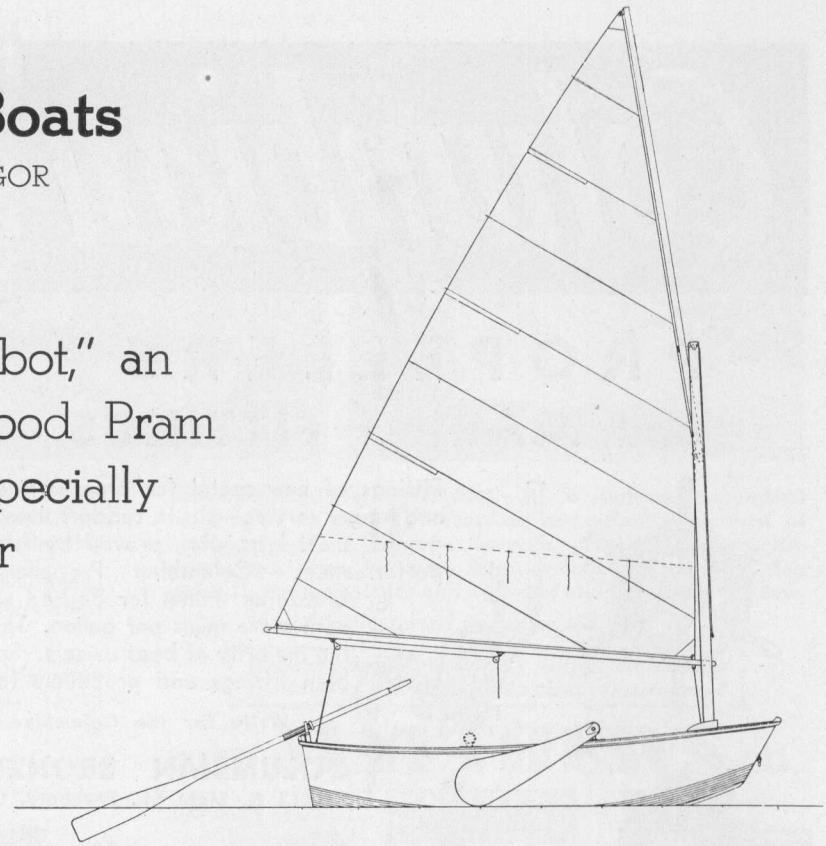
Plywood for Boats

By CHARLES G. MacGREGOR

Part II

Building Plans of "Sabot," an 8 Foot Leeboard Plywood Pram Dinghy, Designed Especially for The Rudder



THE pram dinghy has been very popular in Europe for a great many years and in all probability the type originated in Scandinavia. The pram is rapidly becoming very popular in this country. Experienced yachtsmen have been quick to see and appreciate its many good qualities and are willing to overlook its odd appearance. As a yacht tender it is ideal, because of its unexcelled carrying capacity, short length, and light weight—an important item if the dink has to be carried on deck or on top of the deckhouse; and most important of all, it tows exceptionally well.

With the advent of resin-bonded plywood we are able to overcome weight objections and have gained other worthwhile advantages.

The plans published herewith are those of an 8 foot lightweight leeboard pram of the following dimensions:

Length overall	7'11"
Beam	4'0"
Depth	16"
Draft, leeboard down	15"
Sail area	37 sq. ft.

Leeboards, lugsail rig and the steering oar have been suggested in this design, merely because of simplicity and low cost.

A center-board could be installed if preferred to the leeboards; a sliding gunter or Marconi rig could be used; and a rudder and tiller instead of the steering oar.

The vee-bottom is slightly more difficult to build than the flat bottom, but it is superior to the latter especially for sailing and towing; therefore, its adoption is recommended.

The hard or sharp chine is simple in construction, but the flat chine, as used in the dinghy illustrated last month, is better, improving the looks and making rowing and towing in a heavy sea safer. This, of course, is a patented construction and permission to use it should be obtained from the patentee.

The following items will be discussed briefly:

a. *Cost.* Plywood lends itself admirably to the manufacture of boats in quantity, and there is little waste and less labor even in building one boat. This boat should cost between $12 and $15; sail, leeboards and spars extra.

b. *Weight.* There are fewer structural members in a plywood boat and the materials used are generally lighter than the conventional. This boat can easily be carried on top of a car, or on top of the deckhouse.

c. *Strength.* Because of its construction plywood will not split, warp, shrink or expand. As a planking material it immediately overcomes all these weaknesses in conventional construction. All joints are glued, and it is possible to remove all fastenings in the planking after the glue has set! But the holes would have to be filled again, so we leave them in.

d. *Watertightness.* A boat of this type and construction will not leak if the seams are carefully made and glued. There are only three seams in the planking and these are only partly submerged, as compared with at least 12 to 16 on the conventionally built boat and these are a potential source of leaks. The boat may be left in the sun and will not leak when put into the water, nor is it necessary to leave water inside when hauled out to keep it from drying out.

e. *Repairs.* If due to an accident a hole is stove in the planking, this can easily be repaired by cutting away the jagged portion around the hole, fitting another piece of the same material in the hole and backing it up with another similar piece on the inside, but about ¾" larger all around. These can then be screwed and glued to the planking, taking care to remove the paint down to bare wood, before gluing.

f. *Rowing.* The pram rows well and easily when light, and when loaded with four or five persons aboard, will carry its way between strokes.

g. *Towing.* Even under the worst conditions the pram tows exceptionally well, riding on top, never veering off to one side or the other, always keeping its head up.

h. *Upkeep.* There is little upkeep required. Keep the boat well painted or varnished. If lying on a float and it is desired to empty of rain water, simply lift the boat up at the stern. The water will pour out over the bow transom.

j. *Sailing.* Under sail the pram is fast, especially off the wind, and if not loaded too deep, will plane. On the wind in a short sea it does not act as well as a straight stem boat, due to the roundness forward and short waterline.

k. *Engine.* Any of the small air-cooled inboard or outboard motors can be used in this hull.

l. *Transportation.* This hull is light enough to carry on top of your car, and can be placed there easily by two men, since it weighs only a little over 70 pounds. All the spars

are of such length they can be stowed inside the boat. A small wheel can be fitted at the heel of the skeg, so that one can push it single-handed along the float or sidewalk.

BUILDING

Order your material from the following list:

Planking. 2 panels Resin-bonded Fir Plywood, ¼" 3 ply, 48" x 96". This will be sufficient for the bottom and side planking and the bow deck with a little to spare.

Transoms. Bow and stern, 1 piece African or Philippine Mahogany ¾" thick, about 9" wide, 10' long.

Inner keel. 1 piece Sitka Spruce, Pine or Mahogany ¾" x 3" x 7'6".

Outer keel. 1 piece White Oak ¾" x 1" x 7'6".

Chine Stringers. 2 pieces each ⅞" x 2¼" x 8'.

Gunwale Stringers. 2 pieces Sitka Spruce, each 1¼" x 1" x 8'.

Gunwale Cap. Mahogany ¼" x 1⅜" x 8'.

Bent Frames. 3 pieces each ½" x ¾" x 5'6".

Thwarts. Mahogany, 1 piece 9/16" x 7" x 10' to be cut for three thwarts.

Flooring. Cedar, 4 pieces each ⅜" x 6" x 5'2", with three cleats each, White Oak, ½" x ¾" x 13".

Knees. Should be ⅝" Hackmatack crooks.

Fastenings. Use bronze screw fastenings throughout. 2 Gross ¾" #6 for planking, gunwale cap, etc. 3 Dozen 1" #8 for frames, fashion pieces, etc. 3 Dozen 1¼" #8 for outer keel, etc., and a few miscellaneous sizes.

Gluing. All joints must be close and carefully fitted especially at plank edges. All contact surfaces should be glued with cold resinous glue.

General Notes. The panels should not be laid on a damp floor. Stand them up on edge until they are ready for use. Do not countersink the holes for the screws in plywood.

Build the boat upside down and make the building form strong and rigid.

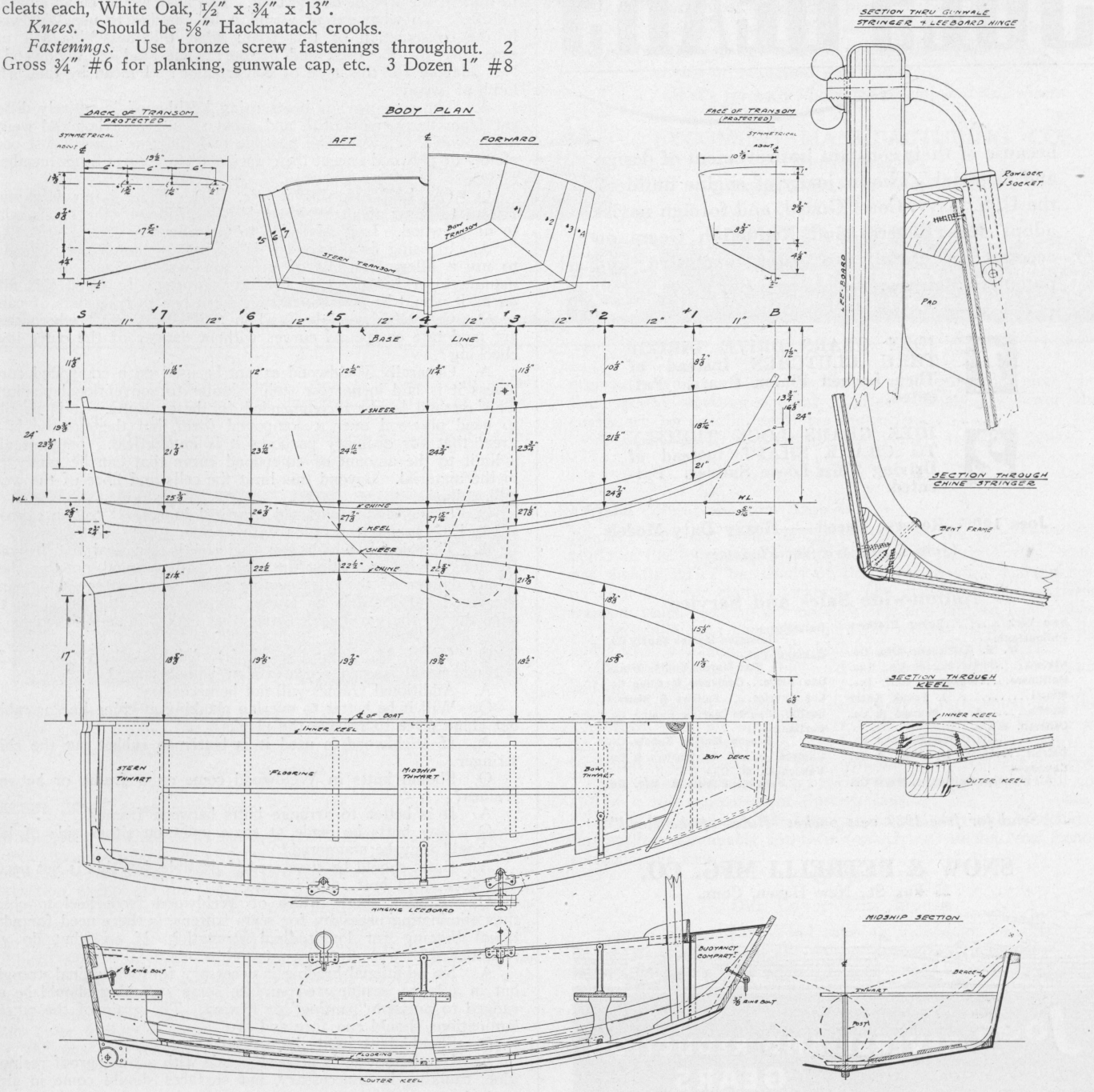
Before finally gluing the planking in place, drive all screws, then back them out, spread the glue along the contact surfaces and edges, and fasten down firmly, re-driving all screws.

QUESTIONS AND ANSWERS

Q. (A. G. W., Detroit, Mich.) Can Weldwood be used to plank a steam bent frame job or is it necessary to use chine construction?

A. Yes, Weldwood can be used but better results can be obtained by using chine construction on the Vee-bottom form of hull.

(*Continued on page* 64)



Q. How thick a sheet can be used successfully in planking a small boat?

A. Plank thickness depends on the size and type of boat, but panels from ⅛" to ¾" thick can be used for planking.

Q. Will Weldwood steam bend?

A. Yes; it generally requires a little longer steaming than conventional lumber.

Q. (F. B. S., San Francisco, Cal.) Can you advise me if there is any formula as to figuring the necessary thicknesses of Weldwood to be used on a boat?

A. There is no formula for figuring the necessary thicknesses of Weldwood to be used on a boat, but generally the thickness is about 40% less than conventional construction. If you will advise me of the size boat you are building I can suggest the thickness for you.

Q. Also, is it possible to use Weldwood where there are compound or reverse curves and if so to what extent?

A. It is not practical to use Weldwood or any other form of resin-bonded plywood on a compound or reverse curve. It is quite suitable for simple curves.

Q. (A. P. K., Beach Haven, N. J.) I am planning to build a 15½ ft. sailboat for use in racing this summer and wish to take advantage of the use of as much Weldwood as possible in order to lighten the weight of the boat. The boat would be an enlarged "Moth." To what extent would it be possible to use Weldwood in the construction of this boat; what thickness should I use, especially for the deck and bottom; what kind of Weldwood is best adapted for this type of construction? I mean by this, what kind of wood?

A. The structure of boats using Weldwood is entirely different from the conventional, and great savings in labor and weight are possible. It would be possible to build this boat almost completely of plywood except the chines and one or two other members.

Q. (A. L. McH., Mifflinville, Pa.) There is so darn much I want to know about Weldwood! The following questions relate to fir plywood. Is it advisable to use filler?

A. In using fir plywood it is advisable, though not necessary, to use a filler. Several of these are available and sold by the manufacturers of plywood for this purpose. In using this filler on fir it would be possible to save from one to two coats of paint.

Q. Can Weldwood be used in arc bottom craft where there are moderate compound curves without danger of the outer layer checking?

A. Generally Weldwood cannot be used on a compound curve unless it is laid in narrow strips similar to conventional planking. This method is not recommended for best results. It is possible to bend plywood over a compound form, but the expense is so great that for ordinary purposes it is impractical. There is also a limit to the amount of compound curve that can be safely put in the material. Beyond this limit the cells and fibre of the wood will collapse.

Q. Is the sketch enclosed practical in respect to the exposed edge; i. e., would it splinter with ordinary use?

A. The sketch which you enclosed is practical but I would certainly advise protecting the edges of all plywood, not that there is any danger of the plies coming apart from water soaking into the wood but there is an uneven expansion of the wood on the edge due to the varying densities, that makes it poor practice.

Q. (E. S. M., Princeton, N. J.) With stations spaced 2-3-0 will additional frames, seven in plan, be necessary?

A. Additional frames will not be necessary.

Q. Will it be better to overlap planking at chine line or rabbet out chine piece to receive the planks?

A. If Weldwood is used it is better to rabbet out the chine stringer.

Q. Should butts in Weldwood come on a frame or between frames?

A. It is better to arrange butts between frames.

Q. May butts be made at same point on either side of keel or should they be staggered?

A. Butts should be staggered if possible, but this is not necessary if a good butt joint is made.

Q. Using a single width of Weldwood from keel to chine, thus eliminating necessity for seam battens, is there need for additional bracing for longitudinal strength? If so what do you recommend?

A. No additional bracing is necessary for longitudinal strength, but in a large unsupported surface some stiffening should be arranged to prevent "panting" or flexing. The grain of the outside laminations should run fore and aft.

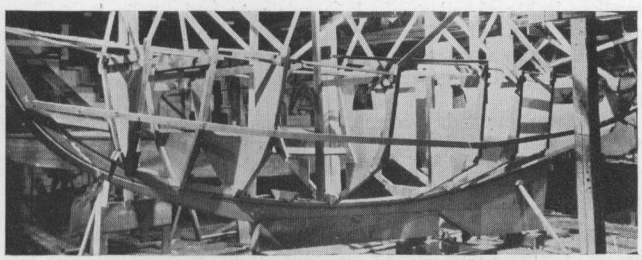
Q. Should butt joints be caulked?

A. If a butt joint is properly made with a waterproof resinous glue, caulking is unnecessary, but surfaces should come in close contact.

Q. Plans call for ¾" planking. Will ½" Weldwood, under advertising "40% lighter for same strength," be correct or do you recommend ¾" Weldwood?

A. ½" Weldwood is the correct thickness as a substitute for ¾" planking.

(*To be continued*)



The Toppan Twosome—largest all plywood auxiliary (23'6") ever built. Toppan Boat Yard, Medford, Mass., are building her from MacGregor designs. Plans in THE RUDDER *for February*

STEEL BOAT (Continued from page 44)

draft 5 feet 6 inches. The sail area is 783 square feet in a modern yawl rig. Spars are hollow spruce. Standing rigging is 6 by 7 imp. plow steel, galvanized. Sails are by Hathaway & Reiser. The construction, except for the hull plating, follows more or less standard practice. The keel is hollow, with lead ballast run in. The hull plating is 3/16, bottom, with sides being 10 ga. metal. The deck is Weldwood bolted and screw fastened to steel beams, painted with "non-skid" paint. The cabin top is the same. House sides are steel. The cockpit is self-bailing, and is floored with cork. She has a five- or six-inch steel rail throughout her length, capped with varnished wood. The boat has full headroom throughout—over 6 feet.

Parsons has termed his type the "Vacationer" and has set out to provide all the cruising accommodations desirable in a cruising auxiliary of her size, in the practically "one-piece" hull that welded steel affords, at a price substantially lower than customary for auxiliaries of her dimensions.

Auxiliary power is a Gray 4-22, with 2:1 reduction gear.

YAWLS (Continued from page 41)

people. This was done, as can be seen by the plans, with four bunks in the forecastle forward, the foot of the after two extending slightly under the heads of the forward ones, leaving space on each side for clothes lockers. The main cabin has extension transom seats, sleeping one on each side and built-in bunks above.

The galley was kept aft where the motion of the ship is less and also in a handy place to both the cabin and the deck.

The toilet room is to starboard with lockers behind for clothing and oil skins.

The boats will be powered with diesel motors which have been kept entirely in the open for access all around. The motors will be boxed in and have drip pans underneath. Centerline shaft installation was chosen and they will have self-feathering wheels.

The sails are being made by Hathaway & Reiser and will consist of a full equipment of thirteen sails.

Work on the boats has been started and they will be delivered this spring, presumably for their first tryouts in the New London to Annapolis race.

Our Cover This Month

Among recent Gar Wood sales to individuals of prominence in the boating world is the sale of a 24 foot Streamline Cabin Utility to Mr. W. K. Vanderbilt, owner of the yacht, Alva, on which the new Gar Wood will be used as owner's launch. Delivery of the boat was made recently in Miami, Florida, at which time the photograph appearing on the cover of this issue was taken. Shortly afterward Alva left on an extended South American cruise.