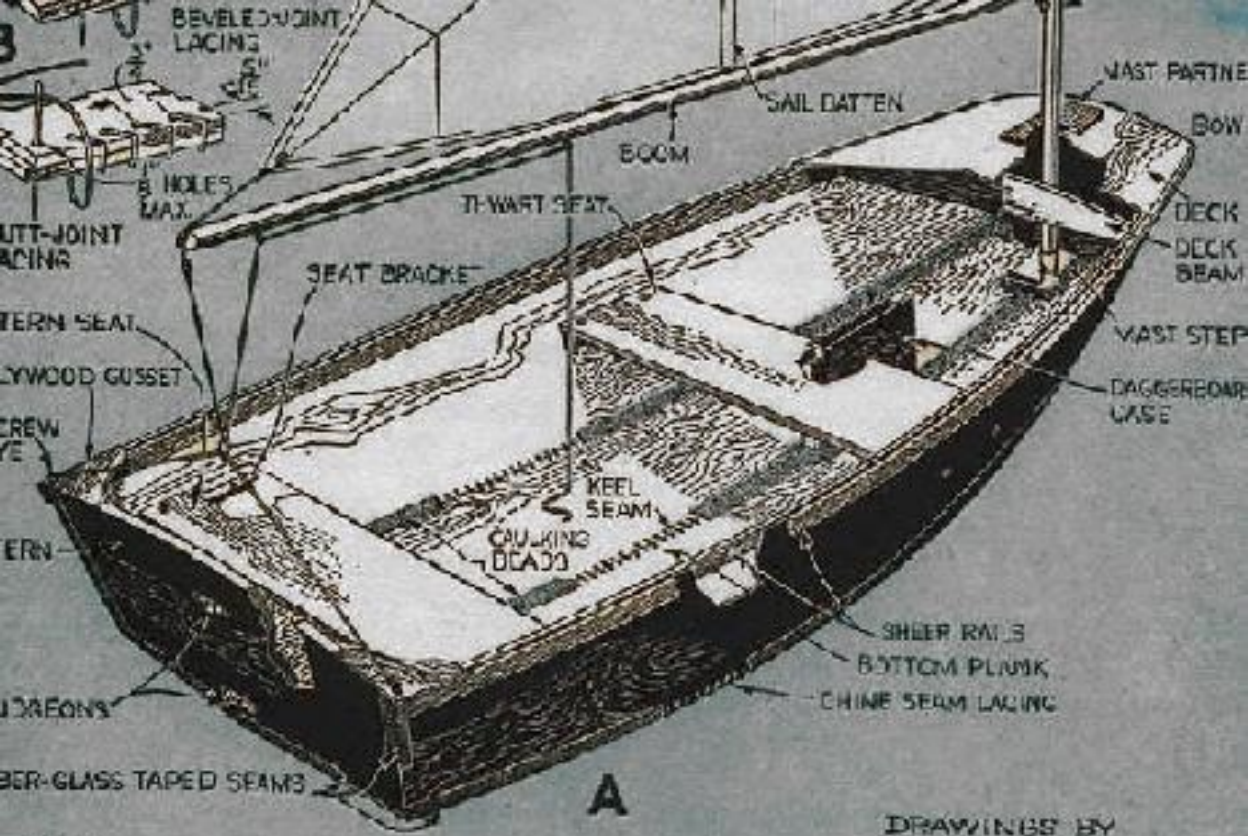

BEVELED JOINT LACING
BUTT-JOINT LACING
8 HOLES MAX.
STERN SEAT
PLYWOOD GUSSET
CREW EYE
STERN
CENTERBOARDS
FIBER-GLASS TAPED SEAMS
SEAT BRACKET
TI-WART SEAT
BOOM
SAIL BATTEN
MAST PARTNER
BOW
DECK
DECK BEAM
MAST STEP
DAGGERBOARD CASE
KEEL SEAM
CAULKING BEADS
SHEER RAIL
BOTTOM PLANK
CHINE SEAM LACING
A
DRAWINGS BY

Graefin-10

Sailing pram, ideal for learning the basics of sailing, is also fun for more experienced sailors.

Designed By Will Graef

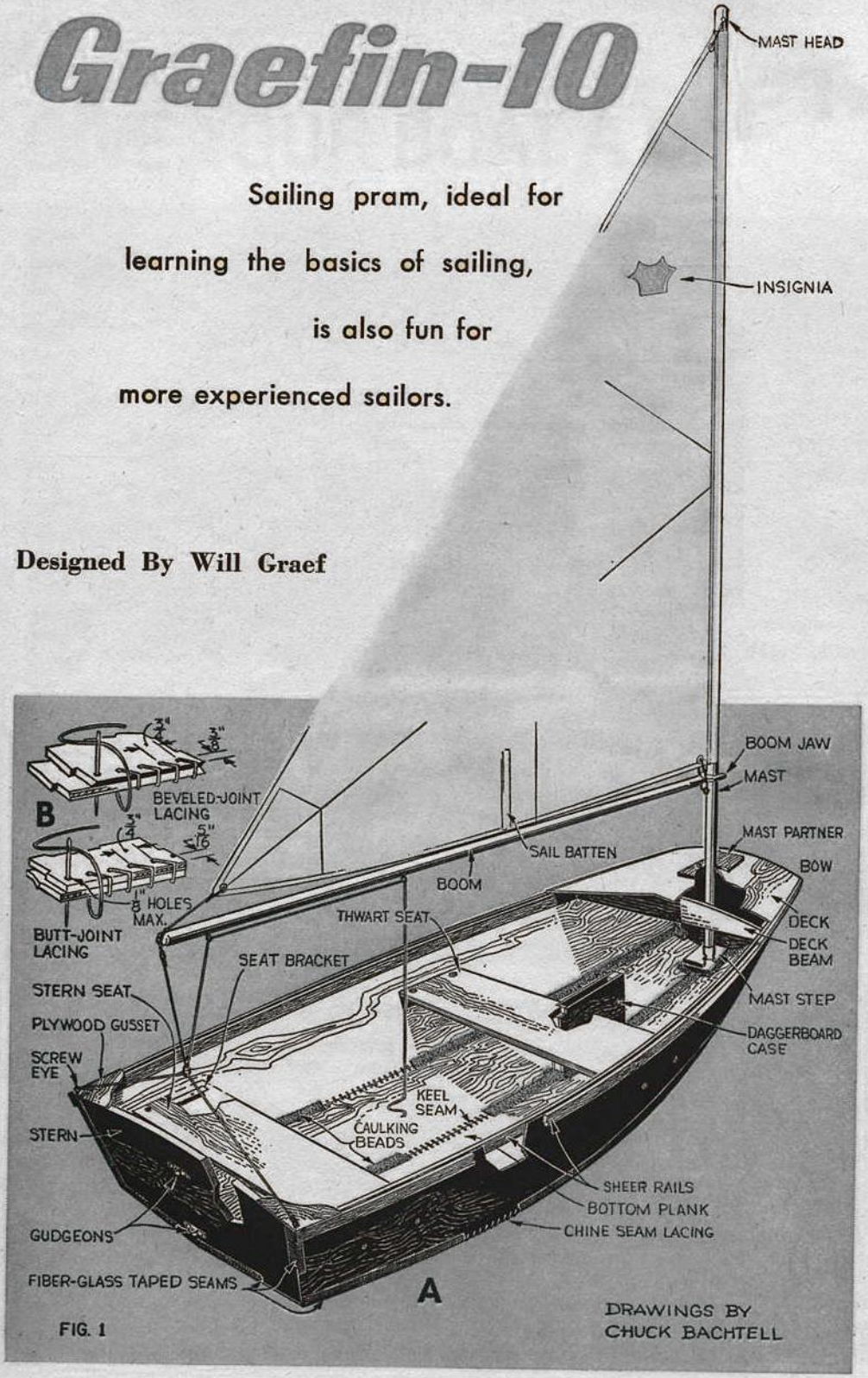


FIG. 1

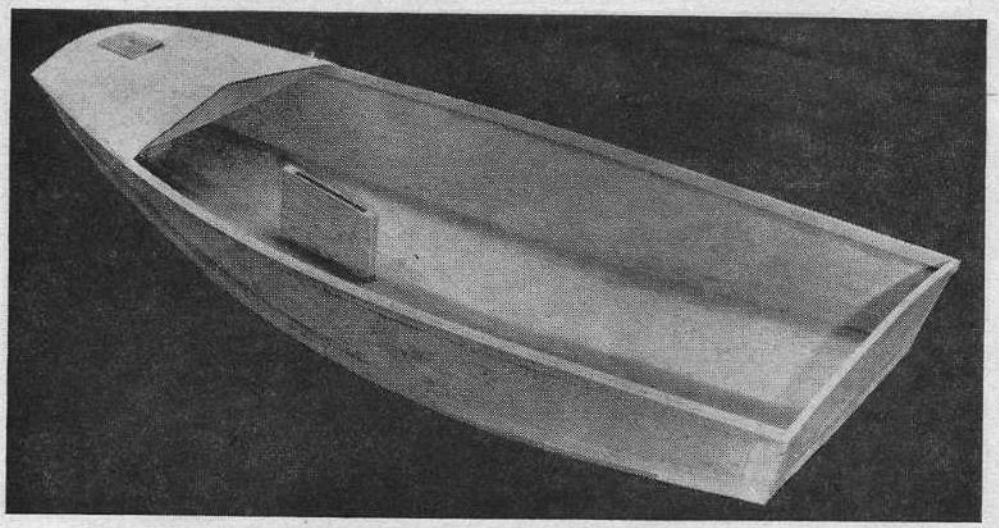
SAILING enthusiasts and backyard boatbuilders are not likely to find plans for a sailing pram that can be built faster, lighter, stronger, or less expensively than Graefin-10. Two men can begin work on a Friday evening and have a smart, lively 10-ft. 85-pound sailer in the water by Sunday evening. It's been done.

Graefin sailers have been dropped two stories in tests without damage and have been suspended by one gunwale while an Army Jeep was suspended from the other. Graefin sailed away.

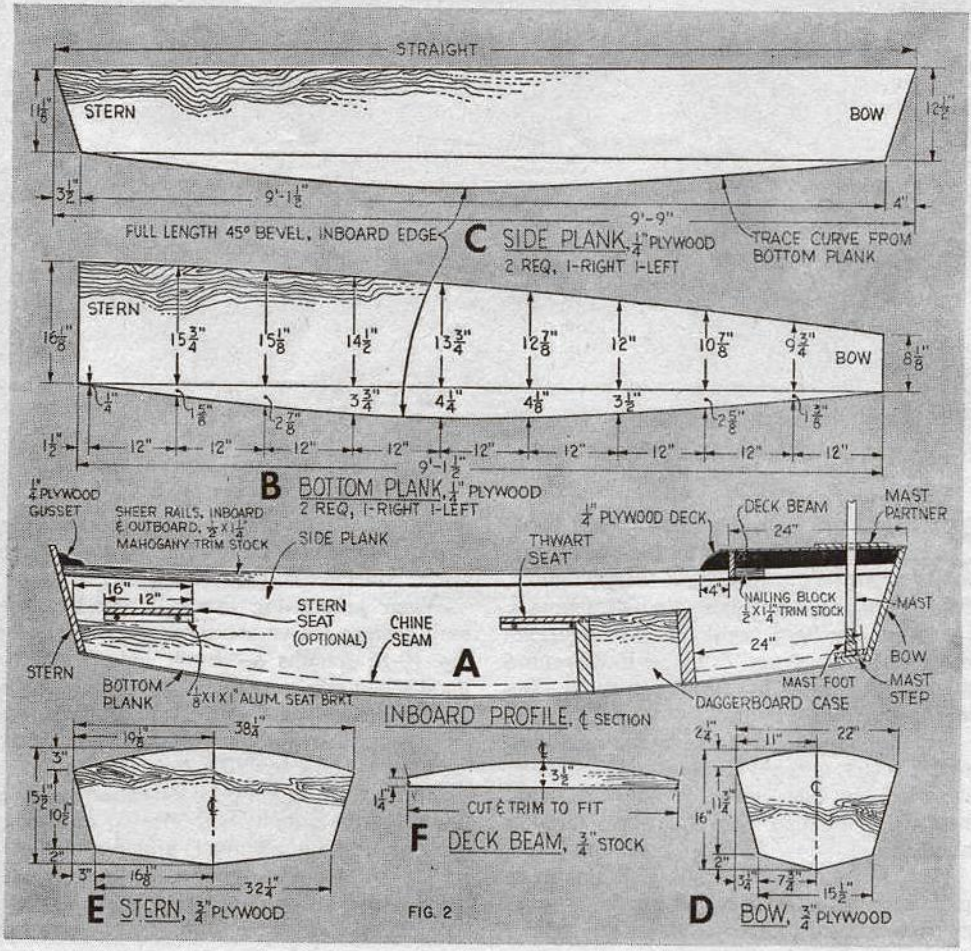
You can build this sailing pram from scratch, using exterior or boatstock plywood from your local lumberyard and any of the dozens of plastic resins on the market. Or, you can purchase Graefin in kit form from Graef Marine Co. (see Materials List).

When purchasing materials locally, you may have to ask your lumber dealer to order the 10-ft. lengths so you'll have them on hand when you're ready to begin work. Mahogany trim stock can be found in the lengths needed among items such as ranch trim in the home building departments.

Although Graefin's construction uses a few nails to eliminate complicated clamping, it could be built without a single metal fastening. A good-size needle is the only unusual (to boatbuilding) tool needed. The half dozen C-clamps found in the average



Caulk all interior joints and seams before turning the hull to complete the underside. Coat contacting surfaces of the mast step and daggerboard and case with putty for a waterproof joint.



3: Use simple overhand stitch. Use Nylon lacing, start with three holes at each end of seam, tie off. Begin again at middle, work toward ends.

4: Cut, locate and nail or clamp spreader bars to 2x4. Sight along sheer to check for straightness.

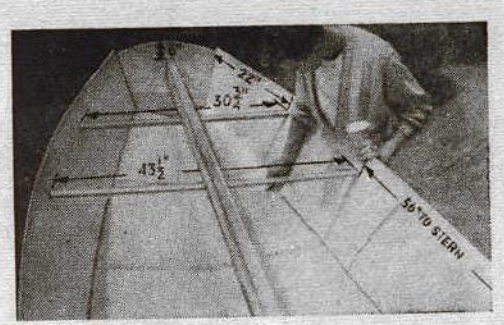
home workshop are more than adequate.

Begin Construction by laying out the bottom planks as in Fig. 2B. First draw in the base line, using another panel as a straight edge, then mark reference points for the curved lines. Now drive finishing nails partway at each reference point and spring a ¾ x ¾-in. wooden batten along them. Secure the batten with a few more nails, sight along it to be sure there are no flat spots or humps in the curve, then use it as a guide for drawing in the line. Repeat this procedure for each curve and cut the panel to shape. Use this panel as a template to cut a second one, being sure you have a pair with the best or "A" side of the plywood outside.

To lay out the side planks (Fig. 2C), draw a base line as before, then lay the first bottom plank over this with base lines aligned. Now trace the chine curve and remove the bottom plank. Complete the layout by drawing in the straight sheer line and go on to make a pair of side planks as you did bottom planks. Cut a 45° bevel along the entire length of the planks where they meet at the chine stem. A sander or plane can be used for this job as the bevels need not be perfect.

Lacing Planks. When finished, lay the bottom planks together with the centerline curves matched and sight along them to be sure they have no flat spots. The curves can be trimmed slightly with a wood rasp or sander. Next scribe a line 5/16 in. from the mating edges (Fig. 1B) with a line gauge and drill ⅛-in. lacing holes centered on the line at ¾-in. intervals.

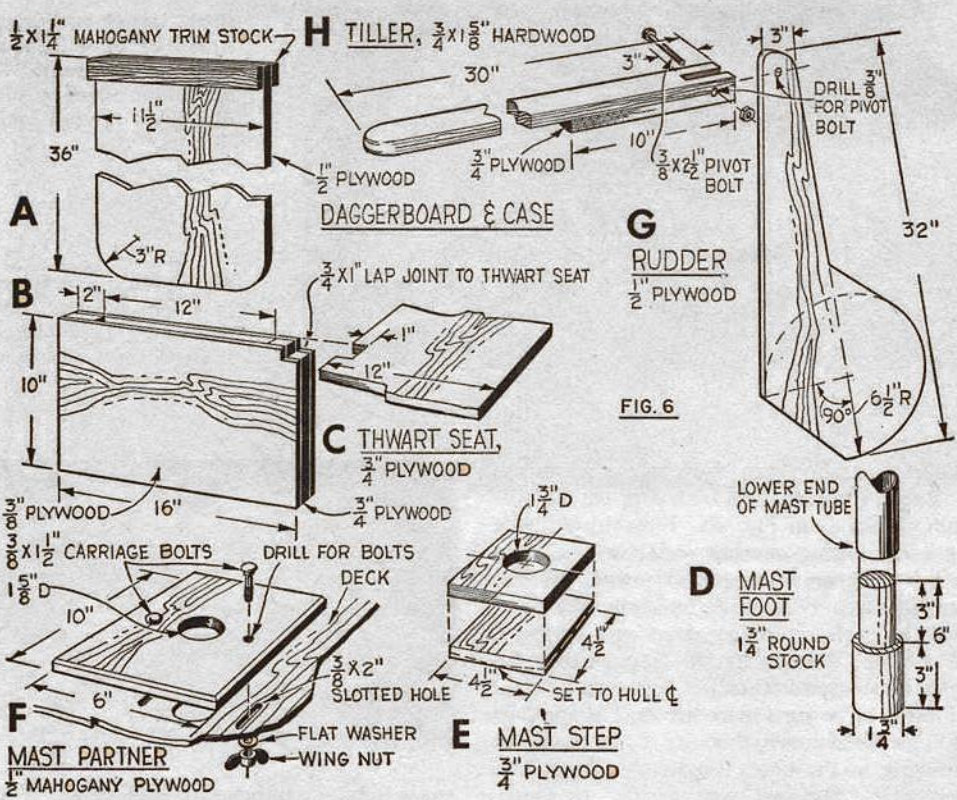
The bottom planks can now be spread flat on sawhorses and the keel seam laced. Using a large needle to guide the nylon lacing, begin at the midpoint of the seam and lace out to the bow, drawing the plywood



edges tightly together with each stitch. When you reach the last hole, double back for three holes, then secure the end of the lacing. Now repeat the process for the opposite end.

Next match and drill the sides and bottoms along the chine curves in the same way except that the distance from the edge to the centerline of the holes is increased to ⅜ in. because of the bevels. A pair of C-clamps will be useful here to draw the side panels flat against the bottoms. When the chines are laced as in Fig. 3, the sides can be unfolded and propped open with a spreader bar amidships while you install the bow and stern.

Bow and Stern. Lay out and cut the bow and stern as in Figs. 3D and E, with a 12° bevel on the edges that contact the planks. Then install the stern by holding it in approximate position and driving nails through the side planks partway into stern about 1 in. below the sheer lines. The nails will act as pivots while you gently force the bottom of the stern outward until the planks conform to the V'd portion. In this position the stern should fit snugly but, if gaps are seen, move the pivot nails slightly to correct the error. Install the bow in the same way, then trim the planks flush fore and aft, and



install the spreader as in Fig. 4.

Now lightly sand the joints at the bow and stern and cut a length of glass cloth tape to cover them (Fig. 1A). Mix four ounces of polyester putty according to the manufacturer's directions and spread it along the joints, using a piece of pure vinyl floor tile as a spreader. Next place the tape on the putty, notching it with scissors at each corner. Lay a second bead of putty on the tape and spread it smoothly while working it through the cloth. When the bow and stern have been taped, turn the boat right side up.

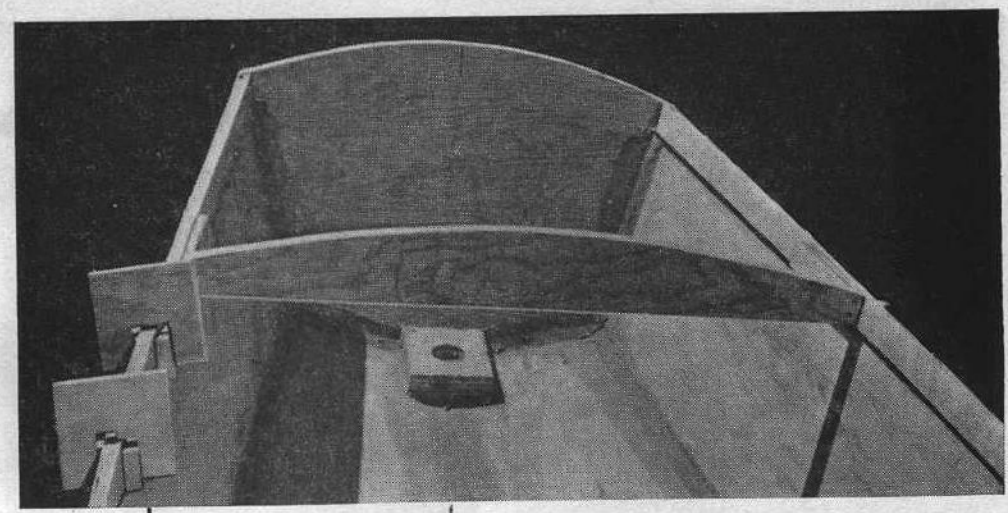
Mahogany Rails (Fig. 1A) are cut to the length of the gunwales and the inboard pieces beveled at fore and aft ends. Sand the mating surfaces lightly and have either C-clamps or block clamps (Fig. 7B) laying in the hull ready for use. Then mix more putty and use it to coat the contacting surfaces of one inside rail, secure this with clamps about 8 in. apart, and clean away excess putty. When the putty has cured, install the opposite inside rail.

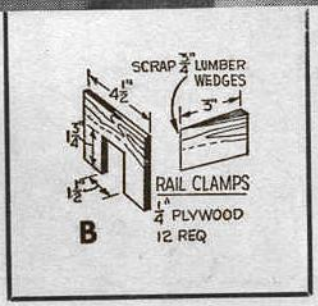
Next make a spreader to draw the putty along the interior chine seams by scoring and folding a piece of vinyl and clipping one corner off the fold. Then lay a bead of putty along the seam and draw it out so you have a uniform fillet completely covering the lacings. Caulk the remainder of the interior joints and seams before turning the hull to complete the underside.

After making the first pass along an exterior seam, firmly place glass tape in place in the soft putty and apply more putty. Two or three passes with the spreader may be necessary to get a seam that will be invisible beneath paint. The taped seams can be smoothed somewhat by sanding but this is hard work that can be avoided by careful spreading.

The hull is now turned again to install the mast step (Fig. 6E). Assemble the step halves with putty and nails and trim the lower block to fit the fore end of the keel seam. Coat the contacting surface of the step with putty, then set it in place, and apply a fine bead of putty around it.

Daggerboard Case. Next make up the daggerboard case and position its fore edge





7A: Install the mast step and the daggerboard case as the interior seams are caulked. Add the mahogany rails and the beam to make the hull ready for finishing.

24-in. back along the centerline while you mark its location on the seam. Drill two or three holes to mark the opening, then install the case with putty in the same way as you did the step.

When the joint has cured, turn the boat, cut the opening with a keyhole or saber saw, and trim it with a wood rasp. Now cut a piece of tape to cover the edges of the opening and attach it over a bead of putty. Trim the tape to lie flat at the corners and spread a second layer of putty. When finished, check the fit of the daggerboard, trimming the edges of the case and the width of the board to ensure a good fit.

The thwart seat is notched to fit over the daggerboard case and its length cut to fit at that position. Mark the location of the seat on the sides and install the seat brackets (Fig. 2A). Be sure the length of the seat does not exert an outward pressure on the sides when fastened to the brackets.

Deck Beam and Deck are installed next (Fig. 1A) and are attached with polyester putty and nails. Trim the edges of the deck flush after assembly and then attach the

MATERIALS LIST—GRAEFIN-10

Amt. Req.	Size and Description	Use
2	¼" x 4' x 10' EXT plywood or boat stock	planking
1	½" x 3' x 3' EXT plywood or boat stock	rudder, daggerboard, mast partner, boom jaws
1	¾" x 4' x 6' EXT plywood or boat stock	mast step, bow, stern, deck beam
24 ft.	½ x 1¼" mahogany trim stock	rails
2	⅛" x 1" x 1" x 12" aluminum angle	seat brackets
	Miscellaneous: seat bracket bolts, tiller pivot bolt, epoxy paint	
	Following materials and information concerning completed prams available by mail from Graef Marine, Duffy Lane, Deerfield, Ill.	
4 qts.	lightweight polyester putty w/ catalyst	$21, plus postage
1 qt.	clear polyester resin w/ catalyst	
12 yds.	2" fiber-glass tape	
50 yds.	flat nylon lacing	
½ lb.	12 ga. x 1¼" copper nails	

bronze pintle, gudgeon, and oarlock kit @ $5, plus postage.
spars, sail, and fittings kit @ $60, plus postage
laced plywood Graefin-10 kit w/ sails & spars @ $150, plus postage

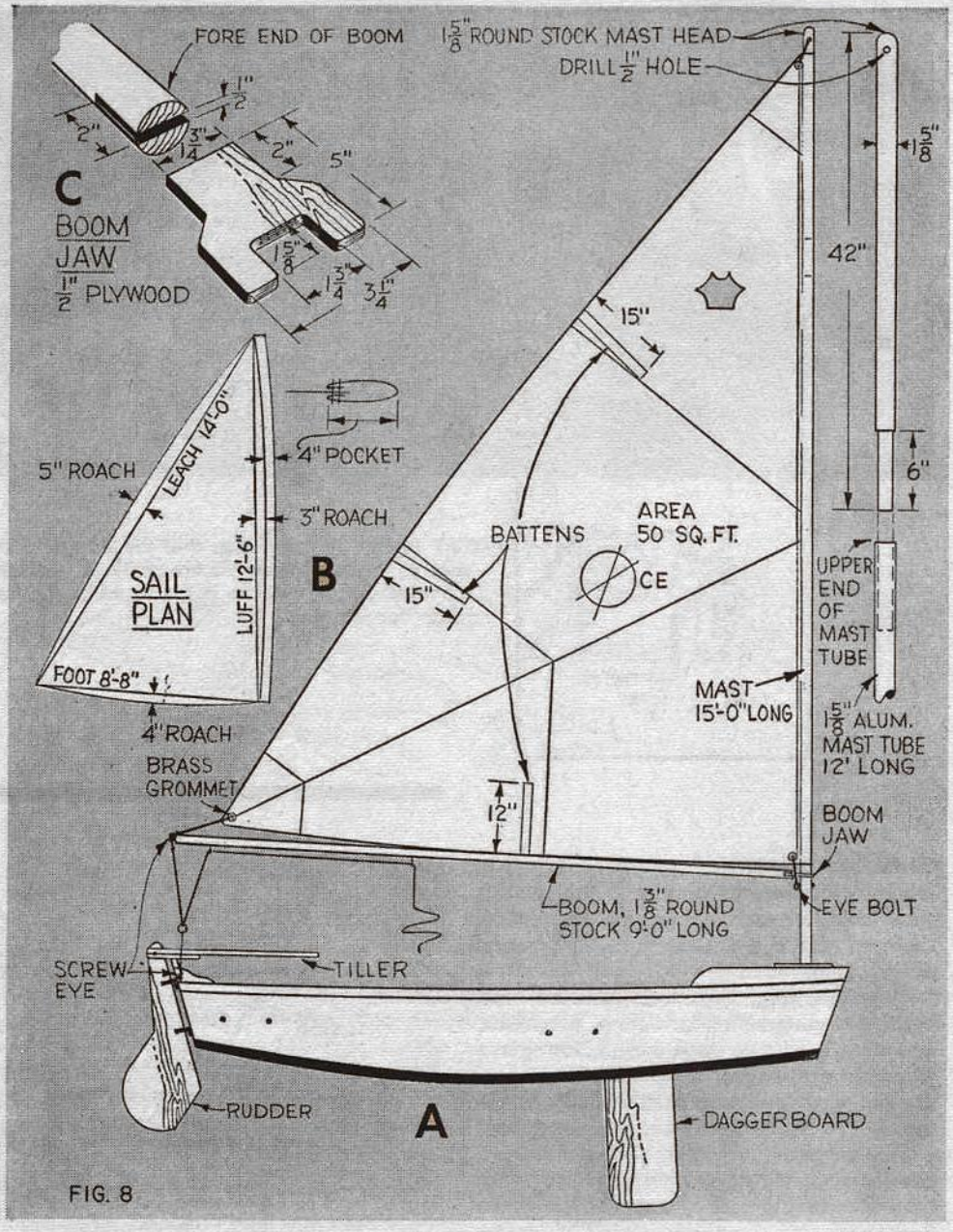
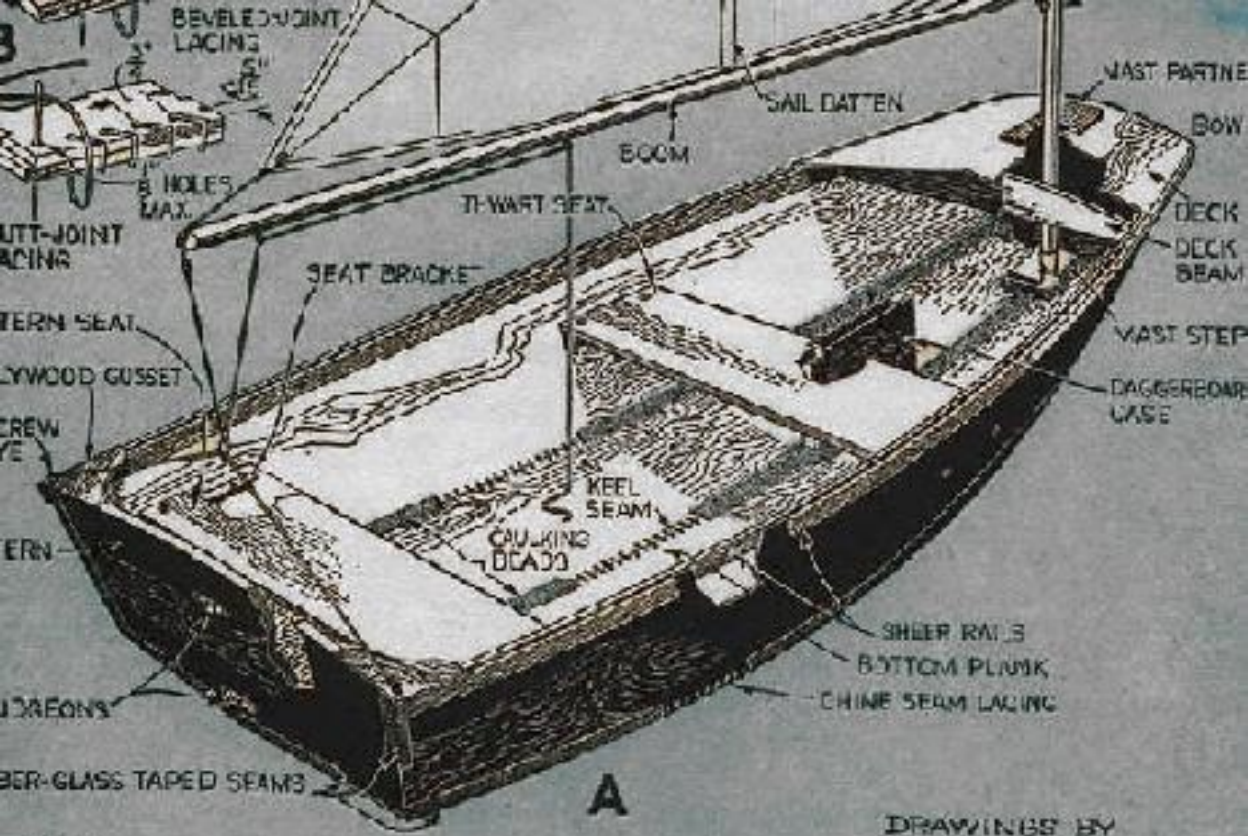


FIG. 8

outboard rails. Allow these to cover the edge of the plywood deck and trim rails and side planks flush with a belt sander. Because the outer rail cannot be clamped forward of the deck beam, copper nails were driven through the rail assembly and were allowed to show—to good advantage—through the natural finish of rails and deck. Seats and gussets were also finished natural by sanding and coating with clear polyester resin. After light wet-sanding of the resin, the remainder of the hull was given two coats of white paint.

To allow some change of rake while tuning your Graefin sailer, fit the mast partner (Fig. 6F) to the crowned deck and secure it with bolts through slots in the plywood. Rudder and tiller are made up next as in Fig. 6G, rigging details on sail plan (Fig. 8). ■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