Weekly work updates from February 2004 through December 2004 on the restoration of the 1895 lumber schooner *C. A. Thayer*

April 12 – 16, 2004

The first of the frame timbers were cut Thursday. These will be the first new pieces to go back into the hull. They are the replacement futtocks of the station frames. The first one cut out was for Frame 20.

Tim and Little Jay of Bay Ship and Yacht have been working to "line off" the hull, with a series of battens or "ribbands" screwed to the outside of the frames. The idea is to establish fair lines along the length of the hull, describing the inside of the outer planking layer. The ribbands are laid at the tops of the flats which have been dubbed into the original frame timbers to accommodate the flat backs of the 4" outer planking.

The problem is to determine the shape of the missing futtocks. The outside shape of the futtock is fixed by the ribbands. Tim makes up a mold or pattern out of thin plywood called "door-skins." The plywood lies against the next existing futtock. Plywood strips, 6" to 8" wide, are the basis of the mold, joined end to end with staples, to follow the curvature of the original timber. Rectangular tabs of door-skin are stapled to the pattern as they are butted against the ribbands. The outer ends of the tabs describe the outer face of the futtock.

The next problem is to determine both the depth of the futtock and the bevel required for the timber to lie fair against both the inner ceiling and the outer planking. Bill Elliot, the owner of Bay Ship and Yacht, is out there taking these measurements. Measuring in from the ribband to the ceiling planking, and/or to the back of timber alongside, Bill figures the "molded depth" of the futtock at each ribband crossing.

There are localized inconsistencies, but the shipwright, Bill, sees the fair line that was intended, and measures to this point.

Bill also checks the bevels, which Tim has first suggested. The futtocks are beveled inside and out. Their sides, however, are always to be 90 degrees to the centerline, the center of the keel. The futtocks remain always 10" thick. This is the "sided" dimension. 10 inches fore and aft. The two futtocks that make up each frame total 20".

The bevels are taken off from the ribbands, with a check against the ceiling planking whenever possible. They are marked in degrees, measured against Bill's own bevel board. The bevels and molded depths are marked on the patterns.

The pattern is screwed down on a plywood floor to check the line of the inner face. A batten is bent around the tabs representing the outer face. The line is checked for fairness and then marked on the plywood. The measurements taken for the depth of the timber are then laid on the plywood floor and marked with nails. A batten is bent against the nails, and the line is again checked for fairness. A bit more adjustment is needed here to arrive at the right line. Nails are moved until the batten lies fair, and the line is marked. Corrected depth measurements are marked on the original pattern.

The pattern is then transferred to the face of one of the new timber pieces. This piece is 10” x 22” by about 10 feet. Using nails and battens, the curves of the inner and outer faces are again transferred to the material. The bevels at the various points along the lines are marked on the piece.

The new ship saw has been set up over the last couple of weeks, and is now ready to go. This is a large band saw, with a capacity of about 30 inches, designed specifically to cut ship timbers. The bevel of the cut is adjusted by tilting the whole saw frame, while the saw table remains flat. The ship saw is set up over a pit, which gives the bottom of the heavy frame casting room to tilt. The gang had to saw a rectangular hole in the concrete floor of the hanger. The bevel adjustment is powered by an air-driven drill motor, with a motorcycle type control handle. Twist the handle toward yourself and the bevel decreases. Twist the other way and it increases. Ball rollers are fixed along the perimeter of the table, and roller tables at the same height as the saw table will support the material as is moves on and off the saw table.

Bill Elliot makes the first cut. Big Jay, who has worked with Bill for years, is on the bevel control. One of the guys serves as tail man, moving the timber left or right to Bill’s hand signals and helping to push the piece through the saw. The cut begins, with Bill hunched over the table pushing the timber and gesturing to the tail man. The bevel is 5 degrees to start, coming down to 4 over about a foot. Jay eases the saw frame back as the cut goes forward, finally arriving at 1 degree toward the end. Bill is trusting that he is getting it right. The cut, the outer face, goes fine.

Bill gathers the crew around to explain the process and make sure everyone gets it. He notes that accuracy in the bevel is just as important to the final fit as accuracy in the line. The better the bevel, the less planing will be needed as the inner and outer planking is finally fitted over the futtock. We are staring with frames that have relatively little bevel, just to get the hang of the process. He notes that at least these futtocks are being sawn out of good, close-grained solid timber. On the Niagara job they used glue-laminated timbers which played hell with the saw blades. With this set up, a blade should be good for a full day of sawing before being taken off for sharpening.

He turns the saw over to Jack to make the next cut. This is a trial cut, on a line an inch or so outside the final inner face. Again, it goes all right, with just a little jerkiness around the tightest bends. So the gang goes for the final cut, with Bill hovering around to make sure. A miss cut will lead to a very expensive piece of firewood. But it goes fine. Everyone is pleased. The material is really great. Bill says we could use it to make pianos. The overhead crane picks the new futtock up and it is placed on the floor near its spot in the hull.

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