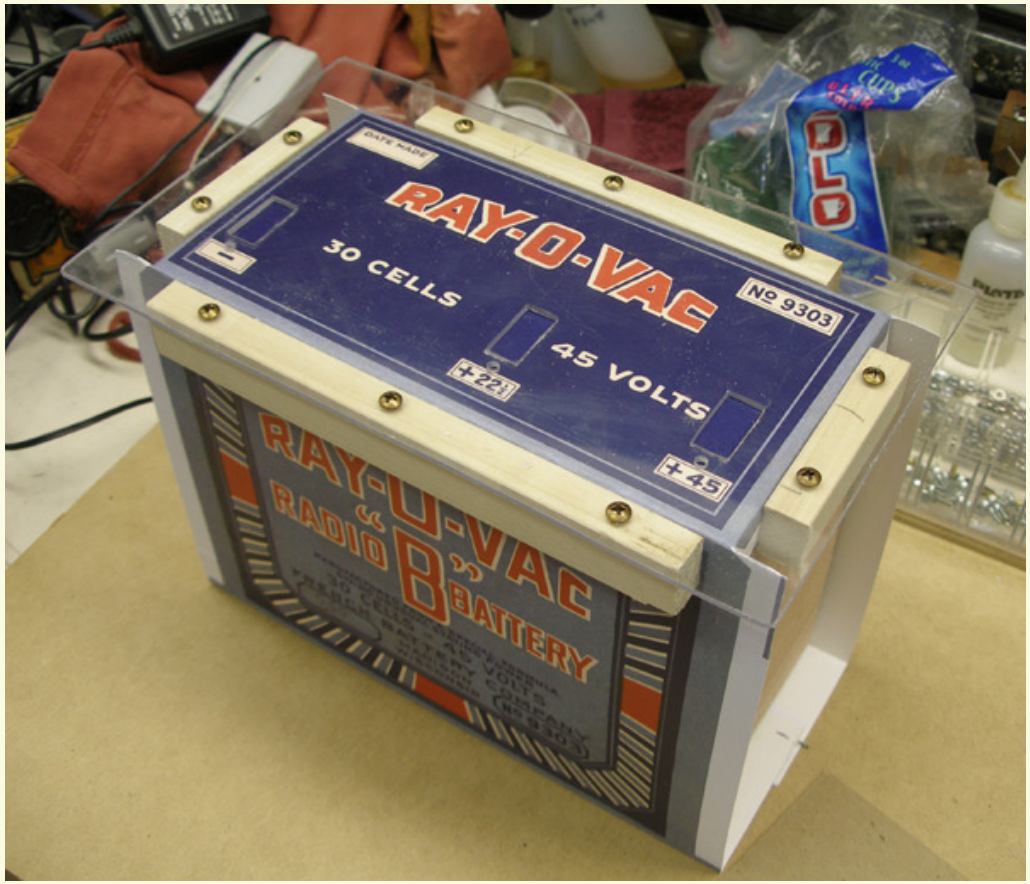




- A jig like this makes it easy to locate mounting holes for the Fahnestock clips in the box top and cutouts in the graphic.

For clean cuts, place a scrap of card stock between the graphic and the plywood top.

It also verifies that the bend lines you have made are square enough to allow the graphic to wrap correctly.



- This battery requires a colored background strip for the Fahnestock clips. Scotch 77 spray adhesive works great here.

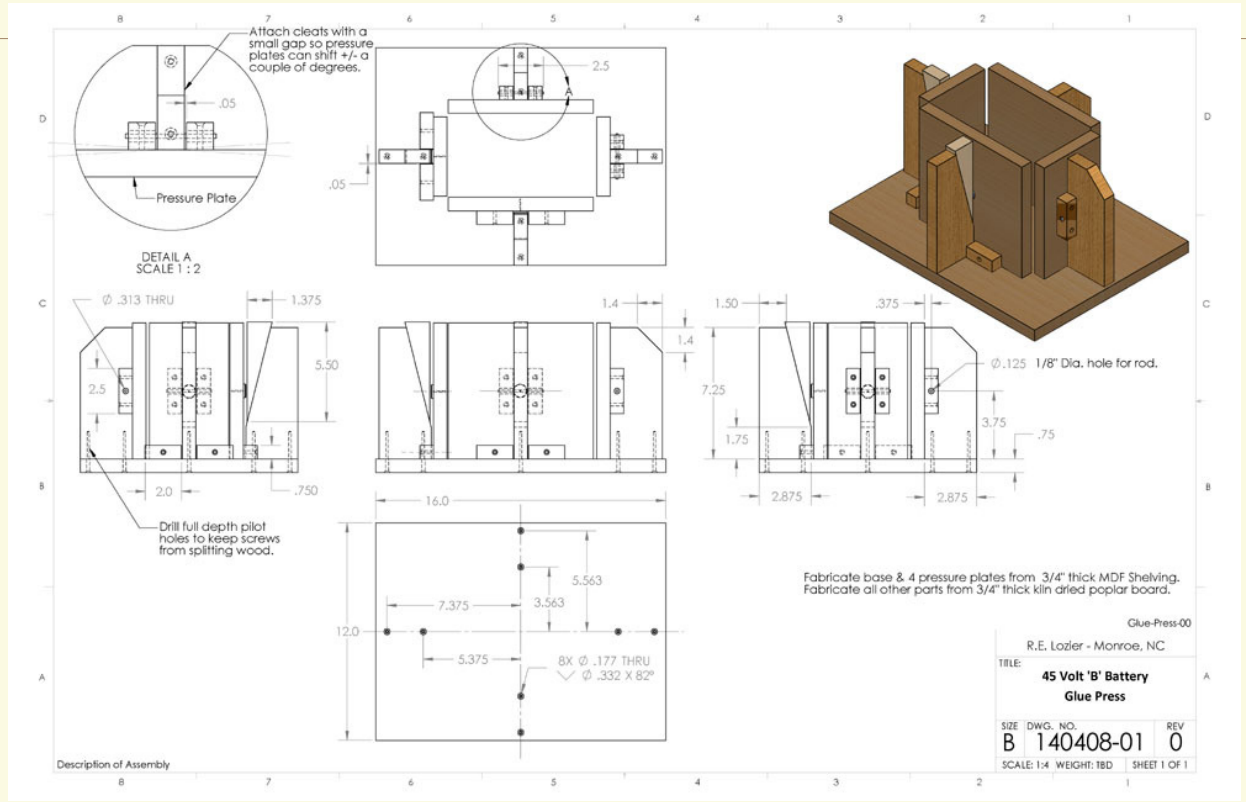
- Here is where a purpose-built glue press makes your work easier and much more precise.

Made of ¾” thick MDF shelving and poplar board.

It can accommodate a wide range of box sizes with shim plates.

Download this .pdf drawing at:

http://kd4hsh.homestead.com/Battery-Art-13B.html

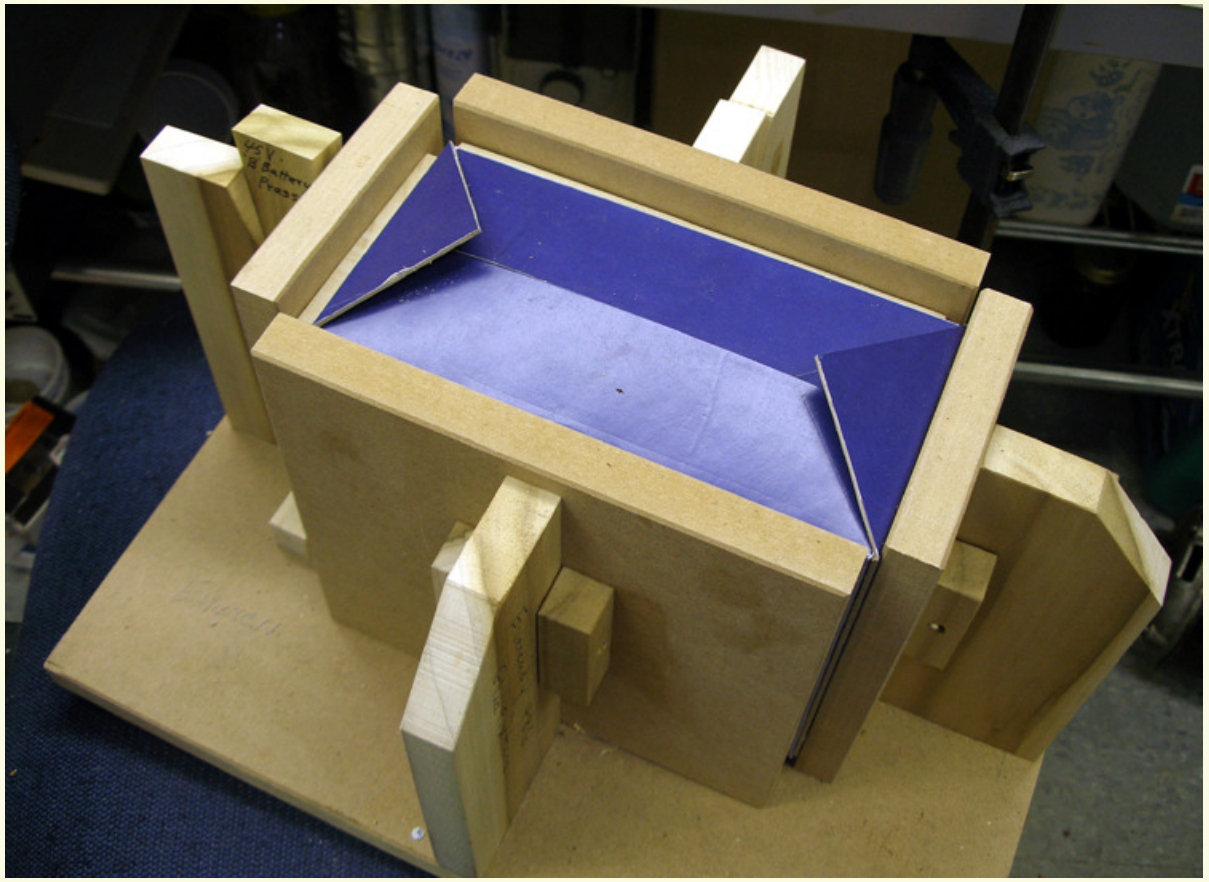


You can also download a cool 3D.PDF to view it at any angle.

(Note: The file is about 21 Meg.)

- The press makes it easy to get your cuts correct on the bottom.

If you want to add batteries, finish the bottom first and then cut an opening.



- The final results…..

A rare chance to see the batteries absolutely necessary for home radio operation in the early to mid 1920s.

- Compare the ‘full size’ Ray-O-Vac # 9303 to the Eveready # 486 battery.