

# Restoration of 12½ -Footers

## Part II



by Maynard Bray  
Photographs by Benjamin Mendlowitz

There simply isn't enough space within the pages of *WoodenBoat* to describe everything Steve Ballentine does to bring back a typical Herreshoff 12½-footer to like-new condition. Last issue we showed how he renewed the transom, the frames and fastenings, and how the stem was removed and restored; for this one we've selected the keel and coamings as subjects, feeling that the techniques used in installing them are unusually well thought out and would be of the most help to the most readers.

But the operations we've had to omit are interesting as well. The following is a list of the steps that make up a complete project of this nature and are taken from an outline furnished by Steve:

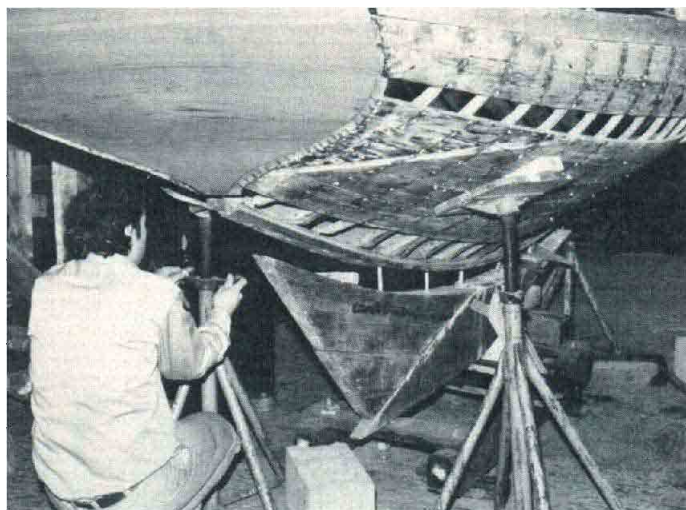
(1) Assess the boat for needed improvements; (2) Dismantle; (3) Replace transom (WB No. 56); (4) Rejuvenate or replace stem and fairing piece for keel (WB No. 56); (5)



Replace frames (WB No. 56); (6) Rebuild sheer area (sheer clamps and sheer strakes); (7) Replace bulkheads; (8) Rebuild keel area (this issue of WB); (9) Fair the hull; (10) Reinstall the fin/ballast assembly; (11) Install new deck frame, forward and aft; (12) Renew cockpit sole (floorboards); (13) Renew covering boards and decks; (14) Replace coamings (this issue of WB); (15) Refinish entire boat.

As one might imagine, and as we mentioned in the last issue, the cost of a major restoration like this is about as much as the price of a new boat. Most of the owners who come to Steve, however, don't want a new boat; they are attached to the one they already have and want it fixed up as good as new. Steve is willing to accommodate them. The photographs and captions that follow show how he goes about installing a new keel and a pair of new coamings and concludes our coverage of his work on the Herreshoff 12½-footer.

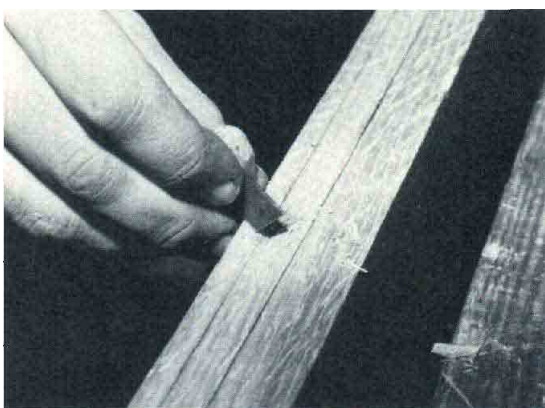
1



## REPLACING THE KEEL

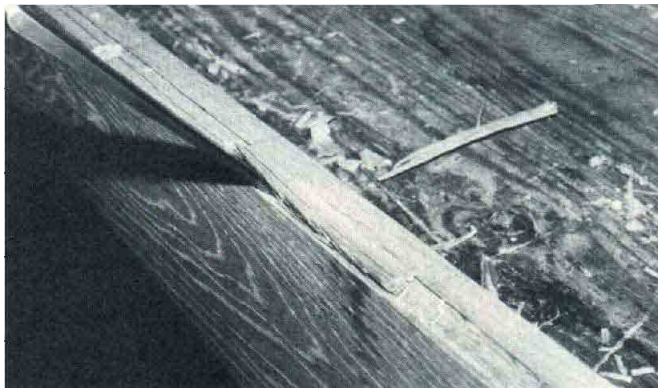
When the old hull has been given new strength with a new transom, frames, and floor timbers, it can withstand having its keel removed and replaced, an operation that will require turning the boat bottom-up. Here, we're talking about renewing the keel, not the fin-and-ballast combination, although the latter assembly has to be removed first, as in this photo. Removal looks easy, but a good deal of careful pounding, wedging, and jacking must be done if there is to be no damage. The screw-type jacking stands positioned under the bilges allow the hull to be conveniently raised so it will clear the projecting keelbolts when the fin/ballast assembly is rolled out from under.

2



The keel timber that's being replaced is of steam-bent oak, 1 3/8" thick and tapering from about 7" wide amidships to less than half that at the ends. A rabbet is cut in its edges for the garboard planks to lie against, the rabbet line being a constant 3/4" above the keel's bottom surface; that is to say, you'd see this amount of the keel outside between the hull planking and the fin/ballast assembly in a finished boat. Planed to thickness and sawn to width, the new keel timber is then marked for the rabbet. Bevels are taken from the old keel at each frame location, and a small homemade bevel gauge is used to help guide the chisel and to check the results after the rabbet is cut.

3



As with most rabbets, a short notch is cut at each place where a bevel is known (on every frame line in this particular instance). When the notches are all cut and proven true with the bevel gauge, a larger chisel, as shown here, is used to remove the wood between the notches in such a way as to have a fair rabbet running between them. The chisel does the roughing out; a rabbet plane will then be used for smoothing and fairing.

4



The old keel serves not only as reference for the shape and bevel of the new one, but also is used by Steve as a bending form, though it is blocked off the boat in the middle to give the new keel a slight overbend, which is always desirable. The hull, of course, has been turned over first as shown on the preceding page and blocked up so it is free from twist.



5

The "steambox" in this case is simply a big sheet of plastic wrapped around the new keel to keep most of the steam from escaping. Steam will be fed into the "box" from the pipe at the left of the picture. Since the keel will be underwater when the boat is in service, there is no need to use wood that is fully seasoned. Green oak bends easier and will not change its dimensions later as much as dry stock would.



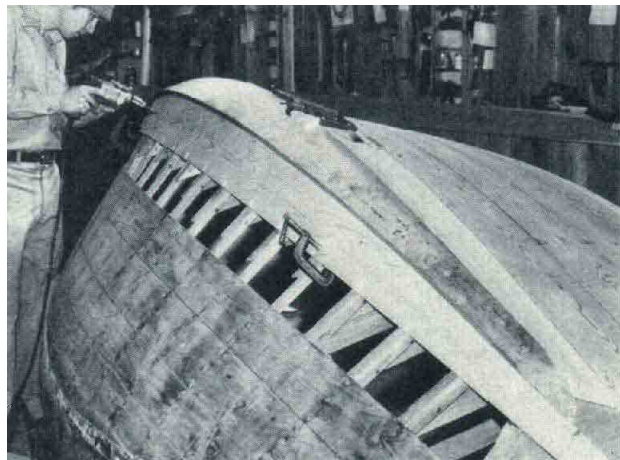
6

Here is what the new keel looks like after it has been softened with steam for a half-hour or so and pulled down against the old keel with clamps at its aft end. The steaming unit has been moved up forward where it will be more effective in softening that end of the new keel. If Steve had a big steambox like the one the Herreshoff shop used when these 12½-footers were built, he would probably use it now and dispense with the plastic; but his technique here shows that only a little ingenuity is necessary for the occasional steaming of a somewhat ungainly timber. After having been clamped to this shape overnight, the keel will be cool and will retain enough of its bent shape to be easily fitted to the boat.



7

With the new keel in place and fastened to the floor timbers, stem, and transom, and after the floor timbers have been planed fair for a good landing, the garboard planks can be installed. The garboards must be given considerable "hollow and round"; that is, they must be shaped to fit against the curvature of the frames and floor timbers. In order to be given this shape and still have the required 7/16" final thickness, the stock for the garboard planking must be about ¼" thicker than 7/16". Dexter Cooper has planed (or "rounded") the undersides of these planks to fit the frames, but has not yet given their outside surfaces the hollow that they'll eventually need in order to fair into the rest of the hull. In contrast to the garboards, the adjoining broad strakes have very little "hollow and round" and can be sawn out of ½" material.



8

After the hull has been planked and partially smoothed, the caulking takes place while the boat is still upside down. The plank seams, if not uniform in width already, can be made an even width by running a roller like this down the length of them. The softness of cedar permits this to be done.

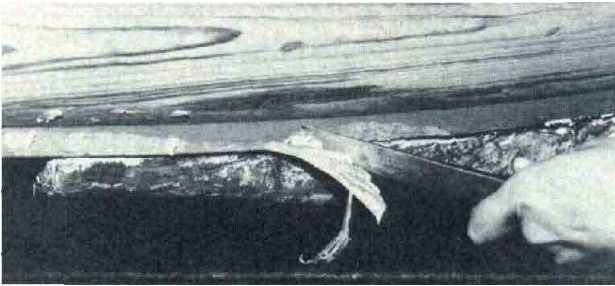


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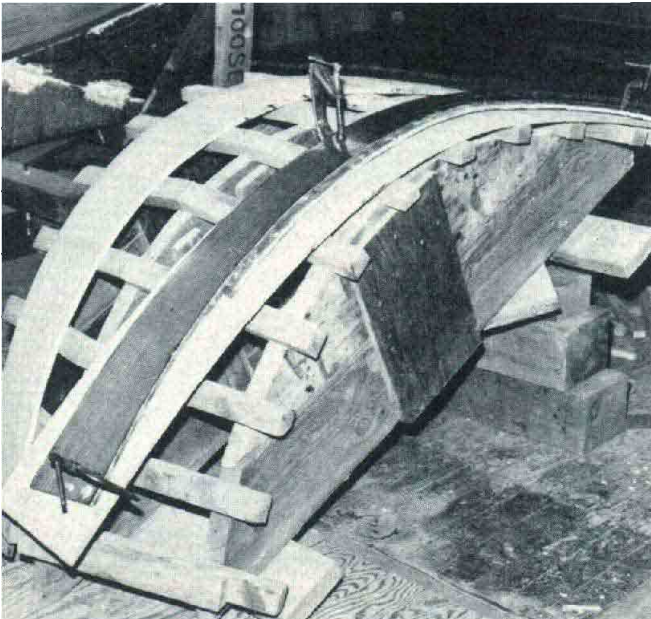
A caulking iron and wooden mallet are used to drive the cotton caulking into the hull seams. Notice that the hull's starboard side has been smoothed, but the port side is still being planked. The garboards are fastened to both floors and frames.

10



Here the edge of the new keel is being faired into the rest of the hull. The boat is again right-side up and has been joined once more to its fin-and-ballast assembly.

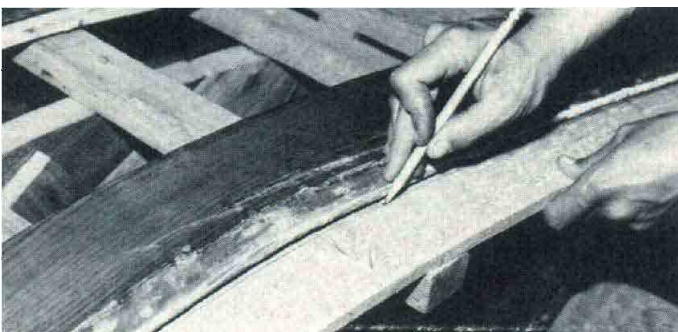
11



## REPLACING THE COAMINGS

Most 12½-footers' coamings were made of oak, steam-bent to shape. Like most varnished oak, they have discolored with age. The original coamings on this boat could, perhaps, have been reused, but a great amount of work would have been required to restore their appearance. So Steve decided to make new ones—an easier task than it sounds, since the original ones were already off the boat for other reasons. A bending form, or trap, as it's sometimes called, is used to give the port and starboard coamings their correct shape. A little "wind" or twist is required. You'll notice that the pieces are overbent as well; when they are undamped from the form after cooling, they spring back to the desired curve as the right-hand piece in the photo has done. Predicting the amount of overbend takes both experience and trial and error; too much bend is better than too little, but if figured right the undamped piece will be exactly the right shape, making the fitting task easier.

12



It's helpful if the old coamings can be removed in one piece to be used as patterns for their replacements. Although the width at any one spot on the coaming is only about 5", the overall shape is such that it requires starting with a piece of stock around 8" wide. In the picture, the exposed part of the new coaming stock projecting beyond the outline of the original one will become scrap after the cut is made. Steve seeks coaming stock with vertical grain because it bends nicely, doesn't cup, and, when varnished, looks better than the more usual slash-grained stock. He prefers to resaw the two pieces from a single thicker piece so the grain matches, port to starboard.

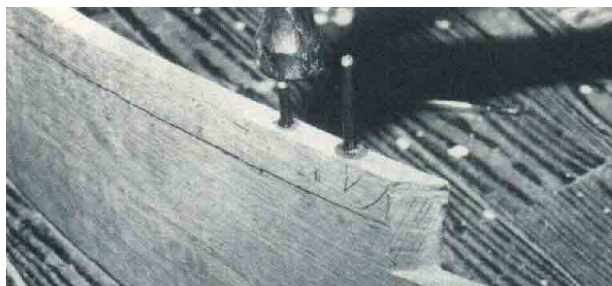


Cutting is done most easily with a portable saw. The line being cut represents the lower edge of the finished coaming, while the one above it is a reference line for lining up the coaming's outside face with the deck edge. The upper edge of the coaming will not be cut at this time, but will be left until the piece is fitted to the boat. At that time it will be scribed for cutting at a constant height off the deck so as to parallel the boat's sheerline.



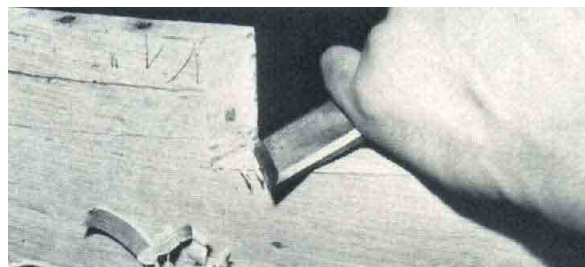
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Steve has found that some otherwise good coamings have been spoiled because of subsequent splitting at the notch for the deck. To avoid splitting in his new work, he reinforces the coaming just aft of the notch with a couple of bronze pins, carefully bored for and set in epoxy, and long enough to extend well beyond the critical area.



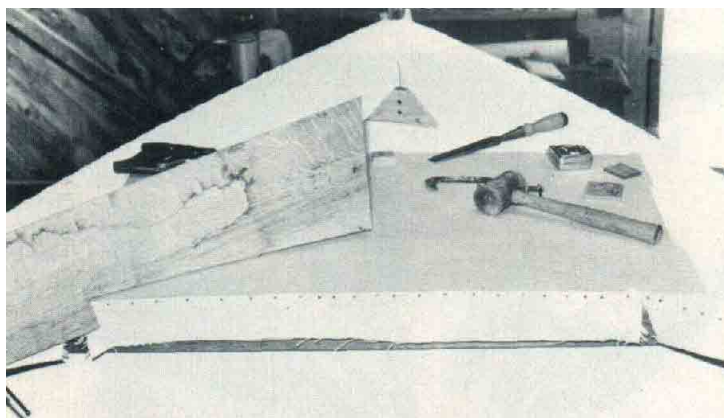
14

The under edge of the coaming where it rests on the deck is now cut roughly to the required bevel before a trial fit is made; the bevel is picked up from the old piece. A sharp chisel is needed here in the corner, but out in the clear a block plane will be used.



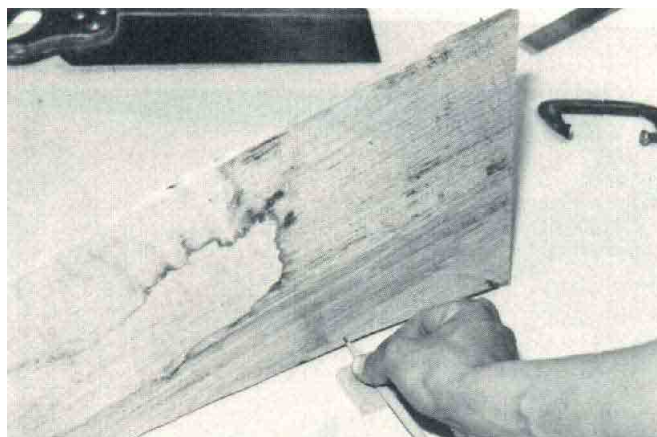
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This first (port side) coaming is then clamped into place for fitting to the deck. The new deck canvas has been laid; to protect it while the coamings are fitted, a piece of wrapping paper has been taped to it and on this a centerline has been marked to indicate where the "point" of the coaming is to fall.



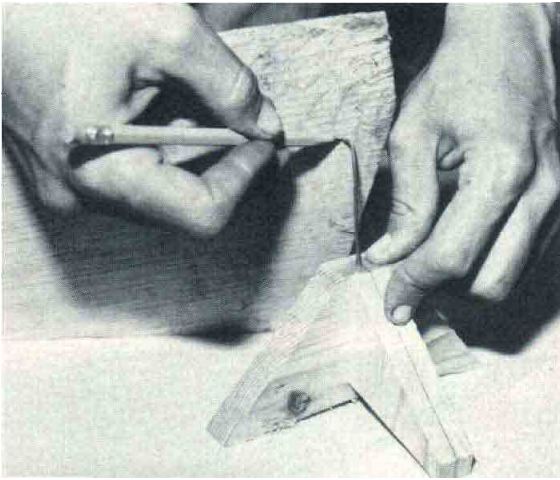
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This operation is called "scribing down" the coaming. It is a simple matter of drawing a line at a constant vertical distance up from the deck on both sides of the coaming. This distance represents the amount the coaming will drop once the wood outside the line has been carefully cut away. Obviously the coaming must be in the correct fore-and-aft and in-and-out positions before it can be scribed. Various marking tools can be used for scribing; a pencil and wood-block shim combination are shown here. A pencil compass is another often used device.



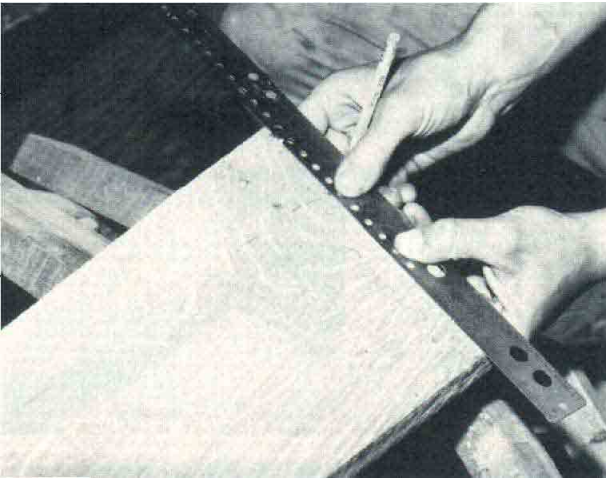
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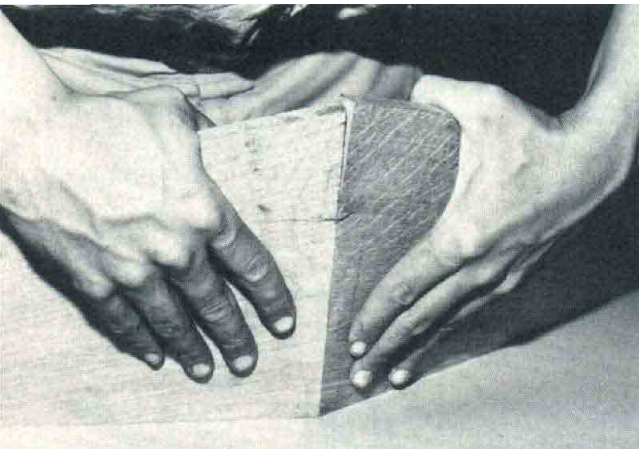
The starboard coaming is fitted to the deck just as the port one was. When each coaming is in its final position, their forward ends can be trimmed so they'll fit together and form the "point" where the two sides join. Marking at the top of the "point" is done with this little tool and results in an upper mark that is on the boat's centerline and at about the height of the finished coaming. Alignment of the tool on the deck is with the marked centerline at its base.

19



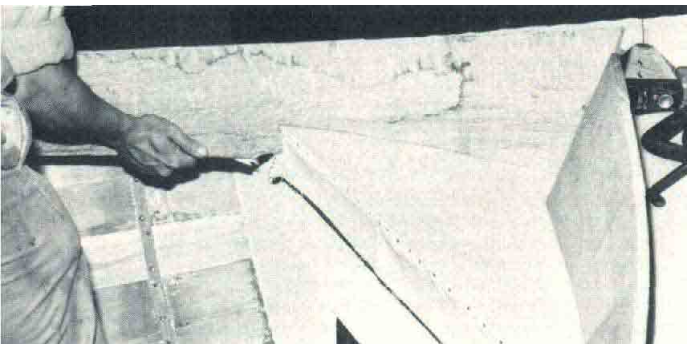
The centerline drawn on the deck is also used to mark the bottom of the coaming; that is, the coaming is marked where its outside face crosses the marked line on the deck. Then, by connecting the upper and lower marks with a straightedge as shown here, the line of cut is established. Of course, this cut can't be square, but must have the right bevel. This bevel is picked up from the old coaming, cut a little shy, and worked down when the two new halves of the coaming are fitted together.

20



Here's what the point of the coaming looks like after both end cuts are made and the bevels are planed to a good fit. The two sides come together right over the centerline, and the joint is vertical when viewed from directly forward or aft. The upper third, above the pencil mark, will be cut away later as waste, so there's no need to be precise about the fit in that area.

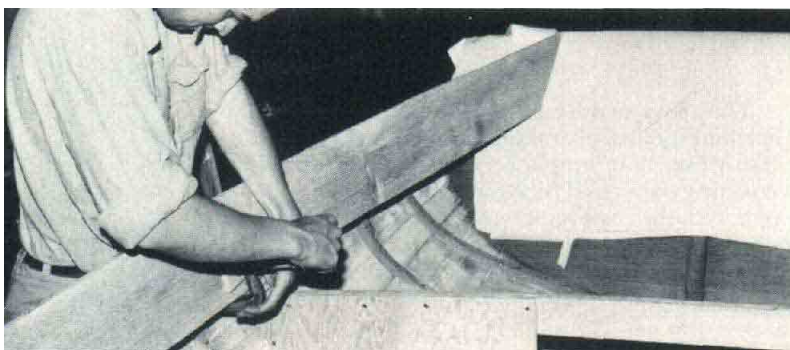
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There's some stain on this coaming from the steaming operation, but it's easily cleaned off with a scraper and sandpaper before the first coat of varnish is applied. Right now the priority is fitting; finishing can come later.

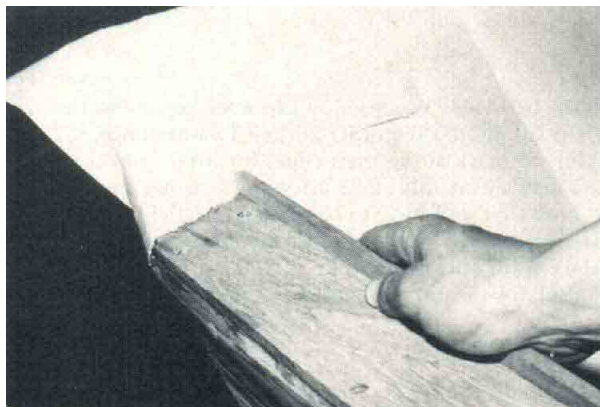


After their forward ends are nicely fitted, the aft end of each coaming must be trimmed to fit against the transom. Marking for the cuts at this end is tricky. Since the coamings are too long to be marked directly, an indirect method must be used. The first step is to clamp one of the coamings into position, starting at the forward end and working aft, leaving a "flapping" end of about 4-5' as shown.



22

An index or reference mark is then made on both the coaming and the adjacent deck opposite the aftermost C-clamp. The coaming is then undamped so a measuring staff or batten can be laid between the above mark (the one made on deck) and the transom. This batten has to lie tightly against the deck edge, just as the coaming will; when its aft end is against the transom...



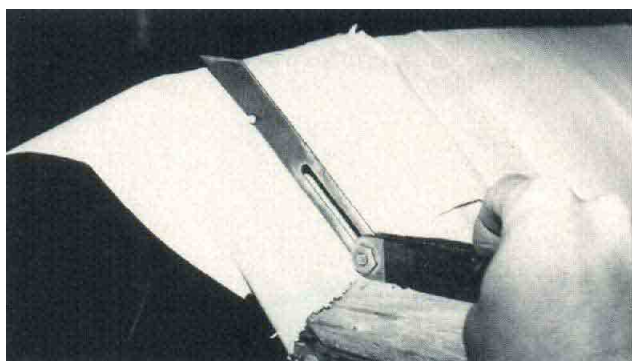
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...its other end is marked next to the reference mark made earlier.



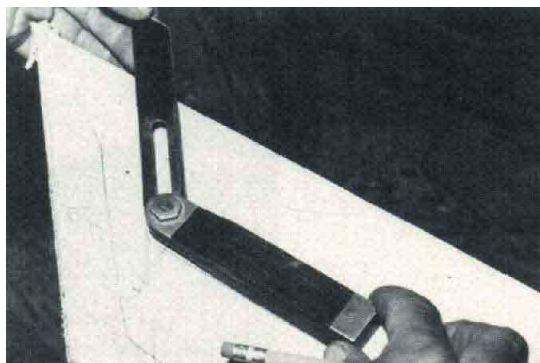
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The bevel between the deck and the transom is then picked up...



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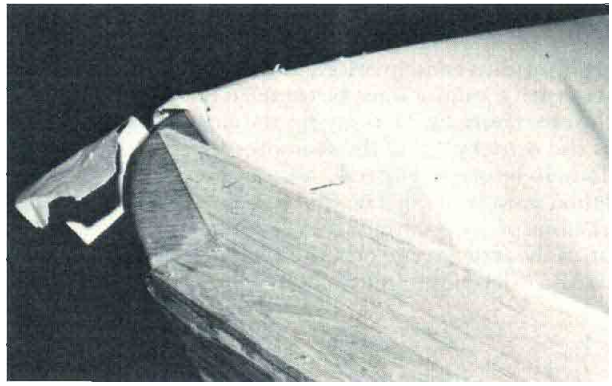
...and transferred to the coaming itself, the coaming having already been marked for the proper length at the deck level from the batten.



26

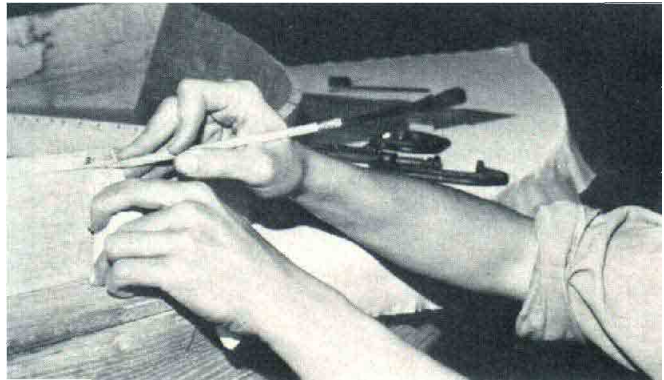
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The above steps should give a fairly good fit the first time, but the sharply raking transom makes final fitting fairly easy. You simply keep planing the aft end of the coaming for a good fit against the transom. As wood is removed, the coaming keeps setting a little lower down in the boat. Steve was careful to leave enough extra wood along the top edge to allow for this.

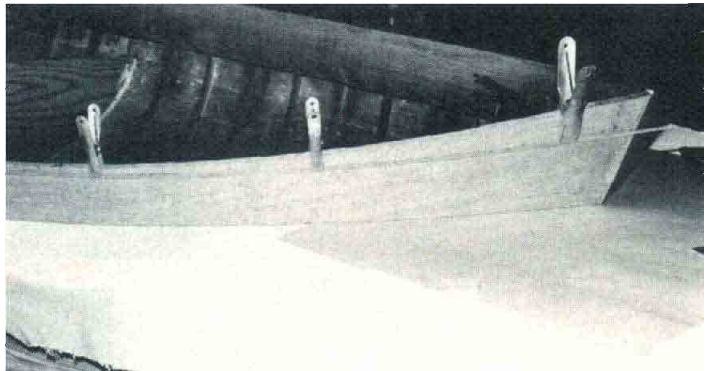


28

Now that there is a good fit of each coaming to the boat and to each other at their forward ends, it's time to mark along their edges for final trimming. There's probably some unevenness along the bottom that will have to be planed parallel with the underside of the sheer clamp. The top edge must be marked for cutting as well—a constant 4" above the deck for most of its length. A spacer block is used for marking the top edge.



Forward, the coaming is a little higher than elsewhere, and a batten is used, along with a few measurements, to get a fair line. When the coamings are removed for this last cutting, they will be smoothed up and given a coat or two of varnish to seal the grain and keep out the water. Then they'll be bedded thoroughly where they fit against the deck, transom, and deck edge before they're fastened permanently to the boat. Oak is notorious for turning black (staining) upon contact with water, so Steve is very careful to seal the grain and bed all contact surfaces to keep out the water.



29

For readers not familiar with Herreshoff 12½-footers, here is what one looks like under sail. This boat appears to be in better condition than most, however, and it may be a while longer before she needs a Ballentine refurbishing. ■



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