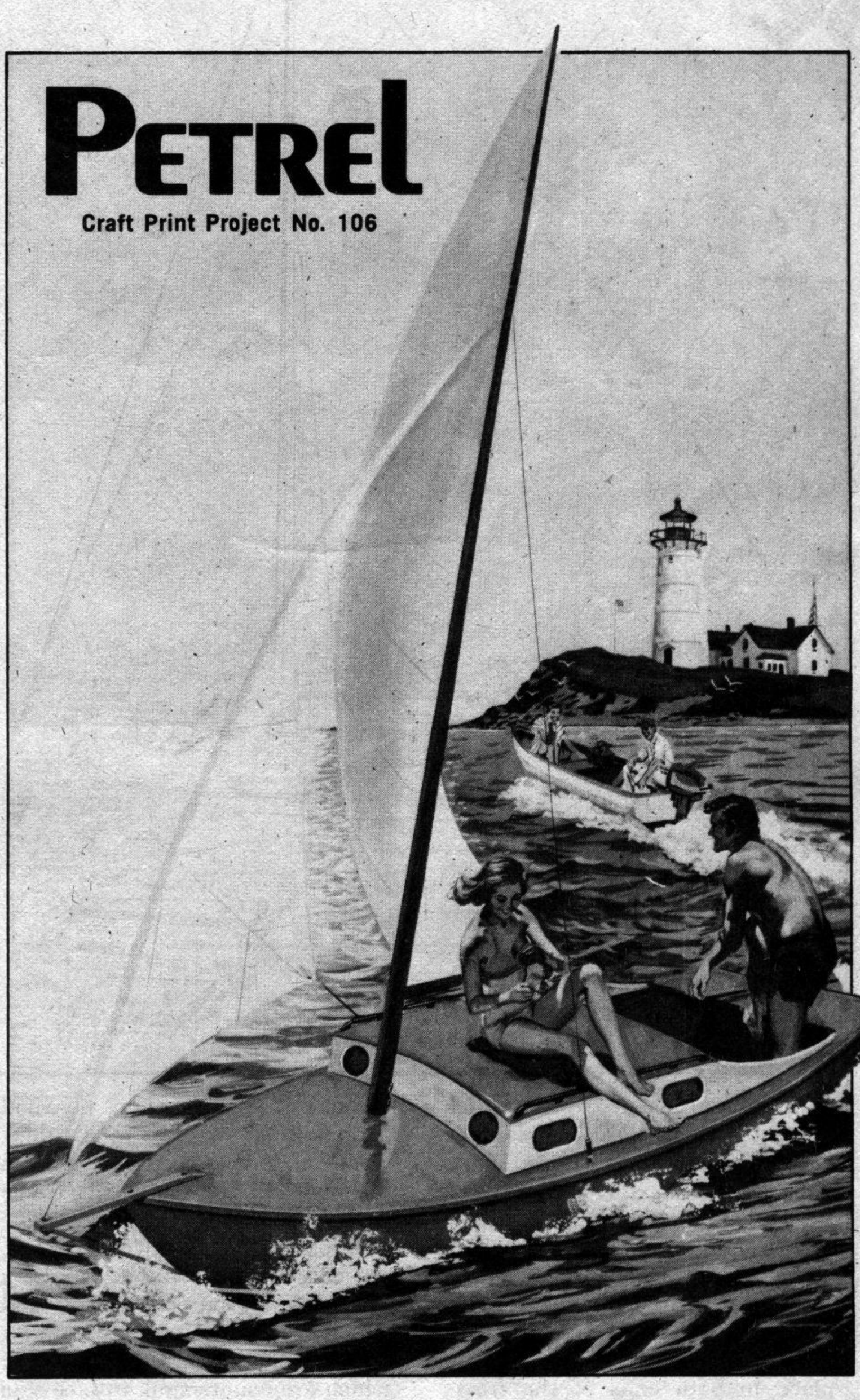
PETREL

Craft Print Project No. 106



You can build this 16 ft. model as a day sailer or an overnighter with cabin

PETREL is a sailboat that fulfills the greatest possible variety of uses in one model, offering the builder either an open-cockpit racing craft with comfortable accommodations for day sailing or a snug cabin model with accommodations for overnight trips to distant points. Either model is constructed from the same basic design, and either model possesses unusual seaworthiness, stability, trim attractive lines, speed, and ability to handle well on all points of sailing.

Exterior plywood is used to plank, or more rightly, to cover this paragon of small sailers, offering lightweight, speedy and able performance, and permanent leakproof qualities, not to mention a minimum of labor and expense in construction. The construction of the two models—open cockpit or cabin—is identical up to a certain point, which will be mentioned later. Due to the simplified construction, ordinary carpenter's tools and only average skill are required to build the boat.

The hull is best constructed upside down, and for this purpose a form as indicated upon the drawings is sawed to shape and mounted upon legs similar to a sawhorse, at a convenient working height. Notch out this form for the frames, and prepare to construct them. Cut all dimensions accurately.

Prepare full-size patterns of all frames, including transom and stem. It is an easy matter to lay frame, transom and stem material

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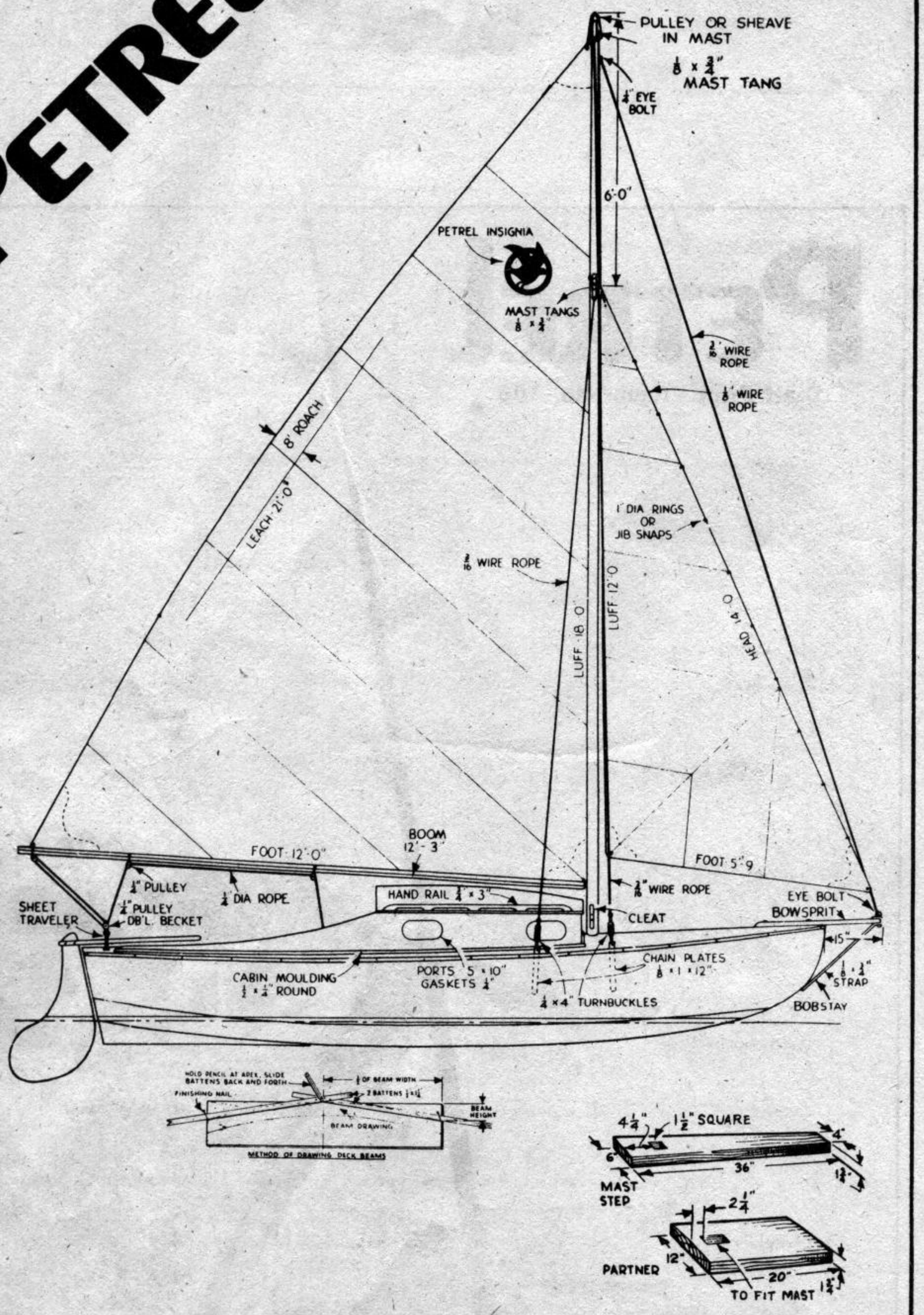

under the full-size pattern, prick the outlines through and saw the parts to shape. The shaped parts are returned to paper patterns and assembled to conform to outline. The frames at chine corners are fastened securely with two ¼-in. x 1¾-in. carriage bolts, while the center of frames at keel joint is joined with a floor frame fastened in place to both ends of the frame with 1½-in. No. 10 *fh* screws. Coat all of the adjoining surfaces with marine glue before fastening, to insure strong and rigid joints.

The transom and frame are constructed similarly except that the transom is cut from ¾-in. plywood and finished with a ¾-in. thick wood or plywood frame. Fasten the plywood transom to its frame with 1½-in. No. 10 *fh* screws. The stem parts, already sawed to shape, are laid upon the full-size pattern to insure proper alignment and joined together with 5/16-in. x 6-in. carriage bolts, the heads of which are countersunk in face side of the stem. Bevel the forward edges of stem and mark and cut the rabbet.

Temporarily assemble the frames, stem, and transom upon the form. A light batten sprung around all frames will indicate the proper bevel each must be cut so the planking will lie evenly. Remove frames, bevel them as marked, and cut notches for keel, chines, and clamp, following the sweep of the beveled edges. Cut notches in the transom frame only, not in the plywood transom itself. Return all parts to the form. To insure proper alignment while building, all frames and the stem should be braced with wood strips nailed from floor to frame parts.

The ¾-in. x 5¾-in. inner keel is now tapered toward each end (as indicated in the plans) and clamped in place over form. This keel is fastened to transom, stem, and mould frame notches with two 2-in. No. 10 *fh* screws at each joint. Each side of this keel is now beveled slightly to conform to vee sweep of bottom frames. The outer keel, ¾-in. x 3-in., is laid in center of inner keel after coating the adjoining surfaces liberally with "C" quality marine glue. Clamp outer keel in place and fasten to inner keel with 1½-in. No. 10 *fh* screws placed about six inches apart. Trim this keel to fit at transon and stem, fastening similarly.

The ¾-in. x 2-in. chines are now sprung around the boat simultaneously to prevent twisting the framework out of shape. Begin at the transom frame, cut to fit and work forward. Bevel the chine ends to fit the sides of stem just aft of the rabbet joint and fasten with one 2-in. No. 10 *fh* screw to each joint.

The ½-in. x 1¾-in. clamps are now secured to frame notches and fastened with one 1½-in. No. 10 *fh* screw to each joint. Bevel fore ends of clamps to fit against side of stem just aft of the rabbet and fasten.

The intermediate frames may be fastened in place now or later.

The entire framework is trimmed and faired so all planking to be applied will lie evenly without any humps or hollows. Accomplish this fairing with the aid of a jack plane and batten laid over all joints to indicate unevenness.

The framework is now ready to

be planked or covered, and certain definite procedure is necessary. Drill lead holes for all fastenings, and before attaching plywood to adjoining surface, coat well with marine glue. Lay cloth strips upon coated surfaces and coat again. This double protection is especially necessary at chines and keel. For all plywood planking on bottom, sides, and deck use 1-in. No. 8 *fh* screws spaced about two inches apart.

The sides of the framework are covered first. Marine plywood of full-length size may be used but if properly accomplished, short lengths properly spliced do not weaken the structure. If spliced, the joint of the plywood side planking should come just aft of amidships. Clamp a sheet of plywood in place starting at the bow. Mark to fit the stem rabbet, and leave enough edge to cover chines and clamps. Remove, saw to shape, and use this piece as a pattern for the opposite side piece of the boat. Fasten both forward side pieces of plywood in place first then the after side pieces. Joint carefully at the splice. Coat edges of splice with glue and secure spliced joint with a hardwood block ¾-in. x 8-in. wide to fit closely between chine and clamp, and screw fasten edges of plywood to this butt block. Fasten the remainder of the side planking similarly and trim edges of plywood evenly along chines.

The bottom of the framework is covered with marine plywood. If spliced, the bottom joint should be forward of amidships. The bottom sheet of plywood is simply laid in position alongside the keel, marked to fit and sawed to shape. As both sides are alike, one shaped piece of plywood serves as a pattern for the other side. Fasten bottom to sides and trim edges evenly along chines. A bottom splice should be backed with a ¾-in. x 8-in. hardwod butt block to which the plywood plank ends are glued and fastened with double rows of screws. The remaining unplanked portion of the bottom toward the stem is now covered with waste pieces of the ⅜-in. plywood, carefully fitted in place and screw fastened. Trim edges of plywood evenly and sand smooth.

The planked hull is now removed from the form and turned right side up. The ¾-in. x 2¼-in. intermediate frames are next fastened in place between the main mould frames as follows: two intermediate frames between mould frames No. 1 and No. 2, two between No. 2 and No. 3, one between No. 3 and No. 4, and one between No. 4 and transom. These intermediate frames should be equally spaced. The corner joints at chines are bolted together with ¼-in. x 1¾-in. carriage bolts, while frames are fastened from outside of planking with 1-in. No. 8 *fh* screws spaced about three inches apart.

The center board slot ¾-in. wide is now cut exactly in the center of the two keels, between No. 2 and No. 3 mould frames. In each end of the slot a ¾-in. x 1½-in. end post is inserted, first coating with marine glue the end that fits into the slot. To the sides of these end posts and along the bottom of each side at keel are fitted the ¾-in. thick plywood center well boards.

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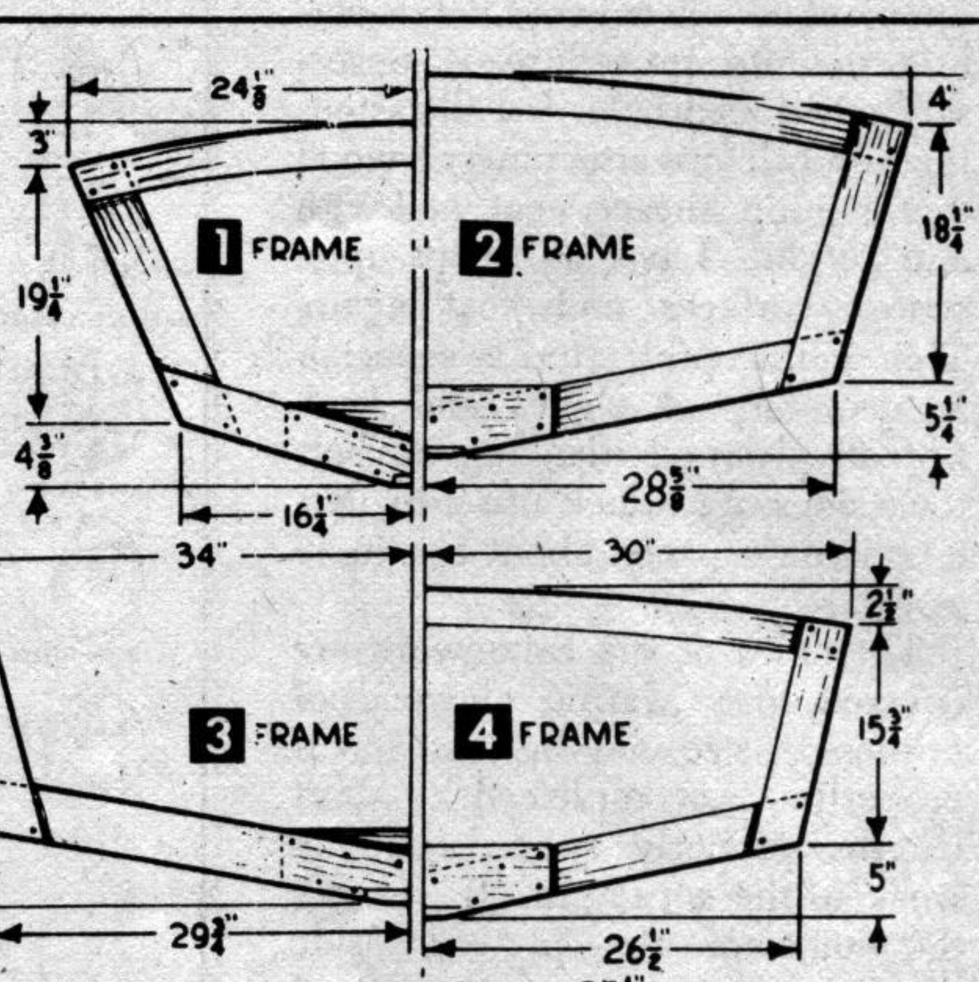
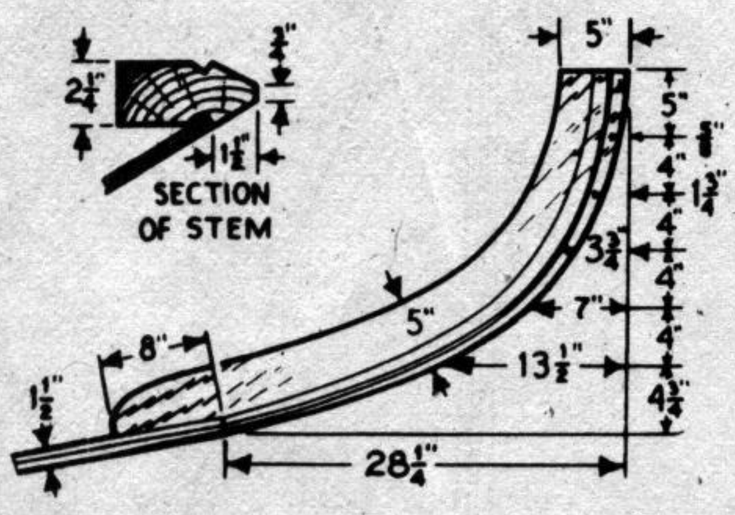
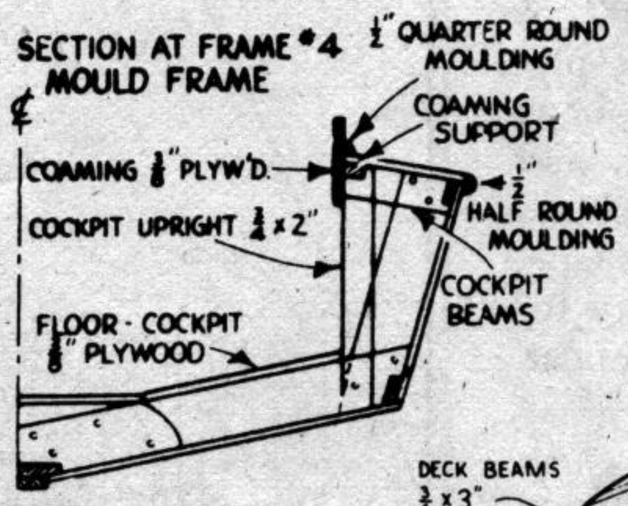
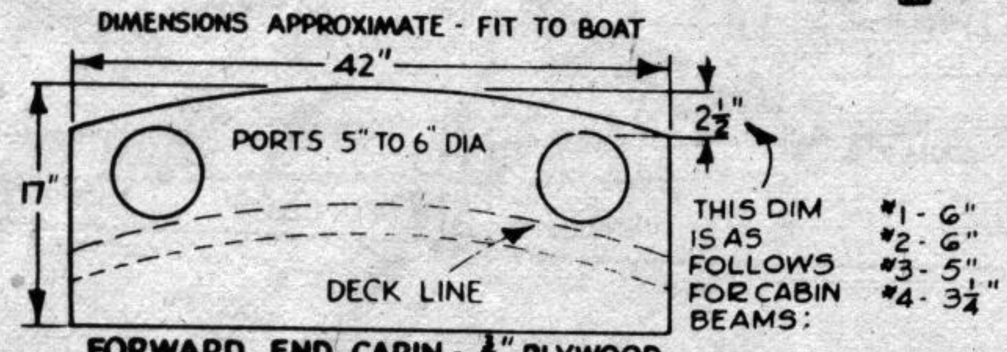
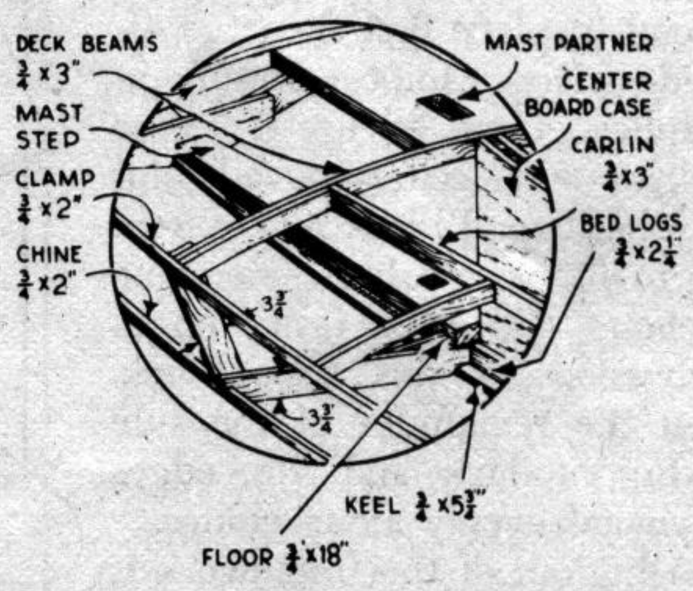
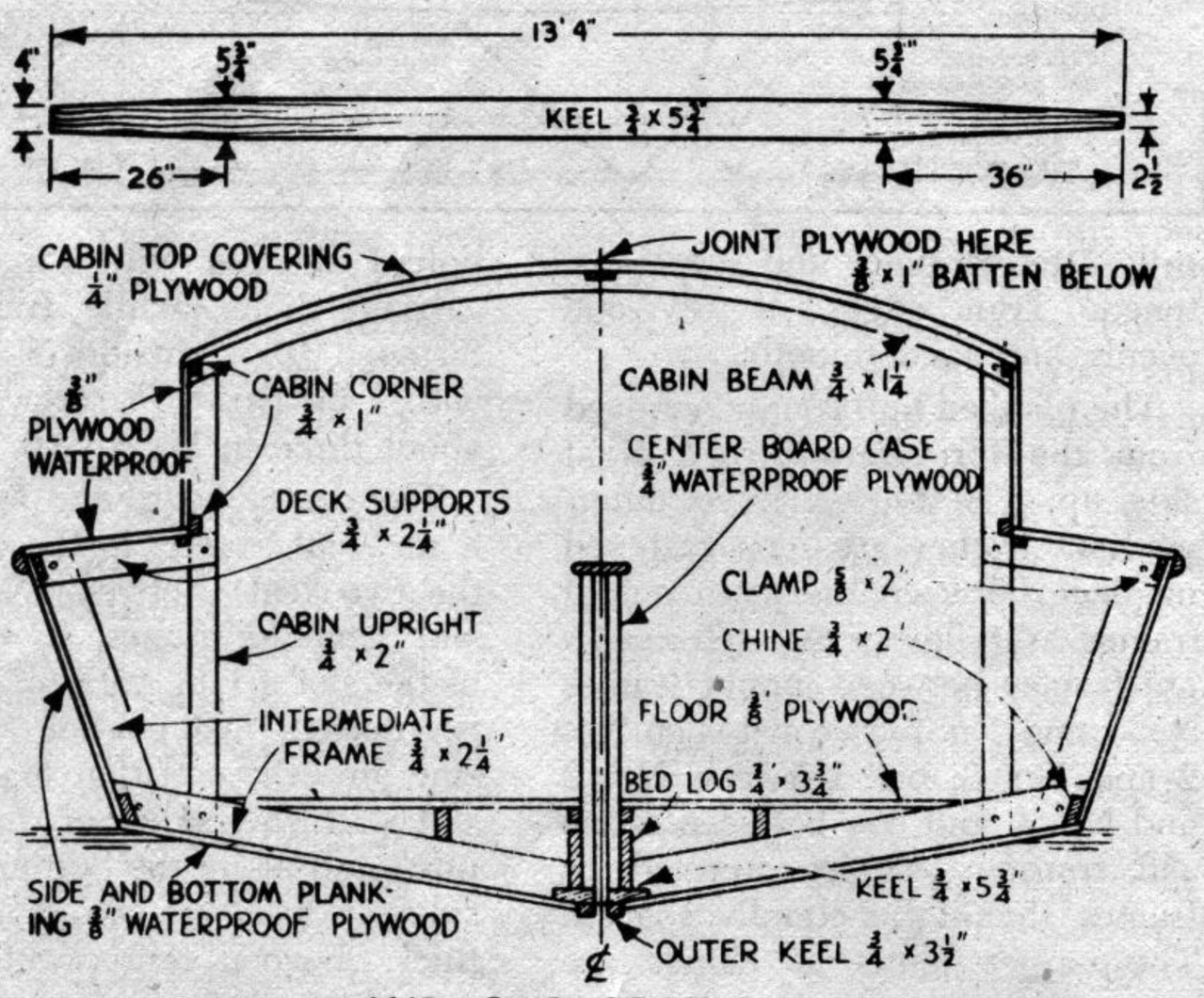








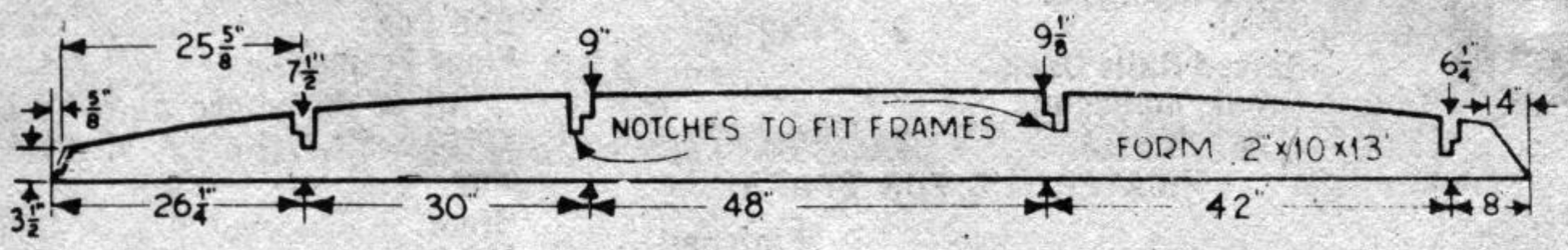


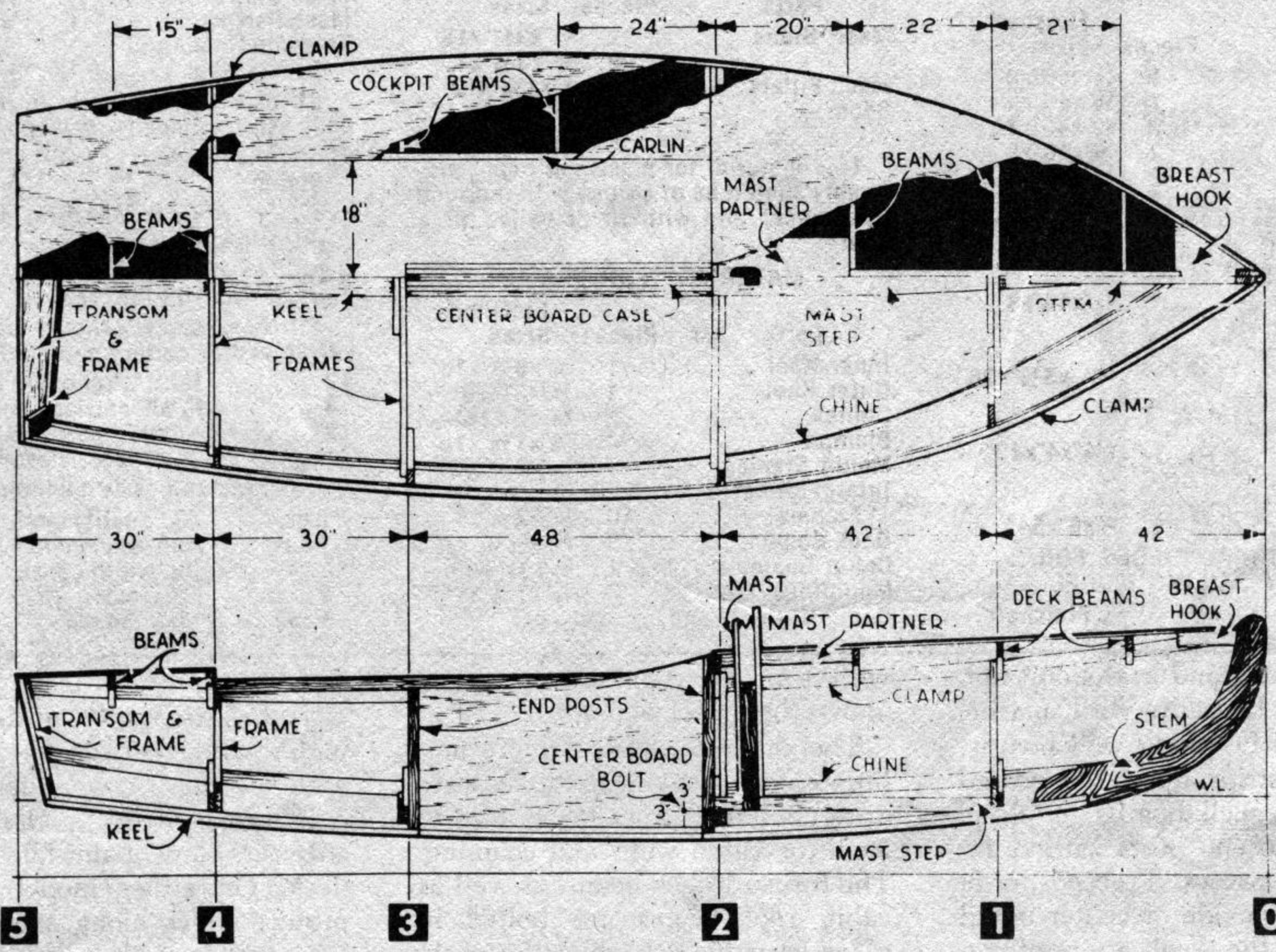


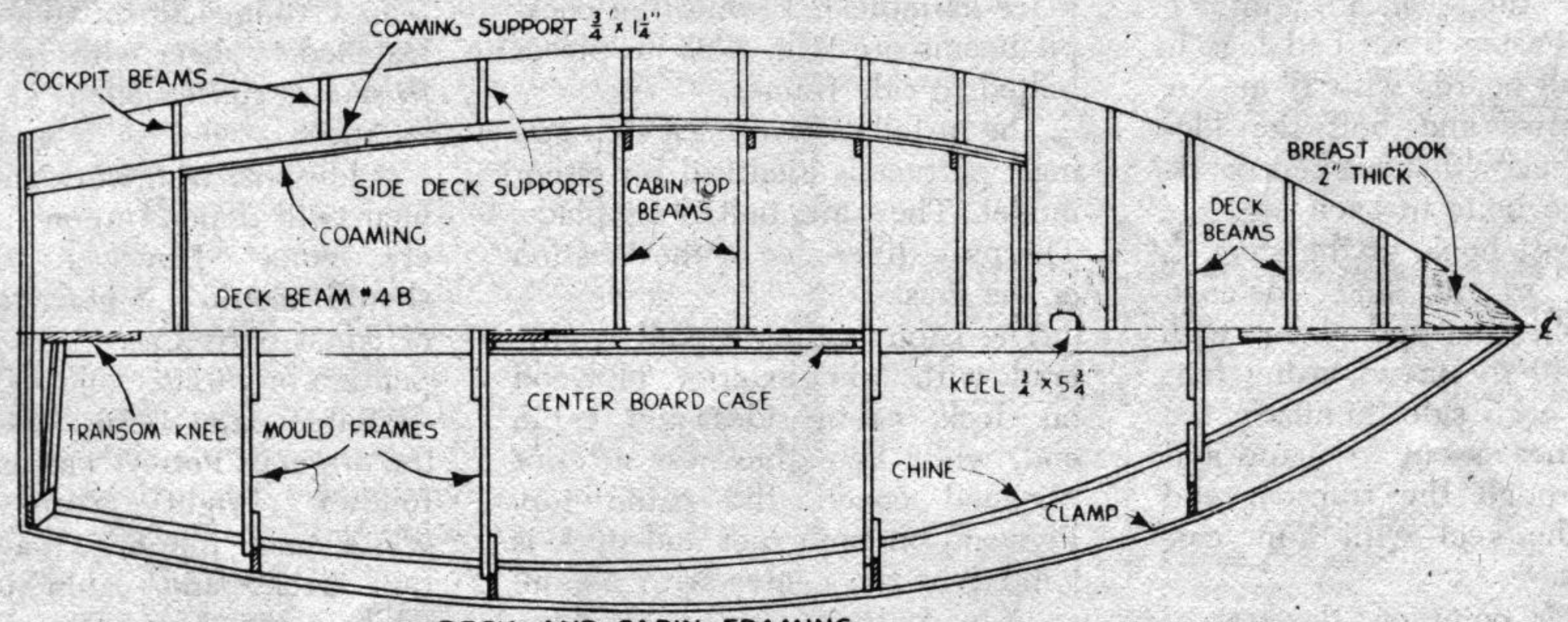
MID-SHIP SECTION

USES: This sloop is designed to serve the greatest possible variety of purposes. Adaptable to individual requirements, it can be built either as an open cockpit racing model with greater accommodations for sailing comfort or as a cabin sailing model, slightly slower in sailing but providing accommodations for overnight trips and shelter on fishing excursions. It's fast, safe, seaworthy and easily handled on all points of sailing. Construction is easy and inexpensive, utilizing exterior plywood, for permanent leak-proof qualities. It is also adapted to outboard or air-cooled inboard motors from 1 to 6 hp.

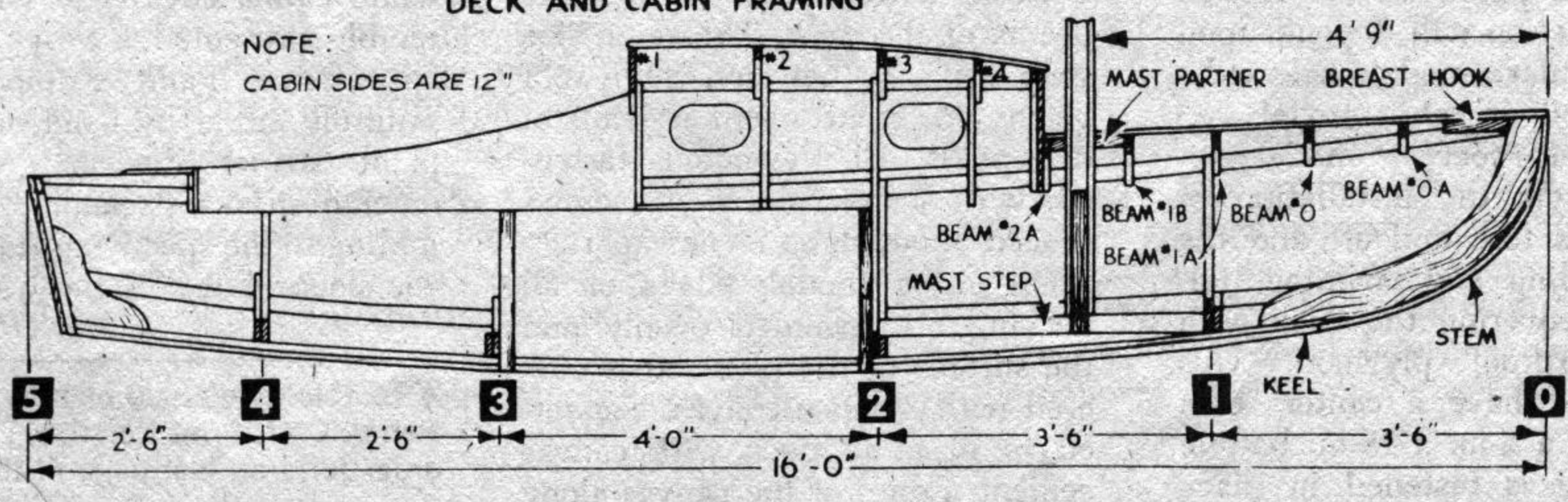
LENGTH	16 ft.
BEAM	6 ft.
DEPTH	23 in. amidships
WEIGHT COMPLETE	650 lbs.
SEATING CAPACITY	4 Passengers (either model)
CONSTRUCTION	⅜" exterior plywood, sawed main frames and intermediate frames
TYPE	Cabin or open cockpit sloop







DECK AND CABIN FRAMING



PETREL

BILL OF MATERIALS
Exterior Plywood

Parts	Pieces	Finished Sizes
Sides	1	⅜"x48"x8'
	1	⅜"x48"x9'
Bottom	2	⅜"x48"x10'
	2	⅜"x48"x6'
Deck	3	⅜"x48"x6'
Cabin Roof	2	¼"x30"x5'
Cabin Sides	1	⅜"x36"x10'
Transom, Well Boards, and Rudder	1	¾"x48"x8'
Bowsprit—oak, mahogany, or ash	1	1¾"x5¾"x36"
Tiller—oak, mahogany, or ash	1	1¼"x4"x42"
Skeg—oak, mahogany, or ash	1	2"x6"x54"

ADDITIONAL PIECES FOR CABIN SAILING MODEL

Parts	Pieces	Finished Sizes
Grab Rails—oak, mahogany, or ash	2	¾"x2"x4'
Raised Rails Deck—oak, mahogany, or ash	2	¾"x2"x7'

MATERIALS FOR SPARS

Parts	Pieces	Finished Sizes
Mast: Sides	2	¾"x3¾"x18'
	2	¾"x3¾"x4'
Mast: Fillers	4	1"x1¼"x12'
Boom	2	½"x1"x12'3"
	2	¾"x2"x12'3"

This material for mast and boom preferably should be of spruce with redwood side pieces and with fir or yellow pine fillers.

MATERIALS FOR FRAME

Parts	Pieces	Finished Sizes
Inner Keel	1	¾"x5¾"x14'
Outer Keel	1	¾"x3"x14'
Chines	2	¾"x2"x16'
Clamps	2	½"x1⅞"x18'
Mould Frames	3	¾"x3¾"x14'
Intermediate Frames	10	¾"x2¼"x6'
Deck Beams	5	¾"x8"x6'
Cabin Beams	1	¾"x10"x4½'
Mouldings	2	¾"x1¼"x18'
Cabin Uprights and Cockpit Beams	6	¾"x2½"x6'
Cabin Carlins	4	½"x1"x5'
Cockpit Carlins	2	¾"x1½"x7'
Bed Logs	2	¾"x3"x4'
Floor Frames	1	¾"x5¾"x6'

All of the above parts to be made of spruce, fir, yellow pine, oak, or mahogany.

Stem	1	2¾"x10"x5'
Mast Step	1	1¾"x5¾"x4'
Mast Partner	1	1¾"x10"x12"
Transom Knees and Breast Hook	1	1¾"x10"x3'

All of the above parts to be made of oak, ash, mahogany, or yellow pine.

Form (Any rough lumber)	1	1¾"x10"x14'

OTHER MATERIALS

8 gro. 1" No. 8 f.h. screws
2 gro. 1½" No. 10 f.h. screws
1 gro. 2" No. 10 f.h. screws

All these screws should be of brass, galvanized or cadmium-plated.

12	¼"x1¾" carriage bolts
4	5/16"x6" carriage bolts
2	¼"x6½" carriage bolts
2	¼"x4½" carriage bolts

Other fastenings as job indicates.

1 qt.	"C" quality marine glue
1 gal.	Canvas cement
12 yds.	36" width canvas
4 ozs.	¼" tacks
1 lb.	Marine glue

Coat end posts and keel along slot, each side, liberally with marine glue, before fastening well boards. Lay cloth strips upon the coated area, clamp well boards in place, and fasten to end posts with 1½-in. No. 10 *fh* screws. Proceed to fit bed logs each side of center board case along the keel, to reinforce the well. Fasten these bed logs to side of well boards with 1½-in. No. 10 *fh* screws and bolt the logs through keel with four ¼-in. x 4¾-in. carriage bolts to each log.

The breast hook, at the stem, is now cut to fit and fastened through planking and clamp with 3-in. No. 10 *fh* screws, using four screws to each side. Similarly the transom knee is cut to shape and bolted through the transom and through the keel with ¼-in. carriage bolts.

From this point on, the rest of the construction will depend upon the particular model selected—open cockpit or cabin model.

The open cockpit model requires merely the installation of deck beams fore and aft and the cockpit railing and coaming, followed by covering the deck with ⅜-in. waterproof plywood. This deck should have a center seam secured by a ¾-in. x 1½-in. batten. All decking is fastened in place with 1-in. No. 8 *fh* screws spaced above three inches apart.

The cabin model is a more ambitious undertaking. It requires uprights bolted from the frames to form the cabin walls and coaming. The forward deck beams as well as cabin roof beams are bolted in place as indicated while the cockpit beams are ¾-in. x 2½-in. pieces bolted to side frames.

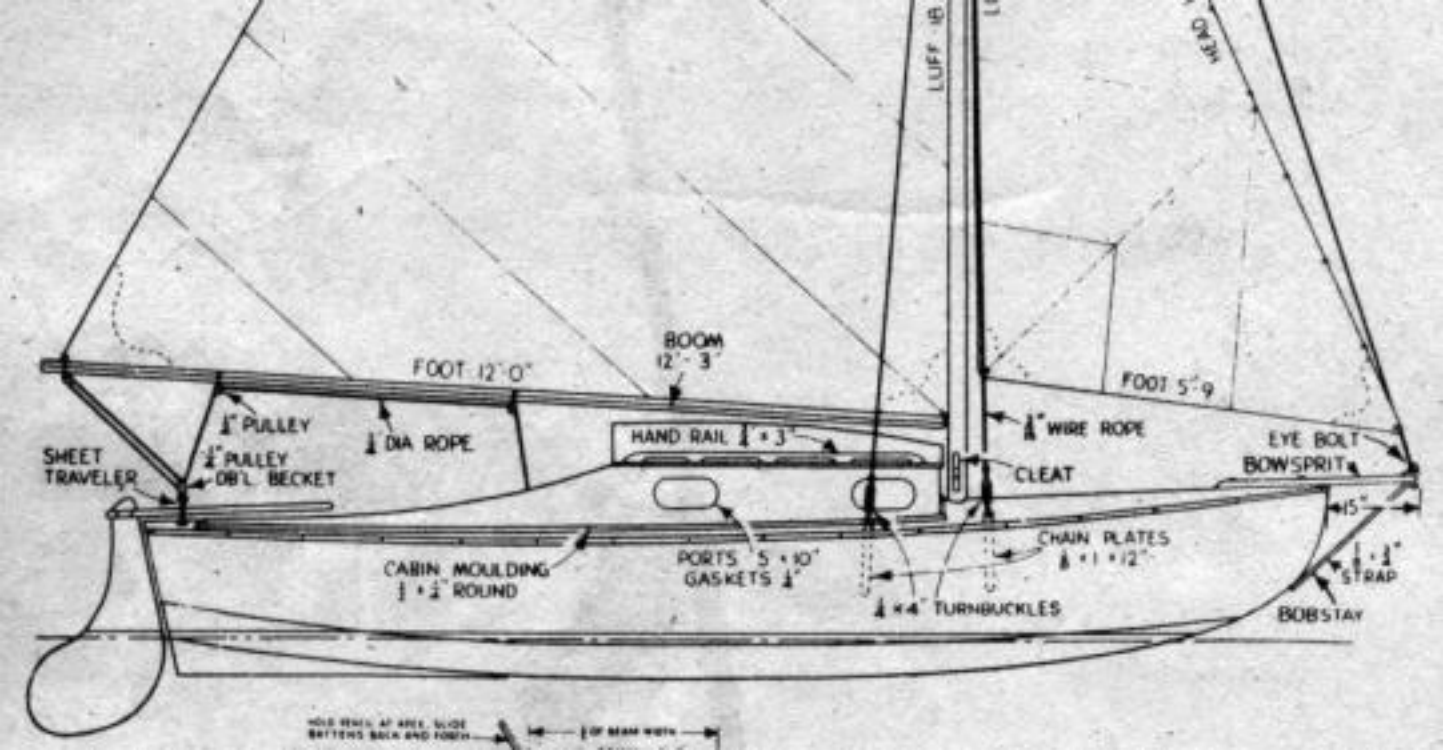
The installation of mast step and mast partner is identical for either model. They are bolted in place. The only difference is the location of the mast.

The cabin sailing model is covered with ⅜-in. exterior plywood on deck, cabin sides and cabin end, while ¼-in. thickness exterior plywood covers the cabin top. Plywood on both roof and deck is jointed in the center with a ¾-in. x 1¼-in. batten notched into the beams of the deck. The same size strip is placed between cabin roof beams to secure center joint at that point. All plywood is fastened with 1-in. No. 8 *fh* screws spaced about three inches apart.

On either model, edges of all decking are trimmed evenly and the surface of the plywood is covered with 8-ounce canvas, cemented in place to deck with canvas cement. Edges of the canvas along the sheer are turned over and tacked. Surface of canvas is filled with diluted canvas filler thinned with alcohol. Such a deck, when painted, is flexible and elastic. It outwears any paint-filled canvas deck. On either model rim and protect edges along sheer with a ¾-in. x 1¼-in. half-round moulding, fastened to sheer with 2-in. No. 10 *fh* screws spaced about eight inches apart.

Additional trim work and equipment will depend upon the builder's fancy. However, the hull should should be given one coat of equal parts linseed oil and turpentine or *Firzite* followed by any desirable paint finish. The hull of the original "Petrel" was painted as follows: bright green bottom, white boot topping, black sides, buff decks and cabin top, and white cabin sides. The whole ensemble presented a very "yachty" appearance. Paint striping, done skillfully either by hand or with a paint striper device, gives the much-desired streamline effect, adding to the speedy appearance of the sloop as it cuts the water. ■

• To obtain enlarged plan for building Petrel, Craft Print No. 106, see handy order form on last page of this issue.


LUFF 18'
LEECH
HEAD
BOOM
12'-3"
FOOT 12'-0"
FOOT 5'-9"
1" PULLEY
1" PULLEY
OB'L BECKET
DIA ROPE
SHEET
TRAVELER
HAND RAIL 1" x 3"
1" WIRE ROPE
CLEAT
EYE BOLT
BOWSPRIT
15"
CABIN MOULDING
1" x 1/2" ROUND
PORTS 5 x 10"
GASKETS 1/2"
CHAIN PLATES
1/4" x 1" x 12"
1/4" STRAP
1/4" x 4" TURNBUCKLES
BOBSTAY