



1  $\frac{3}{4}$  hp. inboard, air-cooled engine propels Sea Mate from  $\frac{1}{2}$  mph trolling speed to 8 mph for the amount of gasoline it takes to operate your power lawn mower.

## Rugged, Sea-Worthy Skiff For Economy Inboards

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Craft Print Project No. 260

**T**HE design for this rugged seaworthy boat was taken from proven sea skiffs used by fishermen for generations. It has been brought up to date so that the backyard boat builder can use newer materials and still retain the durability and seaworthiness of original designs.

Sea Mate (Fig. 1) was built with a plywood bottom and lapped plank sides; however, plywood may be used for the sides or board and batten construction may be used for the sides and bottom (Fig. 8). This wide choice of building materials will enable you to make a faithful reproduction of this little boat with the materials at hand regardless of what part of the world you live in. It is powered with a Trollabout inboard marine engine (Fig. 11), available in kit form which includes prop, shafting, rudder and installation instructions (see Materials List).

This small air-cooled engine utilizes the same efficient method of propulsion as ocean liners—namely, a 2 to 1 reduction gear that permits the engine to turn at higher efficient speeds while propeller speed is reduced by one-half. Integral gear box has lever controlled setting for forward, neutral and reverse.

Start construction by drawing full-size patterns on heavy wrapping paper of all the frames, transom, and stem (Fig. 2). Transfer the outlines of the frame pieces to framing lumber and saw out the parts to shape. Then position the

### STATEMENT OF USES

**USES:** General purpose skiff for the fisherman sportsman and general sports enthusiast. Design derived from proven models of Sea Skiffs used for generations. May be used upon any body of water where a boat of these dimensions is permissible.

**LENGTH:** 15 ft.

**BEAM:** 5 ft.

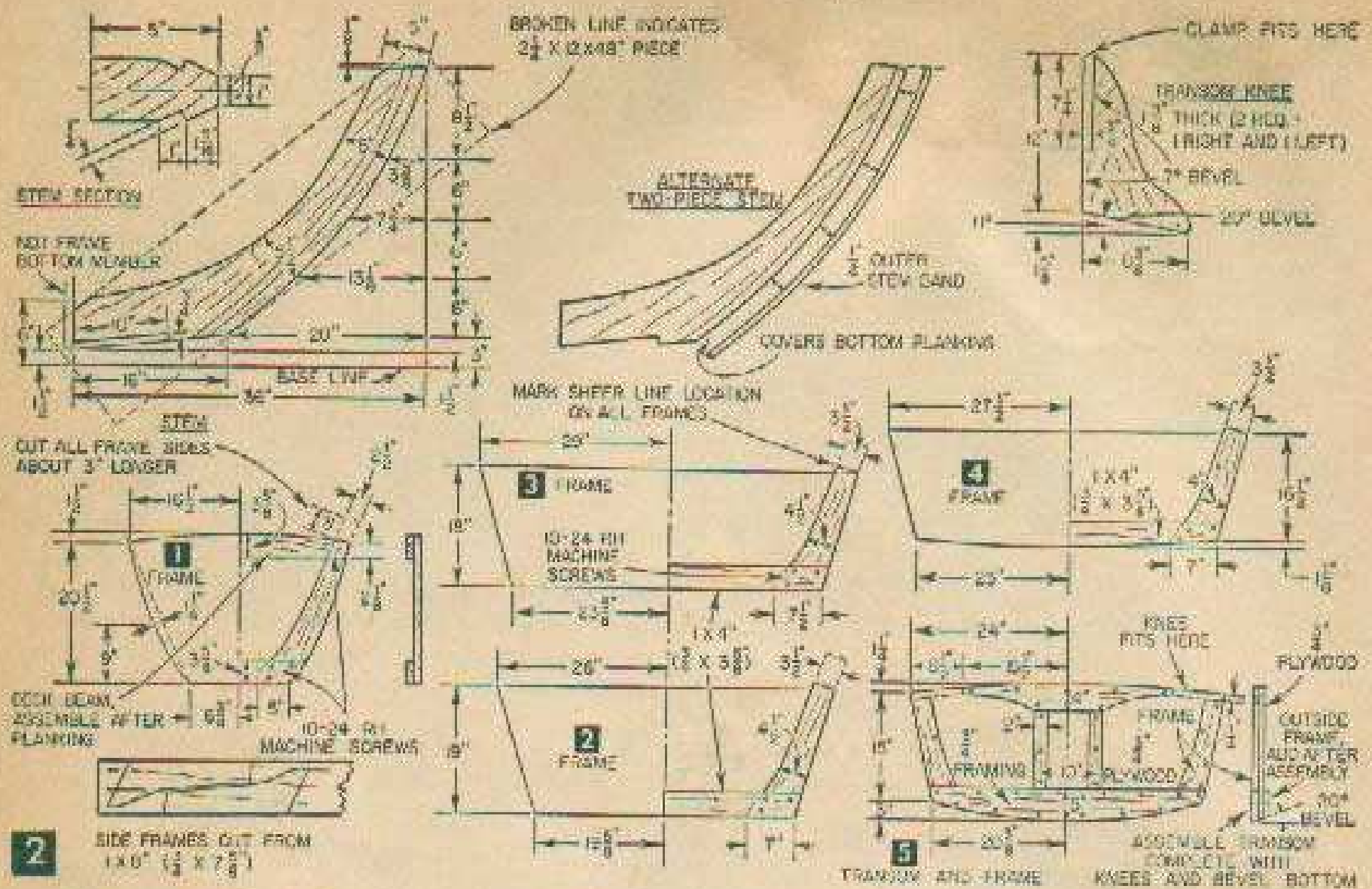
**WEIGHT:** Complete with motor 250 lbs.

**SEATING CAPACITY:** Three to four passengers—with two passengers safe upon any waters.

**POWER:**  $1\frac{3}{4}$  hp. 1 cylinder, 4-cycle air-cooled Rec Trollabout motor.

**CONSTRUCTION:** Side planking lapped and copper riveted, plywood bottom. Design is of the displacement type, will not plane but is efficient at speeds not exceeding 10 mph. Motor described above propels boat efficiently with the minimum of gas consumption, ideal for trolling.

parts over the paper patterns to align them and fasten with glue and 10-24 galv. or cadmium plated rh machine screws, using washers on both ends. Fasten transom framing to  $\frac{3}{4}$  in. plywood with glue and #8 x  $1\frac{1}{2}$  in. fh screws. Do not fasten the transom outer frame at this time. Bevel the lower edge of the transom 20°. Saw the transom knees (Fig. 2) to shape bevel-



ing the edges and fasten to the transom with three #8x1 $\frac{3}{4}$  in. fh screws to each knee. (If higher freeboard is wanted, extend length of stem frames and transom and utilize one more stake of side planking.)

Now comes the most difficult part of the whole boat—making the stem. It was the custom years past to rabbet the stem for the side planking and nearly all boat builders still do. However, if you think this procedure is a little beyond your skill, simply make the stem narrower, bevel the outer edge and, when the hull is planked, screw fasten an outer stem in place to cover exposed edges of planking (Fig. 2). If you make the rabbeted-type stem, cut the rabbet slightly deeper than plank thickness so that the stem may be planed flush with planking.

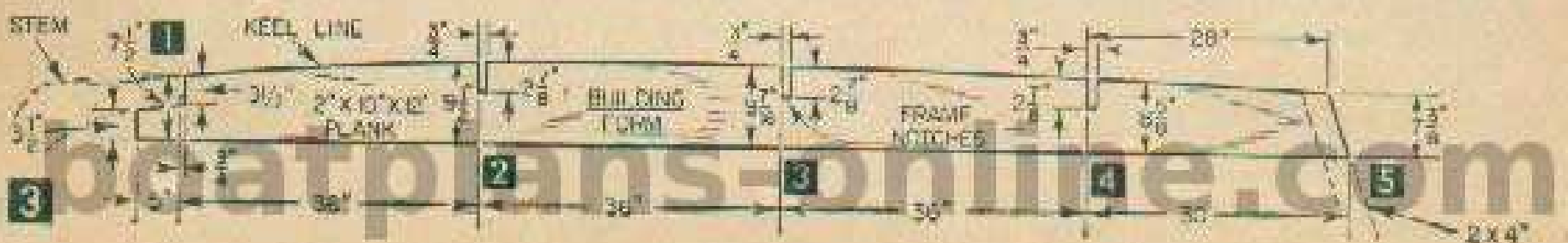
To keep the frames, transom and stem in position and alignment during assembly, a building form Fig. 3 is used. Transfer the measurements on the form drawing to a 2x10 in. plank 12 ft. long and drive 2 in. nails half way in at each frame position along the keel line. Bend a 1 $\frac{1}{2}$ x1 in. strip of wood against the nails and mark the curved keel line. Also mark for frame notches and saw the form to shape. Now mount the form stop legs similar to a saw horse at a convenient working height as in Fig. 4.

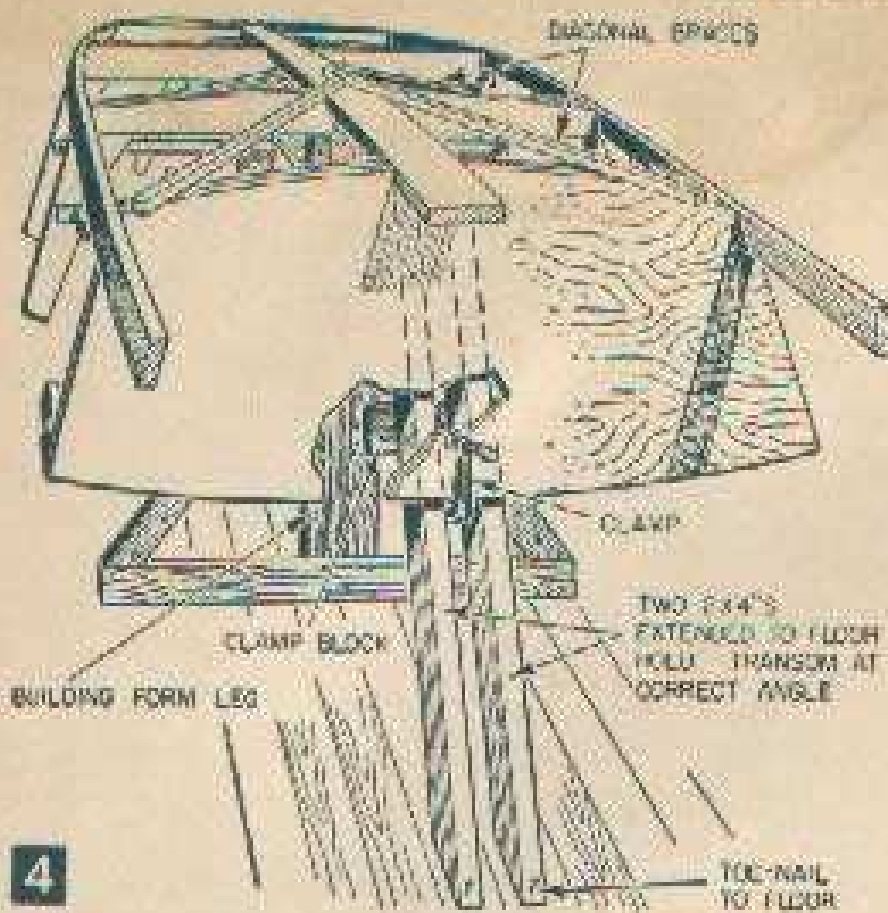
Start assembly of the hull framework by

placing each frame in their respective positions on the building form and brace at right angles to the form with diagonally placed wooden strips nailed to the form. Position and clamp the transom to the 2 by 4 extending to the floor at the end of the form (Fig. 4). Secure stem to form with 1x4's clamped as in Fig. 5.

Install the keel next by placing it on the center of the frames (Fig. 5) and mark each frame and the transom for keel notches. Then remove and cut notches. Taper the fore end of the keel as in Fig. 6 and fasten to the framework with two #10x2 in. fh screws at each joint. Bevel cut the two chines from one piece of lumber as in Fig. 6 and then cut a small 3 in. length off one of the chines to use as a pattern for marking frames and transom for chine notches (Fig. 6A). Since it is difficult to saw the notches at the correct angle at this time, saw the notches slightly undersize and clamp chines in notches. Then run the blade of the saw between the clamped chine and frame to correct the angle of saw-cut edge. Mark and bevel chines to fit stem and fasten with #10x2 in. fh screws.

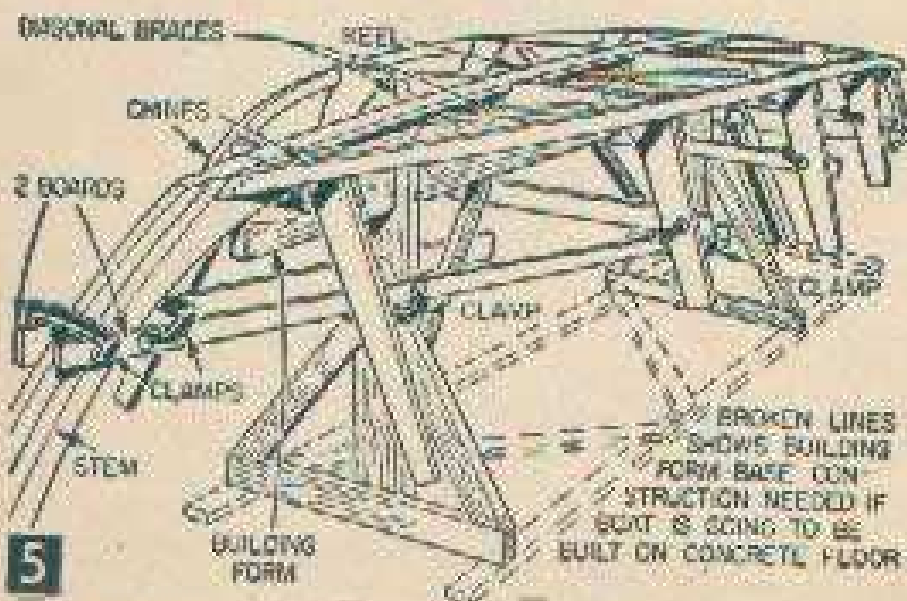
Install the sheer clamps (Fig. 6) next. Locate and clamp the sheer clamps at the sheer-line positions previously marked on each frame. Mark for cutting notches and bevel where sheer clamp meets the stem. Then remove the sheer





clamps, bevel the ends and cut the notches as you did for the chines. When assembling permanently to the framework, fasten the beveled ends to the stem first, then bend sheer clamps around frames and fasten to transom knees. By following this method, if your stem bevel does not fit right the first time, it's an easy matter to pull the sheer clamps forward slightly and rebevel. Cut off to proper length at transom knee last, to make certain of a neat fit at this point. Fasten at each joint with one #8 x 1 3/4 in. fh screw.

Contrary to the established procedure of drilling for the propeller-shaft hole after the boat is planked, it is much easier to drill before planking the bottom when it is possible to see what you're doing. Place a 3/8 in. auger bit through the bronze shaft log and position the log on the keel so that the center of the drilled hole will enter the keel 2 in. forward of frame #4 as in Fig. 6. Then secure the log to the keel with two Jorgensen C-clamps as in Fig. 7. The framework at this time is still in the building form upside down so you are actually drilling the hole from the bottom of the keel up. The shaft log provides the correct angle.



Stem is held in position by clamping to two boards which in turn are clamped to building-form legs.

Measure, mark and cut notches in the bottom frame members for the bilge battens (Fig. 8) next. Bevel the battens to fit against the chines and fasten with one #8 x 1 3/4 fh screw at each joint. If you are going to plank the bottom with boards instead of plywood, insert additional battens on each side of the keel as in Fig. 8. Cover the exposed ends of the keel, battens and chines where they were notched through the transom with the transom outer frame piece (Fig. 2). First coat joining surfaces of transom and outer frame with Kuhls Bedlast and fasten with 14 #8 x 1 1/2 fh screws staggered as in Fig. 2.

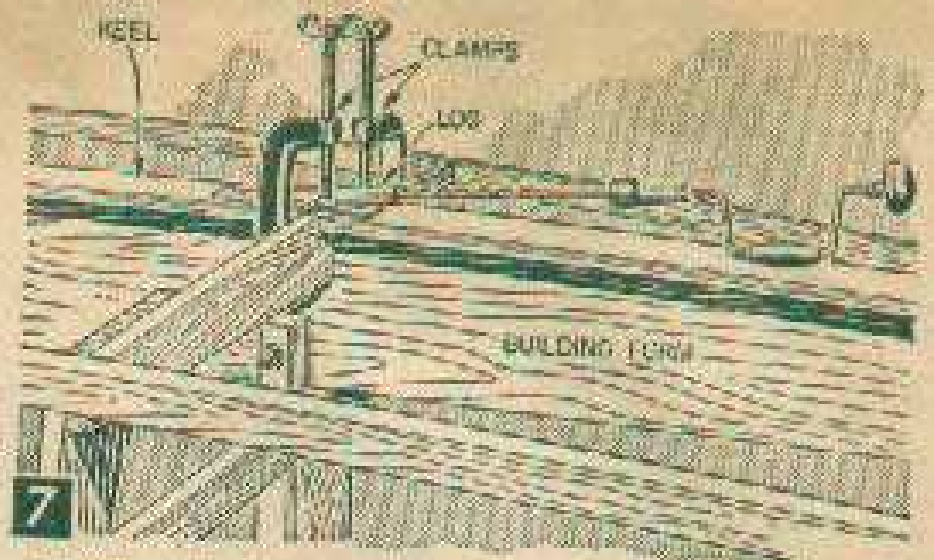
Before applying the planking, fair the framework at all joints with a block plane and rasp until adjoining surfaces are flat when tested with a straightedge. The choice of material to plank Sea Mate will depend on your preferences for plywood or solid wood and the availability of each in the area you live. On the original Sea Mate, plywood was used on the bottom and solid boards on the sides. However, since long lengths of clear lumber is expensive and becoming increasingly difficult to obtain, plywood cut in strakes and similarly lapped can be used. Lapped planking contributes greatly to the

MATERIALS LIST—SEA MATE

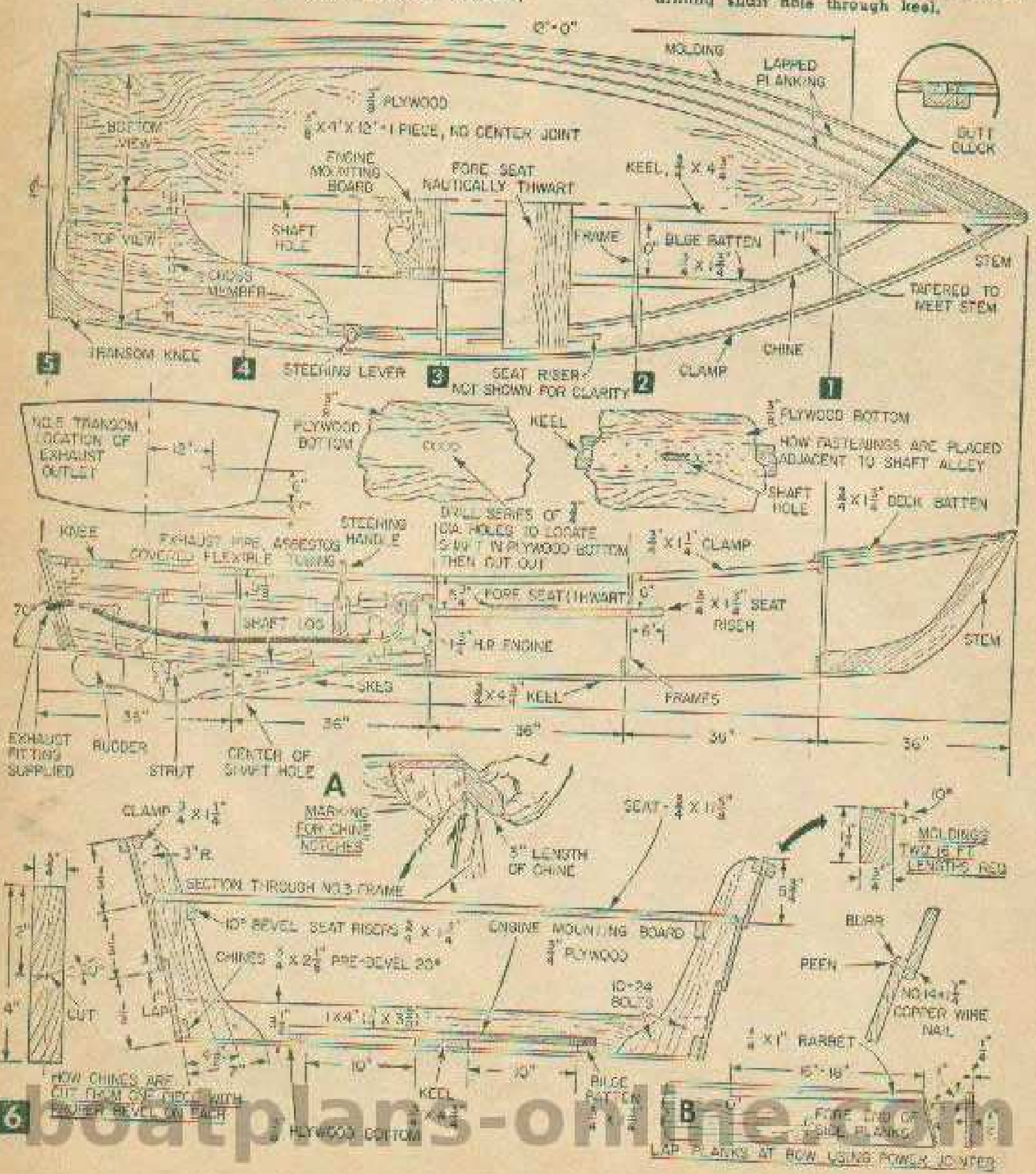
| No. Req.   | Size and Description  | Use                |
|------------|---|--------------------|
| 1 pc       | 3/4 x 4 3/4 x 12' oak or fir  | keelson            |
| 2 pcs      | 3/4 x 1 1/4 x 16' oak or fir  | clamps             |
| 2 pcs      | 3/4 x 1 1/4 x 16' oak or fir  | moldings           |
| 1 pc       | 3/4 x 4 x 14' oak or fir (makes 2 pcs)  | chines             |
| 2 pcs      | 3/4 x 1 3/4 x 12' oak or fir  | bilge batts        |
| 2 pcs      | 3/4 x 1 1/2 x 10' pine (makes fore and aft)   | seats              |
| 2 pcs      | 3/4 x 1 3/4 x 10' pine  | seat risers        |
| 1 pc       | 2 1/4 x 12' x 4' oak, hemlock or pine   | stem               |
| 3 pcs      | 3/4 x 3 3/4 x 8' hemlock  | framing—bottom     |
| 1 pc       | 1 1/2 x 8' x 14' hemlock  | framing—sides      |
| 1 pc       | 3/4 x 3 3/4 x 8' pine or hemlock  | after seat framing |
| 1 pc       | 1 3/8" sq x 5'  | form               |
| 1 pc       | 2 x 10' x 12' pine  | #1 deck beam       |
| 1 pc       | 3/4 x 3 1/2 x 3' hemlock  | deck batten        |
| 1 pc       | 3/4 x 1 3/4 x 3' hemlock  | storing lever      |
| 1 pc       | 3/4 x 3' x 3' hemlock or pine   | and support        |
| 1 pc       | 1 1/4 x 8' x 18" oak, pine or hemlock   | transom knees      |
| 14 pcs     | 3/4 x 1 1/2 x 12' pine or hemlock   | floor boards       |
| 1 pc       | 3/4 x 3 3/4 x 48" pine  | cross member       |
| 2 pcs      | 1/2 x 9 1/2 x 14' pine, spruce, or cedar  | planking           |
| 4 pcs      | 1/2 x 9 1/2 x 16' (utilize 15/16" planking and surface to 1/2")   |                    |
| PLYWOOD    |   |                    |
| 1 pc       | 3/8" x 4' x 12' fir   | bottom             |
| 1 pc       | waste fills in fore end   | motor pad          |
| 1 pc       | 3/8 x 15 x 30" fir  | decking            |
| 1 pc       | 1/2 x 20 x 40" fir makes two halves   | transom            |
| 1 pc       | 3/4 x 24" x 4' fir  |                    |
| FASTENINGS |   |                    |
| 4 gross    | 1 1/4" #8 flat head screws (planking) use brass for salt water and cadmium plated for fresh water   |                    |
| 3 dozen    | 2" #10 flat head screws   |                    |
| 6 dozen    | 1 3/4" #8 flat head screws  |                    |
| 24         | 10-24 x 2" round head machine bolts (cadmium plated or galv.)   |                    |
| 8          | 1 1/2" #8 round head screws   |                    |
| 1 lb       | 1 1/4" #14 copper wire nails, with burrs  |                    |
| 1 qt       | Kuhls Bedlast   | Boatlife enamel    |
| 2 qt       | paint for inside  |                    |
| 1 qt       | paint for sides   |                    |
| 1 qt       | paint for bottom  |                    |
| 1 qt       | varnish for trim  |                    |
| 1          | 1 3/4 hp Reo Trollabout Marine Engine Kit (4-cycle, air-cooled, 1 cylinder) for fresh water \$99.50, for salt water \$124.50. Williams Marine Co., Lansing, Michigan. |                    |

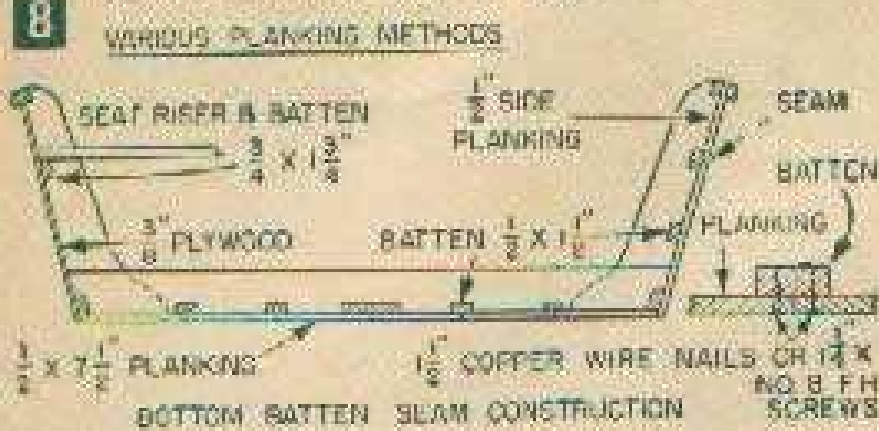
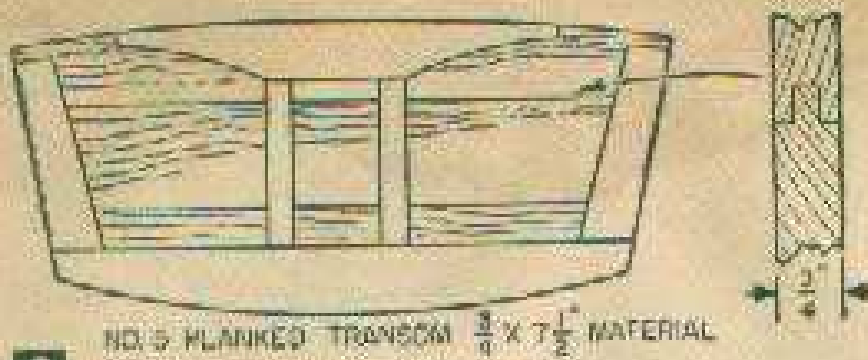
strength of the hull and lower frames are needed to make a strong hull.

Starting with the bottom planking, lay a 4 x 12 ft. piece of  $\frac{3}{8}$ -in. plywood on the hull framework and carefully position. Clamp it down along the chines and mark along chines. Also mark exact position of shaft hole at emerging point upon the plywood. Remove plywood and saw to shape, using an auger to bore holes in plywood for shaft outlet (Fig. 6). Coat all adjoining frame surfaces with *Bedlast*, particularly on keel where shaft will emerge. Replace the plywood on the framework, clamp in position and fasten with  $\frac{3}{8}$ " x  $1\frac{1}{4}$ " in. ft screws placed  $2\frac{1}{2}$ " in. apart. Drive a double row of screws,



Temporarily clamp shaft lug to bottom of keel when drilling shaft hole through keel.





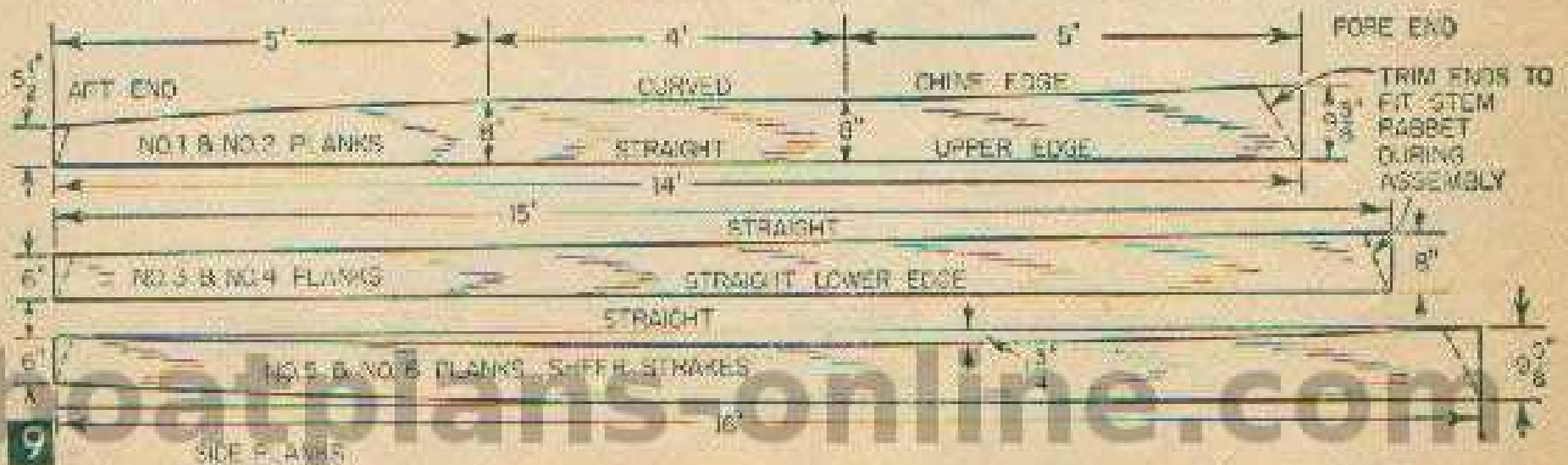
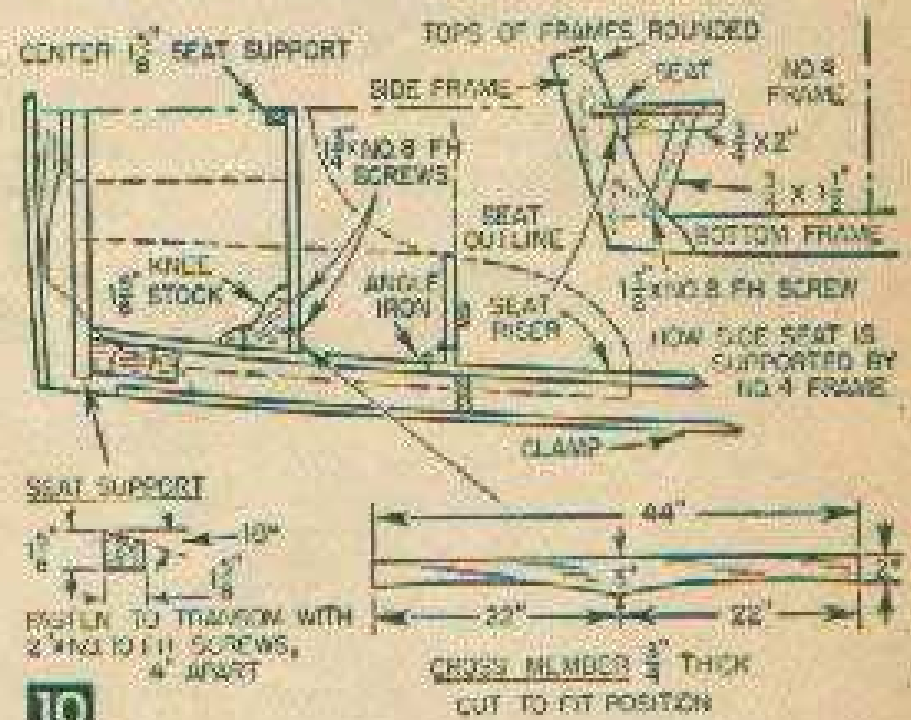
staggered fashion, along keel and transom. When finished there will be a small portion of the bottom, at the stem, uncovered. Leave this for the time being and finish after the two chine side planks are in place. This opening will permit the use of C-clamps to pull the side planks in position. Trim the plywood bottom flush along the chines and transom.

Approximate planking patterns are given in Fig. 9. These plank shapes divide the sides of each frame equally allowing a 1-in. plank lap. Do not cut all planks at once, start with #1 and #2 planks which are the planks at the chines on each side. With a rabbeted stem it will be necessary to spring these planks in position and carefully fit into the stem rabbet. This may require placement and removal of the planks several times before a perfect fit results. Some lumber bends more readily than others. For instance, white pine will bend around into the stem rabbet fairly easy, while spruce, which is much stiffer, will be more difficult to bend. If the lumber you are using does not bend readily, pour hot water on the last 3 ft. to make it flexible.

With the chine planks clamped in position, mark each frame and the transom along the top edge of the planks. Remove and with a saw and chisel cut the long tapering notches in each frame (Fig. 6). The stem is not notched as the frames are for each lapped seam. Instead, a 16 or 18 in. long tapering rabbet is planed on a power

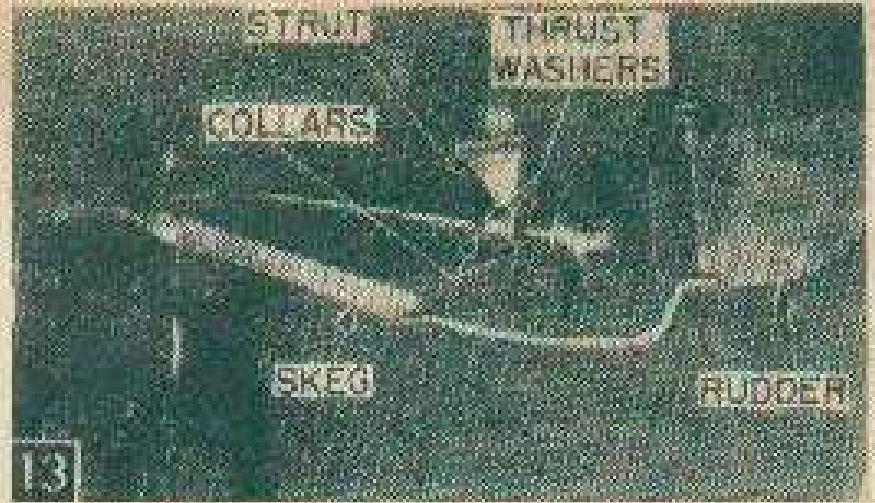
joiner along the forward edges as in Fig. 6B. The resulting 1/4 x 1 in. tapering rabbets on each plank form a half-lap joint so that the ends of the planks that fit into the stem rabbets are flush with one another rather than lapped. Fit the remainder of the planking together in the same way. Coat the chines, stem rabbet, transom and 1 in. lapped edge with Bedlast and fasten planking to chines, frames, transom and stems with #8 x 1 1/4 in. fh screws. Fasten the lengthwise laps of the planking with #14 x 1 1/4 in. copper-wire nails spaced 2 1/2 in. apart. First drill an undersize hole for each copper nail, drive the nail home snugly and then place a washer or burr on each nail on the inside of the hull. Nip off the end of the nail leaving just enough to peen over the washer. Hold an iron weight (a dolly iron used for bumping out auto fenders is ideal) against the nail head while riveting over the cut end. Cover the remainder of the bottom at the stem end with 3/8-in. plywood. Use a butt block (Fig. 6) where edges are joined.

With the planking completed, remove the hull from the building form and turn it right-side-up. Plane the top edge of the planking flush with the sheer clamp and bolt the previously cut deck beam to the #1 frame. Notch for, and install the deck batten (Fig. 6). Measure and notch #2, 3 and 4 frames for the seat risers (Fig. 6), and fasten with one #10 x 2 in. fh screws to each joint. Make and attach the rear seat framing to the seat risers and transom as





Rear seat removed to show seat framing and engine exhaust pipe.



Skeg protects propeller if boat runs aground or strikes a rock.

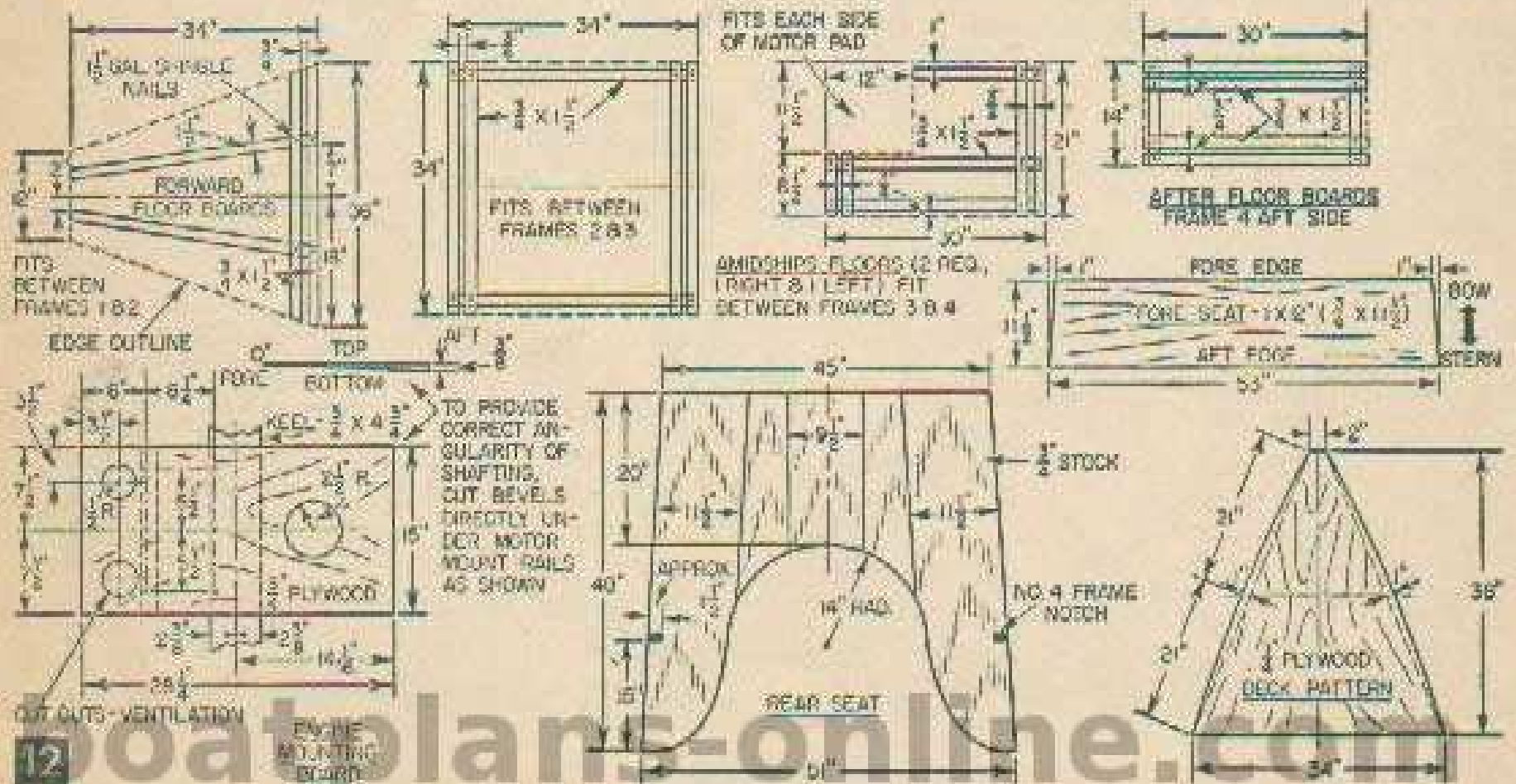
in Figs. 10 and 11. Cut the rear seat boards to shape as in Fig. 12 and temporarily fit and fasten in place with #8 x 1 1/4 in. *ph* screws. Then remove the seat boards and finish with varnish or a three-coat paint job, and lay aside until all engine equipment is installed. Make and fit the fore seat and treat in like manner.

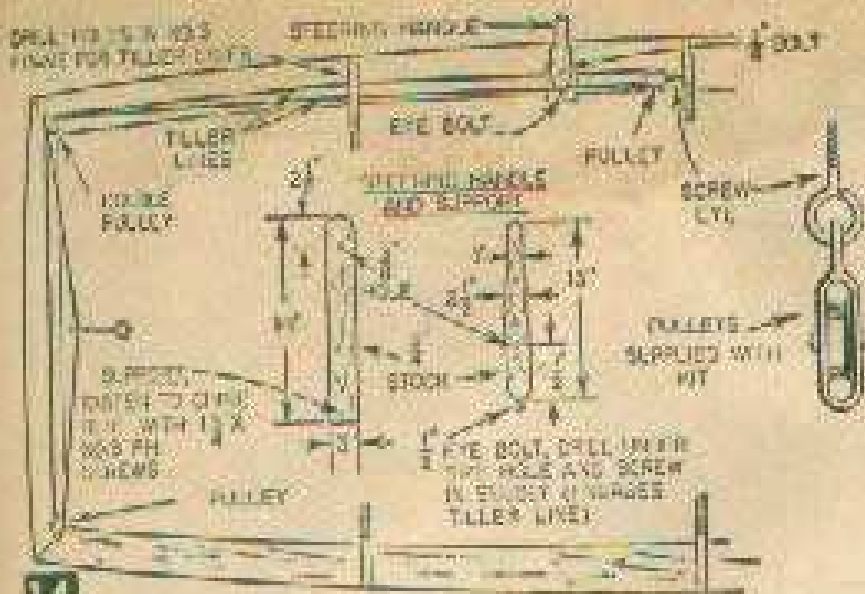
The sheer molding can be permanently fastened in place at this time. Cut them to shape as in Fig. 6, and drill 1 1/16 in. holes for fastening screws at 8 in. intervals. Lay these holes out accurately for uniformity and countersink for screw heads. Follow by clamping in position and attach with #8 x 1 1/4 in. screws. At this point, saw the 1/2 in. plywood fore deck to shape (Fig. 12), and fasten in place with 1 1/4 in. copper nails spaced 3 1/2 in. apart.

Right now is the best time to paint the boat. The original *Sea Mats* was painted green on the bottom and 3 in. up the sides, white on the sides and buff on the interior up to the top of the lower side plank. All other parts including the sheer molding were varnished. This color com-

bination made a handsome appearing craft. Give the painted parts one coat of prime white followed by two coats of marine paint or enamel. Give the varnished parts four coats of marine spar varnish. Allow ample drying between coats.

Since the shaft hole is already drilled, the installation of the engine and propeller shaft parts is comparatively simple. First make the 3/4-in. plywood engine-mounting board (Fig. 12). The holes in the mounting board allow air to circulate under the pad, thus preventing moisture accumulations and consequent rot. Locate this board adjacent to #3 frame but do not fasten in place yet. Place the engine on the mounting board and line up with the bolt holes drilled in the board. With a large rat-tail file, clean out the shaft hole making sure there is clearance for the shaft. Now insert the shaft and couple to the engine shaft. Set screws and wrenches are provided with the engine kit for this purpose. Crawl under the boat and slip one thrust collar, one plastic thrust washer and the strut on the shaft. Allow space for a collar, thrust washer and propeller at the end of the shaft and mark the location of the strut mounting bolts on the hull bottom (Fig. 13). After drilling the bolt holes, daub *Bedlast* on the





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strut flange and bolt in place. Wipe off excess Bedloast with a turpentine soaked cloth. Fasten propeller to shaft with nut and cotter pin.

If a skeg bar is utilized with the outfit, the skeg bar will indicate the exact placement of the rudder. Incidentally, the skeg affords protection to the propeller and shaft and is a worthwhile investment. Bore a  $\frac{1}{8}$  in hole for the rudder pipe through the centerline of the planking and keel, and before placing the rudder pipe and flanges in position, coat the adjacent areas with Bedloast. Push the rudder-pipe sleeve in position, drill flange holes and bolt in place. Place the rudder by slipping the rudder post into the sleeve and then put the after end of the skeg on the rudder post securing with a cotter pin. Now, going to the fore end of the skeg bar, drill for and attach lug to bottom of hull that in turn is used to attach skeg bar to lug. All fastenings are supplied with engine kit.

Installation of the shaft log comes next. Remove the engine and slide the shaft log over the propeller shaft. Position the log on the keel at a point where it will not cause binding when the propeller shaft is turned by hand. Mark the position of the lug on the keel, remove and coat keel and flanges of lug with Bedloast and reset log at marks. Fasten log to keel with #10 x  $1\frac{1}{4}$  in.  $\frac{1}{2}$  brass screws.

With the shaft parts in place, bolt the engine to the mounting board, recouple engine to shaft and fasten board to bilge battens with eight #10 x  $1\frac{1}{4}$  in.  $\frac{1}{2}$  screws and washers. Make floor

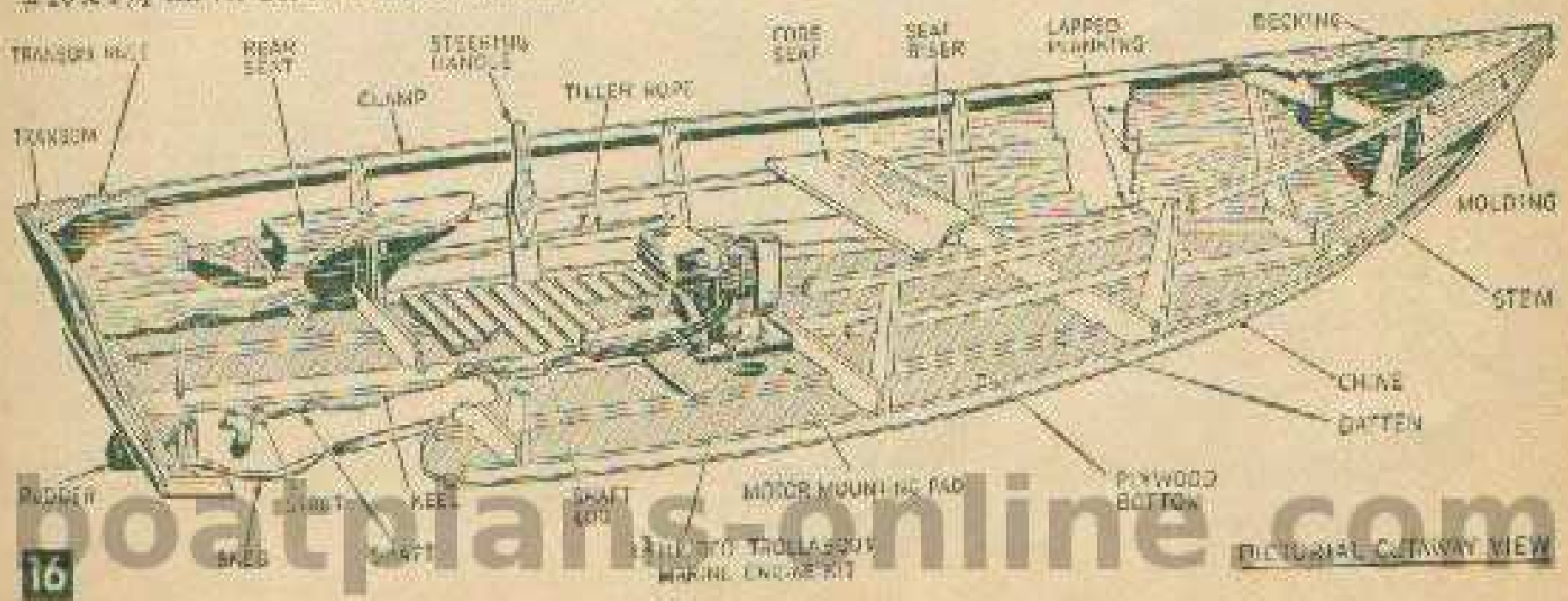


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Sea Mate in water ready for trial run. Note steering lever on right hand side of fisherman.

boards (Fig. 12) and screw fasten in place. Although a steering handle is supplied with the engine kit a new one for side mounting (Fig. 14) was used on Sea Mate. Rig the rudder control with ropes and pulleys as in Fig. 14. Connect the asbestos covered exhaust pipe (Fig. 11) from the engine to a hole drilled in the transom at the location shown in Fig. 14. Completed Sea Mate is shown in Fig. 15.

● Craft Print No. 260, in enlarged size for building Sea Mate, is available at \$1.50. SPECIAL QUANTITY DISCOUNT: If you order two or more craft prints (this of any other print), you may deduct 15¢ from the regular price of each print. Hence, on two prints, deduct 50¢; three prints, deduct 75¢, etc. Order by print number, enclosing remittance (no C. O. D.'s or stamps) Camp Craft Print Dept., 137 Semmes and Mechanics, 450 East Ohio Street, Chicago 11, Illinois. See coupon on page 167. Now available, our new illustrated catalog of "194 Do It Yourself Plans," 25¢. Allow four weeks for delivery.



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PICTORIAL CUTAWAY VIEW