

MODEL YOUR OWN

Dream Boat

By WESTON FARMER

Dreaming of that boat that you hope to build some day?

Then you can't afford to pass this up. It shows you how

to make certain that you'll get the boat you want

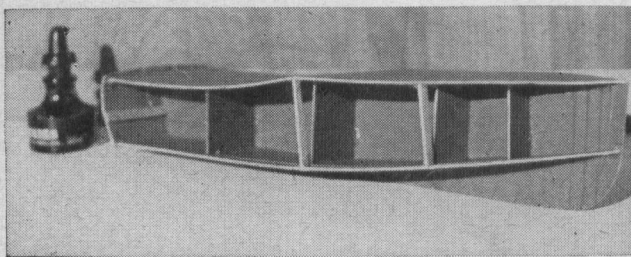
BOAT-MINDED sportsmen usually have a "feel" for sweet curves and flowing lines. But they find it difficult to get these down on paper so that the boatbuilder may interpret what is wanted. Few laymen have the necessary professional skill to draw out a boat, calculate the weight, peg the proper waterline, and predetermine the performance. How, then, to get the boat you want out of dream stuff? How do you know how it will actually look and how it will perform? The method is easy.

You model it. Anyone who can handle scissors and a tube of model-airplane cement can get, with the method I show here, a miniature of his boat which will show him how his dream ship is going to look and how it is going to perform.

First, you need a few simple ma-

terials. You need photo mounting board, a few sheets of 1/32" balsa, scissors, a couple tubes of Testor's fast-drying model airplane cement, some pins, some stiff-backed razor blades, a sheet of fine sandpaper and a small can of varnish. Two dollars will buy the works. A stationery store will supply the sheet of photo mounting board and a model-airplane supply store will provide the cement or "glue," pins, balsa and razor blades. Get the cardboard in the usual gray and blue-backed sheet. The balsa should be of the hard variety. Standard sheets are 1/32"x3"x24" and cost about 14 cents each.

Now you have your materials. The first two things you do are: cut out of the photo mounting board the outline of the deck (sheer) plan, and the outline of the boat in elevation, which is termed the outboard pro-



In this picture you see that the model has been glued up with airplane glue. The cardboard profile is glued to cardboard deck plan and sheer to chine spacers and the chine-line plane put in. The framing topside is begun. Study this photo.

build a better boat

with



BOAT
KITS

three vital advantages... all yours

- 1 EASY ASSEMBLY**... specialized design experience... to give you kits that are fast and easy to build.
- 2 EXCLUSIVE DESIGN... CUSTOM QUALITY**... custom built construction. Exclusive LAMINATED OAK rib and stem construction gives strength four times greater than solid oak. Pre-forming and pre-cutting of all oak frame members automatically gives you proper contours for modified V-bottom design.
- 3 LOW PRICE**... all materials selected for proved quality in marine construction. Save 50% or more in finished cost. Kits are COMPLETE... nothing more to buy. Yet prices are as low as.... **\$43⁴⁵**

your choice of 24 models

Here's a beauty of a Pram. Easy to handle. Light in weight. Ideal for kids and grown-ups alike. Use as rowboat or outboard. Also complete sail conversion kit.



Sturdy flat bottom rowboats. Good family and resort boats. Handle well with oars or outboards. Complete kits with easy to follow plans and instructions.

A 10-foot fast Runabout with Ozarka's famous pre-formed and pre-cut laminated oak ribs and stem. Roomy and perfect for car-top hauling.



Outboards in all sizes. Modified V-bottom gives speed and perfect planing hull. Ozarka designers are specialists... know how to make boat kits for accurate, fast, and easy assembly.

New cabin cruiser for luxury in boating. Built for outboard motor power. In spite of size, it's easy to build. Cabin big enough for bunks and facilities.



Many Other Model Types and Sizes including racers, sailboats, duck boat and accessories.

build boats for fun and profit

You can make real money in your spare time building boats. Buy low cost, quality Ozarka Boat Kits, assemble and sell at a good profit!

WRITE FOR 1954 CATALOG

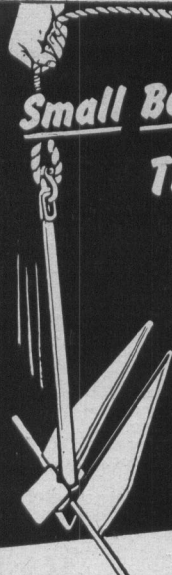
Forty pages of famous Ozarka Boat Kits... rowboats, outboards, runabouts, sailboats, racers, cruiser and accessories. Send only 25¢ for your copy today.

OZARKA, INC.

900 BORDEN LANE
WOODSTOCK, ILLINOIS

sold by leading dealers everywhere... or direct-factory-to-you if no dealer nearby

Small Boat Owners:
THIS 2½ LB.
ANCHOR
WILL HOLD
AGAINST A
760# PULL
 (in hard sand)



Make this Danforth Anchor part of your small boat's equipment and you can anchor in any current or any wind without a worry about holding. Tests by the U. S. Navy show that the DANFORTH will hold more for its weight than any other anchor. Where do you get one? Look in your telephone directory for your boating or marine supply house! All sizes for all boats.

DANFORTH ANCHORS
 REG. TM 2131 ALLSTON WAY
 BERKELEY 4, CALIF.

DON'T DROWN!



FROM THIS TO THIS

RES-Q-PAK

**HUNTERS...
 BOATERS...
 FISHERMEN...**

Everyone near water needs this pocket-size, emergency life preserver. Protect yourself... and protect your children with these self-inflating, two-foot Vinylite life savers.

Res-Q-Pak supports a fully clothed 250-lb. man. Bulldog clip fastens securely to clothing, can't get away even in water.

Slip Res-Q-Pak into your pocket. Be safe always. No larger than a pack of cigarettes.

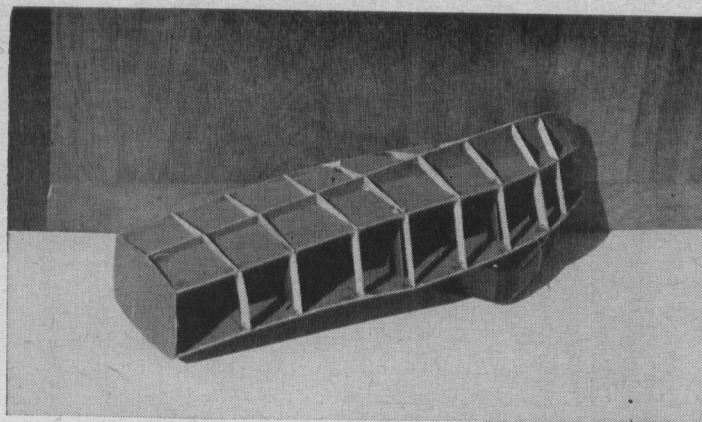
ONE QUICK SQUEEZE presto! it's inflated

ONLY \$2.00 For EMERGENCY use only

Order several RES-Q-PAKS today

141 Arena St., El Segundo, California
 Please send me prepaid Res-Q-Paks.

NAME _____
 ADDRESS _____
 CITY _____ ZONE _____ STATE _____



Bottom and the topside framed in ready for the planking. All you need for the making of model is ability to handle a scissors and model cement.

file. See Fig. 1 in the accompanying drawing. This illustration shows what you are shooting for.

The profile will give you no trouble, but if you find it hard to sketch both sides of the boat symmetrically about the centerline in plan view, cut a separate template to one half the boat's shape, draw one side, then flop the pattern over about the center and draw the other side. This assures symmetry. Any small jogs in any curve usually are smoothed up by cutting when you use the scissors.

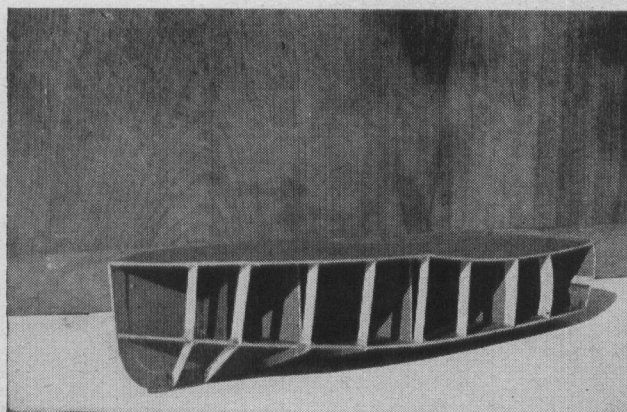
With a razor blade, cut partially through each face of these two pieces—the profile and the deck plan—about ¼ inch from the edge. The idea is to go part way through, but not quite; what we want is a piece of cardboard stiff enough to hold shape while cementing, but which will part

company at the right place when we gut the falsework out of the model.

Next, as at Fig. 3, cut out some spacers for the chine-to-sheer height, assuming your boat is of V-bottom form. If of round-bilge form, forget this step. These spacers go between frame stations and are merely for temporary support of the chine plane.

In gluing the profile and the deck plan together, and in setting in the chine-to-sheer spacers, the technique to use is to hold the piece to be glued in the left hand, and with the tube of cement held in the right, pay a bead of cement out on the edge to be glued. It is like putting a ribbon of toothpaste on a brush.

The next step is to get out the chine planes. In a V-bottom boat the chine line is the hard knuckle where



In the picture above it is seen that the topside frames are all in and the bottom frames have been tacked on. This is a V-bottom model. This article will give you full details on the making of this model and all of the materials needed.

the topsides and knuckle meet. In most modeling, notches are cut in the frames and a small chine stringer is inserted. This method is not as satisfactory as is the method of containing the chine line in a plane of cardboard and bending it into place over the sheer-to-chine spacers. The chine-plane method assures symmetry and accurate flow to the line, something otherwise hard to get. Fig. 4 shows how these chine planes look, including the razor cut, and Fig 5 shows how they are installed.

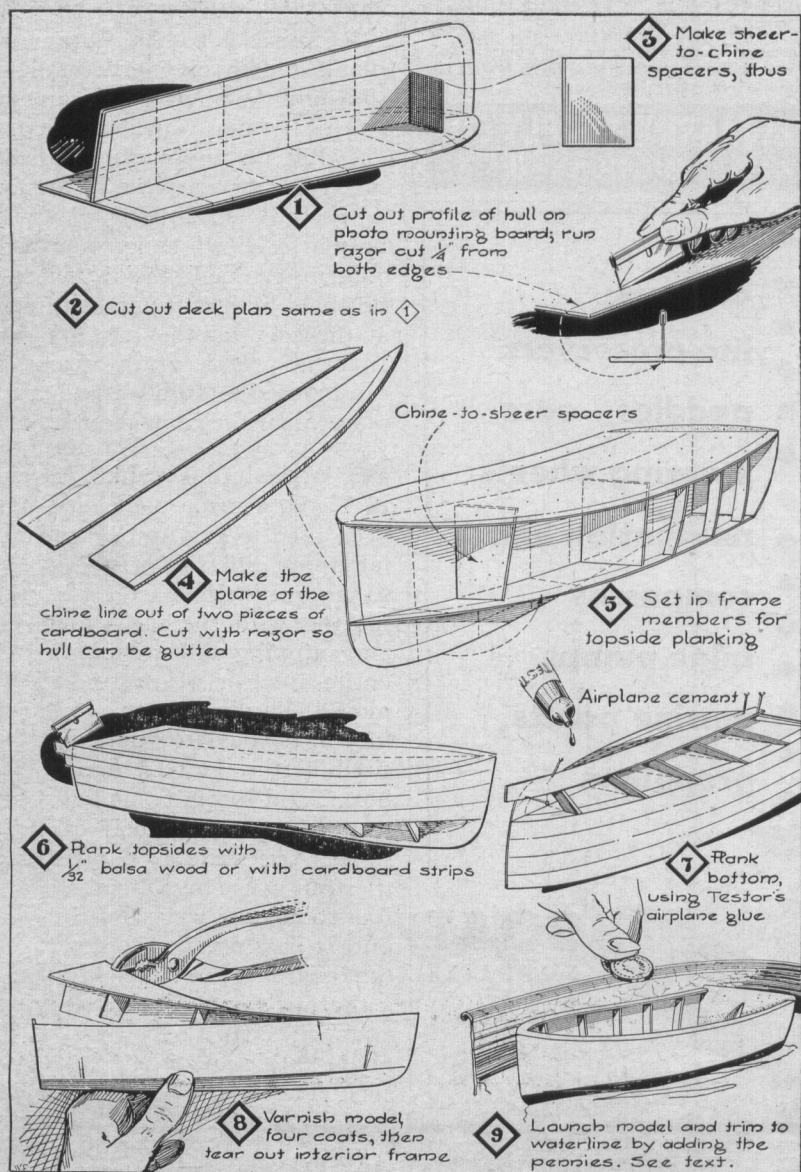
Cut out the transom from cardboard and glue it in place. If you work in a dry room at about 70 degrees, the airplane cement will dry

so it will hold in about one minute. It later sets up glass-hard, holding beautifully.

As shown in Fig 5, you proceed to frame up the topsides. Cut curved frames from cardboard, and use balsa for straight frames. The topsides are best framed first to avoid any propensity to warpage caused by the dope cement "pulling." The heads and heels of the frames are tacked with glue at the $\frac{1}{4}$ " strip which will stay in the boat. Avoid getting glue spread over the razor cut as this will make it hard to rip out the inboard falsework.

The next step is to plank the topsides as shown in Fig. 6, and the bot-

These steps given in the drawing below will explain themselves. If you follow them carefully, you will not have any trouble in obtaining a model that gives you an idea of your desired boat.



STEP UP YOUR OUTBOARD'S PERFORMANCE!



WRITE FOR YOUR FREE COPY OF THE OUTBOARDER'S BIBLE

... our 1954 catalog. It contains much valuable information on how to get better performance and load-carrying capacity from any motor, old or new; MORE SPEED, for racing or pleasure, from $7\frac{1}{2}$ to 50 HP motors. Easily understood recommendations enable you to choose a propeller virtually custom-built for your motor and boat combination and much more rugged and damage-resistant than the original, too. Write for the catalog, NOW. It's FREE of charge.

for INBOARD INSTALLATIONS

Write for our FREE propeller analysis form. Our engineers will assist you in choosing the propeller that best suits your engine, boat and load combination — AT NO CHARGE.

MICHIGAN WHEEL COMPANY,
Dept. SA-54 Grand Rapids 3, Mich.

FISHERMEN! BOATMEN! Grabob OAR RESTS

KEEP OARS SAFELY OUT OF THE WAY

Attach to any row boat
in 18 seconds!



- No wet oars dripping in boat
- No more tripping over oars
- No oars to foul fishing lines
- Easily carried in tackle box

Made of Cast Aluminum

A safe place for your oars
when fishing or motorboating.

JOBBERS and DEALERS:
It will pay you to investigate GRABOB Oar Rests.
Free literature on request.

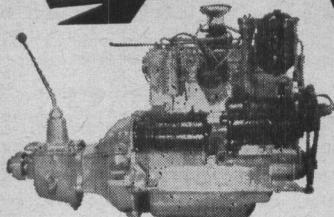
Only
2.95 pr.
Postpaid

GRABOB METAL WORKS
P.O. Box 62 Forest Park Station
Springfield, Mass.

Please send me postpaid _____ Pair(s) Grabob Oar Rests
for which I enclose \$_____ (No C.O.D.'s)

Name _____
Address _____
City _____ State _____

For Your Boat... Low Cost INBOARD JEEP 61 HP MARINE MOTOR MARINE ENGINES



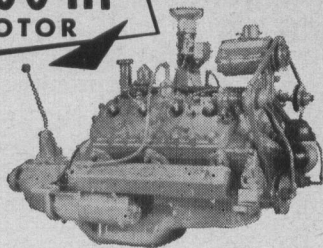
\$375.00

• Stokes JEEP marine conversion is the ideal engine for many types of small craft. Provides plenty of dependable power, ease of operation, amazing economy—plus the advantages of light weight! Brand new conversion parts, starter, generator, reverse gear—with factory rebuilt block... complete, ready for fast, easy installation in your craft. Perfect for either salt or fresh water use.

SMOOTH ★ POWERFUL ★ DEPENDABLE

**FORD 100 HP
MARINE MOTOR**

\$425.00



- For real power and speed... dependable service... and operating economy, it's hard to beat at any price the popular Stokes 100 HP FORD marine conversion motor!
- Here's a truly modern engine, designed and engineered for peak performance. Comes complete with genuine factory rebuilt block, starter, generator, reverse gear—ready to install. Suitable for fresh or salt water use.

Big Savings...

On **CONVERSION KITS • REBUILT MOTORS • SHAFTS
HARDWARE • MANIFOLDS • PROPELLERS • PAINTS
FITTINGS • SUPPLIES OF ALL KINDS**

Send for FREE Catalog Now!

STOKES MARINE SUPPLY CO.
Dept. SA-4 Coldwater, Michigan—U.S.A.
Please send me your New 1954 FREE CATALOG
and complete information on all available motors.

NAME _____
ADDRESS _____
CITY _____ STATE _____

• Big selection of motor Kits. New, used, and rebuilt marine engines, many makes, 2 to 550 HP, gasoline and diesel. Complete stock list sent FREE. Whatever your needs, Stokes can supply you. Buy all your marine requirements by mail from STOKES—and buy at rock bottom prices! **SAVE MONEY—** send for big FREE Catalog today!

STOKES MARINE SUPPLY CO.
COLDWATER, MICHIGAN—U.S.A.

LASTING PROTECTION



GUARANTEED NOT TO CRACK, CHIP OR PEEL!

"How it Lasts!" say boat owners who use BoatLIFE Durable Plastic Finish. Beautiful glossy BoatLIFE, tested for years under the most severe weather and water conditions has been found to be the toughest, most flexible, finest finish your boat can have. BoatLIFE is **WATERPROOF**, amazingly flexible and elastic. Resistant to marine growth... protects against rot.

So Easy To Apply! Flows on smoothly, even over other finishes. Dries tack free in damp weather. Use on wood, metal or canvas. On metal, use primer first. BoatLIFE outlasts and is superior to the finest spar varnish!

Whether you choose glistening Plasticlear, or any of BoatLIFE's brilliant colors, Blue, Red, Green, Gray, Black, Ivory, and non-yellowing Flat or Gloss White, you'll be delighted with its smooth glossy surface. Ask for BoatLIFE at your dealer. Or order direct. **THINNER FREE** with each can. \$3.85 qt., \$12.80 gal., postpaid. West of Mississippi add 25¢ qt. or 90¢ gal., to cover shipping costs.

**WRITE TODAY FOR FREE FOLDER
WITH COLOR SAMPLES.**

Boat Builders! Send 10¢ for folder "How to select the Right Boat Lumber." Helpful for construction and repairs.

M. L. CONDON CO., INC. (Est. 1912)

Specialists in Marine Finishes and Boat Lumber
252 Ferris Avenue White Plains, N. Y.

- anchors
- life preservers
- paddles—oars
- steering wheels
- navigation lights
- compasses
- bilge pumps
- marine paints
- propellers



**BOAT
SUPPLIES**

MARINE HARDWARE

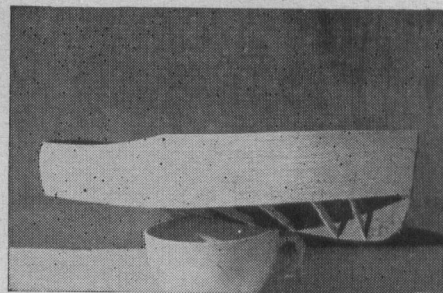
SAVE BY MAIL!

**FREE
44 PAGE
CATALOG**

Save on marine paint, fittings and hardware from the nation's most complete marine supply store. Everything for your boat.

SOUTH COAST COMPANY Since 1908
2208 Newport Blvd., Newport Beach, California

Here we see that the topside of the model is planked and trimmed. The bottom is planked in the same manner. It should be varnished before launching.



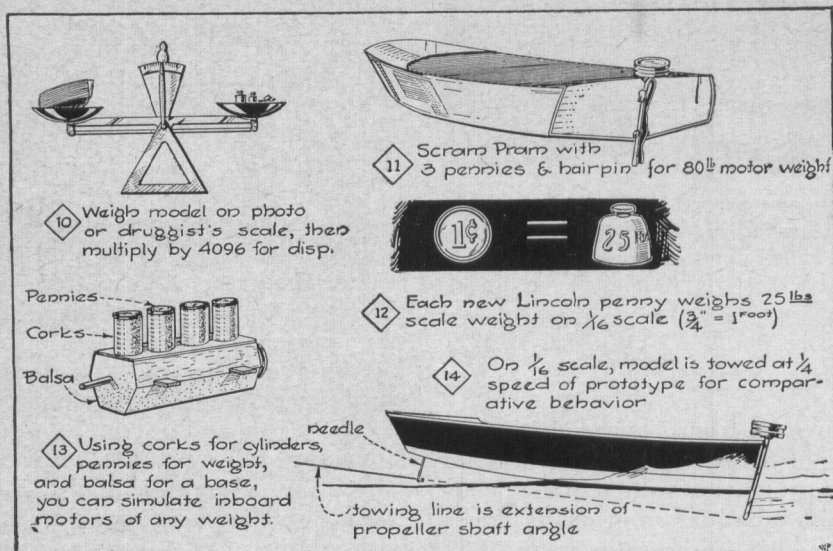
tom, as in Fig. 7. The ends of the balsa are shaved off as they pass the transom. Use a razor blade for this. It is a good plan, after the plank ends have been thus trimmed, to run a bead of cement over the raw end grain of the wood, and smear it flat with your finger tip, the better to provide a glue wrapping about the end of the plank.

Reasonably flat topsides may be planked with one sheet of balsa as shown in the photos. The same holds true of bottoms which are reasonably flat. But on any surface which has much sny, or warpage, strips should be used. The planking of a typical bottom is shown progressing in Fig. 7. Strips can be 1/4" wide, and should be glued both at frame landings and at the edges as they come together. In other words, at the seams. Pins can be used to hold warped strips in place until the cement dries.

NOW the hull is planked. As shown in Fig 8, a razor blade first having been used to pry up one end of the falsework, pliers or scissors are used to pry out the inboard falsework. By nicking with the razor blade here, and snipping with scissors there, the entire interior of the model is removed. This leaves you a hollow hull in which you later can build scale-sized berths, lockers, floors, engine boxes, and so on. Some naval architects who are extremely careful designers use scale-sized manikins so they can gauge headroom, elbow and foot room, and general utility of layout. It pays off. Very often it makes the difference between a klunker and a thoroughbred. The latter kind of boat, one with no bad traits, comes about rarely and is a result only of such close attention to little details.

Now the hull is lightly sanded and finished off. This is one of the main

Below is given the method for weighting your model properly so that you'll be able to judge her condition when boat's equipped with an engine. You may get some surprises now.



reasons balsa is used for planking. It sands and finishes easily. I have used cardboard, and it is perfectly all right, but finishing must be done by waterproofing with hot paraffin, and then scraping with a blunt table knife. Paraffin is not as satisfactory or as long-lived as varnish.

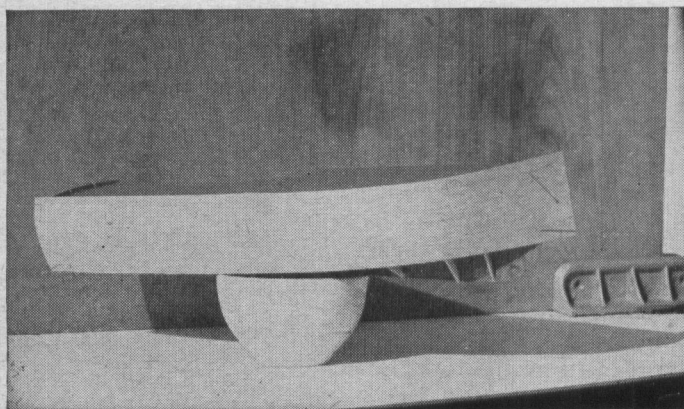
Four coats of varnish is the minimum necessary to really waterproof a model built on this system. Let each coat set up overnight. Do not sand the last two coats, but flow them generously.

Now comes the launching! This and the testing for trim and wake pattern, are the pay-off where the

real fun comes. And here I must get in a word or two about the simple mathematics of similitude.

There is a law in naval architecture which states that (within broad limits) the model of any vessel varies to the prototype as the square root of their linear ratios in the matter of speed, and as the cube of the linear ratios as to weight. Let us take an example to show you what is meant.

Suppose you have worked in the scale of 3/4" equals 1 foot. This is the scale most used by naval architects who use models, because it is one sixteenth full size, and the linear ratio, 16, is easy to cube and to extract



The step pictured here is the one where you are beginning to plank the topside. For the man who is planning to build a boat, the steps in the making of this model will be of great help. He will avoid serious errors in his boat.

HOW to Make Your OLD Boat New



Now YOU can protect your boat permanently with Castoglas Liquid Plastic... it's easy, economical! No need to paint and caulk each year! Instructions show method of plastic plating any boat!

New Manual Tells How to:

- Make boats leakproof, weatherproof, rot-proof
 - Plate hull with plastic skin lighter than aluminum, tougher than steel
 - Skid-proof decks
 - Repair leaking tanks, pipes, compartments
- Castoglas-treated boats will not rust, corrode nor be affected by gasoline, oil, alcohol, salt water, hot sun or below-zero temperatures.

HOW to Build a Fiberglass Boat



Now YOU can build your own Fiberglass boat. Easy-to-follow illustrations and detailed working drawings show step-by-step construction method.

New Manual Tells How to:

- Prepare the mold
- Make the keel
- Apply Castoglas
- Remove boat from mold
- Install the ribs
- Finish the hull

You'll be thrilled with your new boat—and have fun making it! Castoglas-built boats are light as aluminum and tougher than steel.

Send only 25¢ for both these practical manuals to: Marine Division, Dept. MA-205.

The Castolite Co.
Woodstock, Illinois

P.S. DEALERS! Write for proposition!

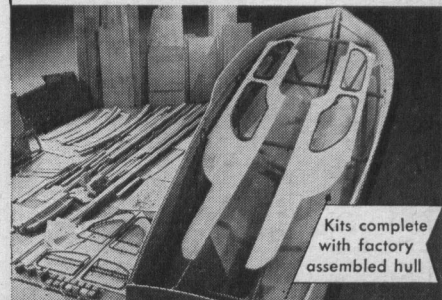
Both for
25¢



23 ft. Express

BUILD YOUR OWN BOAT

Save hundreds of dollars—easy to assemble. All parts are pre-cut and hull is factory assembled. Complete line of small boats and outboard cruisers from 12 to 23 ft. Send for illustrated catalog.



Kits complete with factory assembled hull

16 ft.
Mermaid

19 ft.
Sedan

SEND 10¢ FOR CATALOG

LADD BOATS

DEPT. E-1, P.O. BOX 1345, LOS ALTOS, CALIF.

41 NEW MODELS for 1954

Custom-Craft

THE ORIGINAL "PACKAGED"
BOAT KITS

RATED "TOPS" BY THE EXPERTS in
DESIGN, STYLING, PERFORMANCE

See the World's finest, most complete line before you decide! 41 exciting new models for '54: Dinghies, Skiffs, Inboards, Outboards, Cruisers plus the only Pontoon or "class" Racers available anywhere. Priced from \$49 up. You get more with Custom-Craft. MORE exclusive features, MORE beam and depth, precision pre-cut solid mahogany parts plus brass screws on all models. They're easier to assemble, too! See Custom-Craft before you buy!

SEND 25¢ for BIG, NEW 1954 KIT CATALOG

1954 Catalog PLUS booklet "Boat Selection, Operation & Maintenance" \$1.00. (Refundable)

DEALER INQUIRIES INVITED



Modern BOAT PLANS

World's
Finest
Designs

With FULL-SIZE PAPER PATTERNS

EASIER TO BUILD, SAVES TIME, MONEY

Over 150 modern plans and patterns with material lists and building procedure. Racing classes, cruisers, inboards, outboards, sailboats, 6 to 36 ft. All materials, fittings, etc. available at "Package" prices. Big savings! Design Catalog tells all!

SEND 35¢ for 1954 DESIGN CATALOG
Design Catalog PLUS boat building handbook, \$1.00

ARMOR-GLASS

**CUSTOM-CRAFT'S
NEW SUPER XXX
FIBREGLASS**

You've read about this remarkable product everywhere. Makes hulls watertight permanently, stops leaks, adds terrific strength to the hull. Eliminates annual painting forever.
SEND 10¢ for Literature and "How-to-measure and Order Form", or send \$1.00 for valuable booklet describing, showing and explaining how to use Armor-Glass for boats, auto bodies and dozens of other ideas. Tells all, shows all!

Marine BUYER'S GUIDE

World's most complete catalog full racing and speedboat accessories, fittings, paints, marine engines, conversions, kits and hundreds of bargains! Send 35¢ for CATALOG or send \$1.00 for Catalog PLUS booklet "How to Paint, Outfit and Care for Your Boat".

CUSTOM-CRAFT • DEPT. 27 • BUFFALO 7, N. Y.



**44 Pages of Helpful
Boating Information**

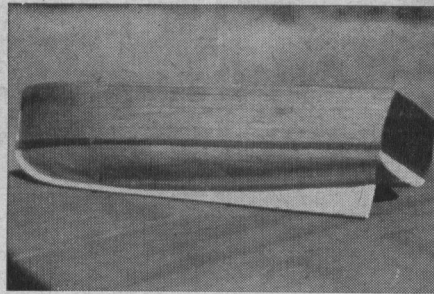
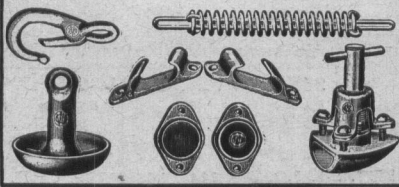
Our new 44-page Catalog is chock full of gadgets for outboards, small motorboats and kit boats. For your further convenience, this book features suggested equipment lists for various boats, plus helpful installation drawings.

Ask your dealer for a copy, or write us direct and enclose 10 cents to help defray mailing costs. We urge you to see your dealer now—buy fittings early—and enjoy a full season of carefree boating!

WILCOX-CRITTENDEN

"A Century of Dependability"

93 South Main Street • Middletown, Conn.



In the photograph above you find the fully finished model of the round-bilge form ready for the launching. You will now be ready for testing of the model.

square root from. Your model is then one sixteenth full size. Its speed in scale proportion will be to the prototype as the square root of the linear ratio. The linear ratio is 16. The square root of 16 is 4. Therefore the model when towed will exhibit the wake and behavior of the prototype at one fourth the speed of the bigger vessel. If your prototype is to be powered for a speed of 16 miles an hour, tow the model at four miles an hour (a nice brisk walk at lake edge) and the behaviors will be similar. For a 40-mile prototype speed, one fourth of 40 being 10, a moderate running gait will give you 10 miles an hour and similarity.

Because these towing speeds so readily lend themselves to a gait a man can achieve on his own legs, the scale $\frac{3}{4}$ " to 1 foot is most useful.

As to displacement, or weight, the scale varies as the cube of the linear ratio, or, on $\frac{3}{4}$ " scale, as 16 times 16 times 16. This is 4,096. Therefore, if your model, after trimming to waterline, weighs one pound, the finished prototype will weigh 4,096 times 1 or 4,096 pounds.

After launching your model, a most convenient form of ballast is multiples of the Lincoln penny, which scales out very close to 25 pounds scale weight in $\frac{3}{4}$ " scale. By adding pennies until you reach the waterline trim, and gunking these pennies into permanent place by flowing a bead of cement over them, the model, after being removed from the water and dried, can be both weighed and balanced. Where the model balances will be the fore-and-aft position of the center of buoyancy, much more accurately arrived at this way than by Simpson's rules of calculation. The center of buoyancy and center of gravity always

coincide in a fore-and-aft relationship.

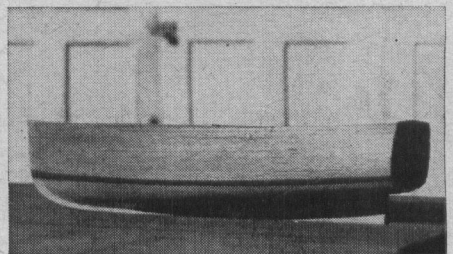
After ballasting, weigh your model on a photo scale or on a druggist's balance. There are 16 ounces in a pound, and 480 grains in an ounce, troy weight. Thus, the total weight of the model in pounds, ounces and grains can be converted to pounds and decimals of a pound, multiplied by 4,096 and presto! you have the weight of the prototype. The method is quite accurate.

Thus both the wake pattern and the total displacement of the prototype as well as the location of the buoyancy center and gravity center are made known by modeling.

Figs. 9, 10 and so on show the launching and weighing, and give suggestions whereby engines of different weights may be simulated with pennies, balsa, corks and pins.

As to towing methods: it is important, in order to simulate the proper thrust components, to extend the towing cord in the same angle as the propeller shaft. A needle is shown in the last drawing of the series, through the eye of which a silk thread is knotted. The towing operator then keeps the towing line at an extension of the shaft angle. In tank work the towing thrust is usually applied at the thrust block, but this is not practicable for our simple experiments.

A self-integrating model shows up errors in basic premises if there are any. To the skilled, the best method of arriving at the ultimate dream boat is to carry both calculations and model along together. To the sportsman not concerned with theory, the model will show him more in a few days' time than a whole library possibly could. He is taking his answers from the boat and the water itself. Together they are infallible.



Another view of round-bilged model—fully planked with the balsa strips and varnished—and ready for its launching. Compare the text with these photos.