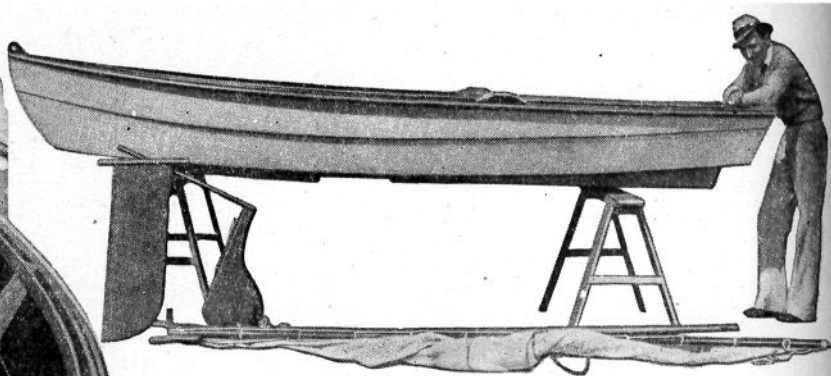


BUILDING A

General



HERE is a rowboat that is in a class by itself—the final development of a long line of forerunners. This graceful little V-bottom craft is 13 ft. long, carries from four to six passengers, rows easily, sails like a charm, and may be powered with a small outboard motor of from 2 to 12 H.P. for fishing, camping or high adventure. The construction is relatively simple and the cost of materials low—not more than \$30 at most.

Mate has been tested under all conditions and is exceptionally seaworthy and dry in choppy seas. The lap-strake con-

struction makes the hull rigid and insures that it will remain water-tight even when the boat is taken out of the water and put in again at infrequent intervals. The boat weighs

from 175 to 190 lbs., depending upon the materials, and consequently may be transported easily by trailer.

Before starting the construction, study the plans and list of materials carefully. Although this hull has already been laid down full size on paper, many times a better conception of the boat as a whole may be had by the builder if he does this work himself. Incidentally, patterns of the stem, breast hook, skeg, and transom knees may be taken from the full-size layout.

The 2 by 10 in. by 12 ft. form upon which the hull is built should be shaped

and notched out for the frames as shown. Mount the form upon wooden legs similar to a sawhorse and high enough to be convenient.

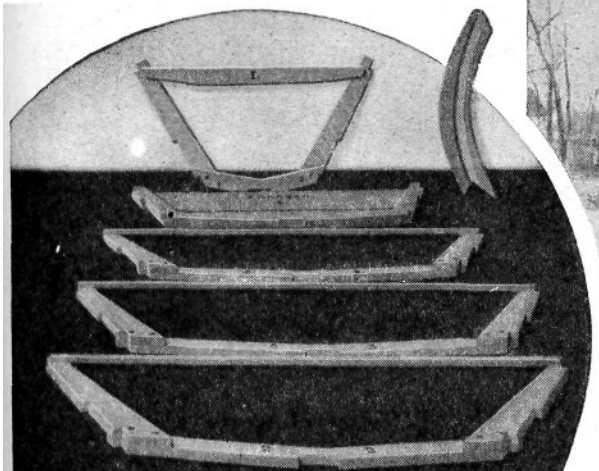
Make full-size paper patterns of the stem and frames. Lay them on the $\frac{3}{4}$ -in. frame material and the $1\frac{3}{4}$ by 8 by 27 in. stock for the stem. Prick the outline through by driving brads and removing them or by using a dressmaker's toothed wheel. Connect the marks with pencil lines. To allow for beveling, leave the top edge of side members marked Nos. 1 and 2 fully $\frac{1}{2}$ in. wider. This edge will then measure 2 in. Saw the frame parts and stem to shape and trim the edges evenly.

Lay the side and bottom frame members on the paper patterns so as to conform to the outline, and bolt together with two 2 by $\frac{1}{4}$ in. carriage bolts at each joint. Before fastening, coat the adjoining surfaces with casein glue. Nail $\frac{3}{4}$ -in. wood strips across the frames to hold the shape.

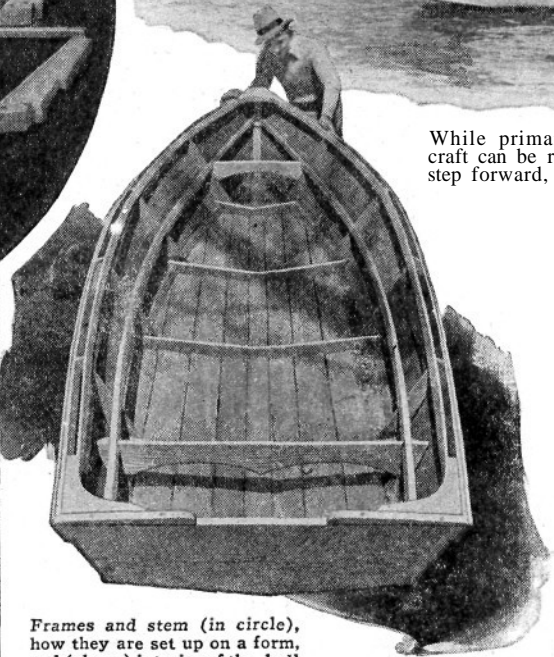
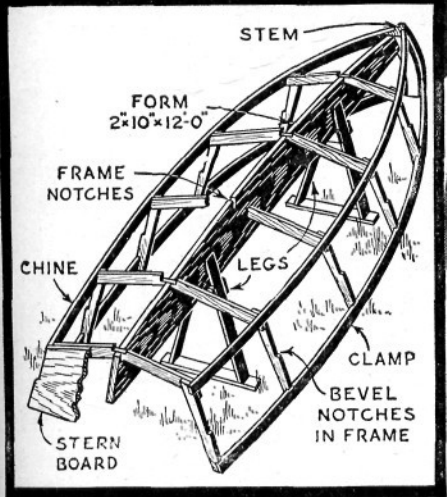
The stem is now carefully beveled and rabbeted as shown in the three details. Cut the rabbet $\frac{1}{2}$ in. deep, using a piece of planking with the edge cut square as a depth gauge.

Utility Rowboat

AN IMPROVED DESIGN FOR AMATEUR BUILDERS . . TAKES SAIL OR MOTOR



While primarily a rowboat, this stanch little craft can be rigged for sailing. There is a mast step forward, a small centerboard, and a rudder

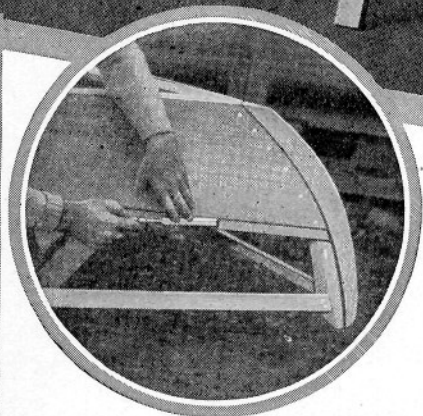
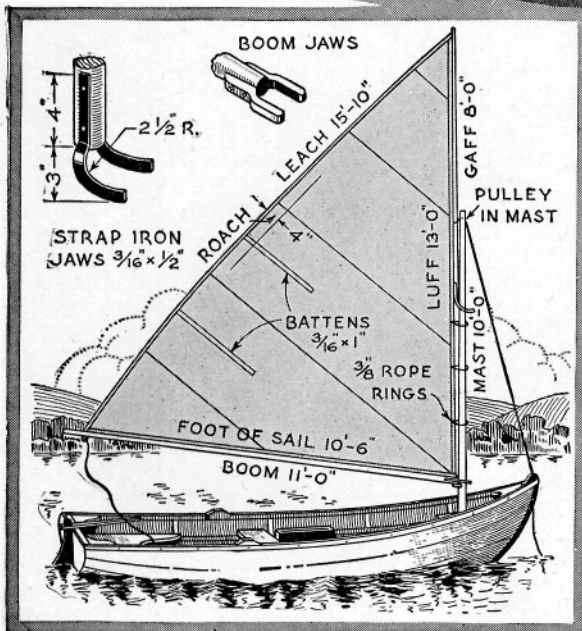
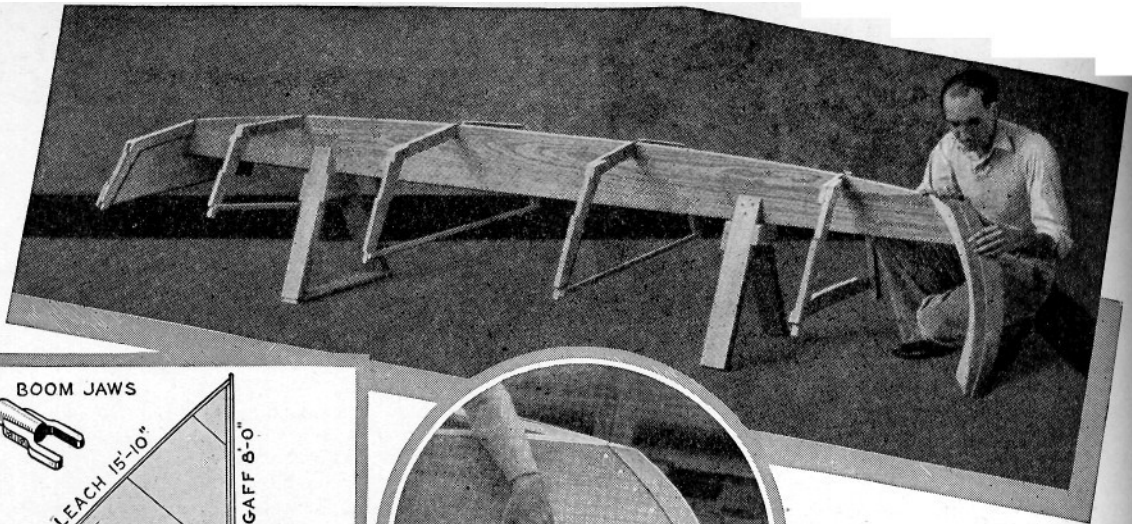


Frames and stem (in circle), how they are set up on a form, and (above) interior of the hull

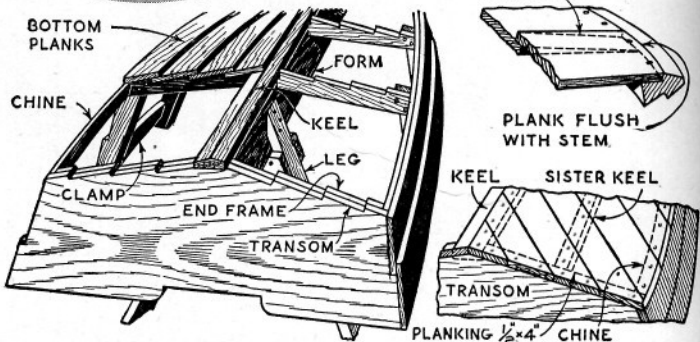
Clamp the stem to the form and temporarily assemble the frames on the form. Bend a light batten around the frames, and mark the bevel on the outside frame edges. Remove frames and bevel edges. Cut the notches for the clamp, keel, planks, and chines in the frames, following the bevel on each frame.

Replace the frames on the form and fasten the $\frac{3}{4}$ by 3 in. keel to each frame and to the stem with two $1\frac{3}{4}$ -in. No. 8 F.H. (flathead) screws. Incidentally, galvanized screws are cheaper and will serve as satisfactorily as brass.

The " frames are set up on a notched form made as shown in the drawing at the preceding page. This form is placed on legs like a sawhorse at a convenient height for working in comfort



As the boat is of lap-strake design, the planks are overlapped except at the stem, where both planks are chiseled out to allow the upper to come flush with the stem, as shown at left and below



The sail plan and, at right, how the side planks are fitted at stem and two methods of laying the bottom planking—lapped or laid diagonally with butt joints

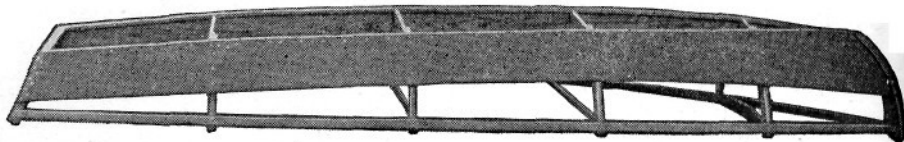
Square and line up the frames, and clamp the $\frac{3}{4}$ by $1\frac{1}{2}$ in. chines in place. Fasten the chine to each frame with one 2-in. No. 10 F.H. screw. Fit the forward ends against the keel and fasten with one $1\frac{3}{4}$ -in. No. 8 F.H. screw on each side. Fasten both chines simultaneously.

Square and line up the side members, clamp the $\frac{1}{2}$ by $1\frac{1}{2}$ in. clamp piece in place, and fasten to each frame with one $1\frac{1}{4}$ -in. F.H. screw. Fit the forward ends to the stem, just behind the rabbet, and fasten with two $1\frac{1}{4}$ -in. No. 8 F.H. screws.

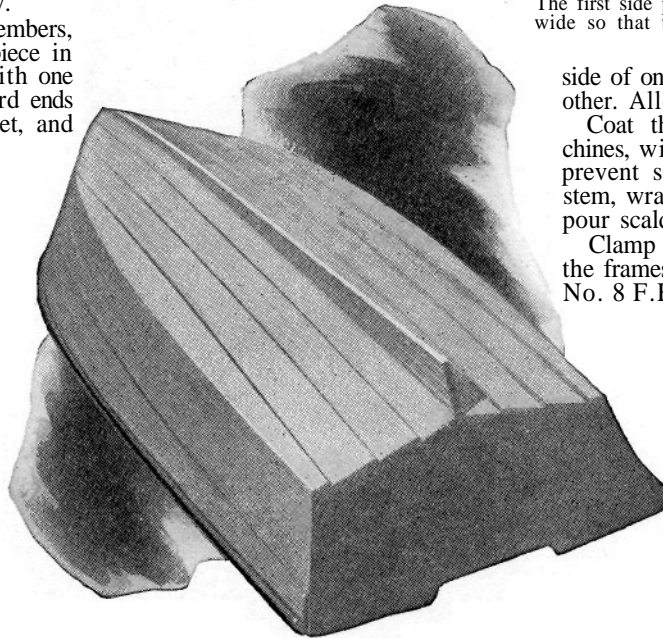
Trim and fair the entire frame, planning all joints down so the planking will fit evenly.

The planks on each side next to the chines are attached first. Clamp a $\frac{1}{2}$ by 12 in. by 14 ft. plank in place so it fits the frame notches snugly. Carefully measure and fit the forward end in the stem rabbet. Mark along the chine edge, remove, and saw to shape.

To make the side and bottom planks fit flush together at the forward ends, a rabbet joint is cut with knife and chisel as shown. The depth of the rabbet runs from nothing 24 in. back from the end to half the thickness of the planking at the outer end. The cut will be on the out-



The first side planks are sawed from a board 12 in. wide so that they fit the frame notches accurately



A bottom view of the hull. Note particularly the skag. It is a $\frac{3}{4}$ by 1 in. strip with a triangular filler piece at the stern

side of one plank and on the inside of the other. Allow 1 in. for plank lap.

Coat the stem rabbet, transom, and chines, with "C" quality marine glue. To prevent splitting the side planks at the stem, wrap the forward ends in sacks and pour scalding hot water.

Clamp the plank in place and fasten to the frames, stem, and chines with $1\frac{1}{4}$ -in. No. 8 F.H. screws spaced at $2\frac{1}{2}$ -in. intervals. Fasten the other side similarly. The planks next to the clamp piece are now fitted. Before fastening them, coat the lap, stem rabbet, frame edges, and clamp with marine glue. Fasten the lap together and fasten the plank to the clamp with $1\frac{1}{4}$ -in. iron or copper clout nails, spaced $2\frac{1}{2}$ in. on centers, clinching nails on the inside. Drill lead holes for all nails and screws.

If considered desirable, short lengths of planking may be used at an angle to make

an easily built but stout bottom by the alternative method shown on the plans. The regular lap-strake bottom planking, however, is attached as follows: The two center planks are the only ones requiring fitting. Mark a center line on the keel. At frame No. 3 clamp the first plank in place so the edge is even with the center line. The forward and after ends will overlap. Measure, mark, and saw off the surplus so the plank edge fits even with the center line. Bevel the center seam edges and allow a 1/16-in. seam. Clamp the plank fore and aft, edge even with center line, and mark each frame along the outside edge. Remove the plank and make a saw cut 3/8 in. deep on the outside frame mark. Chisel out frame and transom notches as shown. Cut the plank notch at frame No. 1 to a depth of 3/16 in. Coat the keel, transom, and chines with marine glue. Clamp planks in place and fasten to the keel, chines, frames and stem with 1 1/4-in.

No. 8 F.H. screws, spaced 2 1/2 in. apart. The forward ends of the planks are lapped in a manner similar to the side planks. Countersink screws along the keel to allow for planing so the skeg will fit evenly.

FASTEN the remainder of the planking in like manner, allowing 1 in. for plank lap. Fasten the lapped edges together with 1-in. iron or copper clout nails, spaced 2 in. apart. Hold an iron on the underside while clinching. Before fastening a plank, thoroughly coat the lap with marine glue and place 1 in. wide muslin tape over the glued area. This insures a permanently water-tight joint.

The 3/4 by 1 1/4 in. seat riser is fastened to the frames at the height shown, with one 2-in. No. 10 F.H. screw at each joint. Slightly notch the frames for the riser. Nail a small block to the stem directly under the ends of the risers, and nail risers to block. Fasten the after and forward seat supports in place with 1 1/4-in. No. 8 F.H. screws. To hold the rear seat support, 3/4 by 1 1/2 in. legs are screwed to the support and chine with 1 3/4-in. No. 8 F.H. screws. The after edge of the transom seat is supported with a 3/4 by 1 1/2 in. piece screwed to transom. Bolt the mast block through the planking and keel with two 3 1/2 by 1/4 in. carriage bolts. Shape the seats as shown and fasten to the supports and seat riser with 1 1/4-in. No. 8 F.H. screws. Saw a circular hole in the forward seat for the mast directly over the mast block. The center of the mast should be 24-in. back from the top edge of the stem.

The breast hook and transom knees are now marked out on the 1 1/4-in. stock and sawn to shape. Cardboard patterns used as templates will eliminate much of the fitting. The breast hook should be slightly curved on top. Fasten in place with six 2-in. No. 10 F.H. screws, and use four screws to each transom knee.

THE 1/2 by 1 1/4 in. gunwale is fitted and fastened to the breast hook, frames, and transom knees with 1 1/4-in. No. 8 F.H. screws. Bevel the top edges of frames Nos. 1, 2, and 3 so the gunwale fits evenly.

The sheer molding is a piece 3/4 by 1 1/4 in. with the edges rounded. Fasten to the sheer with 1 1/4-in. No. 8 F.H. screws spaced 6 in. apart.

Bolt each oarlock through the sides as indicated with two 3 1/2 by 1/4 in. carriage bolts. Fit oar sockets and fasten with 1 1/4-in. No. 8 F.H. screws.

For the well, saw a 3/4-in. slot about 18 in. long through the keel and planking, from the after side of frame No. 2 to a point where the forward edge of the middle seat is over the other end of the slot. Two supports 3/4 by 1 1/2 by 16 in. are now coated with white lead or marine glue, and driven into each end of the well slot. Screw the forward post to frame No. 2 and the afterpost to the edge of the seat. Fit the 3/4 by 12 in. well sides to the keel and posts. Liberally coat the bottom edges with white lead or glue, and clamp to the posts. First fasten the well boards from the bottom up, with four 2-in. No. 10 F.H. screws in each board. Fasten them to the posts with 1 1/4-in. No. 8 F.H. screws spaced 1 1/2 in. apart.

Turn the hull over and plane the center

seam flat so the skeg will fit evenly. Thickly smear white lead in seam. Fasten the skeg filler piece from the inside with four 2-in. No. 10 F.H. screws. The 3/4 by 1 in. skeg is now fastened to the filler piece and to the center of the keel with 2-in. No. 10 F.H. screws spaced 8 in. apart. Saw the skeg off at each side of the well slot, and bevel the skeg out to 3/8 in. at the stem.

Fasten the 5/16 by 2 5/8 in. floor boards to the frames as shown, separated 3/4 in., with 1 1/4-in. No. 8 F.H. screws. Provide short center supports between frames for the floor boards.

Sand the entire hull smooth. The seats and inside are varnished or painted as desired with three coats. The sides and bottom should be painted with three coats of good lead and oil paint. Sand lightly between coats.

The mast should be made as shown, 10 ft. long, tapering from 3 to 2 in. Saw it square on the bottom to fit the mast block. The boom and gaff may be sawn from a 2 by 6 in. plank. The boom is 11 ft. long, 1 3/4 in. in diameter; the gaff 8 ft. long, tapering from 1 3/4 to 1 1/4 in. Use spruce, fir, or yellow pine for the spars. Saw them out square, then shape them round with plane and sandpaper.

The sail requires 10 yd. of closely woven muslin or sheeting. Sew a 1/4-in. cotton rope inside the outer hemmed edge to prevent stretching. To lace the sails to the spars, insert 1/4-in. grommets every 10 in. on the boom and every 12 in. on the luff. Use four 3/8-in. rope rings on the mast, and lace the remainder of the sail to the spars with 1/4-in. cotton rope. Use 1/4-in. or 5/16-in. rope for the halyards.

The rudder, made as shown, is attached to the hull by fastening screw eyes to the transom and rudder, through which a 16 by 5/16 in. iron rod is dropped. Shape the rudder handle from a 3/4 by 2 by 30 in. piece of oak, and bolt to the rudder.

The 1/2-in. dagger type centerboard is merely pushed through the well. A 1/2 by 2 1/4 by 18 in. headpiece is notched all the way through and is screwed to the centerboard.

List of Materials

LUMBER

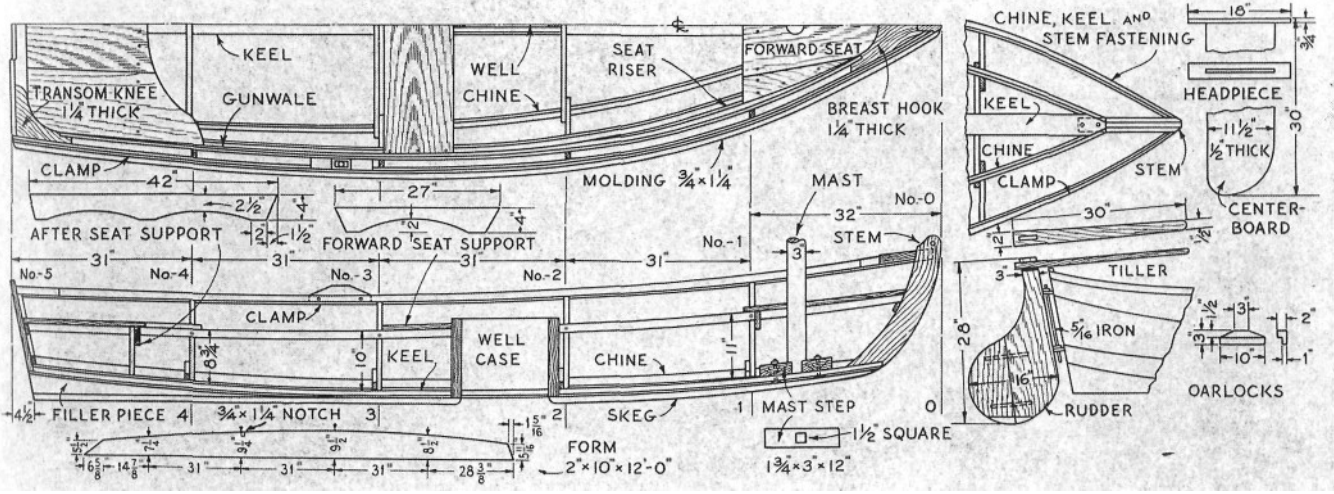
Planking: Sides, 2 pc. 1/2 by 12 in. by 14 ft. and 2 pc. 1/2 by 10 in. by 14 ft.; bottom, 2 pc. 3/8 by 6 in. by 8 ft., 2 pc. 3/8 by 6 in. by 10 ft., 2 pc. 3/8 by 6 in. by 12 ft., white pine, cedar, cypress, or mahogany.
 Frames: 1 pc. 3/4 by 6 in. by 14 ft., 1 pc. 3/4 by 6 in. by 8 ft., oak, spruce, fir, or mahogany.
 Transom: 1 pc. 3/4 by 8 in. by 8 ft., oak or mahogany.
 Floor boards: 2 pc. 3/4 by 6 in. by 10 ft., fir or yellow pine. Saw in two pieces and resaw to make eight pieces.
 Seats, well, and rudder: 2 pc. 3/4 by 12 in. by 10 ft., white pine, cedar, cypress, mahogany, or redwood.
 Centerboard: 1 pc. 1/2 by 12 in. by 3 ft., white pine, cedar, cypress, mahogany, or redwood.
 Breast hook and transom knees: 1 pc. 1 1/4 by 12 in. by 3 ft., oak.
 Oarlocks and mast step: 1 pc. 2 by 4 in. by 3 ft., oak, fir, or yellow pine.
 Stem: 1 pc. 1 3/4 by 8 by 27 in., oak.
 Sheer molding: 2 pc. 3/4 by 1 1/4 in. by 14 ft., oak, fir, or yellow pine.
 Seat supports (forward and after): 1 pc. 3/4 by 4 in. by 6 ft., fir, yellow pine, oak, or spruce.
 Centerboard posts, seat legs, and ledge: 1 PC. 3/4 by 1 1/2 in. by 8 ft.
 Chines: 2 pc. 3/4 by 1 1/2 in. by 14 ft., oak, spruce, fir, or yellow pine. Use the same wood for all the following five items.
 Clamps: 2 pc. 1/2 by 1 1/2 in. by 14 ft.
 Gunwales: 2 pc. 1/2 by 1 1/4 in. by 14 ft.
 Seat risers: 2 pc. 3/4 by 1 1/4 in. by 14 ft.
 Skeg: 1 pc. 3/4 by 1 in. by 12 ft.
 Skeg filler piece: 1 pc. 3/4 by 4 in. by 6 ft.
 Keel: 1 pc. 3/4 by 3 in. by 14 ft.

FASTENINGS

5 gross 1 1/4-in. No. 8 F.H. (flathead) brass or galvanized screws.
 2 doz. 1 3/4-in. No. 8 F.H. brass or galvanized screws.
 5 doz. 2-in. No. 10 F.H. brass or galvanized screws.
 1/2 lb. 1 1/4-in. copper or iron clout nails.
 1/2 lb. 1-in. copper or iron clout nails.
 16 carriage bolts, 2 by 1/4 in.
 6 carriage bolts, 3 1/2 by 1/4 in.
 4 large screw eyes for rudder, and 1 pc. 5/16-in. rod 15 in. long.

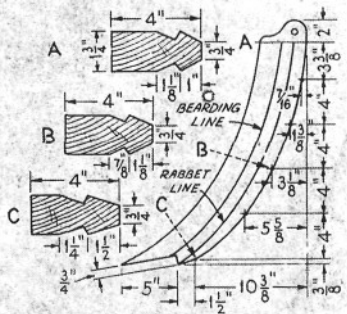
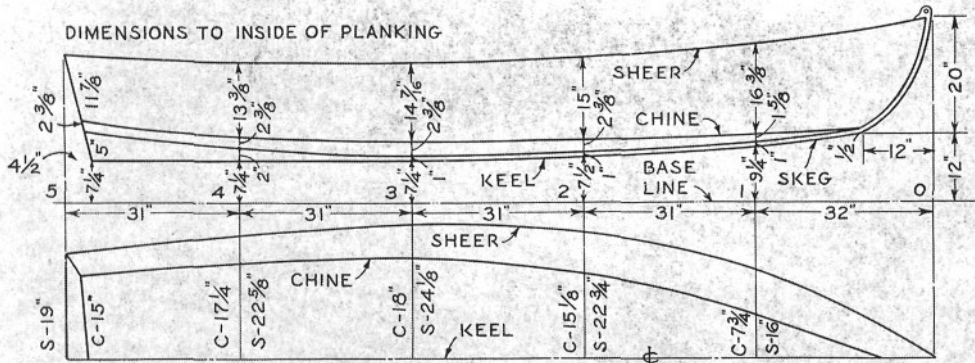
MISCELLANEOUS

1 pr. oars 7 ft. long.
 1 set oarlocks and sockets (North River style).
 1/4 lb. casein glue.
 1 qt. "C" quality marine glue (liquid).
 1/2 gal. paint for outside.
 1/2 gal. paint or varnish for inside.
 Small quantity white lead.
 Strips of cloth.

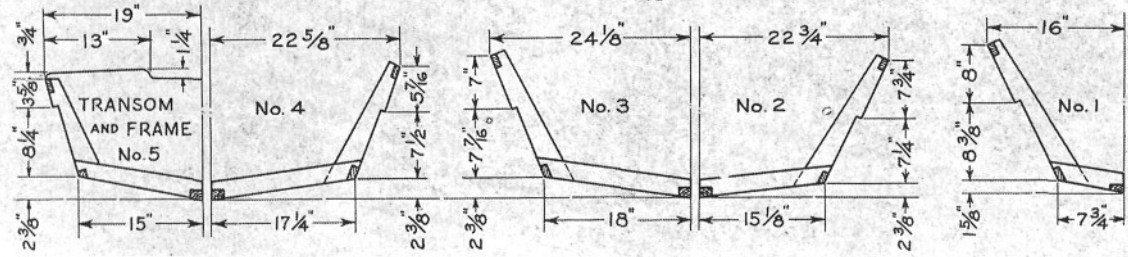


Top and side views of the boat; how the chines, keel, and stem are fastened; details of the centerboard, rudder, oarlocks, mast step, and construction form, and, on the facing page, the general layout and details of frames and stem. See the list of materials for dimensions of stock

DIMENSIONS TO INSIDE OF PLANKING



STEM DETAILS



FRAME DETAILS