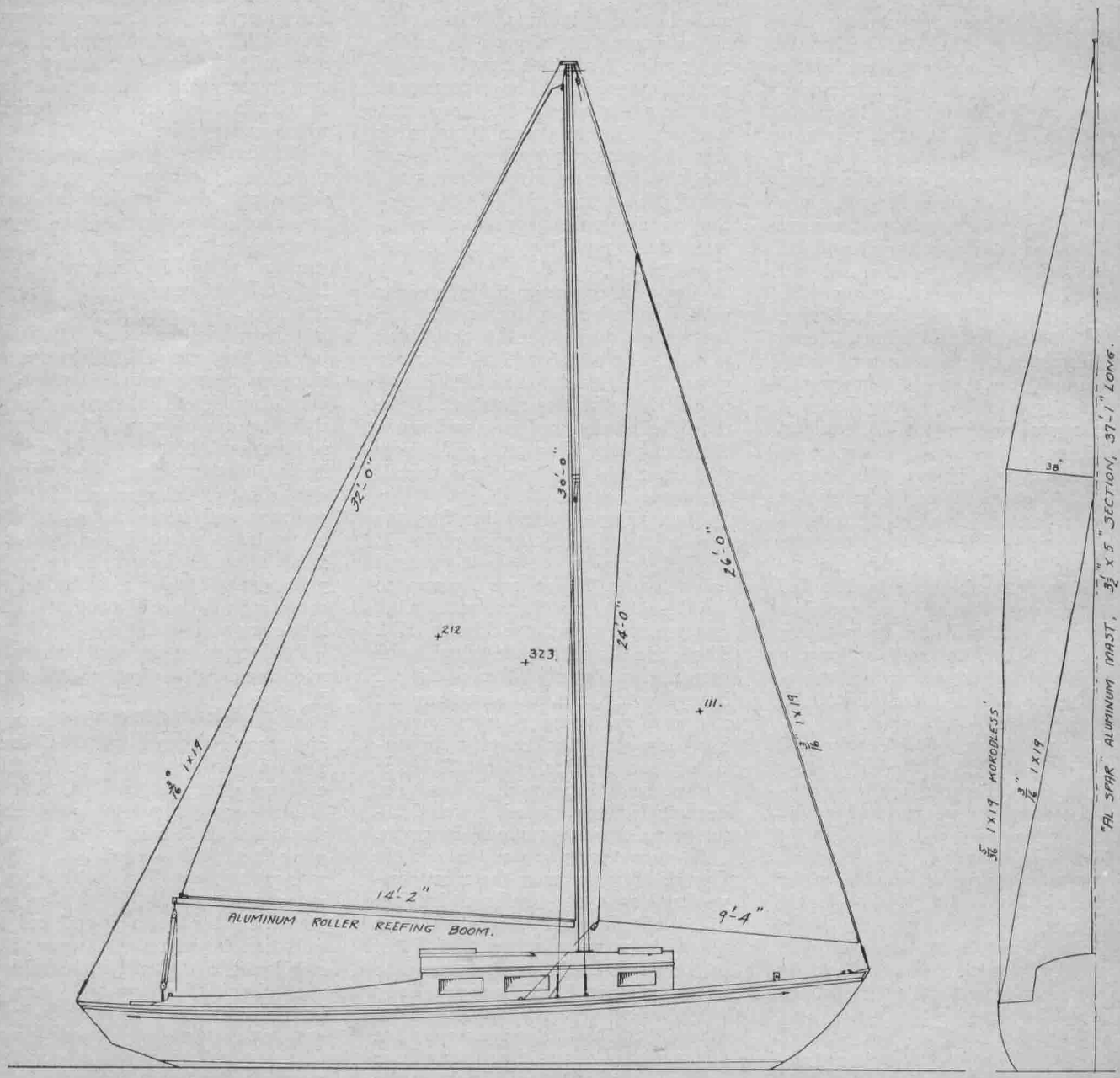
A SMALL CRUISING SLOOP

BY EDSON I. SCHOCK



NO. 261.
SAIL PLAN.

You'll have a lot of fun at the helm of this smart-looking little auxiliary. She has nice lines and should step out well under sail

Length overall	27'11"
Length at waterline	20'10"
Beam	8'
Draft	4'5"
Lead outside ballast	2000 lbs.
Displacement	7120 lbs.
Sail area	323 sq. ft.

This boat was designed for the amateur builder with a good grasp of boatbuilding fundamentals and considerable woodworking skill. He should have built a boat or two before trying this one.

Ownership of such a boat, however, is not limited to the experts. You can have a boatyard build a "planked hull' for you, consisting of the stem, keel, ballast keel, transom, floors, frames, engine bed, shaft hole bored, planking and clamps. From here you take over, decking her and building the cockpit and cabin, doing the interior work and installing spars, rigging and hardware.

By starting from a "planked hull," you eliminate the steaming and the heavy work, and you do the fussy part, which takes a lot of time. Time is what you pay for in a boatyard, so by this method you save a lot on the cost of the finished boat. This is really a very satisfactory way to build a boat.

Mold Loft Work

Laying down the lines is always the first job. This process is described so often we will not repeat it here, except to say that the keel, stem, transom and knee, floors, mast step, shaft log, engine beds, rudder and all main structural members should be shown on this drawing. Robert M. Steward's *Small Boat Construction* (Rudder Publishing Co.) details the lofting process, as well as other phases of building, very clearly.

Molds

Make a mold for each station, 12 in all. Any wood will do so long as it is strong enough to take the pressure of the ribbands.

Mark the center line and the waterline on each, both sides. The top of the molds should be about 6" above the sheer and the sheer marked. These ends are left for attaching overhead bracing.

Ballast Keel

Either a pattern or a mold is made for the lead keel. Better talk this over with the foundryman who is going to cast the lead for you and follow his suggestions. He will probably be set up to do it more easily one way than the other.

Also settle with him how the keelbolt holes will be made in the lead casting.

Stem

Have the stock planed to 3" thickness, two sides finished. Lay out the curve from the loft drawing; usually the easiest way is to cut out the outline from the drawing and use it as a pattern. Band-saw to shape.

Shape and rabbet the stem.

Do the same for the gripe between the stem and keel. Fit the scarph, and bolt these two together, with thick white lead in the joint. Where the rabbet crosses the scarph, fit white pine stopwaters. Use ⅜" Everdur bolts.

Keel

Have the stock planed to 2½" thickness, finished top and bottom.

Mark the center line and the stations. Measure the station spacing along the curve of the keel on the loft. (Tack down a batten, then mark, then transfer to the keel stock.) The half breadth of the rabbet at each station is given in the Offset Table, and the outside edge of the keel is 1½" outboard of the rabbet.

Draw the outline on the stock and band-saw to this line. Taking the bevel at each station, and fairing between, cut the rabbet. Use power tools if available, as this is a long job.

Transom Knee

Cut the pattern from the loft drawing. Band-saw the knee to shape. Where it fits against the keel and transom, smooth and square the surfaces.

If possible, get a natural crook for this knee. If none is available use a crooked-grain piece of oak, cut so that the little ends will not try to split off.

Transom

Lay out the shape of the transom on the loft, to the forward side. (The forward side is larger than the after side, so if you lay out to it, the bevels will not have to be added.) Use ¾" Philippine mahogany boards. Cut to shape, glue and dowel together and batten the seams.

Fit a sawed frame around the forward side to take the side-plank fastenings. Fit the transom to the inside of the planking and allow the side planks to overlap it. Put a stiffener up the center under the knee. Fit all seams tight—use no caulking.

Keel

Get out the 6" fir planks for the deadwood of the fin keel. A longitudinal section of these is shown on the lines.

They are bolted together and through the flat keel with ⅜" Everdur or Tobin bronze rods, except for those bolts going through the lead, which are ½" diameter.

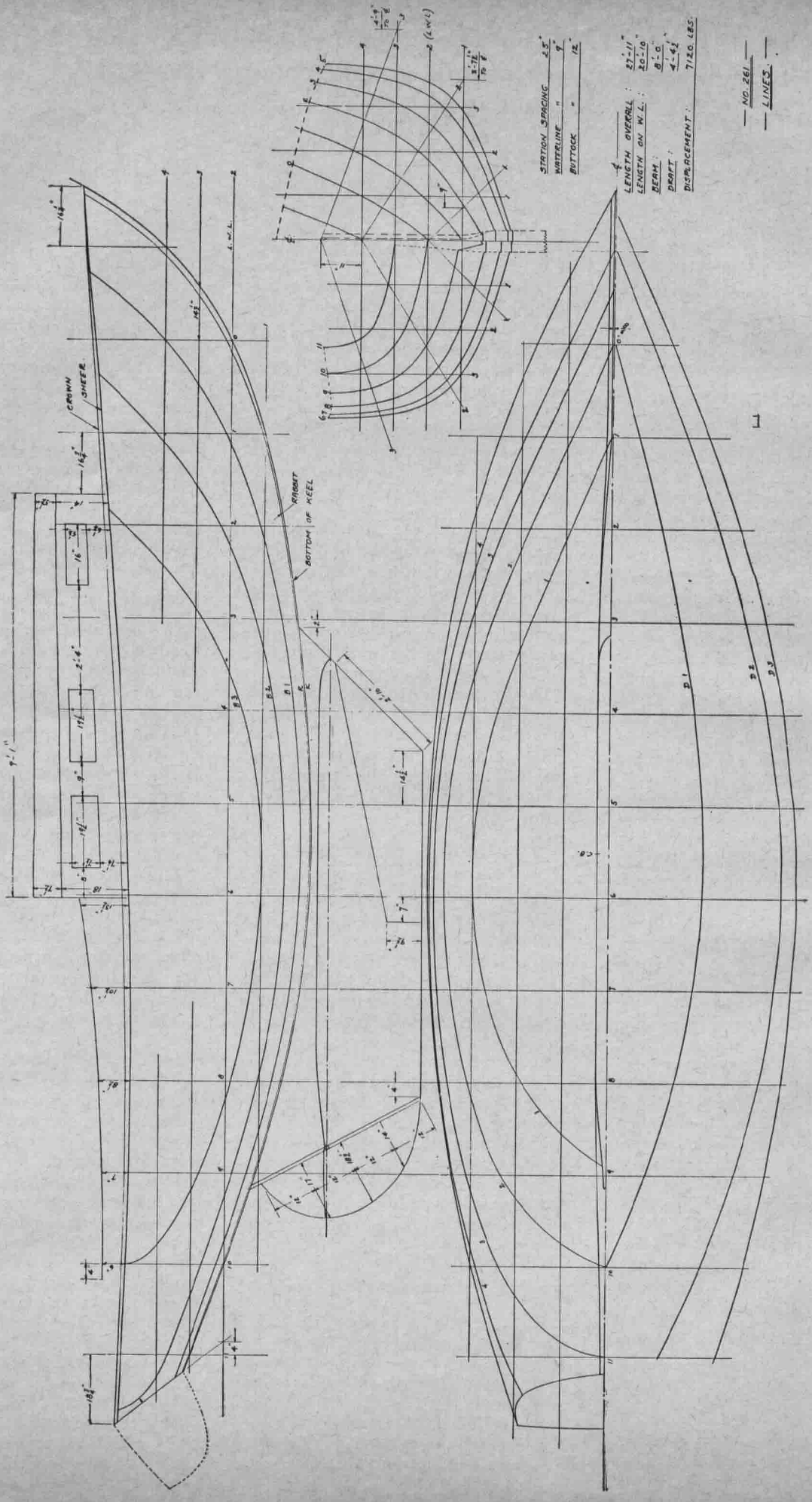
The sternpost is oak. Dowel it to the deadwood with bronze rods. Bore the flat keel for the rudderpost.

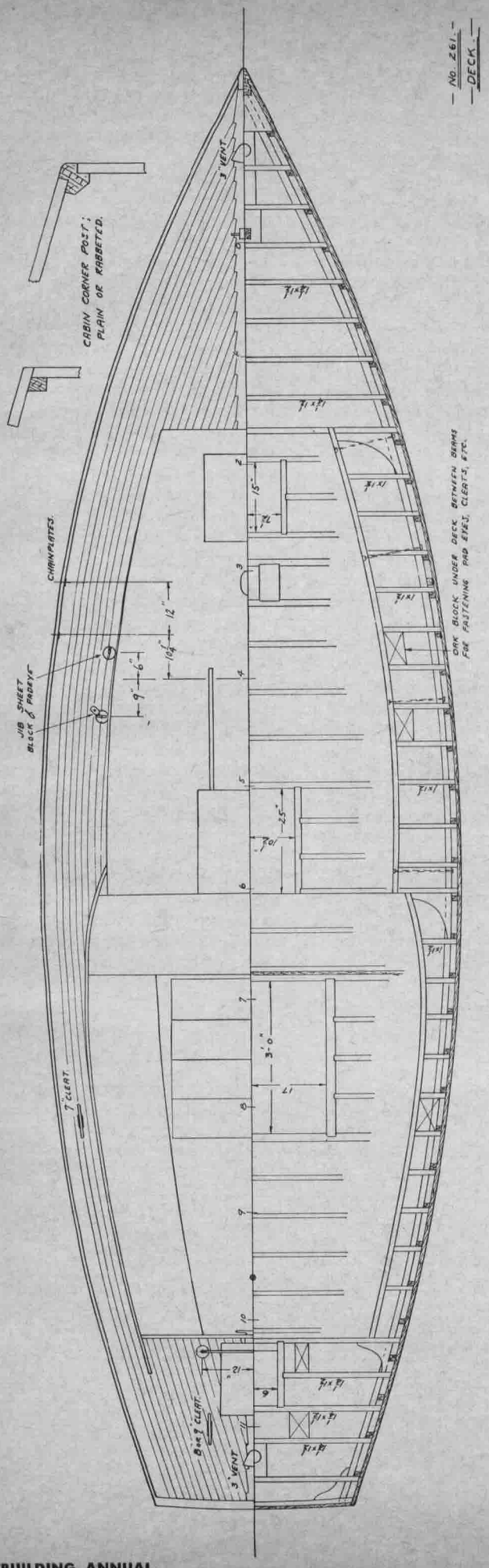
The ½" keel bolts go through floor timbers; the rest of the deadwood bolts can go through the flat keel only. It is easier to drill the keel than the keel and floors both. Make the bolt holes a watertight fit. Set them in white lead.

Assemble the fin horizontally on horses, then set it up on top of the lead. The lead should be set up from the floor of the shop on four-by-fours, long enough to distribute the load over a big area of the floor. Keep clear of the bolt holes, so that you can get at the nuts. The bottom of the lead should be counterbored for the nuts, with big enough holes to take a socket wrench.

Set up the keel assembly. Bolt on the fore gripe and stem, transom and knee. Brace everything to the overhead framing of the shop. The keel should be level and plumb and straight.

Set up the molds with the forward side on the station line forward of amidship and the after edge on the line aft. Brace them to the overhead, and be sure they are square across the ship and plumb. Check the cen-


NO. 261
LINES.
STATION SPACING 4.5"
WATERLINE " 9"
BUTTOCK " 12"
LENGTH OVERALL : 27'-11"
LENGTH ON W.L. : 20'-10"
BEAM : 6'-0"
DRAFT : 4'-4½"
DISPLACEMENT : 7120 LBS.
CROWN
SHEER
KEEL
BOTTOM OF KEEL



ter line with a wire stretched as tight as you can make it. Use diagonal bracing to hold the molds square across the boat.

Keel posts at the ends of the boat should be well braced and carefully measured to have the outline, or profile, of the keel correct.

Ribbands

Use the strongest stock you can bend around the molds. Something about 1¼″ thick and 1½″ to 1¾″ wide would be a good first try. Use Douglas fir or yellow pine. Space the ribbands about 10″ to 12″ apart.

Put on the top one first, about 2″ above the sheer line. As soon as one is fastened on one side, put on the corresponding one on the opposite side. Fasten from the middle of the boat toward the ends. Screw the the ribband to the mold with a round-head screw with a washer under it.

Frames

Use 1⅛″-square straight-grain unseasoned white oak or elm. Steam the frames about an hour and a quarter in a steam box, or soak them in boiling water. Steaming is better. Cut the stock about a foot longer than the finished frame length.

Bend on the flat of the grain—that is, with the annual rings of the tree parallel to the planking.

Take a frame from the steam box. Fit the end against the keel. It may require notching. Nail it to the keel with one nail. Bend around the ribbands, pulling the frame toward the center of the boat and pushing down on the top. Twist it to lie flat against the ribbands, and clamp it to them.

There should be three men on the job. Work as fast as you can, before the frame cools. If marks are made on the ribbands where each frame is to go, it makes it easier to place them properly. Bend a batten around the ribbands and chalk-mark where it crosses each ribband.

Put in the amidship frames first, and work toward the ends. Keep both sides of the boat going together —a frame on one side, then one on the other.

Floors

This boat has a floor timber on each frame.

The ones over the lead keel, where the keel bolts go through the floors, are 1⅝″ oak; the rest are 1″ oak.

Fit the ones having keel bolts through them at the time you bolt up the keel assembly. The rest can go in after the hull is framed.

Drift-fasten them where they are over the deadwood, and bolt the rest. Use ¼" bronze bolts, two per floor, through the keel.

Rivet or bolt or screw the frames to the floors with three or four fastenings per frame. Make the floors a good fit against the keel, planking and frame. These are very important members of the structure, and should the keel touch ground, the floor timbers will take a severe load.

Cut limber holes in the floors.

Clamp

Transfer the sheer-height marks from the molds to the frames. Measure down from these marks 2" if you are using ½" deck, or 2¼" if you are using ¾" deck. This is the top of the clamp.

Cut away enough of each mold at the top to allow you to get the clamp in between the mold and the frame.

Bend the clamp around the inside of the frames, and bolt it to each frame with a ¼" galvanized carriage bolt, nut and washer on the clamp side.

Fasten to the breasthook at the bow and to the quarter knees at the transom.

Mast Step

With an aluminum mast, the wood part of the step is a plank on which the cast-aluminum step rests. Bolt it to the floors with ¼" bronze bolts.

Shaft Log

The shaft is 1¼" off center to port. The log size and exact location depend on the engine you use, but it is bolted to the keel in any case, using bedding compound or white lead in the joint. The shaft hole may be rough-bored before it is put into the boat and finished after.

Engine Beds

Make these from the engine builder's installation plan. Bolt them to the floors. Use oak.

For fastening the engine to the beds, use hanger bolts, not lag screws. This allows you to remove the engine without wrecking the thread of the screw in the wood.

Planking

Use ¾" white cedar or western cedar or 11/16" Philippine mahogany. Use narrow planks—say, not over 6" wide for the garboard, 5" for the sheer strake and the rest narrower.

Lay out the widths of the planks on the Body Plan on the mold loft at the amidship section. From here they taper fore and aft, so the maximum width will be shown here. Arrange the taper of the planks so that they will each have about the same taper and will look good when finished. Put on the sheer strake first. Take a spiling and fit the top edge to a line the deck thickness below the sheer. Do both sides of the boat.

Next fit the garboard. This will probably be the most difficult operation of the lot, and it has to be a good job.

Next plank is the one above the garboard. Plank up a few strakes, then put on a few below the sheer strake, planning to end with the middle plank. This one has less shaping than the others, so it is easy to put on last, when clamping is difficult.

The planks are fitted to touch on the inside edge and to be open 1/16" on the outside to receive the caulking.

Details of the planking procedure are in the SPORTS AFIELD Boatbuilding Annual for 1963 and in Mr. Steward's book mentioned above.

If possible, get a professional to do your caulking. This is a skilled trade, and when it is improperly done it can harm the boat.

If you do it yourself, caulk the tight seams first, leaving any that are open (a poor fit) until last. Begin at one end of the seam and drive the caulking-cotton strand in to about the middle of the thickness of the plank. Do not drive it in too deep. Leave room on the outside for seam compound.

Drive in the cotton in little loops, keeping the strand in compression all the time, never pulling it so as to have it in tension.

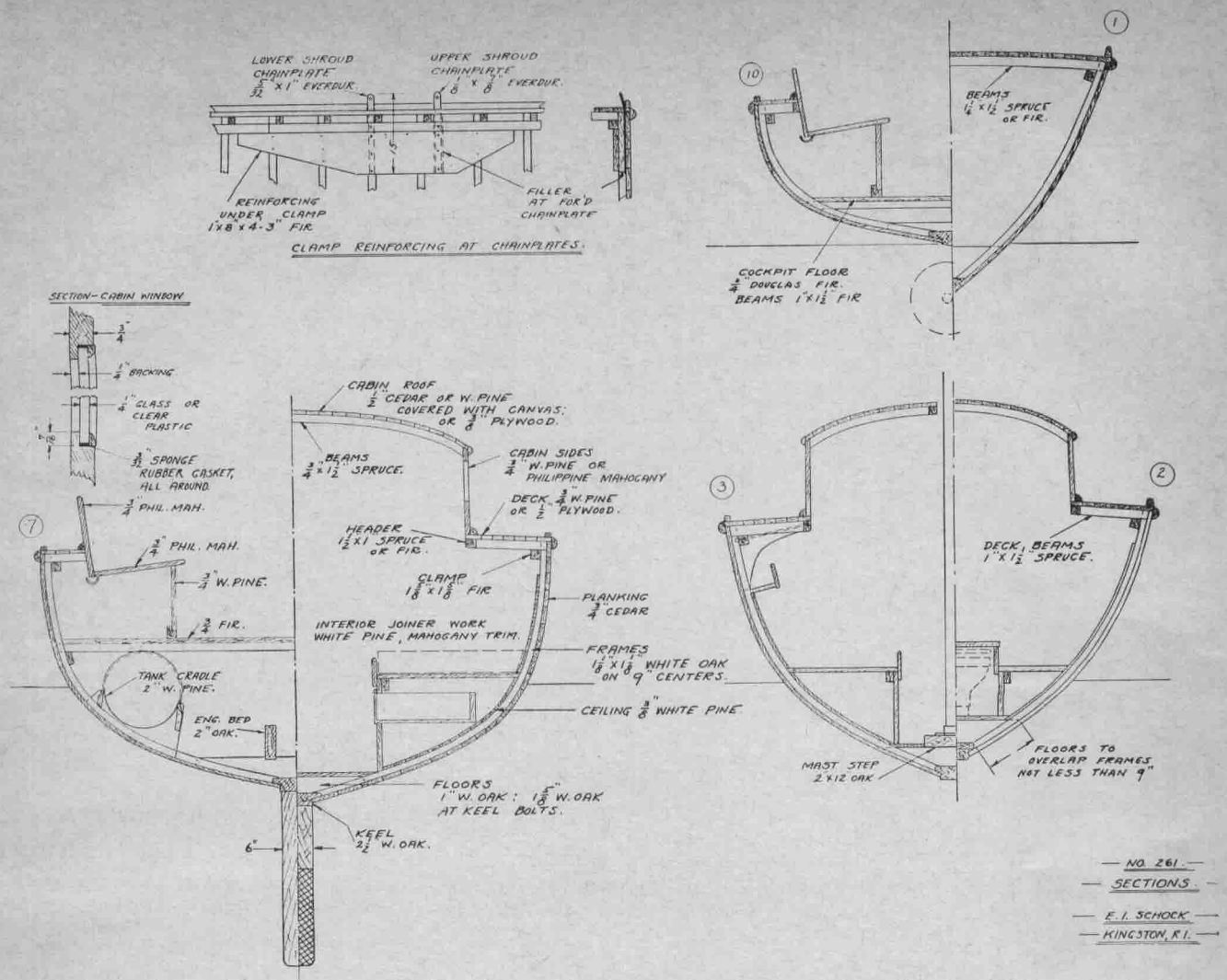
The planking is rough-planed before caulking, finished smooth after.

One method of getting the planking smooth is this: Make a batten of white pine, about ¼" thick, 2" wide and 24" to 30" long.

Rub one side with chalk. Press the chalked side against the planking and rub it about, keeping an even pressure all over the batten. This will leave chalk marks on the planking at the high spots, which may be planed off. When it seems smooth

OFFSETS IN FEET · INCHES · EIGHTHS .

STA.	DIAGONALS .			HALF BREADTHS .						HEIGHTS – FROM L.W.L.						
	1	2	3	RAB.	W.L.1	W.L.2	W.L.3	W.L.4	DECK	KEEL	RABBET	B1	B2	B3	SHEER	CROWN
0		0·10·5	1·3·5	0·1·4		0·0·3	0·6·7	0·11·7	1·8·3	0	0·1·5	1·6·0			3·0·5	3·1·4
1	0·7·3	1·8·0	2·1·6	0·1·4		0·10·5	1·5·7	1·11·1	2·6·0	0·9·4	0·8·1	0·1·3	1·7·5		2·10·2	2·11·6
2	1·1·4	2·4·4	2·10·4	0·2·3	0·10·2	1·9·6	2·4·3	2·8·5	3·1·1	1·3·3	1·2·0	0·8·0	0·2·4	2·4·3	2·8·2	2·9·7
3	1·6·6	3·0·1	3·5·4	0·3·0	1·9·1	2·7·5	3·0·7	3·3·7	3·6·4	1·7·3	1·5·6	1·1·7	0·7·2	0·7·1	2·6·3	2·8·2
4	1·10·5	3·6·0	3·10·5	0·3·0	2·5·6	3·3·0	3·6·7	3·8·6	3·10·0		1·8·7	1·5·4	1·0·4	0·3·6	2·4·6	2·6·7
5	2·0·4	3·9·3	4·1·1	0·3·0	2·11·0	3·6·5	3·9·5	3·11·0	3·11·5	4·4·4	1·10·0	1·7·1	1·3·0	0·8·2	2·3·3	2·5·4
6	2·0·6	3·10·1	4·2·1	0·3·0	3·0·0	3·8·0	3·10·6	3·11·6	4·0·0	4·4·4	1·9·7	1·7·2	1·3·3	0·9·0	2·2·4	2·4·3
7	1·10·3	3·8·1	4·0·6	0·3·0	2·8·4	3·5·6	3·9·2	3·10·5	3·11·0	4·4·4	1·7·2	1·4·7	1·1·2	0·6·5	2·1·6	2·3·6
8	1·5·4	3·4·0	3·10·3	0·3·0	1·11·0	3·1·2	3·6·5	3·8·3	3·8·7	4·4·4	1·3·0	1·0·5	0·8·4	0·1·3	2·1·6	2·3·2
9	0·10·0	2·9·4	3·6·3	0·2·4		2·4·0	3·1·2	3·4·5	3·5·2		0·8·1	0·6·0	0·2·1	0·7·1	2·2·0	2·3·1
10	0	2·0·6	3·0·4	0·1·6		0	2·4·5	2·10·6	3·0·0	0	0·0·2	0·2·1	0·6·1		2·2·6	2·3·4
11		1·2·0	2·5·1	0·1·2			0	2·2·5	2·5·0	0·9·0	0·9·1	0·10·5	1·3·0		2·3·6	2·4·4



enough, sand to the desired finish.

Ceiling

From Station 1 to the after end of the cabin, plank the boat on the inside of the frames the same way you plank the outside, using 3/8" white pine. Fit this ceilng carefully with tight joints. It adds to the strengh of the hull.

To do this, the molds must be taken out. Be sure you have cross bracing at the top of the frames to hold the boat in shape when the molds are out.

Deck Framing

Except at the ends of the house and cockpit, there is a deck beam on each frame. Bolt to clamp and frame with 1/4" galvanized bolts. The beams at the corners of the house have knees to provide extra stiffness, bolted to the beam and clamp. The header under the edge of the house is tied to the clamp with four tie rods of 5/16" or 3/8" bronze.

Under all deck fittings, fit blocks between the beams, very securely fastened.

The chain plates are let into the planking on the inside and backed with special reinforcing, as shown on the chain-plate-reinforcing detail. Bolt each chain plate with four 5/16" bolts through the planking, backing and reinforcing. The head stay is similarly fastened to the stem, and the backstay plate to the transom.

Finish all structural work under the deck before the decking is put on, such as the bitt forward, tank cradles, muffler supports and so on.

Frame around hatches and the mast opening.

Decking

This deck is designed with 3/4"x1" white pine strips, edge-nailed.

Plane the stock on four sides, with the edge grain parallel to the 3/4" dimension. The edge of the grain must be up, as slash grain will pick up and splinter. Start at the king plank. Nib into it one half the width of the plank (1/2"). Lay the planks parallel to the deck line of the boat. Edge-nail (sixpenny bronze nails) between beams, and nail down to the beams. Use bronze barbed finishing nails, and set the heads.

Such a deck should not need caulking. The seams may be glued or not as you wish.

Cabin House

Philippine mahogany is good for this kind of work. Use 3/4" stock. Lay out the shape of the sides of the house on the mold loft, and make up the necessary width by splining two pieces together. Cut out the holes for the windows.

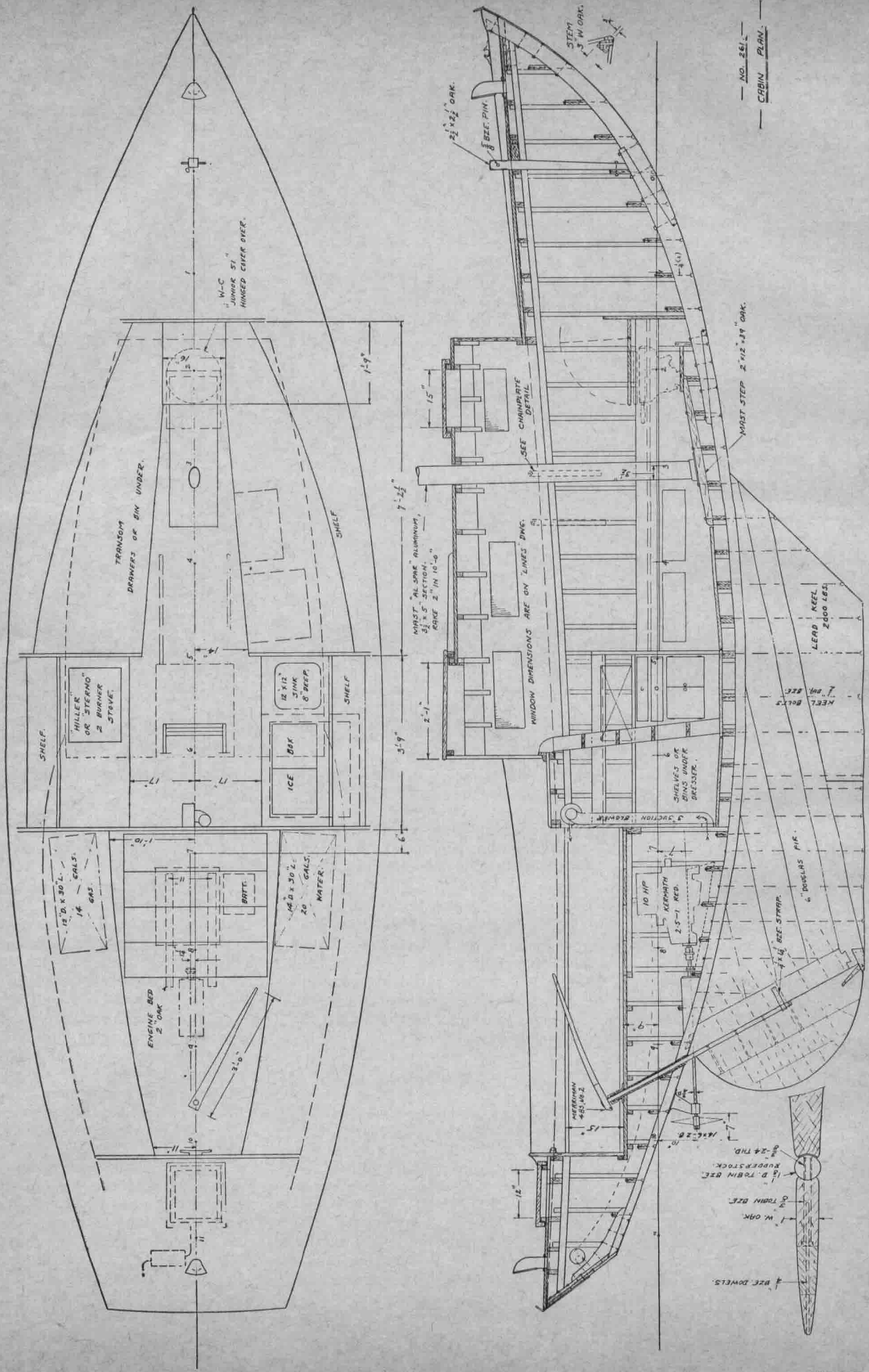
At the corners, either use rabbeted corner pieces or lap the sides over the ends.

Bend the sides to the curve over molds, either on the shop floor or on the boat; then set the cabin house in place and bolt down through the header.

Saw the cabin-roof beams to the crown, finish-plane the top and bottom edges, chamfer the lower edge and fasten them in place.

Lay the roof of 3/8" plywood or strip-plank it. Cover with fiber glass or canvas.

To canvas it, paint the wood with thick paint, stretch the canvas as tightly as you can and tack it down with closely spaced copper tacks.


— NO. 261 —
— CABIN PLAN —
STEM 3" W. OAK.
2½" x 2½" OAK.
⅜" BEE. PIN.
W-C "JUNIOR 51" HINGED COVER OVER.
TRANSOM
DRAWERS OR BIN UNDER.
SHELF
SHELF.
"HILLER" OR "STERNO" 2 BURNER STOVE.
12" X 12" SINK 8" DEEP.
SHELF
SHELF
ICE
BOX
MAST "AL SPAR" ALUMINUM 3½" x 5" SECTION. RAKE 2" IN 10'-0"
WINDOW DIMENSIONS ARE ON "LINES" DWG.
SEE CHAINPLATE DETAIL
MAST STEP 2"x12"x19" OAK.
LEAD KEEL 2000 LBS.
KEEL BOLTS ¾" DIA. 32"
SHELVES OR BINS UNDER DRESSER.
SECTION RUDDER
10 HP KERMATH 2.5-1 REV.
4"x4" SEE STRAP.
6" DOUGLAS FIR.
MERCRUISER 440 V8-2
14"x28"
RUDDERSTOCK
1¼ D. TOBIN BZE.
-24 THD.
1" W. OAK.
¾" TOBIN BZE.
¾" BZE. DOWELS.
12" DEEP
ENGINE BED 2" OAK
12'D. x 30'L. GALS. 14 GAS.
14"D. x 30"L. GALS. 20 WATER.
BATT.

Dampen it to stretch it by brushing with a not-too-wet scrubbing brush. Paint it while still damp.

Turn the edges down under the trim all around, and turn them up at openings.

Fit blocks on each side to take the forward ends of the cockpit coaming. Cut out the ¾" Philippine mahogany for the coaming, and fit it so that it flares outboard a little. It will be more comfortable to lean against if it is not vertical. Make the slope about 10 to 15°.

The windows shown on the plans do not open. Cabin ventilation seems to come more from hatches than from windows, and windows that open also leak.

Cockpit

The cockpit-floor framing is done the same way as the deck framing. Build a good big hatch over the engine so that you can really get in there to work.

The flooring is edge-grain Douglas fir, with caulked seams.

Finish-bore the hole for the rudderstock tube. Make the tube of brass or bronze tubing or pipe, threaded into the keel and fitted with a collar at the cockpit floor. Cap the top with a cap bored out to fit the rudderstock for a stuffing box.

Seats in the cockpit slope so as to be at right angles to the coaming. The joint between the seat and the coaming is left open a little, and a drain is fitted below it, to empty overboard.

If you prefer lockers under the seats, make them level and watertight.

Build the bulkhead between the cabin and cockpit. Make it strong and rigid—it forms a strength member of the hull.

Interior Cabin Work

Lay the cabin floor, or sole, in hatches for access to the bilge.

The joiner work can be done before the deck is on. There is more room to work then. White pine with mahogany moldings, the pine painted white and the moldings varnished, makes a light and attractive interior.

Layout and details will vary to suit individual owners.

Engine

Installation drawings come with the engine and should be followed.

The shaft log has been bored from the loft layout. Using it to guide the drill, bore the keel for the shaft.

Stretch a wire through the hole to check the alignment. If it is out, it may be corrected by the use of a boring bar and fly cutter supported on wood V-blocks and driven by an electric drill. Finish the hole 15/16" or 1" in diameter to clear the ¾" shaft. Fasten the stuffing box at the inboard end with hangar bolts.

Make a pattern for the strut, fitted to the boat. Have it cast in good bronze, bored and lined with a Goodrich Cutlass bearing. Bolt through the keel with four bolts.

Use through-hull sea cocks on the cooling-water connections. (Through-hull cocks should be used also on the toilet, with lubricated plugs.)

Locate the storage battery close to the engine to make the wires short.

The gasoline-tank filling pipe opens on deck. The line to the engine should be removable, having a union at each end, for cleaning and two strainers at the engine end. Use dead soft copper tubing with SAE flanged fittings. Support the strainers from the boat—do not hang them on the gas line. Put a horizontal—never vertical—loop into the line for vibration and expansion, or put in a section of metal gasoline hose.

Run exhaust hose to the muffler under the afterdeck. Have a drain in this line at the engine end. Pipe all the cooling water overboard through the exhaust hose.

Install a suction blower on the engine room–cabin bulkhead to discharge into the cockpit. Connect it to a safety switch (Perko Fig. 193 style) so that the engine cannot be started unless the blower is started first.

When running the engine, open the afterdeck hatch and let the engine ventilate the space under the deck.

The engine shown on the plans is a Kermath 10-hp with 2½-to-1 reduction gear, ¾" Tobin bronze shaft and 14"-diameter, 6"-pitch two-blade propeller. It should drive her a little over 5 mph.

Fasten the engine to the beds with hangar bolts. Shim under the feet for alignment adjustment.

Tank Foundations

Cut the tank cradles to fit the tanks, and line them with something to prevent chafe. Secure them to the hull. Diagonal braces between the cradles are desirable. The full tanks are heavy and must not go adrift. Put the tanks in and strap them.

Additional Deck Work

Make the companionway slide and rails and the two hatch covers. Use hardwood for the frames and the slides. In making hatch frames, do not miter the corners; half-lap them.

Make wooden cleats. Hard maple is a good wood, as it is hard and strong and takes a good finish. Varnish them. Make carefully fitted mast wedges.

Fit the little rail all around the deck, and put on the rubbing strip.

Bolt deck hardware in place.

Spars and Rigging

Because of the amateur's aversion to spar making, aluminum-alloy spars are suggested. There are several makes on the market, and a copy of the Sail Plan, together with a request for quotation, is all a supplier needs to select the proper sizes for this boat.

The standing rigging is all stainless steel, 1x19 construction, and can be supplied by Merriman Bros. from the Sail Plan.

Running rigging is up to the owner. Plymouth brand Manila yacht rope is excellent, but many prefer the newer synthetics. Halyards may be wire; sheets, nylon or Dacron, cotton or linen. The owner's preference prevails.

Have the sails made by a good sailmaker, such as Ratsey & Lapthorn. Dacron seems to be the popular material just now. Roller reefing is suggested for both jib and mainsail. It is very handy.

Finishing, Sanding, Painting, Varnishing

Much of this work is done as the construction proceeds.

Painting of inside surfaces must be done before they are closed in and inaccessible.

Oak is better for a coat or two of Cuprinol.

Bolts are set in white lead paste.

Interior painting should be of a light color, as the inside of a boat is dark anyway.

Floors (cabin and cockpit sole) should have nonskid paint. Deck has to be smoothed, sanded, nonskid-painted.

Do not paint seats with nonskid. It will quickly sandpaper the seat out of a pair of shorts.

For topside painting, use a good marine paint; bottom, a medium-priced antifouling. Varnish work takes more coats than you think it ought to have; when you think it looks fine, put on two more coats.

Blue-line prints of this boat, scaled one inch to the foot, are available for $10. Write to E. I. Schock, c/o Sports Afield Boatbuilding Annual, 959 Eighth Ave., New York, N. Y. 10019, asking for Design No. 261. Make check for money order payable to E. I. Schock.