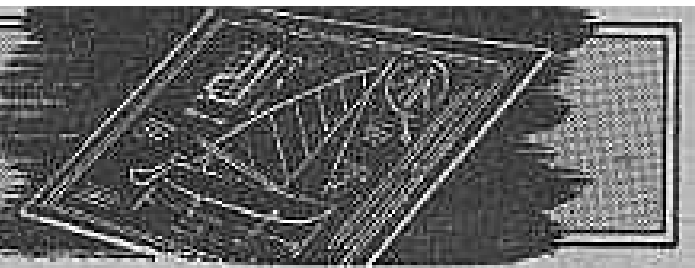


BOATS



If you like your sports speedy, try this lightweight, 12 1/2 foot outboard hydroplane

By **WILLIAM D. JACKSON**
Naval Architect

METEOR is a fast and sporty outboard hydroplane with convex bottom and non tripping chines. It's the type of lightweight boat that can be hauled anywhere by trailer. With small high speed outboard motors, Meteor's performance is flashy but efficient, and it will haul four passengers with ease. Constructing Meteor is not difficult, but it does require workmanlike attention to making close, even joints, as the plywood used is only 1/4 in. thick.

For the form on which Meteor is built select a straight 2 x 10 in. x 12 ft. board, and shape it to the form dimensions (see plans). Then mount completed form on legs which bring it to a convenient working height and notch the form for the frames which are later inserted in it. To prepare templates on which to lay out the frames, mark outlines of frame shapes as indicated on a sheet of paper or 4 x 6 ft. plywood. (After frame shapes

Craft Print Project No. 27

USES: Here's a fast, lightweight, outboard runabout for knockabout service that can be easily transported anywhere. Propelled by 10 to 22 hp outboard motors, it can achieve speeds up to 35 mph.

TYPE: Two cockpit model convex bottom outboard hydroplane.

LENGTH: 12 1/2 ft.

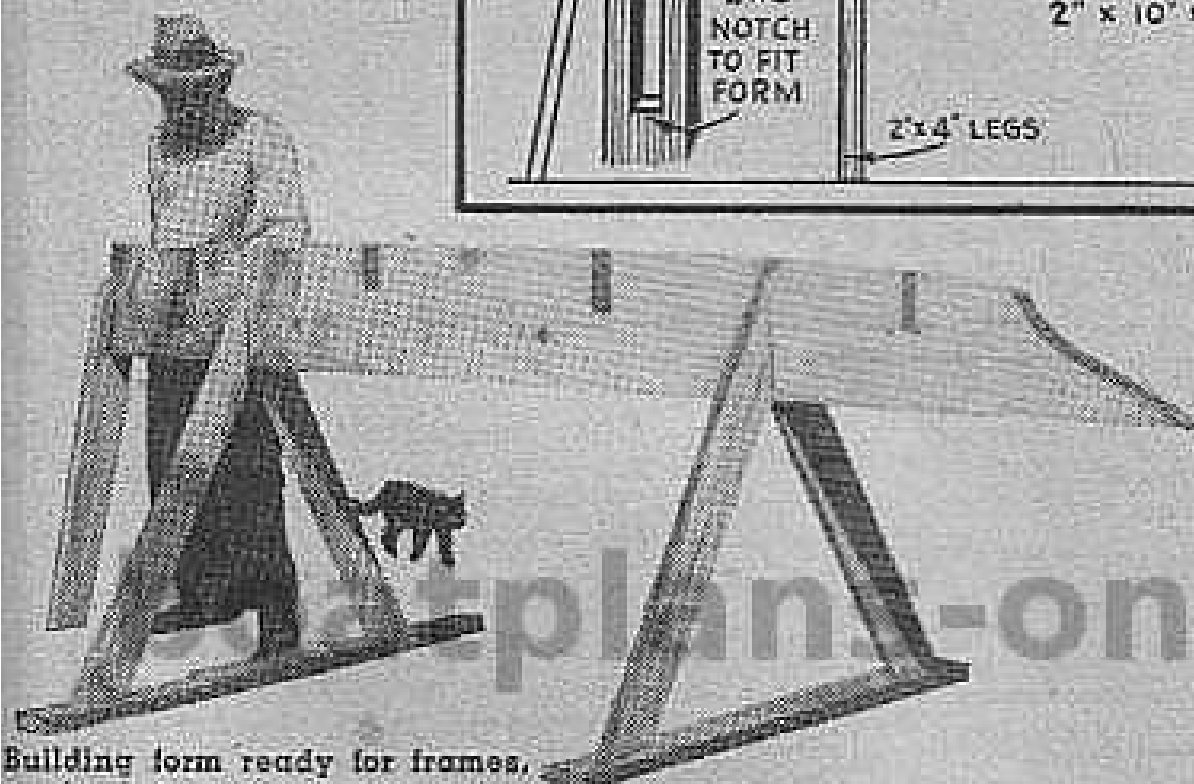
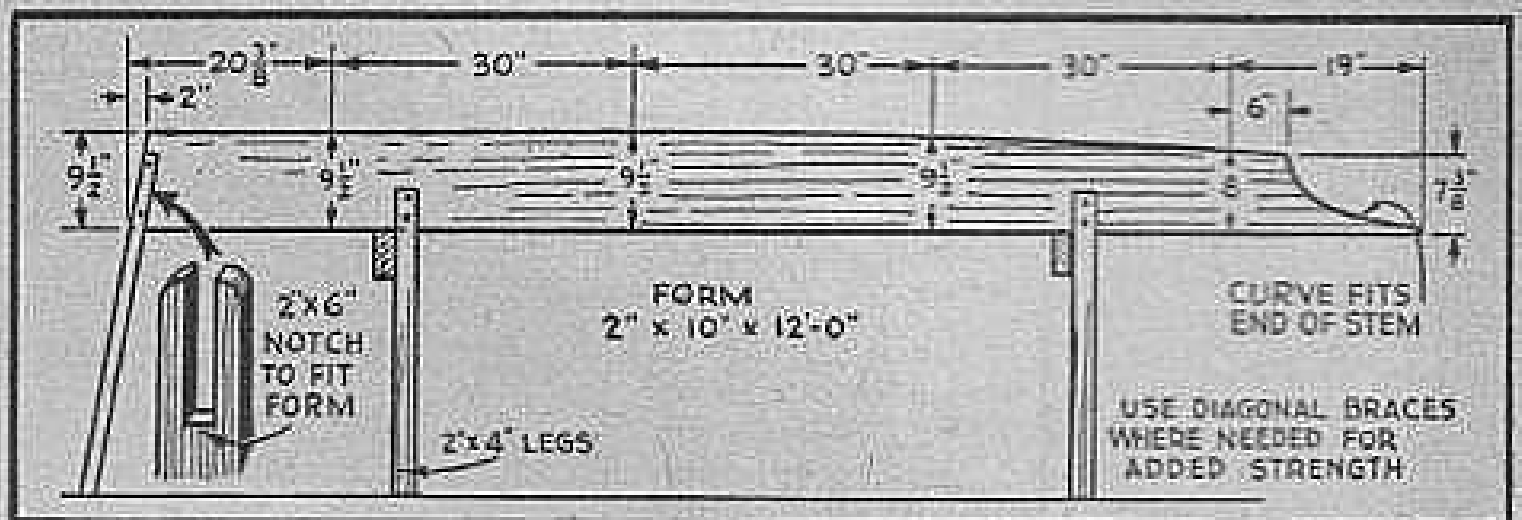
BEAM: 57 1/2 in. (approximately 58 in.) overall.

DEPTH: 24 in.

WEIGHT COMPLETE: 200 lbs.

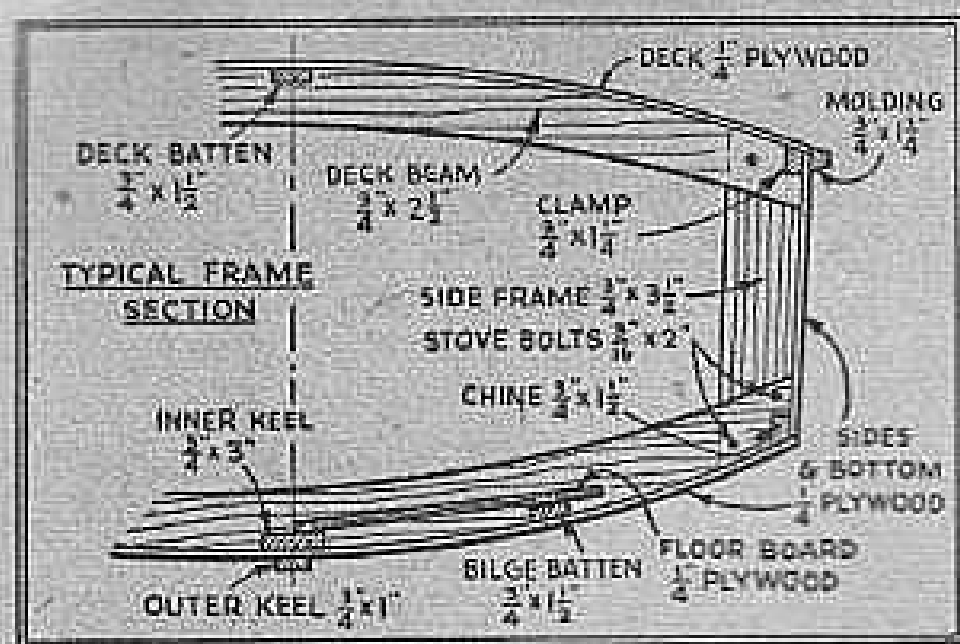
SEATING CAPACITY: 4 persons.

CONSTRUCTION: Plywood planking (3/4 in.) applied over a frame especially adapted to the use of plywood. Frames and bottom are designed to have non-tripping chines at high speeds. Hydro-conic bottom design (developed exclusively for SCIENCE AND MECHANICS) increases in speed almost in direct proportion to the amount of power utilized.



Building form ready for frames, keel, transom and stem.

have been cut out they are aligned with the pattern on the paper or plywood to insure correct assembly.) Next mark frame shapes directly on 3/4 in. stock used for the frame members and saw each frame piece to shape. Then locate curved bottom frames on patterns and align straight side frames on bottom frames and patterns. With frame members aligned, fasten frame joints together, using two 3/16 x 2 in. stove bolts to



each joint. The transom is a 1/2 in. thick piece of plywood, shaped as shown; a 3/4 in. frame is screw-fastened with 1 in. #8 fh (flathead) screws to the inner surface. For a really stiff and durable job coat all contact surfaces with resin glue before assembly. After each frame has been fastened in place, notch all frames for keel, chines, and clamps. Notch the transom frame similarly and notch the transom itself for the chines only. Next prepare a full-size paper pattern of the stem, cut this pattern out and lay it down on the material selected for the stem. Mark to shape and saw out the stem. Then join two pieces of stem together with two 1/4 x 4 1/2 in. carriage bolts. Notch stem for the keel as indicated and finally assemble stem, transom and all frames in their respective positions atop the form.

Attach keel first, fastening it to transom notch, frames and stem with two 1 1/2 in. #8 fh screws to each joint. Starting at the transom, place chines in position and allow 6 in. of the chines to extend aft of the transom. Now bend both chines simultaneously towards the bow, running a saw between chines and frame to insure good contact surfaces, and fasten chine with one 1 1/2 in. #8 fh screw to each joint. Bevel chines to fit against the stem and fasten similarly. Then spring the clamps in place and fasten in the same manner as the chines were fastened, but with after-ends of clamps flush with transom in the frame notch.

Frames are now notched for the two bilge battens which fit flush into bottom frames. Position batten midway between keel and chines and screw-fasten with one 1 1/2 in. #8 fh screw to each joint. Next trim and fair entire framework so plywood lies evenly at all points, selecting a

MATERIALS LIST—METEOR

Plywood Required:

Bottom and sides	2 pcs.	1/4" x 4' x 14' Fir or Birch
Decking	2 pcs.	1/4" x 4' x 14' Mahogany
Floor Boards	(use waste from decking plywood)	
Transom	1 pc.	1/2" x 18" x 60" Fir

Other Lumber Requirements:

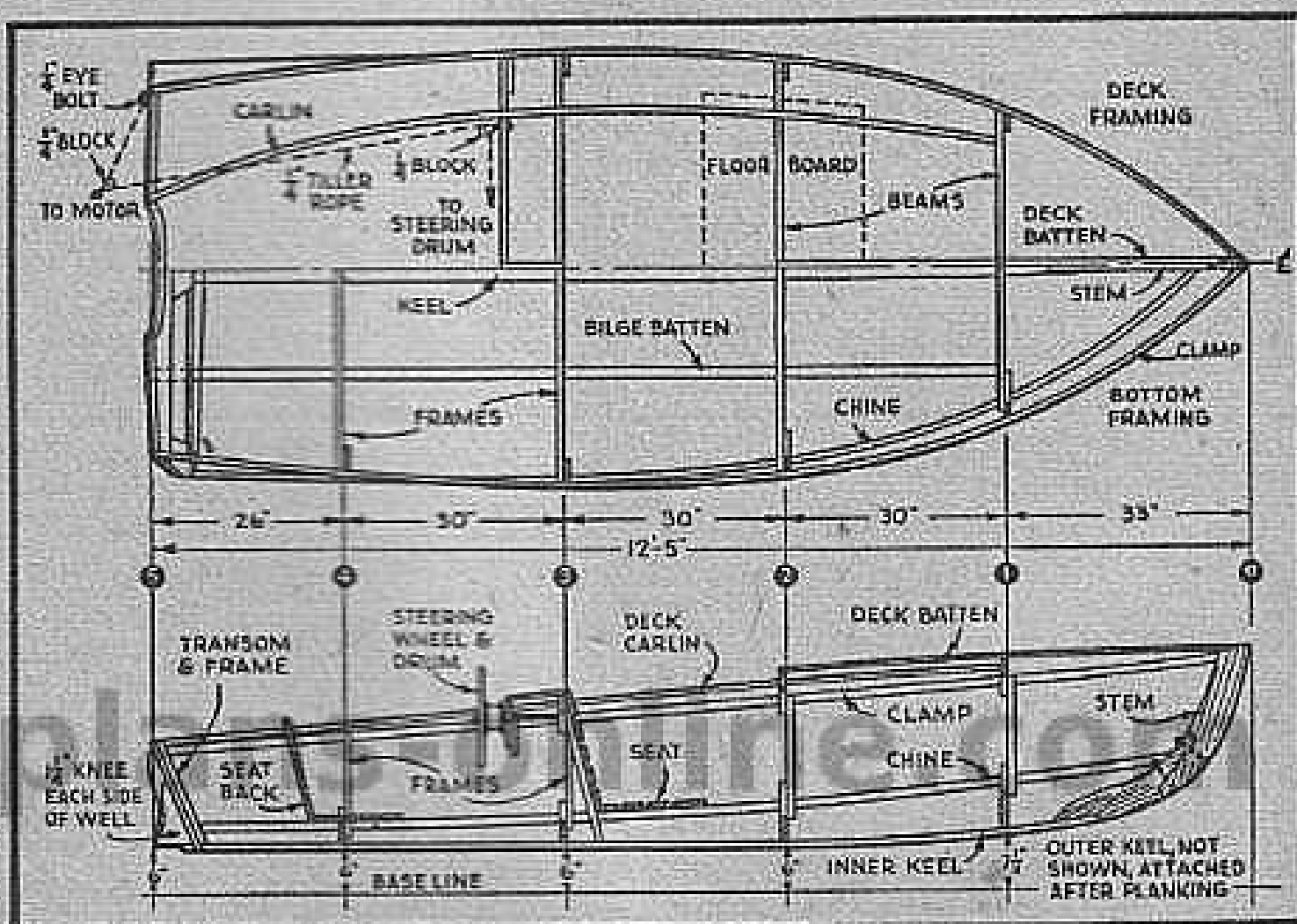
Chines	2 pcs.	3/4" x 1 1/2" x 12' 6"
Clamps	2 pcs.	3/4" x 1 1/4" x 13'
Keel (Inner)	1 pc.	3/4" x 3" x 10' 6"
Keel (Outer)	1 pc.	3/4" x 1" x 10'
Bilge battens	2 pcs.	3/4" x 1 1/2" x 10'
Moldings	2 pcs.	3/4" x 1 1/4" x 13'
Deck battens	1 pc.	3/4" x 1 1/2" x 8'
Carlins	2 pcs.	3/4" x 1" x 10'
Frames	1 pc.	3/4" x 3 3/4" x 6'
Frames	1 pc.	3/4" x 5 3/4" x 10'
Frames	1 pc.	3/4" x 7 3/4" x 10'
Frame side members	2 pcs.	3/4" x 3 1/2" x 8'
Deck beams	2 pcs.	3/4" x 7 3/4" x 10'
Stem	1 pc.	1 3/4" x 6" x 3'
Seat (Front)	10 pcs.	3/4" x 2" x 42"
Seat (Back)	10 pcs.	3/4" x 2" x 36"
Form	1 pc.	1 3/4" x 10" x 12'

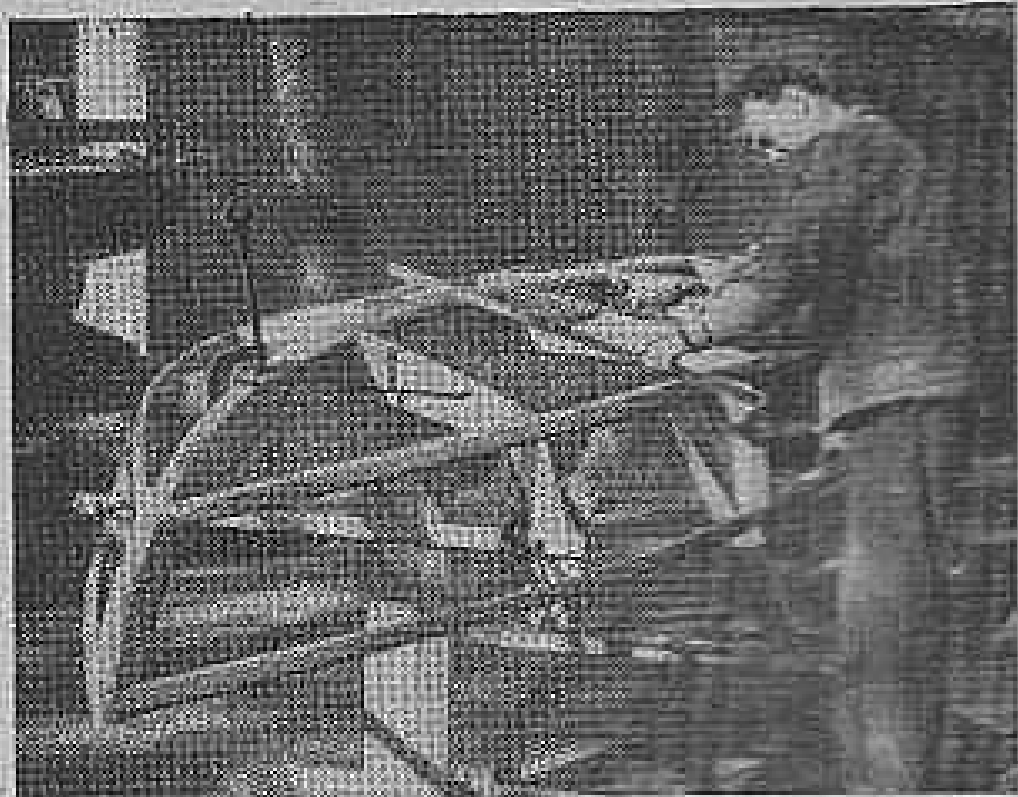
Fastenings:

Stove Bolts	16	3/8" x 2"
Screws	4 gross	1" #8 flathead
Screws	1 gross	1 1/2" #8 flathead
Screws	3 dozen	1 3/4" #9 flathead
Adhesive	1 quart waterproof resin glue	
Paint and varnish		

Fittings:

- 1 racing outboard steering wheel (Kainer #704, Ace Marine #40)
- 2 aluminum stern or transom lifting handles (#140 Ace Marine Co., #500 Aluminum Marine Hdw. Co.)
- 1 aluminum bow lifting or carrying handle (#130 Ace Marine Co. or #501 Aluminum Marine Hdw. Co.)
- 1 pr. bow chocks (#200 Aluminum Marine Hdw. Co.)
- 1 6" cleat (#100 Aluminum Marine Hdw. Co.)
- 1 windshield bracket (#700 Aluminum Marine Hdw. Co.)
- 4 steering gear pulleys (#250 Ace Marine Co.)
- 25 ft. 1/4" dia. filler rope (#R-10 Ace Marine Co.)



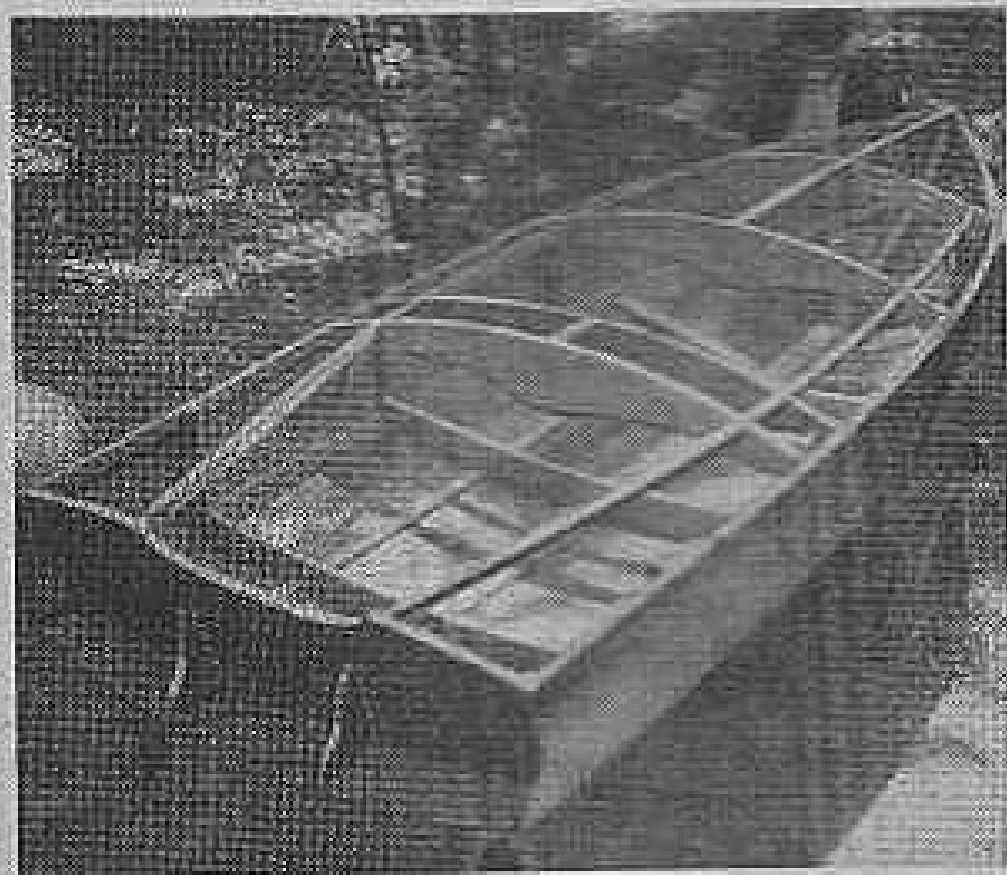


Checking framework to see that the plywood bottom lies evenly at all points.

$\frac{3}{8}$ x $\frac{3}{4}$ in. batten and laying it over the frames, to be used as a guide to indicate bevels to cut and any unevenness that must be faired.

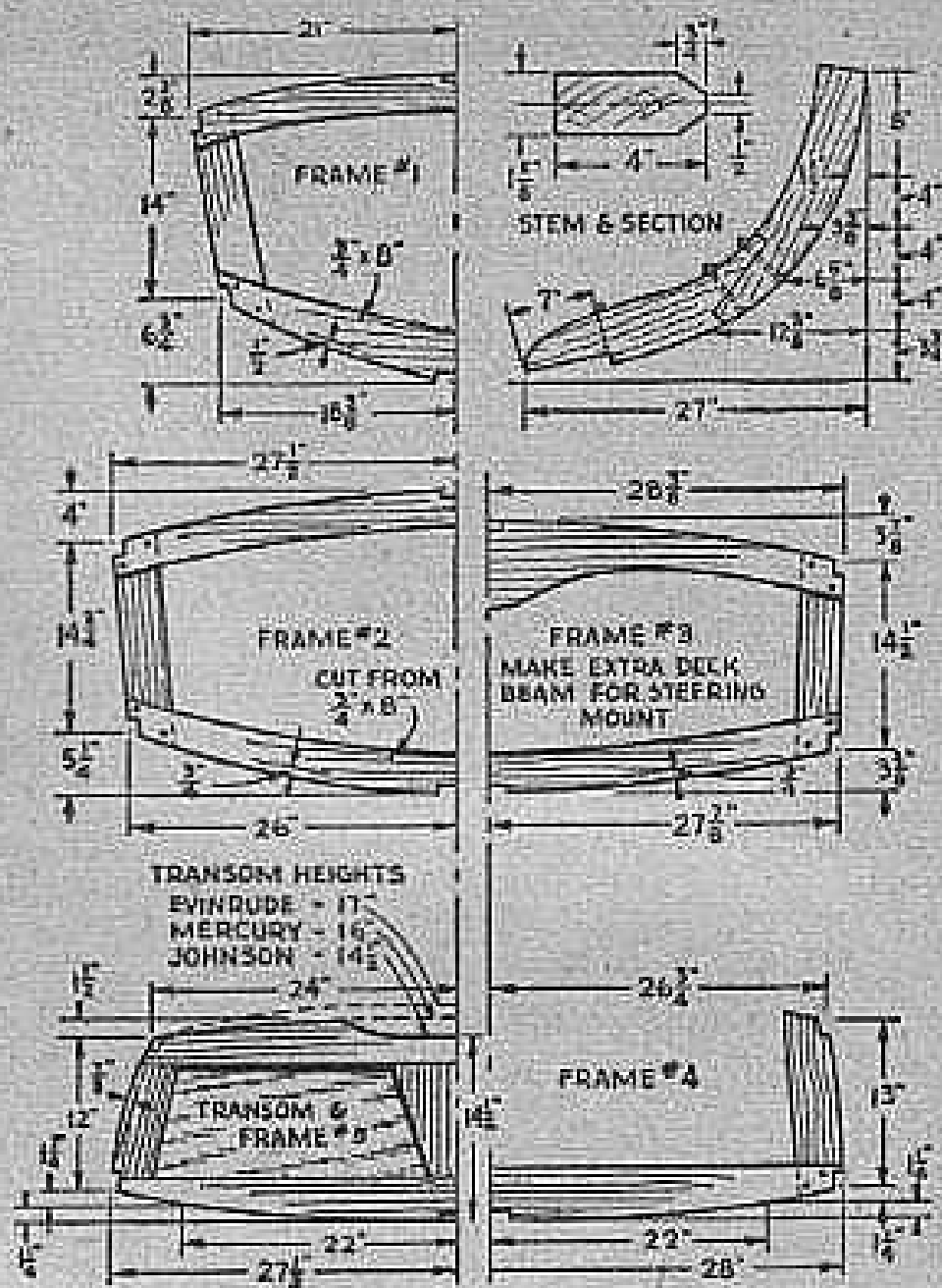
Applying the Planking

With the framework faired we are now ready to apply the plywood planking. If one continuous length piece of plywood is not available, join two lengths with $\frac{3}{4}$ x 2 in. hardwood butt blocks over the joints and bond the assembly together



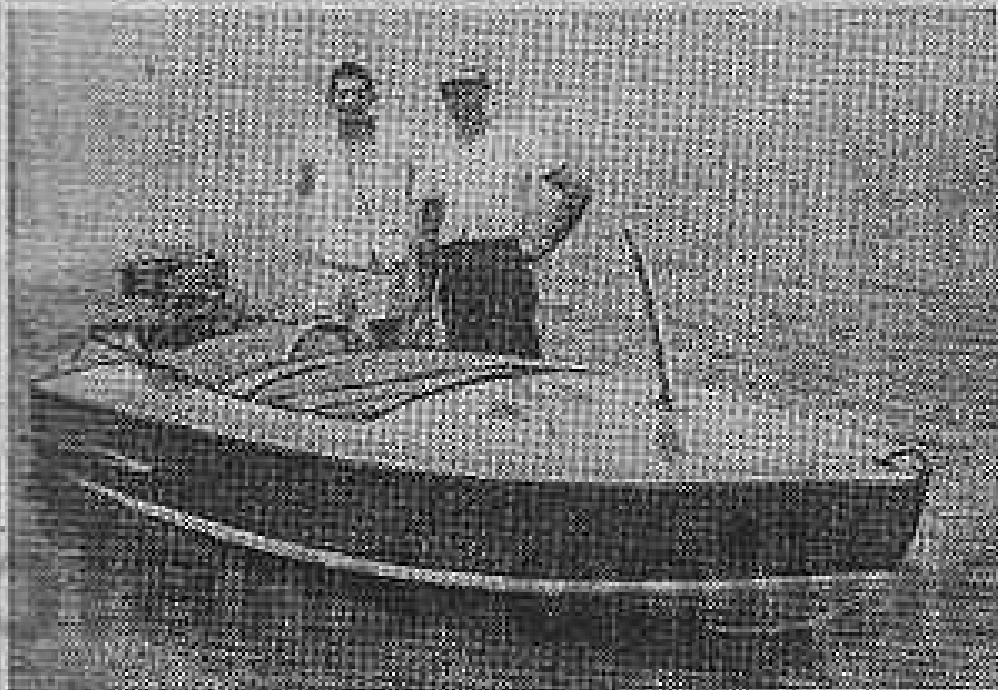
Interior view showing beam installed complete with carlins and deck batten.

with resin adhesive, fastening joints with 1 in. #8 fh screws. Plank the bottom of the framework first as follows: Lay a plywood sheet in position on the framework with inner edges of plywood exactly meeting center line along the keel. Then mark on the plywood the shape of bottom along the outside of the chine, remove plywood and cut it to shape. Use shaped plywood piece as a pattern for the opposite side. For a strong planking job, coat all contact surfaces with resin adhesive, lay plywood in position, and clamp and fasten at all points with 1 in. #8 fh screws spaced about 2 in. apart. The fore-ends of bot-

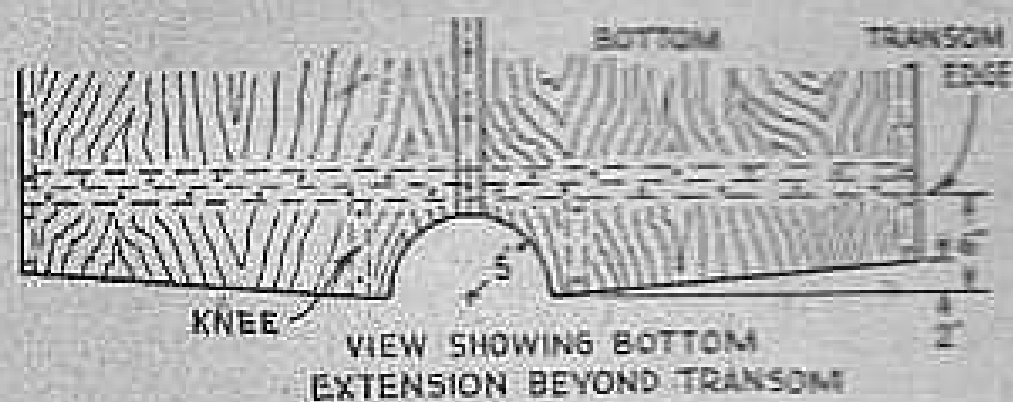
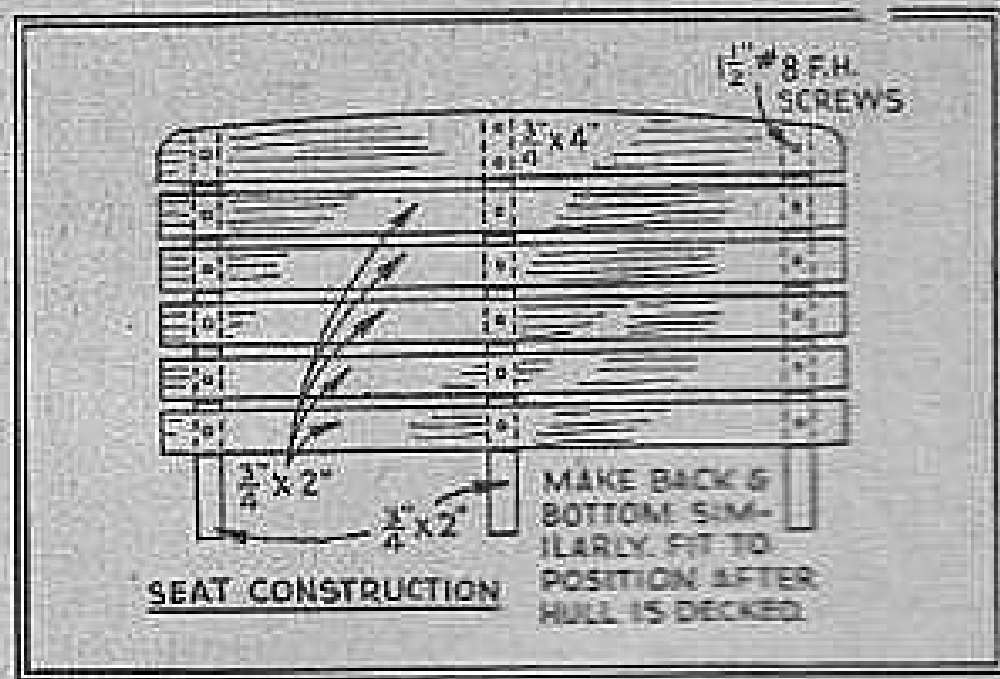


tom planking may have to be steamed by pouring hot water on these ends until they are soft and pliable and then bending and fastening them in place. After-ends of bottom planking extend at the transom and are cut as shown to allow motor to project through this extension. With the bottom planked, trim edges of plywood along chines evenly.

Next plank the sides using resin glue on all contact areas. Allow side planking to extend aft of transom as shown. With both bottom and sides planked, trim edges of plywood along chine edge and stem edges and cover exposed edges of plywood along stem with a piece of $\frac{1}{2}$ x $1\frac{1}{2}$ in. hardwood; this will go in place much more readily if it is first softened with hot water and then sprung into place and fastened with a $1\frac{1}{2}$ in. #8 fl screw. Now cover center seam along the



These fellows don't mind getting their feet wet if it gives them a closeup view of the finished Meteor.



keel with an outer keel piece which is glued and fastened in place with $1\frac{1}{2}$ in. #8 fh screws spaced about 8 in. apart.

For the next step, remove the hull from the form and turn it right side up. Then saw the deck beams to shape and fasten them in their respective positions with one $1\frac{1}{2}$ in. #8 in. fh screw to each joint. To attach the beam aft of #3 frame, first cut two small knees as shown, screw-fasten them to plywood sides and then fasten the beam to the knee. Next notch the deck beams to receive the deck battens which support the center plywood joints. Notches for deck carlins are also cut into the beams as indicated. Fasten both carlins and battens with one $1\frac{1}{2}$ in. #8 fh screw to each joint. Before decking is installed, clean interior of hull and paint or spray it with three coats of Firzite, allowing ample drying time between coats.

Now place the deck plywood in position and mark and cut the shape. Then place plywood on the deck and fasten it at all points with 1 in. #8 fh screws spaced about $2\frac{1}{2}$ in. apart. With the hull decked, trim all edges evenly along sheer and cockpits. Place the moldings on each side along the sheer, fastening with $1\frac{3}{4}$ in. #8 fh screws spaced about 8 in. apart. The $\frac{3}{8}$ in. x 2 in. coamings are fastened to cockpit edges with 1 in. #8 fh screws.

Make the seats of $\frac{3}{4}$ x 2 in. slats screw-fastened to uprights, fitted to their respective positions, and screw-fastened in place. The $\frac{1}{4}$ in. plywood floor boards are screw-fastened to bottom of hull through the keel and the battens. Finish the hull with paint or varnish to suit your plans and add a steering wheel, bow handle, and stern lifting handles as shown.

● Craft prints in enlarged size for building outboard hydroplanes are available at 25c a set. Address Craft Print Dept., SCIENCE AND MECHANICS, 49 East Superior Street, Chicago 11, Illinois.