

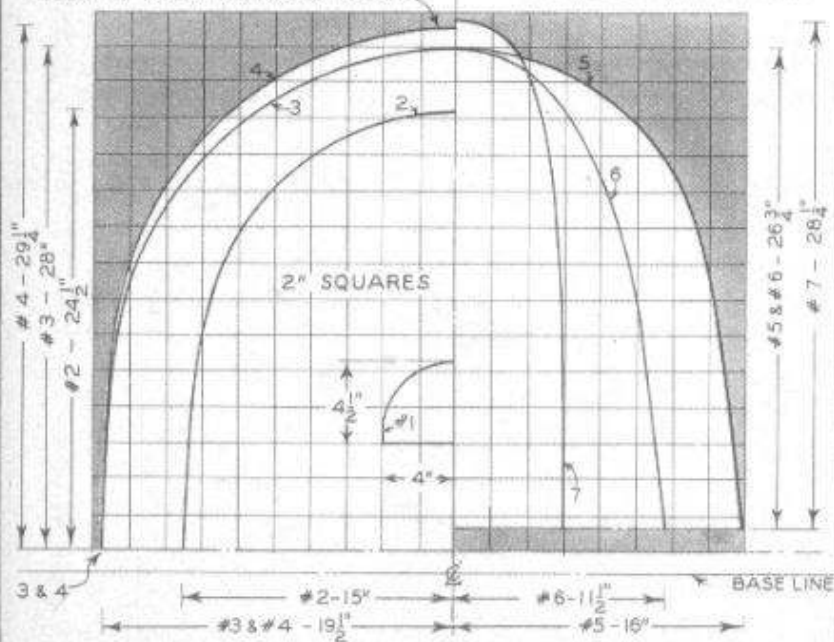


Crawfish ready for a speedy spin over the ice. The mast is braced with three sets of stays, the backbone by a martingale stay which can be seen directly below the mast.

HALF-WIDTH MOULD LINES

NO 4 (SEAT BACK) OF 1/2" PLYWOOD.— ALL OTHER FRAMES OF 3/4" X 4" OAK JOINED TO SUIT.

NOTE: DIMENSIONS ARE TO INSIDE OF PLANKING AND INCLUDE NEC. ALLOWANCE FOR THE REQ'D. FRAME BEVELS



Crawfish

Fast front steering craft with a snug, teardrop cockpit that will protect you from bitter winter winds.

by E. A. Doty

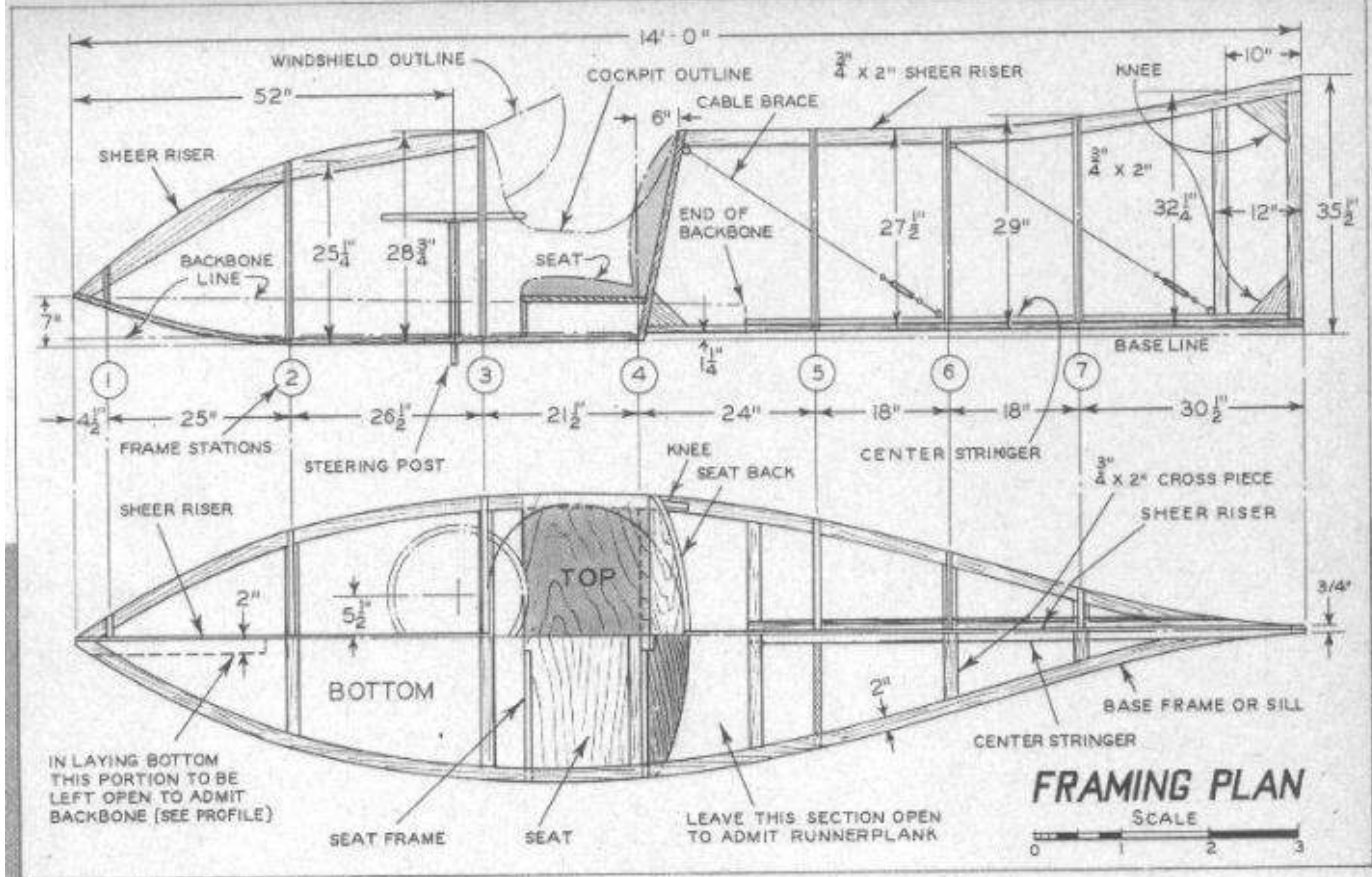
AN INNOVATION in front-steering iceboats is this aerodynamically streamlined cabin craft for those who desire protection from the frigid blasts. Graceful in line and appearance, *Crawfish's* body hardly interferes with fast sailing qualities, because it is ultra-streamlined so that air resistance is minimized to the utmost. Lightly built, its weight is negligible.

With an overall length of 28', *Crawfish* has 175 sq. ft. of sail, classifying her as a Class C racer. The cockpit has room for one person beside the pilot. Additional passengers

may ride the runnerplank, with the body providing some wind protection.

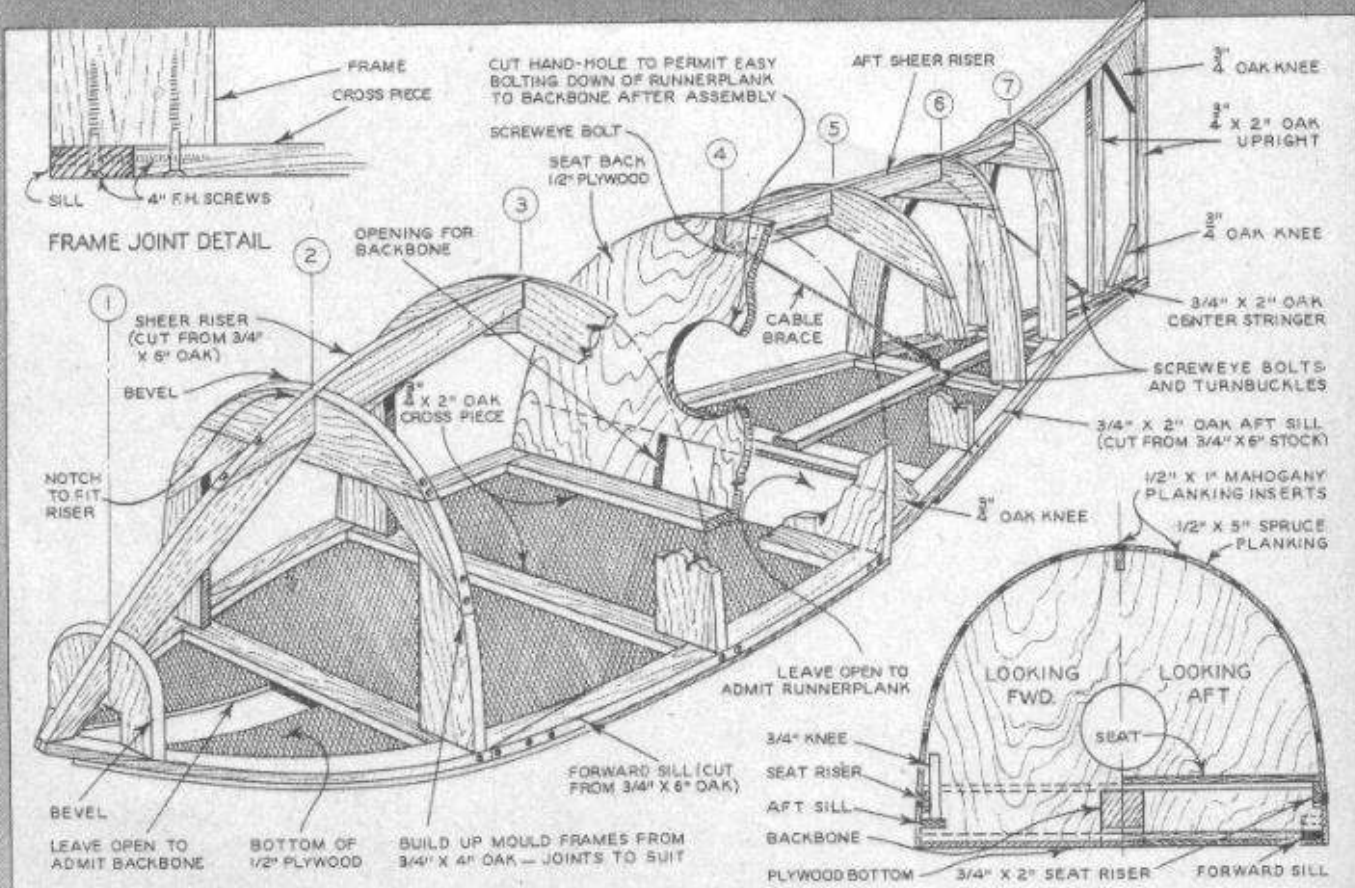
Steering is accomplished by means of a wheel in the cockpit, which is sheltered by a larger celluloid windshield.

Iceboaters who already have hulls of this type and size can convert their craft merely by adding the streamlined cockpit. The amount of overhang, aft of the runnerplank, is immaterial. Banjo-type cockpits are detached from the backbone, or center timber, and the streamlined body is installed as described later.



— Streamlined Iceboat

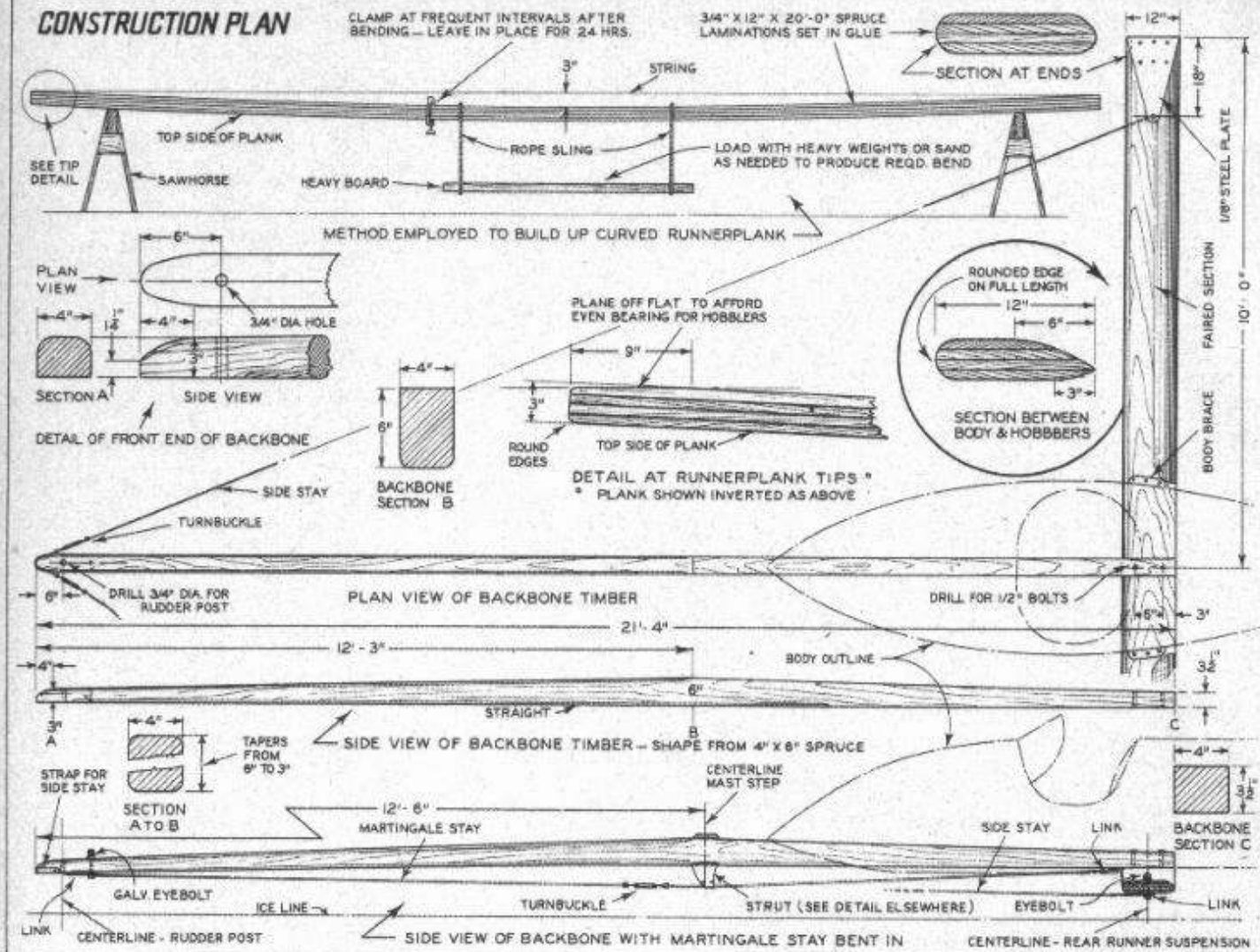
Construction plans of cockpit are shown on this page. Opposite are mould lines from which frame patterns can be made.



FRAMING DETAILS

SECTION THRU BODY AT SEAT BACK FRAME (N#4) SHOWING PLANKING LAID

CONSTRUCTION PLAN



It is immaterial which part of *Crawfish*, as a whole, is built first—the runnerplank, streamlined body or the backbone. For the benefit of those converting existing craft, the construction of the body will be discussed first.

Straight-grained sitka spruce, $\frac{1}{2}$ "x5" is recommended for the body planking. If desired, the planking of the shell may be alternated with $\frac{1}{2}$ "x1" strip of mahogany or black walnut, as photo shows, for trim appearance.

To get the body shape, it is necessary to build a mould-like framework, which is *permanent*. In order to get perfect contours, reproduce the profile and half-breadth drawings full-size on heavy wrapping paper.

The base of the framework is of $\frac{3}{4}$ "x2" white oak, used horizontally and made according to drawing details. The center strip and crosspieces are the same size stock, and the curved side frames are fastened to them with 4" F. H. screws.

Cut the mould frames from $\frac{3}{4}$ "x4" oak to the size and shape of your full-sized drawing, grafting pieces to get the necessary curva-

ture. The center top of each frame is mortised $\frac{3}{4}$ "x2" for the sheer riser. The forward sheer riser is not bent, but cut from 8" board and scarfed, with the joints screwed. Bevels required on the mould frames are best cut on the job, fairing up with battens as you proceed. Mould frame stations are shown in profile drawing, with the seat-back, tilted 6", acting as a frame. The foremost frame is later cut out as needed to fit into the backbone.

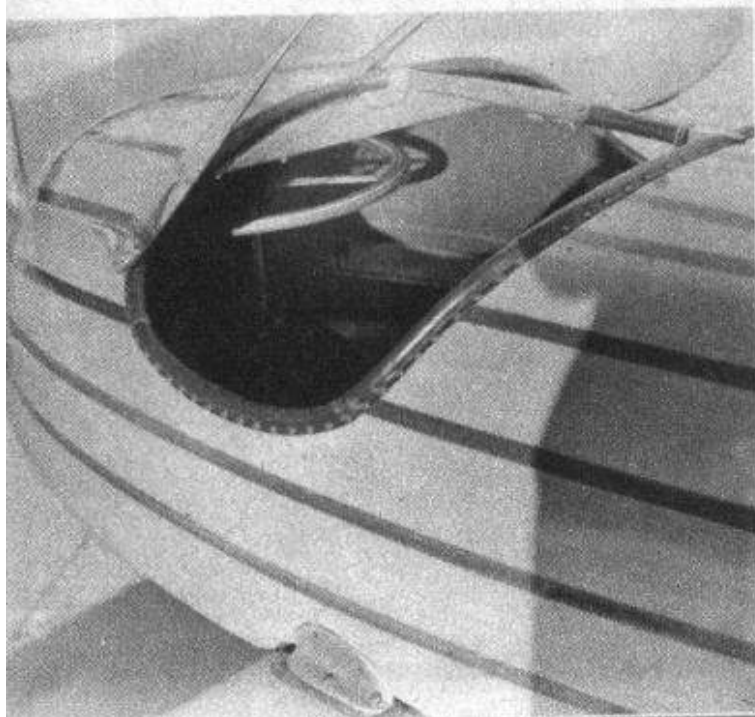
Start planking the framework along the centerline on top, using a 1" piece to start. Use 1" flat head screws for plank fastenings. Allow enough in excess lengths so that the shape of the cockpit may be cut later. The fore ends of the boards must be spiled, or narrowed, so that same number used amidships will be at the tip, as is regularly done in planking round bottom boats.

Planking should be full length without seams. Fore and rear ends of planking are casein glued and screwed. Fasten the fore end first, then the rest of each board will bend around the frames easily.

The easy curvature aft will enable you to

bend each board to the contour of the fin. At each frame, the planks should be held with a C-clamp while screwing.

The pointed fore end of the body is sheathed and reinforced with a sheet of aluminum, bent to shape and screwed in place. This sheathing, $\frac{3}{32}$ " thick, overlaps 6" for attaching the body to the backbone. Trim



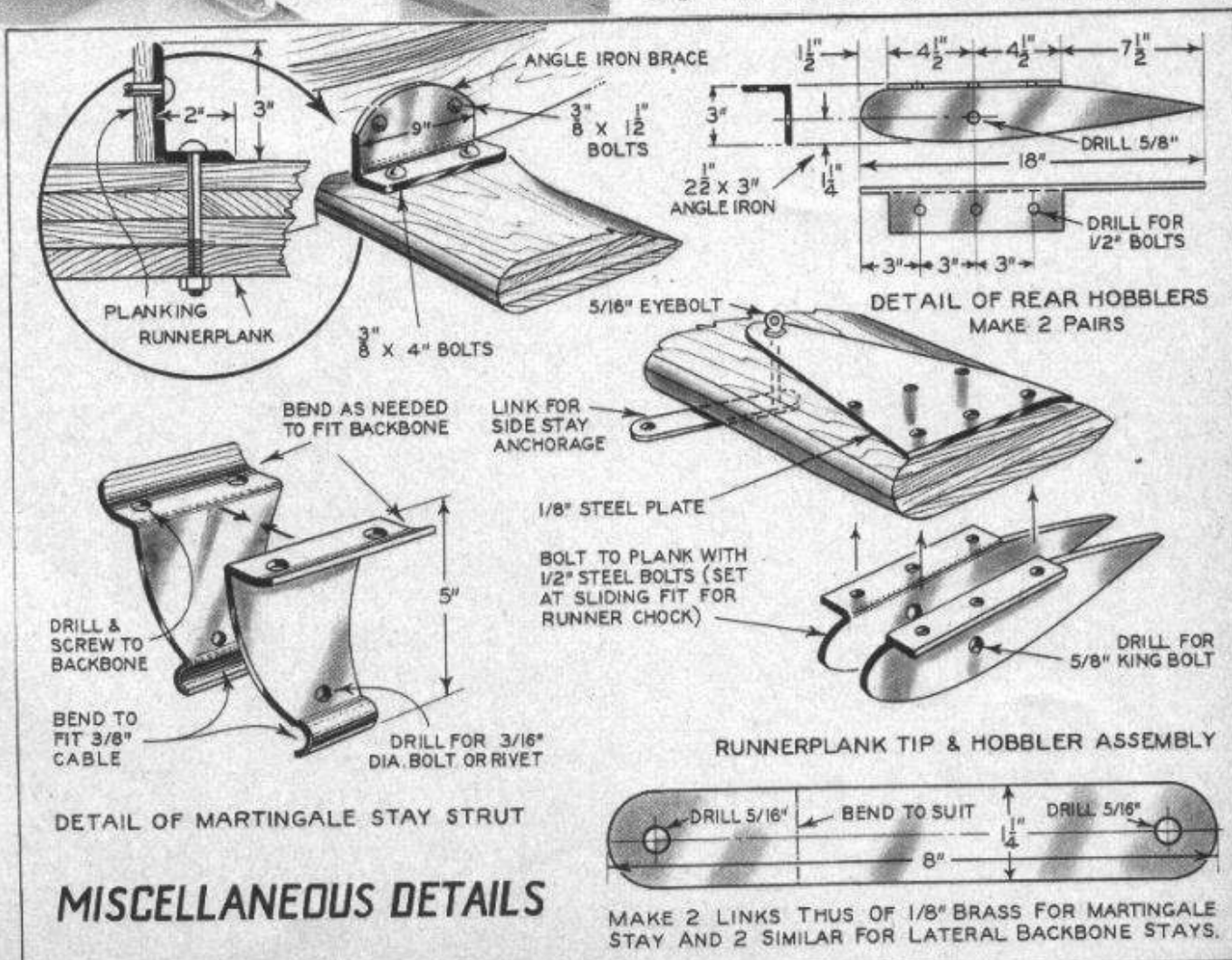
the cockpit edges to the shape shown. A dashboard of 1"x4" oak may be used to hold the ends of the boards at the cockpit front but is not essential. The backrest may be padded with horsehair and covered with artificial leather or other waterproof material.

Edges of the cockpit are similarly padded and covered, effecting a neat roll. The windshield of $\frac{1}{16}$ " celluloid is built to suit. Punch holes around the outer edges of the celluloid to hold stitching of leather or cloth protection.

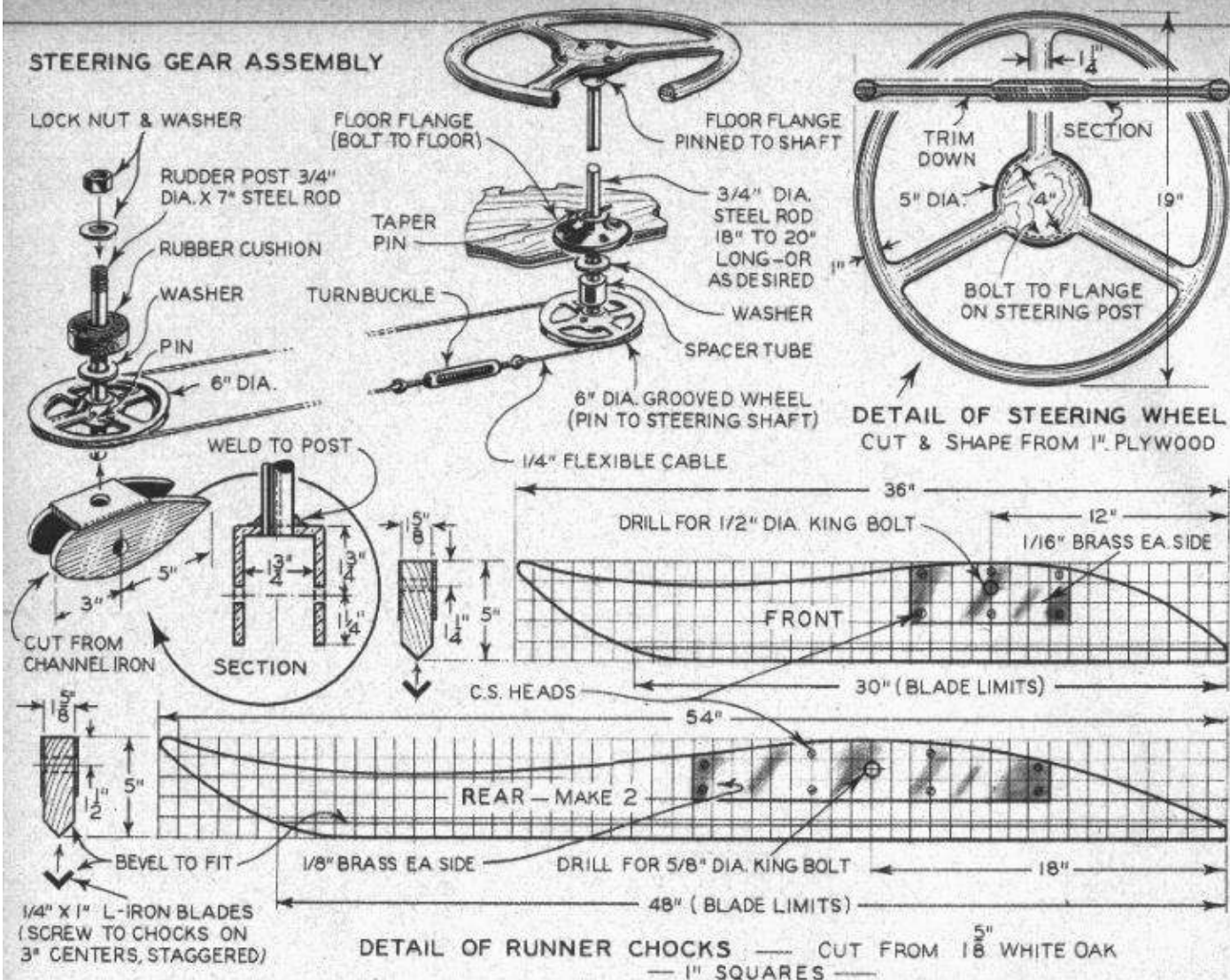
The 21' 4" backbone is shaped next out of solid straight-grained 4"x6" spruce. Details for trimming the backbone to size are given in construction drawings. A $\frac{3}{4}$ " hole is drilled 6" from the fore end for the rudder post. Drill two $\frac{1}{2}$ " holes at the other end for bolting to the runnerplank. The rear end of the backbone fits flush with the rear edge of the runnerplank.

The runnerplank is laminated of $\frac{3}{4}$ "x12"x20' spruce, built up to 3" thickness by gluing four boards as shown. After the boards are coated with casein glue and laminated to the proper thickness, the bend is

Closeup of cockpit showing steering wheel and windshield. Wheel is connected to steering runner by cable tightened with a turnbuckle. Note edges of cockpit trimmed with padding. The strut running fore and aft adds stiffness.



STEERING GEAR ASSEMBLY



effected by supporting the plank on saw-horses and weighting the center. Clamp the plank in numerous places with C-clamps, which should remain in place until glue is dry. Allow 24 hours for drying. Fore edges of the plank, on top and bottom, should be rounded with a plane or spoke shave.

Bolt holes, 1/2", should be drilled at each end to conform with the holes in the forthcoming hobbler. Hobbler should be made of 1/4" thick angle iron with one side 2 1/2" wide and the other 3". The hobbler may be cut to teardrop shape, as shown, although this is only for streamlined appearance.

In attaching the hobbler to the runner-plank, a 1/8" steel plate, drilled to correspond to holes in the plank and hobbler, should protect the plank from the bolt heads. It is inadvisable to tighten the hobbler bolts until after the runners have been accurately aligned.

Details of the 3/4" rudder post and rudder hobbler are shown in drawing. The rudder post should be welded to the channel-iron hobbler. A 6" grooved wheel for the steering cable is set-screw locked to the post. A similar wheel is likewise fixed at the bottom

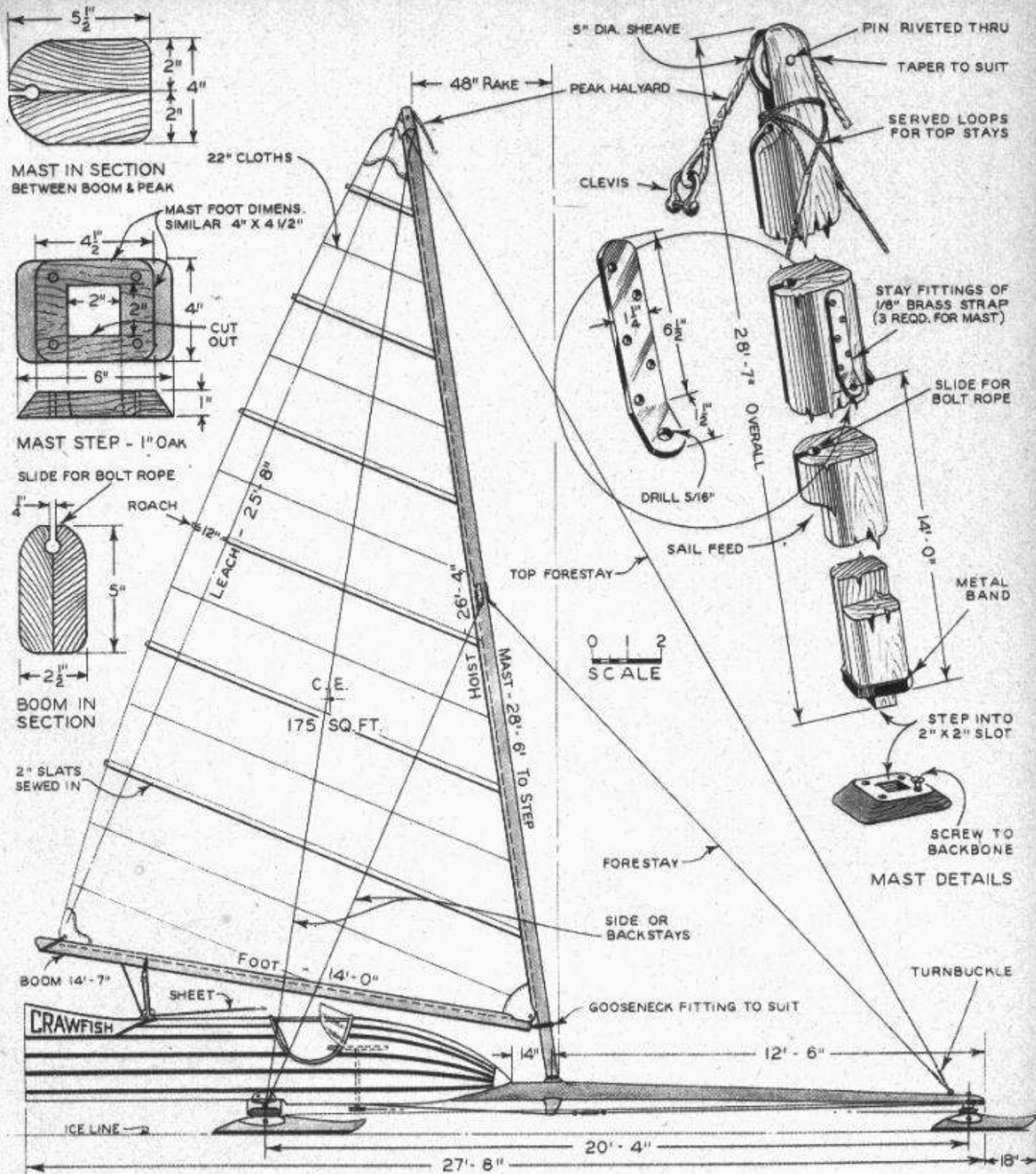
Marine plywood may be used for the steering wheel, or you may obtain one from an auto junk yard if preferred. Runner adjustments must be made in hobbler before final tightening up.

of the steering wheel or tiller post, which is supported by a flange as shown.

Runner chocks are made out of 1 5/8" white oak. Bevel the bottom edges 45 degrees on each side, if 1" angle iron is selected for blades. Blades should be heated for bending to the shape of chock and screwed thereto with 1/2" flat head screws. Cover screwheads with liquid solder, after countersinking them flush. Runner chocks should be protected with brass sheeting, to prevent wearing in the hobbler.

Before assembling the craft, a martingale stay must be rigged to the underside of the backbone, to take the stress and strain of the down-pressure of the mast. This stay is absolutely essential, and *Crawfish* should not be sailed without it, lest the backbone break at the maststep. Rig the martingale with a 5" strut and use a turnbuckle to draw 3/8" cable absolutely taut.

Before assembling the runnerplank, insert the side runners in the hobbler on 5/8" king-bolts. Align the runners by precisely meas-



Spars are Swedish grooved type, and sail must have an extra bolt rope along hoist and foot to fit in grooves. Lightweight duck (about 4 oz.) is suitable sail material.

using the distance between the cutting edges at the fore and rear ends of the blades. If not exactly equidistant, twist the hobbler with the runner acting as leverage. Also make sure the runners are square with the centerline of the runnerplank. If runners are not aligned, the craft will not sail freely.

The backbone is bolted to the center of the runnerplank. The body is bolted to the backbone after inserting the latter and additionally braced by 2"x3" angle irons bolted to the runnerplank, as shown. The backbone must absolutely be at right angles to the
 [Continued on page 105]

Crawfish

[Continued from page 39]

runnerplank. To ascertain this, measure between the fore corner of each end of the plank and the centerline at the fore end of the backbone. These should be equidistant and rechecked after the side hull stays of $\frac{1}{4}$ " cable are tightened with turnbuckles. The $\frac{1}{4}$ " steering cable for remote control is drawn taut with a turnbuckle.

The mast, made of spruce according to given details, is stepped into an oak block 12' 6" from the bow. The mast is supported with three sets of double stays, slightly slack.

Sand the entire hull thoroughly and smoothly. Varnish all with at least three coats of good spar varnish for a bright finish, including the boom, mast and runner chocks. Use aluminum paint to cover hobbler, runnerplank bolt plates, etc.

List of Materials, CRAWFISH

- Framework—40 feet of w. oak, $\frac{3}{4}$ "x2" and 35 feet of oak, $\frac{3}{4}$ "x6".
- Mould Frames—12 feet of oak, $\frac{3}{4}$ "x4".
- Planking—14 pieces spruce, $\frac{1}{2}$ "x5"x15' ($\frac{1}{2}$ "x1"x15" mahog. strips optional).
- Dashboard—1"x4"x27", oak (optional).
- Backbone—4"x7"x21'-4", spruce.
- Runnerplank—4 pieces spruce, $\frac{3}{4}$ "x12"x20'-0".
- Runner Chocks—2 pieces w. oak, $1\frac{5}{8}$ "x5"x54" and 1 piece w. oak, $1\frac{5}{8}$ "x5"x36".
- Runner Blades—2 pieces 1" L-iron 48" long and 1 piece 30" long.
- Mast—2 pieces spruce, 2"x5 $\frac{1}{2}$ "x28'-7".
- Sheave—5" diameter.
- Boom—2 pieces spruce, 1 $\frac{1}{4}$ "x5"x14'-7".
- Hobblers—4 pieces L-iron, 2 $\frac{1}{2}$ "x3"x18".
- Rudder Post—Steel rod $\frac{3}{4}$ " diameter, 7" long. Channel iron, 3" deep and 8" long with 1 $\frac{3}{4}$ " wide channel.
- Steering Gear—Post: $\frac{3}{4}$ " diameter 20" long with taper pin and flange, 2—6" diameter grooved wheels and 40 feet of $\frac{1}{4}$ " flexible cable with turnbuckle.
- Stays—(Mast and hull) 200 feet of $\frac{1}{4}$ " aeroplane cable, and 6 turnbuckles.
- Martingale Stay—20 feet of $\frac{3}{8}$ " aeroplane cable and 1 heavy turnbuckle.
- Hobbler Bolts—12 machine bolts, $\frac{1}{2}$ "x4".
- King Bolts—2 machine bolts or pins, $\frac{5}{8}$ "x3 $\frac{1}{2}$ " (rear) and one $\frac{1}{2}$ "x3" (front).
- Windshield—3 feet of $\frac{1}{10}$ " celluloid 12" wide.
- L-iron Body Braces—2 pieces angle iron, 2"x3".
- Body Sheath—3/32"x8"x10", aluminum sheeting.
- Strut—5" strut for martingale— $\frac{1}{8}$ " steel plate
- Runner plank plates— $\frac{1}{8}$ " steel plate