

How to Build Sea Gull

Small sailboat is eighteen feet long with a beam of seven feet. Uses jib-headed mainsail

By W. F. CROSBY

SEA GULL is presented herewith as another of THE RUDDER series of "how-to-build" articles that have appeared from time to time over a period of many years. She is eighteen feet in length with a beam of seven feet and is the simplest type of real boat that it is possible to build. No steam bending is required anywhere in her construction and she may be made from materials that are available almost anywhere. She should make a fairly fast and seaworthy boat for her size and will most certainly prove to be a fine little craft for a one-design class.

The accompanying blueprint tells the entire story of her construction. On the sectional drawing you will find a complete list of materials necessary and on the table of offsets will be found all the measurements for making the molds which, by the way, remain in the boat as frames. The sail plan, at the right, shows the sizes of the spars and sails and the sails are so simple that even an amateur ought to be able to make them.

The sizes given in the midship section are approximate only and if your local lumber yard cannot supply them exactly as given, you may get the next nearest thing available. An eighth of an inch one way or the other will have little effect on the completed boat.

The plan at the left has a scale accompanying it which may be used with a certain amount of discrimination for general measurements. It should not be used in place of the table of offsets for the molds, as the paper upon which it has been printed has probably stretched a little in one direction and has shrunken in the other. Since the scale is relatively small as reproduced it stands to reason that it is quite possible to make an error of a half inch or more on the scale. Do not, under any circumstances, use the scale for the sections or for the plan below.

In the construction of this boat, the first thing to do is to work out the keel and keel batten with their attendant stem, fairing the keel and its batten into the stem which is only three inches wide. The keel and keel batten must be wider to permit the introduction of the center-board. The construction at the center-board trunk may be varied to suit the particular fancy of the builder as there are many different ways of accomplishing the same end.

With the keel, keel batten and stem fastened together with copper or galvanized iron rivets over galvanized or copper washers, these members may be set up on the floor, using the table of offsets to secure the proper curve. This is given in the "heights above base line," in the first row of figures. If you wish the boat may be built upside down by erecting uprights from the floor to the height as specified in the offset table and then deducting the thickness of the keel and its batten. This will probably make the planking job somewhat easier. The slot for the center-board may be cut either before or after the keel has been set up, or you may wait until the boat is planked before doing this job.

It will be necessary to lay down the sections as shown,

on a fairly smooth floor, using the table of offsets only and laying down the sections to full size scale. The materials for the frames may be worked over these lines and the brackets at the chine placed so that they will hold their shapes. With both sides of the frame made, they are connected together across their bottoms with a floor of the same thickness as the frame, and across the top with a temporary piece strong enough to hold the entire assembly firmly in shape. Be sure to deduct the thickness of the planking from the section lines after they are laid down on the floor.

The keel may be spaced off to the proper distances between frames and the frames may then be set up on the keel, making sure that each frame is plumb and square to its neighbor and to the keel. Each frame, when you are sure it is straight, should be securely braced in place.

According to the midship section there are three planks above the chine and six below. What governs this is the maximum width of the plank at the section having the greatest girth. The frames fore and aft should be divided into an equal number of parts in order that the planks shall run in a nice curve from stem to stern. Planking the boat with straight pieces as so many amateurs do, is certain to give some queer effects, the least of which will be feather edges where the planks end.

When you have divided each frame into an equal number of spaces, the notches for the seam battens may be cut. Notches are also cut for these members in the stem so that they will lie in flush with the inside of the planking when it is put in place. The battens are started by fastening them to the stem and are then sprung around the molds, each fitting into its proper notch in the frame and being fastened with a brass screw.

By now you will have a good idea of what she will look like and if for any reason a seam batten has to be forced into an unfair curve to make it fit into its notch, check your dimensions and see that you have followed those given. Each one should fit nicely. The chine log is nothing but a square piece of oak or similar material fitted into notches at the chine and then planed off to the shape as shown in the 'midship section. The bevel will change slightly from bow to stern, but this is easily worked by laying a piece of the planking, six or seven feet long along the frames in such a way that its under side will lie flush with the chine log and frames when the planing has reached the proper stage. The chine log may be clamped into position until finished off properly and then brass screw fastened to each frame.

The planking is clearly shown in the drawing and the first plank on should be the one next the keel. This is called the garboard strake. Its outer edge should come at the center of the first seam batten. The next plank is laid against this one in such a way that it is fitted fairly close and so that it covers the other half of this seam batten. The others are fitted in the same manner until the whole side is planked.

The boat may then be turned over and the center-

board trunk finished off, the clamp put inside, the side decks and coamings in and the forward and after decks as well. The beams under the decks are sawn to shape and the decking, composed of half inch tongue and groove material, laid in. This may then be covered with canvas and painted.

The center-board is made up of oak in several pieces sawn to the proper shape and doweled together with galvanized iron rods. It is pivoted at the forward end in such a way that it swings up and down easily. It may be necessary to put a small piece of lead at the lowest point in order to make it drop quickly. In the perspective drawing you will see a pin arrangement that holds it up when not in use and also a short length of rope with which it may be hauled up when lowered.

The rudder and tiller speak for themselves and may be made from oak. The rudder will, of course, be in at least two pieces, also doweled together like the center-board with galvanized iron rods. The mast is stepped just forward of the center-board and will have a tenon cut in it to fit the mortise in the block on the keel.

The sails should be made by a professional, as it is not an easy job for an amateur, but they *can* be made if one is not too particular about their set. A regulation brass track is used on the after side of the mast instead of the usual rings. This is far simpler and it permits the use of spreaders which would otherwise interfere with the hoops. The complete rigging is shown in detail on the right hand side of the drawing, with all dimensions necessary. A back stay is used from the mast head down to a point on deck just forward of the traveler. Halliards for the jib and mainsail are run through sheaves on deck at the foot of the mast and thence through the coaming to cleats aft. The jib sheet is double and runs through small bull's eyes on the forward coaming. All of the standing rigging may be made from quarter or three-eighths inch galvanized wire rigging material and the shrouds are set up with small turnbuckles which should be attached to pieces of fourteen gauge brass run down inside the planking for a distance of at least eighteen inches to distribute the strain.

Sea Gull should make an inexpensive and easy boat to build and should be fast for her size, making her an ideal boat for the education of the younger sailors. No other sails are shown because no others are needed. A small spinnaker may be rigged up but it is not essential except when used for racing purposes. The rig is not too tall and with the beam of seven feet and with two people in her, she should prove to be practically non-capsizable.

Be sure that the location of the mast in relation to the center-board remains exactly as it is shown in the blueprint, for Sea Gull is balanced to sail properly. Changing the sail area or other factors will throw her out of balance and she will not behave properly. Remember also that in a boat as small as this, the shifting weight of two people or of even one person will have some effect on her sailing qualities. After you have sailed her a few times you will find out where the captain should sit and also where the crew of one should sit in order to secure the best balance. As shown in the plans the hull is a little deep in the water but this is done to make up for the weight of the crew. Under some conditions it may be necessary to add some ballast although these features can best be found out by trial. Old window weights, broken up into lengths of about six

or eight inches will make excellent ballast and may be added until you think she is in the proper trim. Sometimes a boat will sail a lot better with some ballast than she will without it and in some cases "too much" ballast has proven to be exactly the right thing for a boat that has been slow.

No seats or flooring are shown in the plans for the simple reason that the individual builder can decide these things for himself. A rather neat flooring may be made of three-quarters of an inch material laid across beams, the ends of which rest on the chine log. By using flooring about three or four inches wide and allowing a space of a quarter inch between pieces, you may be sure of having a sweet bilge at all times. A light slat flooring may also be laid up under the forward deck for storing sails, anchor, spare line and so on.

For seating arrangement a thwart across about amidships butting up against each side of the center-board trunk will be a good thing, as it reinforces the trunk and at the same time makes a good place for the "crew" to sit. From here side seats may be run aft so that the man at the tiller can shift over from side to side easily.

A few further points on construction will not be amiss. The transom should be made of one and a quarter inch oak or mahogany and a frame should follow all around inside it, forming a cheek piece which will take the fastenings in the planking and at the same time strengthen the transom. The transom is on a rake and, therefore, in the body plan appears a slightly different shape from the other sections, but by following the table of offsets and laying it off true to these, there should be no difficulty.

In making up the galvanized or copper fastenings to go through the keel and stem and from the keel to the stern knee, burr up one end of the rod and place a washer over it. Drill the hole for the rod, slightly smaller than the actual size of the rod and, after putting it to the proper length, drive the rod through. The outboard ends should all be countersunk, the driving being done from the countersunk end. Another washer is slipped over the inboard end and any excess metal sawed off with a hacksaw. With a "holder on" outside with a weight against the head already burred over, the inner end is burred tightly over the washer, thus drawing the entire structure together tightly.

The outboard end, which has been countersunk, is then filled with marine glue and a wooden plug driven in and finished off flush with the keel. Before putting the keel and keel batten together be sure to coat each of the surfaces with a good layer of white lead or old, thick paint to preserve the wood. Of course, the same thing should be done where the stem joins the keel and wherever other wooden members come together for good. This includes the seam battens in their notches in the frames and stem, around the center-board trunk, etc. By using a little care here, the useful life of the boat may be prolonged indefinitely.

No plans are available for this craft other than those shown here. The materials as specified are standard practice in the eastern part of the United States and if for any reason certain woods are not easily secured in your neighborhood, consult your local lumberman and find out the type of material that is closest to the one specified. Exclusive of sails Sea Gull should be built by an amateur for around \$100.00.