

Simple Method to Copper the Bottom of a Ship

While they never got much notoriety, there were 49 double-ended paddle-wheel gunboats built for the Union Navy during the Civil War. Almost all joined in the fight before the war was over. When I decided to build a *Sassacus*-class double-ender, the *Agawam*, I considered coppering the bottom, but after building an earlier model of a double-ender (USS *Miami*), a navy enthusiast friend suggested that the Navy would never have taken the time and expense to copper the bottoms of these gunboats. Would have been too costly for mundane vessels, would have taken too long, and they were in desperate need for ships to patrol in enemy waters. It occurred to me that maybe it would not be historically accurate to copper the bottom!

A Congressional report answered the question as to whether these ships had copper bottoms. The builder of the hull of *Iosco*, a *Sassacus*-class ship, claimed he was due more money. One line quoted from the specifications was useful:

"It is further mutually understood and agreed that the sixth payment is not to be made **until the vessel is coppered** and delivered as this contract provides at the premises of the parties who have agreed to place the steam machinery on board and that to entitle the said parties of the first part to the twenty per centum reserved as above named the hull equipments and outfits . . ."

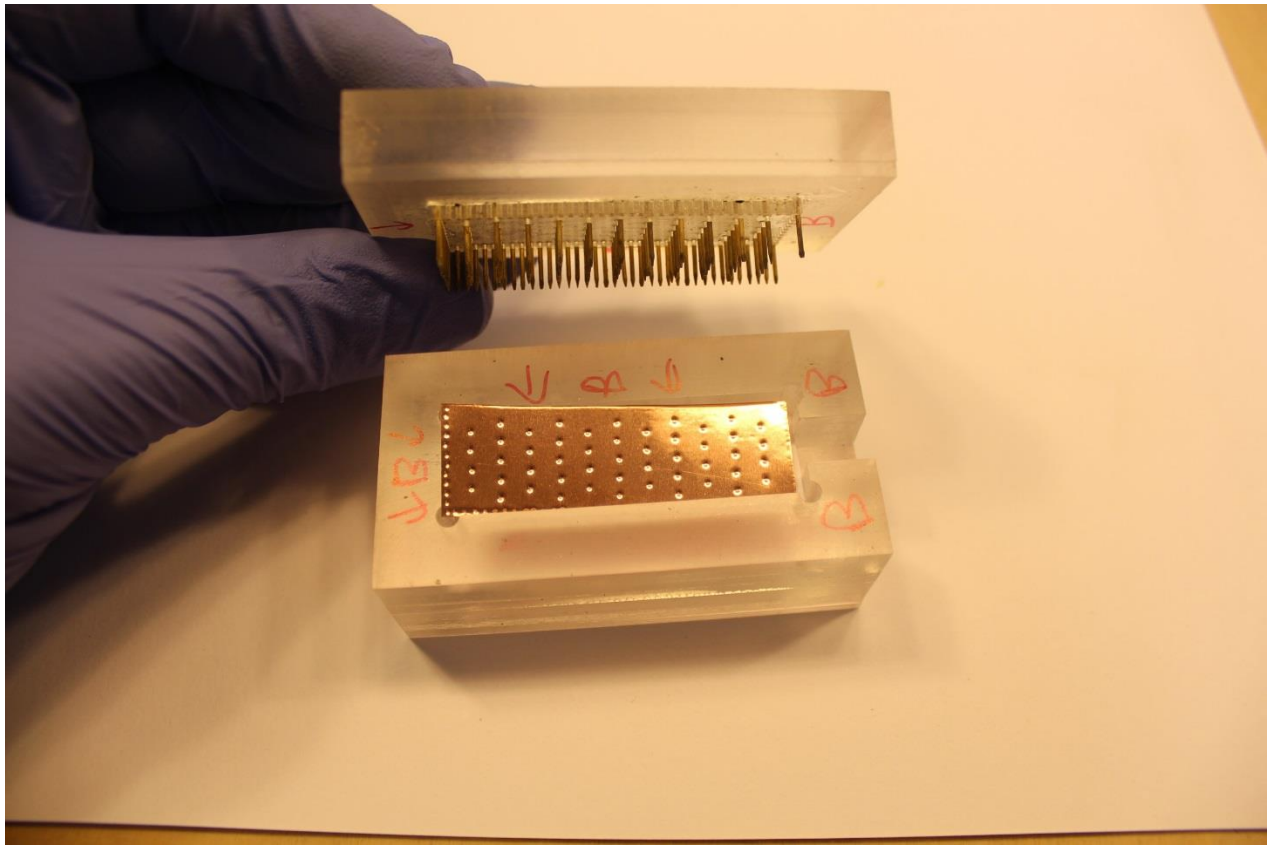
(The specification also, by the way, noted the price for her hull was \$75,000!)

This was just what I needed, and confirmed that coppering was in the specification for the twenty-seven *Sassacus*-class ships built. Apparently, the Navy wasn't going to send ships south without coppering, no matter how urgently they were needed. So, I added a copper bottom on my model of USS *Agawam*.

Most authorities agree that the size of the sheets of copper used in the mid-19th century were 48 inches long, by 14 inches tall. The sheets were laid starting at the keel and stern and proceeding forward and up to the water line. This assured that the movement of the ship through the water did not tend to peel it off. When a new sheet was added, there was always a small overlap along the top edge and the edge toward the stern. Generally, there were some five rows of nails holding each sheet to the hull, with about 9 to 12 nails in each row. These rows were staggered so that the nail holes did line up vertically on the sheet. Therefore, one row would have, say, 10 nails. The row below would have 11 nails, and the next row back to 10. An additional row of nails, more tightly spaced, covered the area where the plates overlapped. A very good history of copper sheathing with ample illustrations, is at:

http://www.academia.edu/358814/The_Introduction_and_Use_of_Copper_Sheathing_-_A_History

Our club member Carlos Montalvao, in Portugual, coppered the bottom of his current model and wrote to tell me how it was done. He cut strips from a sheet of copper, then cut these into individual plates. He built a tool, and indented each individual plate!





As you can see, he correctly has five rows of eleven “nails” per row. For American ships, the rows should be staggered, not in verticle lines.

I tried various ways to imprint the pattern of the nail holes as per Carlos, but my poor tool making did not work properly.

Since Carlos’s system proved too difficult for me, I used a method I used before. For my 1:48 scale model (e.g., $\frac{1}{4}$ inch equals one foot) I used copper foil tape available in most hobby shops. The tape is apparently used for leaded glass applications. It has an adhesive on the back. I used $\frac{3}{8}$ ”wide tape for the *Agawam*, which would scale out at a width of 18 inches. Close enough to 14 inches for me. Paid about \$14 at Dan’s for a roll (needed two rolls for my rather large model). I cut individule pieces of copper foil, and placed them in the same manner as I had laid the planks the side of a ship, on a curved line fore and aft. I then used a ponce wheel and, pressing hard, psenetrated the copper sheets in long rows. Sometimes my control was poor, and the lines were not in perfect lines. But no matter, these lines of indents are really hard to study closely, and most are on the underside of the model where only a mirror would reveal the work. The holes the ponce wheel makes vastly increases the adhearance of the plates, as I pressed through them and the flaired copper holes acted a bit like rivits. In key places, I also used CA glue.

I wanted to simulate the look of a vessel that was in the war zone in Southern waters. This meant, for the first time on any of my models, adding a bit of grime around the anchor ports, on the decks, and other locations one would expect such accumulations, plus a bit of wear, tear and scuffs. I also decided to simulate the weathered look that would exist on the copper bottom of a ship that had been at sea. But what would the weathered bottom of such a ship look like?

I got the answer from pictures of the USS *Constitution*, which had her copper bottom repaired while in drydock in 2015-2016.



This is obviously the color a copper bottom gets to be after some time in the water. To get a similar blue green, I thought about mixing up my own version of the color. But first, I tried “Maid-o’-Metal” brand liquid “solution of Patina for Copper and Brass.” I tested it on a few patches of copper tape. It looked ok so I applied it to upside down hull. The liquid needs to sit a few hours, then you wipe it off. In some places, I applied it again.

By using a damp cloth and brisk rubbing, the patina can be wiped off to allow for evening out the color as wanted. I will seal it up eventually with a clear coat of acrylic.

