

HOW TO MAKE A BOAT.

BY FREDERIC G. MATHER.

ALMOST all boys who live near the water want to own a boat, and it very often happens that the only way they can get one is to build it themselves. It is very well to do this, for, when they have done their work well, they get not only a boat, but some excellent experience in mechanical construction, which can scarcely fail to be of use to them.

The object of this article is to tell boys how, with a good deal of labor and a very little money, they can build a boat for themselves.

The first thing to be done is to learn to swim—that is, if you do not know how already. No boy should have a boat who cannot swim. Any boat, no matter how skillfully handled, may upset, and any boy, no matter how careful he may be, may fall out of a boat.

The next thing is to study carefully the plain account here given of the building of a boy's boat. Any boy who can use a plane, a saw, a bit-stock, and a drawing-knife, can easily build a boat like the one of which we are about to give the history until she floated gracefully in the water.

In the first place, you must go to the lumber-yard or mill, and select two boards of clear pine, eleven or twelve feet long and one inch thick. One should be wider than the other; but together they should make a width of twenty-five inches. Have them planed on both sides, and a groove planed out of the edge of one board and a tongue out of the corresponding edge of the other board. When you have taken the boards home, buy a two-pound can of white lead. Fill the groove with this lead; then put the boards together, and drive the tongue of one into the groove of the other. This will make the joint water-tight. To keep the boards from spreading, tack three or four strips across the crack, and lay the whole on the floor with the strips downward.

You will then have what is the same as one

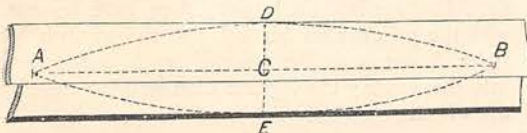


FIG. 1.—THE BOTTOM BOARD.

board, eleven or twelve feet long and not less than two feet wide. This we will call the bottom board (Fig. 1).

The next thing to do is to sweep the floor of your workshop, so that there will be a clear space of about fifteen feet square. Place the bottom board at one edge of the space thus cleared, and draw the line A B, which divides the width into equal parts.

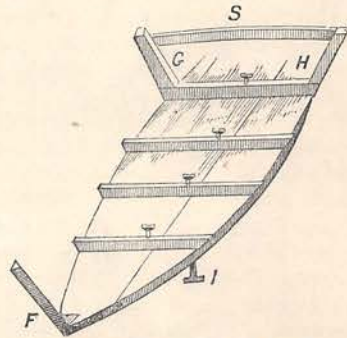


FIG. 2.—THE BRACES AND RIBS.

Draw D E at right angles to A B. The points A and B should be five feet three inches from C; and D and E, each one foot from the same. This will make A B ten feet six inches, and D E two feet.

To mark the curved line A E B, drive a nail in the floor in the direction of D, and about fourteen feet three inches from E. Having made a loop at the end of a piece of wire (string will stretch too much to be accurate), you must bring the wire to the point E. The wire is your radius, and your object is to hold a pencil at such a point that it will pass through the points A, E and B. Your pencil will easily hit A and B. If it falls outside of E, you must move the board away from the nail; if it falls between C and E, the radius is too long, and the board must be moved toward the nail. Having found the exact spot, draw the curved line A E B. Then turn the board around, end for end, and mark the line A D B in the same manner. Then saw carefully along the curved lines, and you will have cut out the bottom of your boat.

The next step is to bevel the edges just sawed; that is, to cut the wood away from the under side of the edge of the bottom board, so that the side boards will easily be fitted to it.

At H (Fig. 2) is an angle of 120 degrees. The under edge must be cut off at this angle; but, as you come toward the end, cut away less and less of the under edge, until at F you cut away scarcely any. Bevel the entire edge in the same way,

taking great care to change the bevel gradually and uniformly.

You must now fasten some hard-wood strips, one inch square, upon the bottom. Lay one in the middle (G H), and three toward each end, about thirteen inches apart. Let them be long enough for the ends to project an inch over each side. Drive an inch-and-a-half screw through the middle of each strip into the bottom.

Then turn over the bottom board and drive from four to six screws the other way, as at I, taking care to drive screws into each strip not more than an inch from the crack between the boards, and not more than that distance from the outer edge.

You would do well to put these screws in first, and afterward put in as many others as may be necessary to keep the bottom from warping. Use the gimlet and countersink, and dip the screws into oil or paint before driving them. The heads of all the screws, which are drawn large in the cut so as to show distinctly, should be below the surface.

The ends of the strips, or braces as we will now call them, should be sawed off to correspond with the bevel of the edge which is just below them.

You will now need fourteen pieces of the inch-square hard-wood. They are for the ribs, and each one should be one foot long. Fit one of the ribs to each end of the middle brace, so that the angles at G and H will be 120 degrees. Fasten the ribs to the brace by an angle-iron (H), which any blacksmith can make. A temporary brace (S)

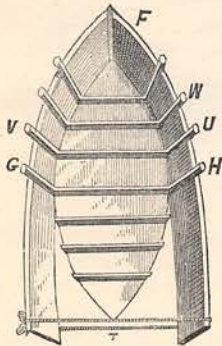


FIG. 3.—THE SIDES.

should be nailed into the ribs, G and H. A triangular piece (F), called the "dead-wood," is fastened with a block at an angle of 120 degrees with the bottom.

You must do the same with the other end of the bottom, which does not show in Fig. 2. You will then have seven braces, two ribs, and two dead-woods, all fastened to the bottom of the boat.

The boards for the sides should be of half-inch pine or three-eighths-inch ash. They should be of

uniform thickness, with both sides smoothly planed. The length, fourteen feet; and the breadth, fourteen inches. Mark the exact middle of one of the boards, and place that mark against the rib H (Fig. 3). Let the lower edge project four inches below the bottom, and fasten the side to the rib with about five screws.

Now fasten the other side to the rib G in like manner. Tie a string around the ends at T, so that they will not spread. Bring the other ends,

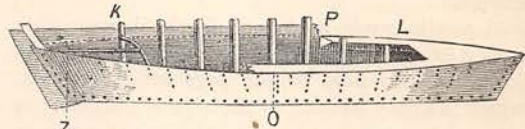


FIG. 4.—THE DECK AND CURVED BRACES.

at F, as near to each other as possible, and confine them with a string. Commence at H to fasten the side upon the bottom. Put in inch-and-a-quarter screws, about three inches apart. When you have reached the first brace, put the rib U in place and fasten it.

Pass to the other side, and fasten the bottom edge from G to V, and also the rib V. Return now to the first side, and fasten from U to W and the rib W. Do this alternately until you are within a foot of the end, F. You will then be obliged to cut off the ends of the side boards, in order to bring them up to the dead-wood at F.

This process is shown more plainly in Fig. 4. Your boat now looks something like Fig. 3; and the same course is to be followed as you commence at G and H and fasten toward the end, T.

The edge of the boat is rough, and the ribs project, as appears from K to P in Fig. 4. Having marked O, nine inches, and Z, eleven inches, you must trace a gradual curve each way from the middle. Be very careful about this, especially as you saw through ribs and all while following the mark. One edge in Fig. 4 is cut off in this way. The under edge is easily trimmed so as to be even with the lower surface of the bottom board.

The ribs nearest the ends should be connected at the top by the curved braces, K and L. A straight brace should extend from the middle of the curved brace to the top of the dead-wood. The corners which were left when you sawed out the bottom will now be of use. From them you can cut sixteen triangular pieces for brackets to support the deck. Let these brackets be upon each edge, seven, six, and five inches respectively. They are to be fastened half-way between the ribs with screws from the outside. The screws enter the edge which is six inches long, leaving the five-inch edge to receive the deck. Quarter-inch pine makes the best deck, and the fewer pieces in the

deck the better it will be. The greatest breadth of the boat across the deck will vary, according to the manner in which you have done the work. It ought to be about three feet two inches, and the extreme length twelve feet. For security, it is well to fix a ring and staple in each end of the deck.

Benches or stools make good seats, but these you can arrange according to your fancy. A false bottom of slats will help to preserve the true bottom. You can fit a rudder to either end, if you choose.

A paddle can be used to good effect in propelling such a boat as this, but oars are better. For oar-locks you can have simple pegs set in a block, which is firmly screwed to the edge of the deck; or you can buy iron oar-locks which fit into a hole in a block which is fastened as above; or you can have iron arrangements like Fig. 5 made at the blacksmith's. There may be two of these, each made of inch horseshoe iron. They pass through plates of one-eighth-inch iron, screwed into the deck and into the bottom, and are eighteen and a-half inches long. They are straight for thirteen inches of this length, and are finished with a thimble in which the pin of the iron oar-lock can play.

All the carpenter-work of the boat is now com-

pleted, and you must turn your attention to the painting. After the first coat, or priming, paint two other coats of whatever color you wish. Upon

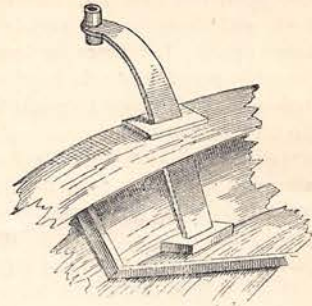


FIG. 5.—IRON SUPPORT FOR OAR-LOCK.

your choice of a color for the body will depend the color for the trimmings. If your own taste is not reliable, perhaps your friends will advise you how to paint.

At length, having followed these directions, you will have the satisfaction of launching your craft; and if it be carefully constructed, it will prove to be a very safe and a very useful boat, and not least among the pleasures you will experience will be that of having made it all yourself.

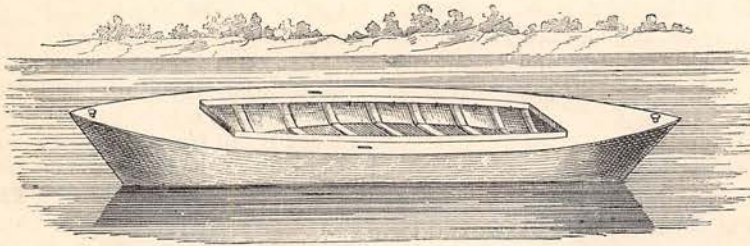


FIG. 6.—THE BOAT COMPLETE.

LITTLE Peri-Winkle,
 With her eyes a-twinkle,
 Said, "I am going to the ball to-night."
 But nobody could wake her,
 Hard as they might shake her,
 For she went to sleep with her eyes shut tight,
 And never waked up till the sun shone bright.