

Building "ROCKET"

A 15-Ft. Inboard Step Hydroplane

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Craft Print Project No. 81

THE "Rocket" is a boat designed for those who like their boats fast and sporty but still inexpensive to build and operate.

Any motor, with or without reverse gear, will power the "Rocket." Auto motors that develop more than 35 horsepower, if of light weight, high speed design, will do nicely. Marine motors of similar high speed, light weight design will perform even better.

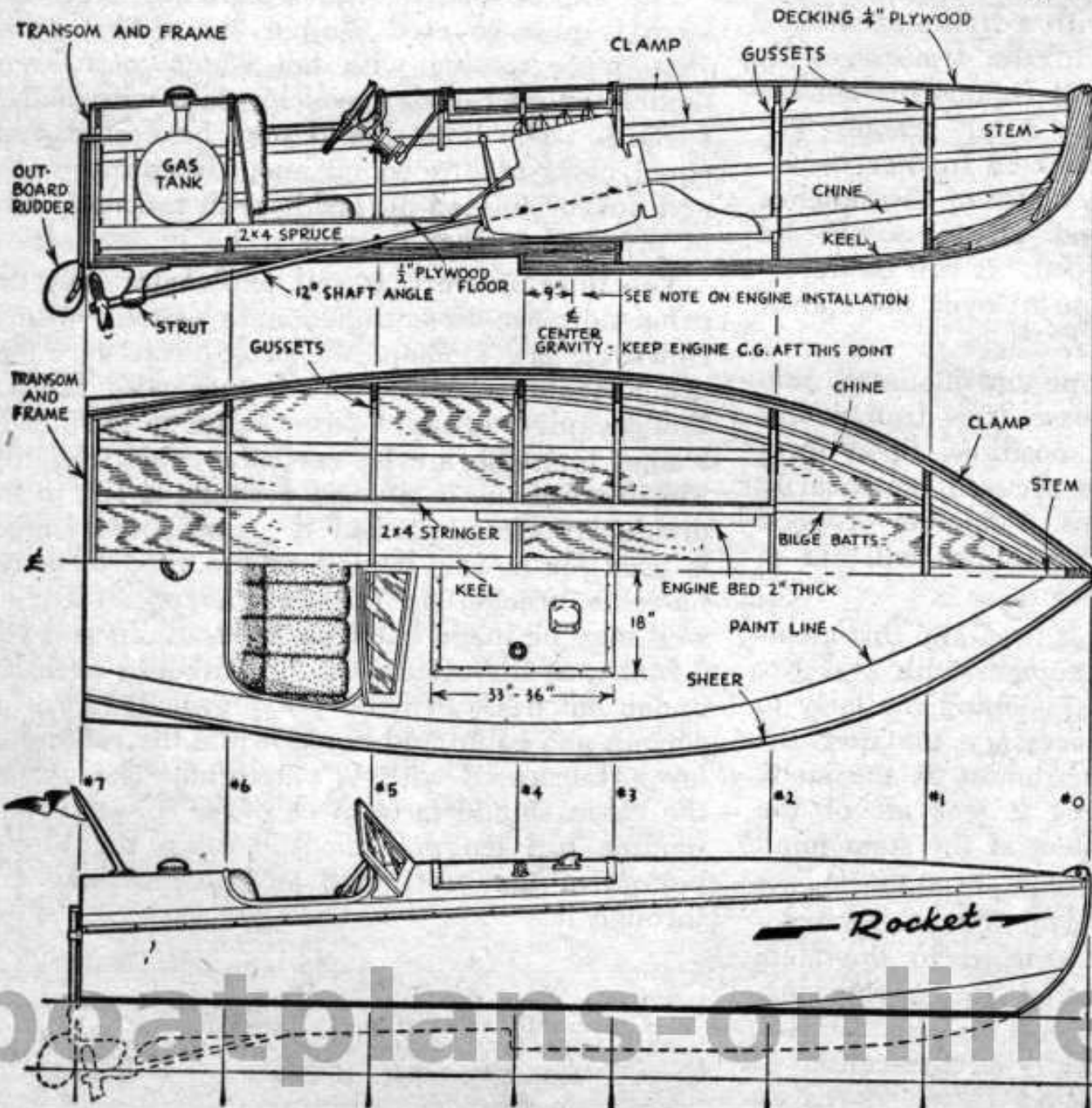
A properly designed step hydroplane like the "Rocket" is planned to ride the water's surface. To start hydroplaning takes considerable power, but when planing trim has been established the motor can be throttled back without losing the planing action. Hydroplaning does, however, take more power than conventional boats require.

Speed with the "Rocket" will, of course, depend on the motor that goes into her. Twenty-five to 60 miles per hour can be obtained by proper powering.

As speed increases, any inaccuracy in underbody design will become apparent and the maximum obtainable speed will be reduced. Build bottom planes carefully. Undertake changes, if any, with care if you want highest speed and best performance out of the "Rocket."

Construction of the "Rocket" is not difficult. She is built of plywood over an oak frame.

It is advisable to lay





the lines down full size on large sheets of paper. This full scale layout will provide patterns of all parts and give a much clearer picture of the whole boat before you begin building. Be careful to follow exactly the bottom lines shown between the fore and aft planes, to avoid "porpoising."

When you have materials of the right size for frame, stem and deck beams, lay the patterns on your material, mark and saw to shape.

The frames are secured at the chine joints and keel with $\frac{3}{8}$ " plywood gussetts, attached to both sides with Ferdico resin glue and 1" #8 F.H. screws. The step frame # 4 is made as shown while the after step part of # 4 frame is glued and screwed in place.

The transom # 7 is cut from $\frac{3}{4}$ " plywood and an oak frame glued and screw fastened around the edges. The stem, being cut to shape in two pieces, is jointed and joined together with glue and $\frac{3}{8}$ " bolts and finished by beveling edges according to the full size layout.

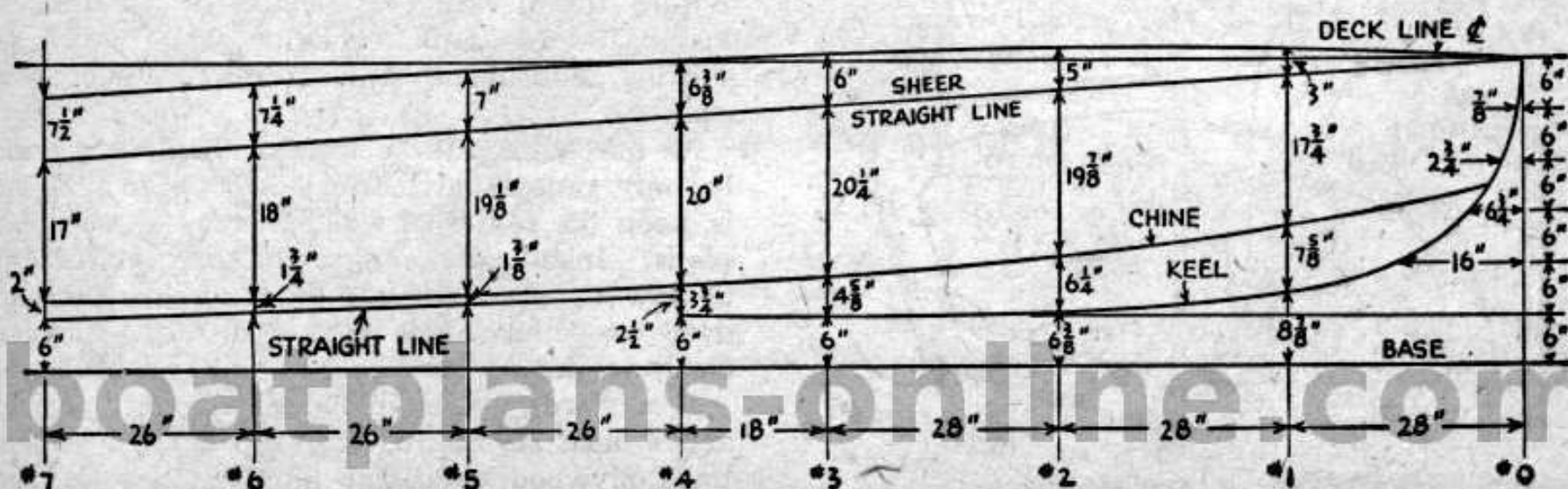
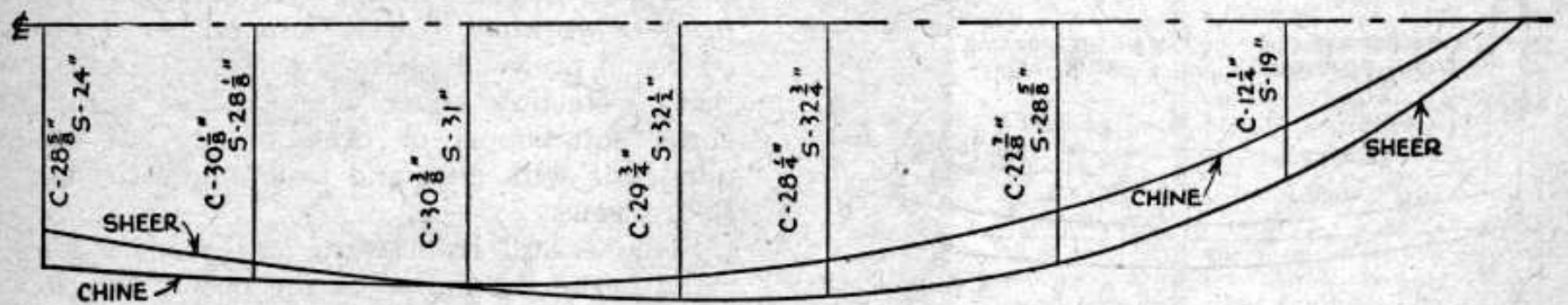
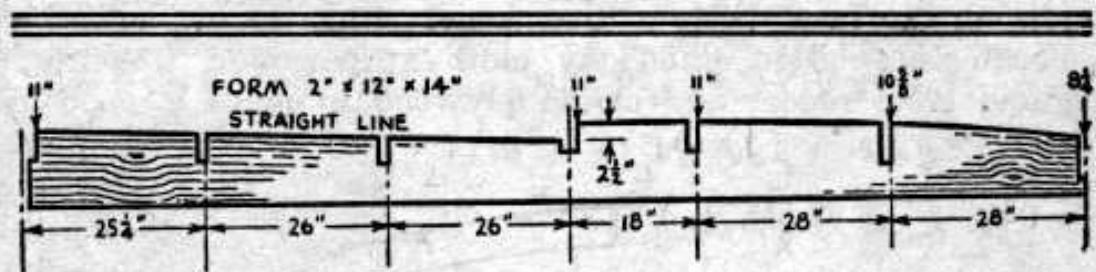
A building form being erected and notched for frames, the frames and stem are mounted on the form and everything aligned and braced with wood strips to hold in proper alignment. Cut notches for keel chines and clamps in frames and proceed to fasten the two piece keel to frames and stem with 2" #10 F.H. screws.

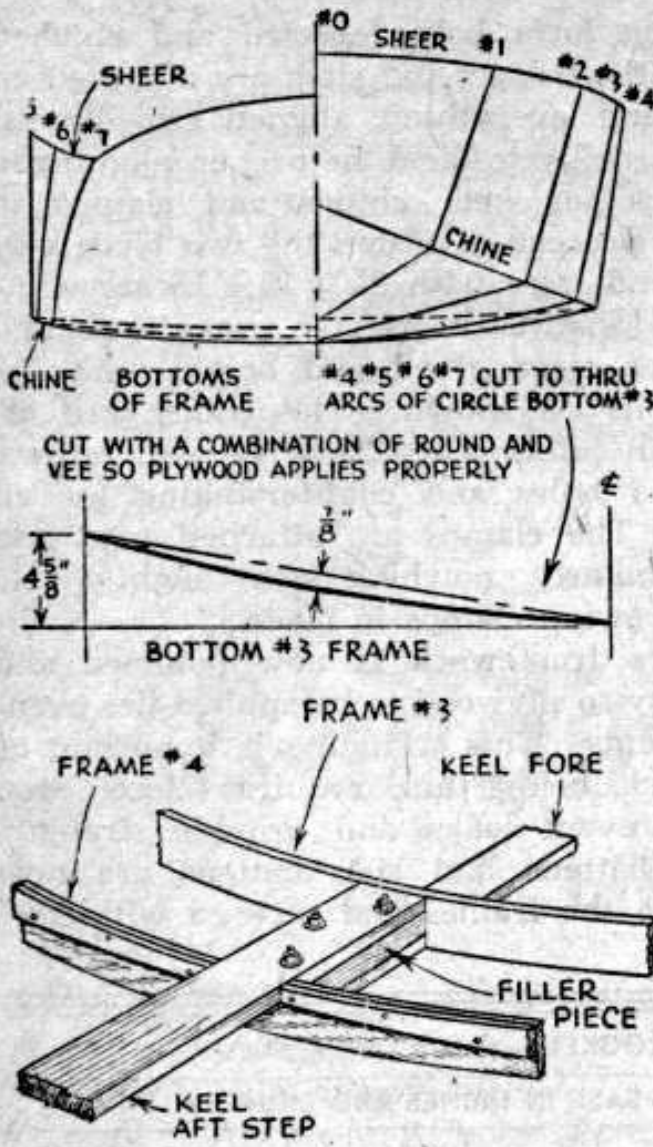
The keel forward of #4 step frame is jointed with a filler piece glued and bolted with $\frac{1}{4}$ " carriage bolts as shown. The chines are attached at all joints with 2" # 10 F.H. screws, drilling lead holes and countersinking for all fastenings. The clamps are attached next and fastened similarly, notching stem slightly and securely screwing clamps in place.

The entire framework is now trimmed and faired evenly so plywood to be applied lies evenly at all points. This trimming is important as the plywood, being thin, requires close, even joints to prevent leaks and provide strength. The bilge battens and side battens are now notched into the frames and secured with $1\frac{1}{2}$ "

| LINES FOR "ROCKET"—A 15-ft. Hydroplane | | | | | | | | |
|--|--|------|------|------|------|------|------|------|
| HEIGHTS ABOVE BASE IN INCHES AND EIGHTHS | | | | | | | | |
| Station | | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Keel | | 8-7 | 6-3 | 6-0 | 6-0 | 7-6 | 6-7 | 6-0 |
| Chine | | 16-4 | 12-5 | 10-5 | 9-6 | 9-1 | 8-5 | 8-0 |
| HALF BREADTHS | | | | | | | | |
| Sheer | | 19-0 | 28-5 | 32-3 | 32-4 | 31-0 | 23-1 | 24-0 |
| Chine | | 12-2 | 22-7 | 28-2 | 29-6 | 30-3 | 30-1 | 28-5 |

All dimensions to outside of frame.





DETAILS OF KEEL STEP JOINT

| LIST OF MATERIALS | | | |
|--|--------|---|------------------------|
| Part | Pieces | Finished Sizes | |
| Bottom and sides | 4 | 3/8"x4'x8' | Plywood |
| Seats and floor | 2 | 1/4"x4'x8' | Plywood |
| Transom | 1 | 1/2"x4'x6' | Fir waterproof plywood |
| | 1 | 3/4"x30"x5' | Plywood |
| FRAME MEMBERS | | | |
| Chines | 2 | 7/8"x2"x16' | |
| Keel, inside | 2 | 1 1/8"x4"x8' | |
| Keel, outside | 2 | 1/2"x1 1/2"x8' | |
| Clamps | 2 | 3/4"x1 1/2"x16' | |
| Mouldings | 2 | 3/4"x1 1/8"x16' | |
| Frames, side | 2 | 3/4"x3 1/4"x12' | |
| Frames, bottom | 2 | 3/4"x12"x10' | |
| Deck beams | 2 | 3/4"x12"x10' | |
| Stem | 1 | 2 1/4"x8"x5' | |
| Battens, deck | 5 | 3/4"x1 1/4"x14' | |
| Battens, sides | 2 | 3/4"x1 1/4"x16' | |
| Battens, bottom | 4 | 3/4"x1 1/4"x14' | |
| Engine bed | 2 | 2"x12"x5' | |
| Engine stringers | 2 | 2"x4"x12' | |
| FASTENINGS | | | |
| 4 dozen | 1/2" | No. 6 Flat head screws | |
| 6 gross | 1" | No. 8 Flat head screws | |
| 6 dozen | 1 1/2" | No. 8 Flat head screws | |
| 6 dozen | 2" | No. 10 Flat head screws | |
| (Fastenings should be galvanized steel for greatest strength.) | | | |
| 3 | | Carriage bolts 3/8"x4 1/2" | |
| 3 | | Carriage bolts 1/4"x6" | |
| 1 | | quart Ferdico's aviation glue | |
| 1 | | pint or 1 lb. Ferdico's powdered resin glue | |
| | | Cloth strips | |

#8 F.H. screws. These battens provide longitudinal strength, making a much stiffer boat, especially when plywood is used.

Beginning with the after plane, the entire hull is now covered with 3/8" plywood. Coat all adjoining surfaces below the water line with Ferdico's aviation glue, lay cloth strips upon glued area, recoat and clamp plywood in place

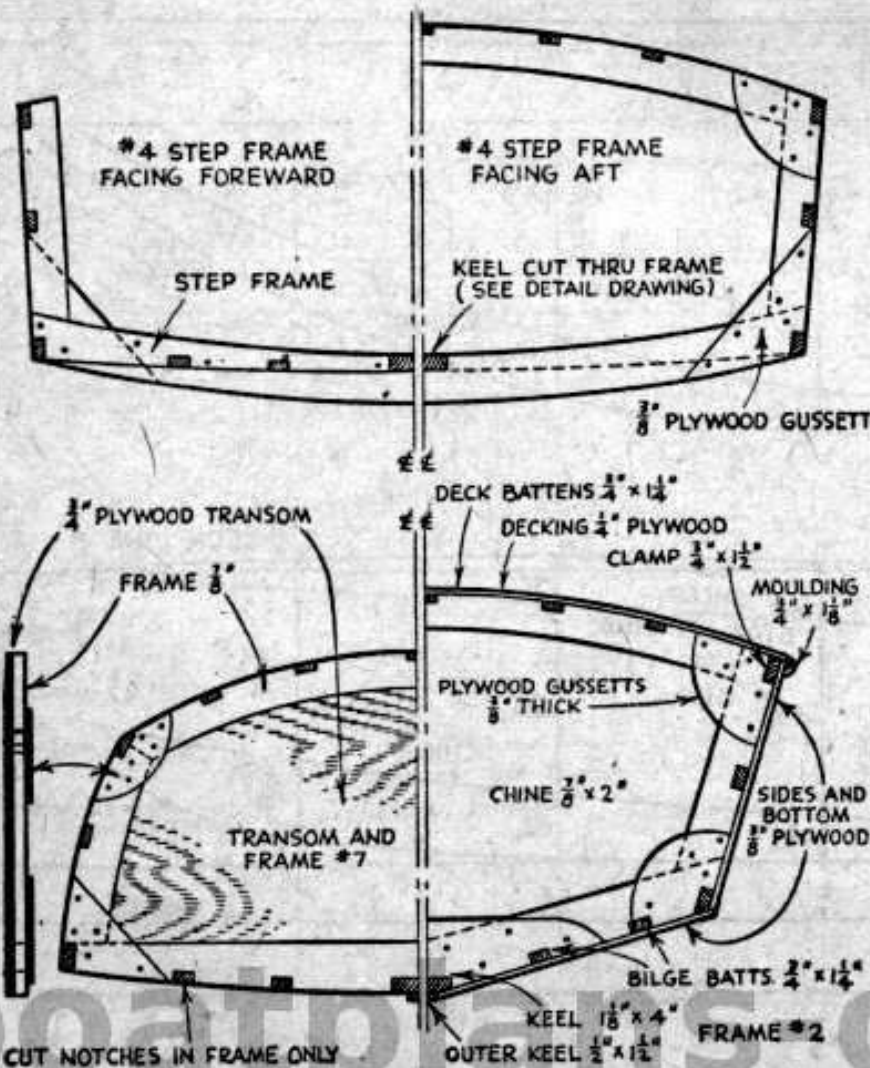
and fasten with 1" #8 F.H. screws spaced about 2" apart at all points. With the bottom planked, trim edges evenly along the chines, again coating chine joints with aviation glue. Above the water line use Jeffery's resin glue at all contact areas. Trim edges of covering evenly along the stem and cover exposed plywood at this point with a 1/2" piece of oak, bent in place and trimmed after fastening. Fasten planking along the sheer with 1" #4 F.H. screws.

At this point trim and fair the hull outside, smoothing nicely and apply a coat of Hold Fast primer, working it well into edges to protect edges of plywood along the chines. As a further protection cover chine edges with #26 gauge soft copper or brass angle, first coating underside with glue and fastening with #6 1/2" F.H. screws.

Remove hull from form and prepare for installation of the motor, as the proper location of the motor hatch depends upon motor installed. Before the decking is applied is the time to install the gas tank, chocking well to prevent shifting, and make provision for the steering gear.

As the engines to be installed will vary widely, only general advice may be offered and that is, keep the center of weight where shown upon plans. Install the engine to keep shaft angle as low as possible, but allowing 2" clearance over propeller blade tips and with sufficient clearance inside over keel for oil pan of engine.

If a Ford V-8 is installed and top projects above deck afterward, simply provide a streamlined plywood ventilator atop hatches to cover



BOAT BUILDER

motor. A small cockpit may be provided forward and built with flooring and a suitable seat.

Install and secure deck beams to their respective frames, fastening with gussets and screws. Notch out beams for deck battens and fasten in place with $1\frac{1}{2}$ " #8 F.H. screws. Carlines and beams are now provided for the motor hatch opening, making hatch beams same curve as deck beams. The $\frac{1}{4}$ " plywood decking is placed in position marked, openings cut out and plywood fastened in place with 1" #8 F.H. screws spaced about 3" apart. When finished secure mouldings to hull with $1\frac{1}{2}$ " #8 F.H. screws spaced about 8" apart.

Seats and flooring are of $\frac{1}{2}$ " plywood and all fittings to outfit the hull properly are available from any marine dealer. An attractive finish for the hull, after the priming coat is applied and smoothed, is to carefully fill all edges and seams with trowel cement, then apply color coats such as Smith's hard racing finish for the bottom, in either bronze red or green, a contrasting boot topping and sides of Smith's flat black or white, with a two tone deck of Smith's deck and topsides finish in any desirable colors.

● Craft Print No. 81 in enlarged size for building the "Rocket" is available at 25¢ each. Address Craft Print Dept. B-48, SCIENCE AND MECHANICS, 49 East Superior St., Chicago 11, Ill.