

Building GYPSY

**A Motor Sailer
With a Past
and a Future**

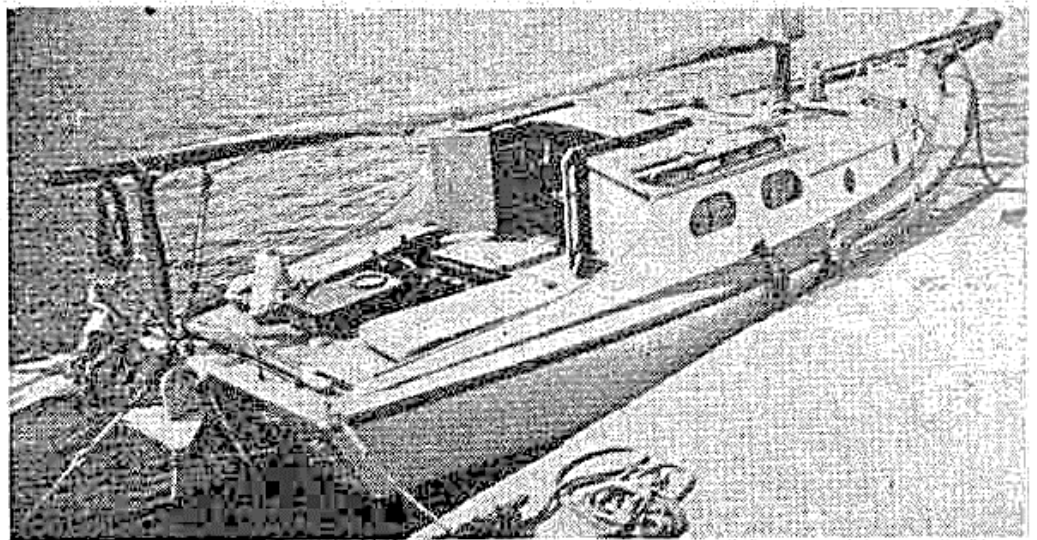
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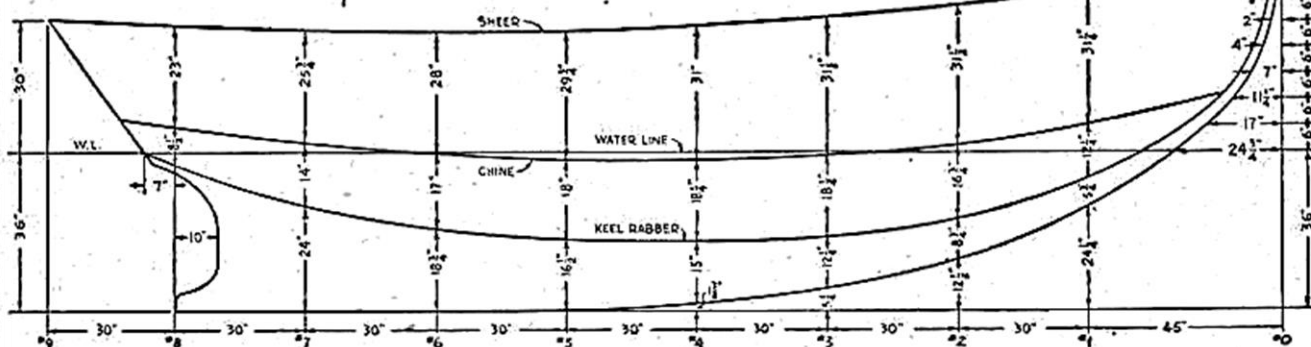
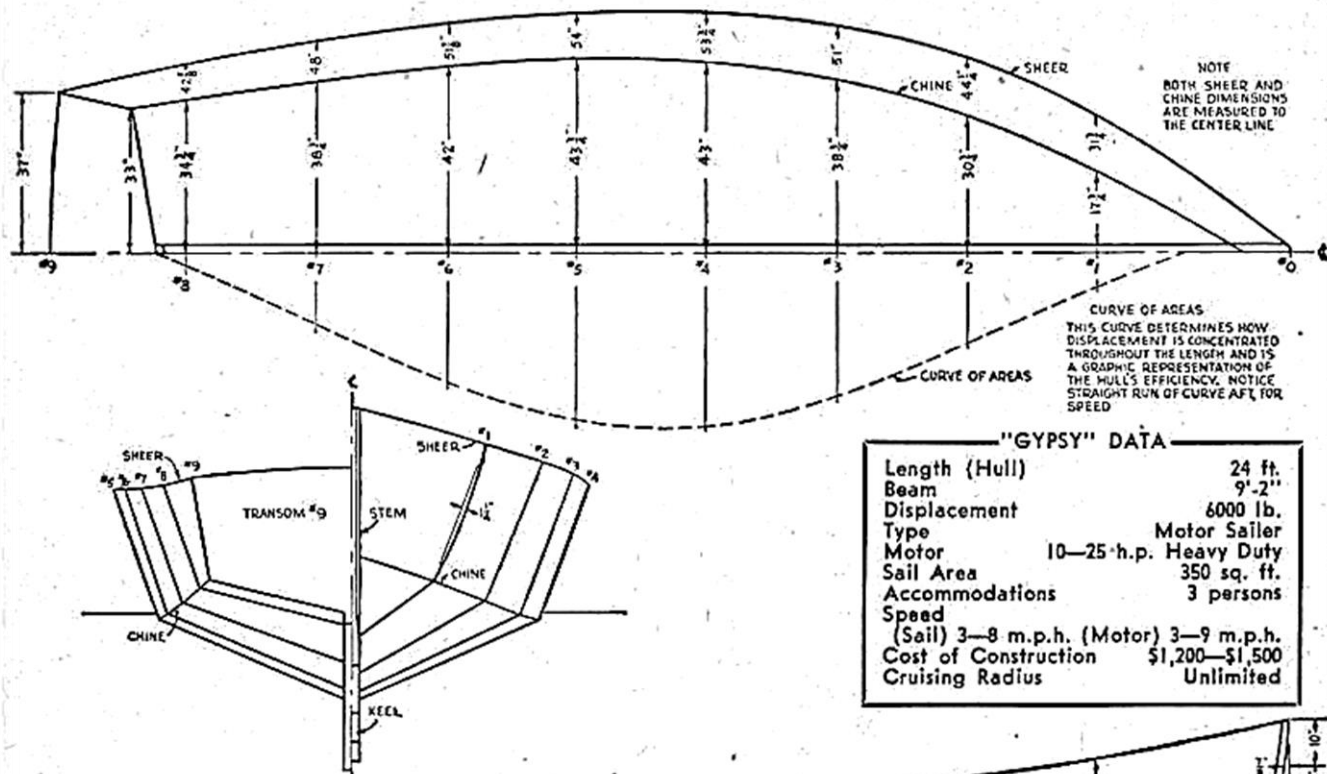
WILLIAM D. JACKSON

Craft Print Project No. 53

period of six years the original design was tested and improvements made to make this sailer smarter and even more seaworthy. All of the good points of the original design were retained and everything that was learned and tabulated during its period of usage that would make operation and performance better was ap-

GYPSY is a proven motor sailer that will outweather the best of the ordinary large or small cruisers. The original design was sailed some 6000 miles in all kinds of weather under all manner of conditions, and been out hundreds of miles from the coast line on the Gulf of Mexico and weathered blows that caused quite large boats to seek shelter. Over a





plied to this new and improved design.

The original of *Gypsy* was designed and built by the author and finally sold on Florida's West Coast, where it is still in use and giving a good many happy and carefree hours of sport and relaxation to a family of sailors—a couple with three children, who now have this sailer moored at Clearwater, Florida. This foregoing is just to indicate that this is no paper boat; if you invest your money in this proven design, you'll have a boat that will return full value over a long period of years.

Don't build this boat if you expect speed—because she cannot be forced over 10 miles per hour by any power you could install in her. But if it's relaxation you want over a long period of time, *Gypsy* is the boat. It may be propelled by marine motors of 10 to 25 horsepower for speeds up to 9 miles per hour. With the sailing rig and a fair wind it can enable the boat to loaf along at 3 to 8 miles per hour. With a good economical marine motor such as the Falcon 10 horsepower or the Universal Economy Four, you'll have a boat whose first cost is higher than an ordinary cruiser; but you'll be able to

cruise far longer on less money and in comparative safety and comfort, with a boat that will be able to stay out and take "it" regardless of weather conditions.

There you have *Gypsy*—a trim lady with buxom lines, a remarkable past, and a pleasant future. Since she was sent to finishing school she has returned with new graces and accomplishments that will fit her for the times now and some decades in the future.

Building a boat such as *Gypsy* is really a more ambitious undertaking than any boat so far presented by SCIENCE AND MECHANICS. It requires considerable thought and preparation before its construction is even attempted. A few words of caution—don't change the lines in any way, don't make the hull shorter or longer or the cabin higher. If the completed boat is to look like a real ship and act like one, build it exactly as shown upon the plans. The interior arrangements may be changed to suit individual desires, but if you don't want a floating nightmare leave experimenting alone or find a design that exactly suits your needs. Don't spoil this attractive design by changes because it won't give the satisfaction you expect and you'll only be wasting a lot of hard work and money.

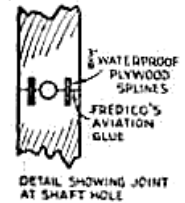
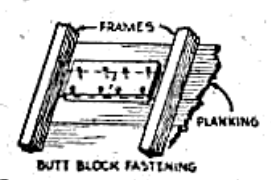
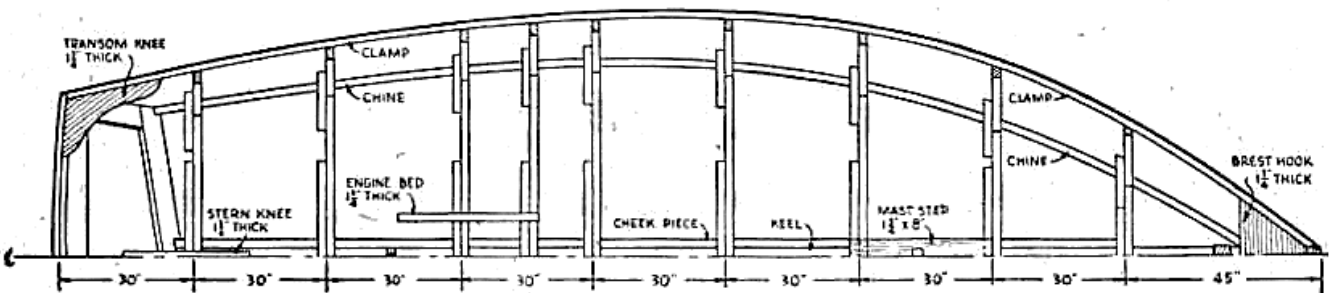
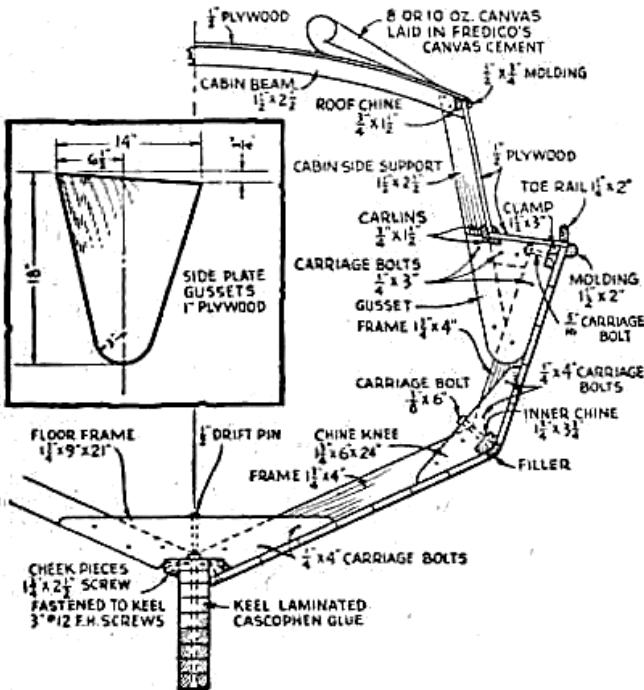
If possible, build *Gypsy* under cover—even a shed roof is preferable to building outside without benefit of any cover whatsoever. As for tools, a suitable circular saw and a band saw (the 12 inch band saw will handle the work but a 14 or 16 inch saw is better as some of the timbers are heavy) are particularly useful. The best way to obtain the timbers for *Gypsy* is to contact a local saw mill and get them to furnish all timbers. Then let them air dry at least six months—if they've been freshly sawed. White oak is the best material to use for the frame-

work. Long leaf yellow pine or hard maple may be used for the keel if the oak is not available.

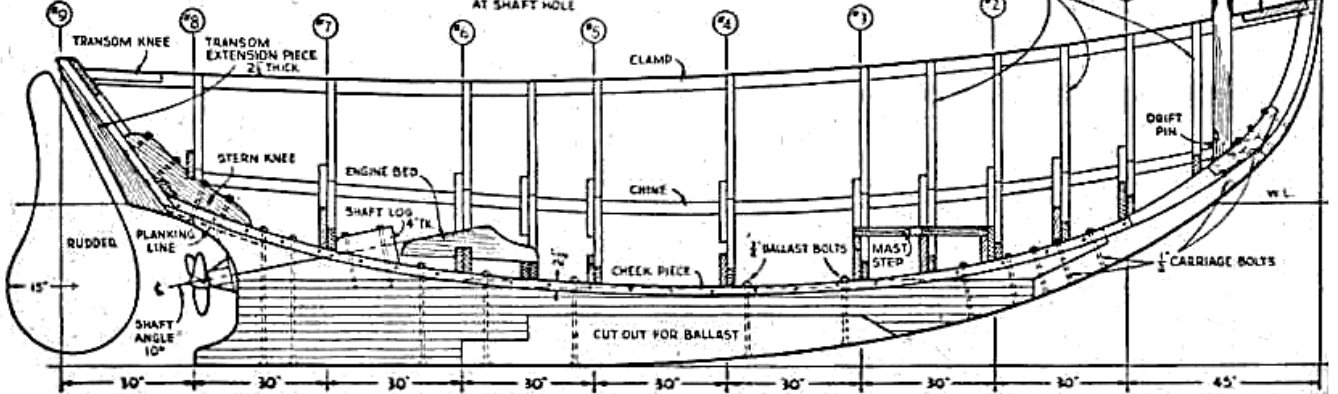
Laying Down the Lines

The first item in the construction is the preparation work to insure fair sweet lines on this hull. Referring to drawing (1), lay the lines of this hull down full size on large sheets of building paper or a smoothed well painted floor. Be sure to fair all lines to make absolutely certain everything is uniform. This full size layout will also furnish patterns of all parts that really fit. Lay down both the half breadths and profile sections. If slight irregularities appear, fair the lines to eliminate small errors. This preliminary fairing of lines will also give one a much better understanding of the boat as a whole. The dimensions as given upon the plans are to the outside of frames only and not to the outside of the planking. All calculations for displacement however are to the outside of $\frac{13}{16}$ inch planking. Visual tables of offsets are given upon the plans at every station; this is a much easier method of laying down boat lines as it gives at a glance the correct dimensions for that station.

In laying the lines down full size, draw upon the full size layout the position of the engine bed, brest hook, and transom knees. Then draw the partial bulkheads and it will then be an easy matter to make full size patterns of these parts that really fit. This full size layout will also indicate the bevels to which each frame must be cut, the correct rabbet bevels for the stem and also the chines. When these parts are cut to size, it will be an easy matter to bevel and rabbet

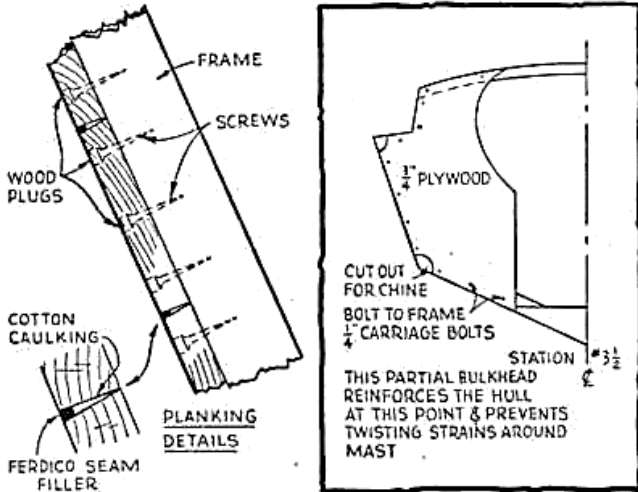


NOTE
AFTER FRAMEWORK IS COMPLETE WITH CHINES AND CLAMPS IN PLACE, MEASURE AND INSERT INTERMEDIATE FRAMES EQUIDISTANT BETWEEN MAIN FRAMES. MAKE INTERMEDIATES THE SAME SIZE AS MAIN FRAMES.
FIRST 3 INTERMEDIATES SHOWN CONTINUE TO TRANSOM SIMILARLY



the respective parts before assembly, making the whole job fit better and the assembly a more rapid and easier job.

Begin the construction by cutting the material to shape for the frames from #1 to #9—the transom. With side and bottom frame members cut to shape, fasten keel joints with a floor frame



bolted in place with carriage bolts. Chine joints are secured with chine knees bolted in place. For a really stiff and long lasting job, coat adjoining surfaces with Cascophen Glue before fastening. The stem is cut to shape as indicated and the joints are similarly bolted and joined together, followed by rabbeting this member as indicated on the full size layout. The transom #9 is built up of 1 3/4 x 8 inch boards secured on inner surfaces with a 1 3/4 x 4 inch frame. Secure chine joints with chine knees, Cascophen bond and bolt all adjoining surfaces together.

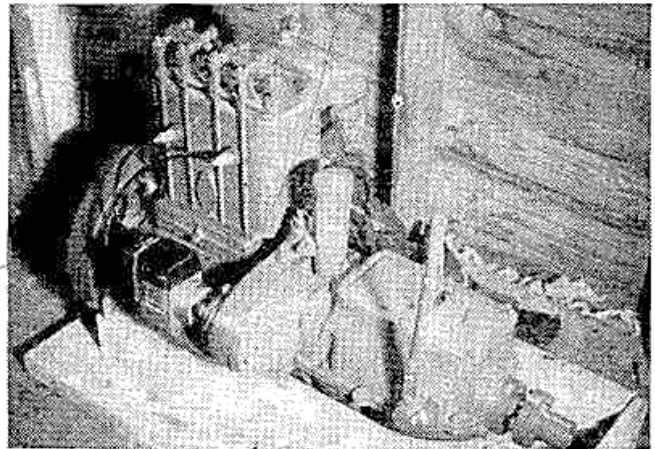
For a really smooth outer surface on this transom, cover the transom with 3/8 inch plywood glued and screw-fastened to the outer surface of the transom. It will save time and labor now and later to refer to the full size layout and mark bevels on all frames and transom and then bevel each one. Then cut notches for the clamps, chines and keel in the frames. To prevent distortion of these frames during construction, nail or bolt 2x2s across the top of each frame.

Keel Comes Next

The next subject to discuss is the keel. Here some explanation of the construction of this member is necessary. Since heavy timbers are becoming increasingly difficult to obtain, try this technique. Build up the keel from 1 3/4 by 4 inch pieces, bond joints with Cascophen resin glue, and bolt where needed. Follow by bolting and Cascophen bonding stem to keel assembly. At this point either set the ballast in

the keel or mark the keel where the ballast will be placed. Place the keel casting in position when the boat is almost finished. This keel casting, incidentally, should preferably be cast iron well protected from rust at the proper points. Lead may be used if obtainable but since it is heavier, it will make the finished hull somewhat stiffer.

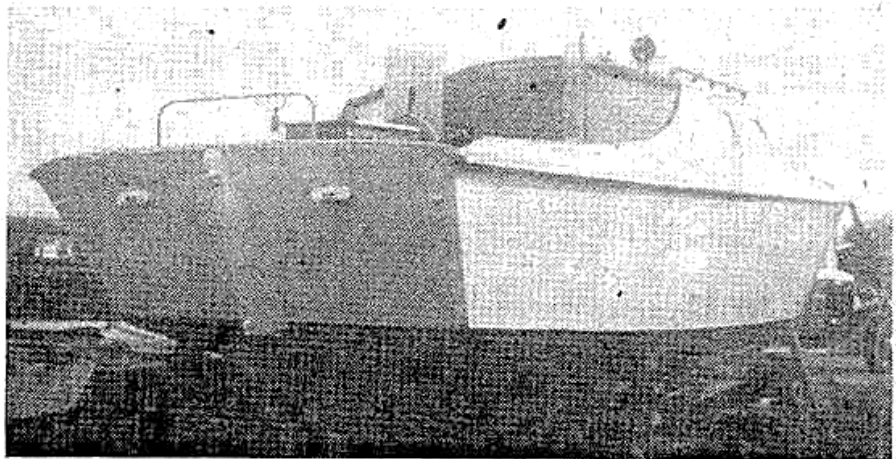
Mount the transom upon the keel assembly and secure with transom knees and 1/2-inch diameter drift pins. Now prepare to set the keel assembly up at its proper level. Hold transom and stem in alignment with wood strips nailed to building's rafters or drive in ground and support these members so that they are plumb and

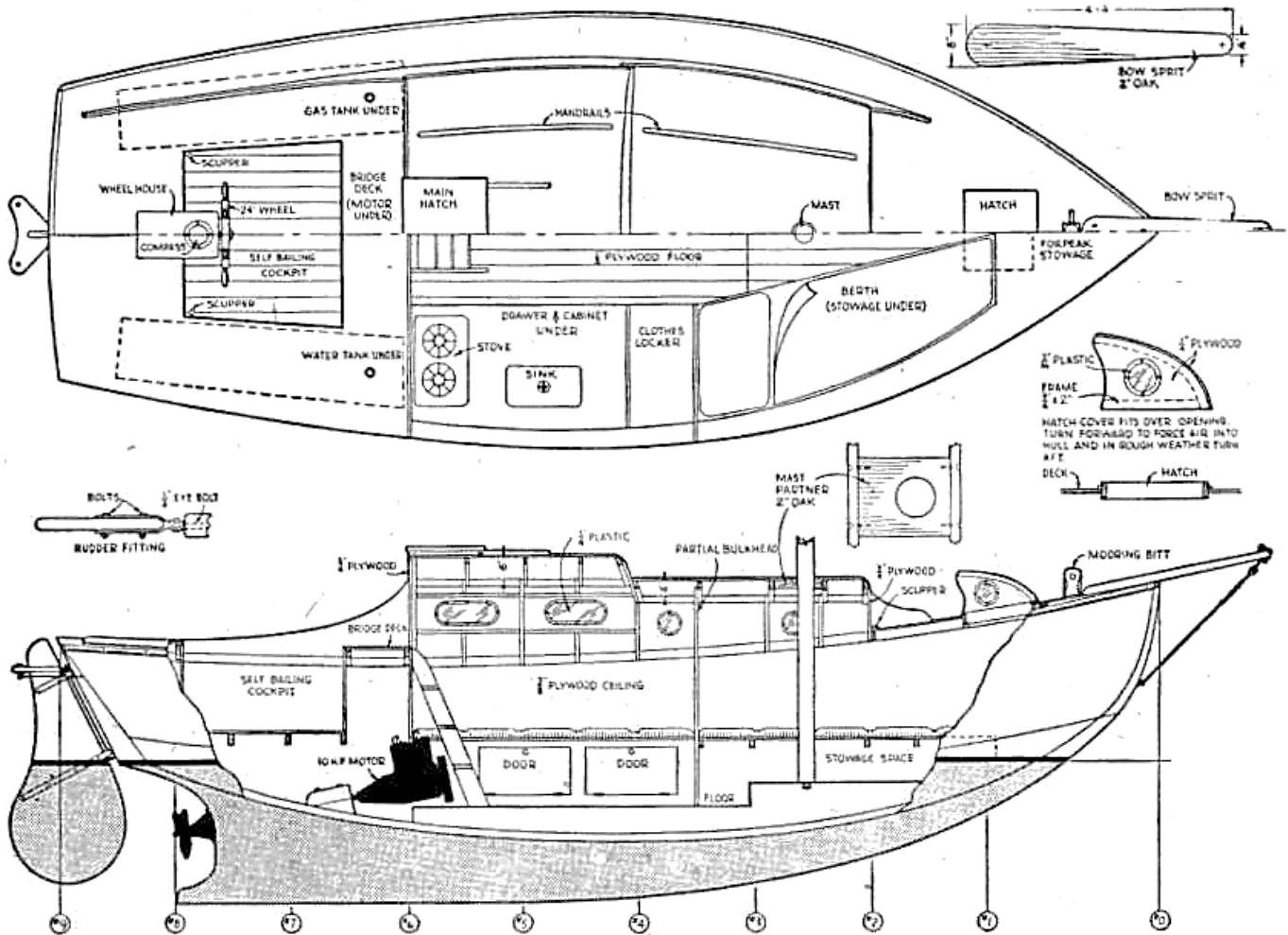


A U. S. Motor 10 horsepower Twin Falcon makes a good power plant for the Gypsy motor sailer.

square with the keel. Fasten the cheek pieces on each side of the keel, first beveling these cheek pieces according to the full size layout. Fasten cheek pieces to the keel with Cascophen glue and 3 inch No. 14 flat-head screws. Then assemble frames atop the keel at their respective positions, holding frames level and plumb with wood strips nailed to floor or roof.

Now go over the framework and if the keel is set up at its correct position, as indicated upon the plans, all frames may be aligned with the aid





of a level and square. Be very careful to align all frames correctly as the finished appearance of the boat depends upon a fair uniform alignment of the frames.

Bevel the chines before attaching. Next, starting at the transom, fasten ends to transom and, using a rope or long clamps such as Pony Clamps, bend both chines simultaneously towards the bow. Clamp in the chine notches with "C" Clamps. Then position chines fair with frames and fasten them with carriage bolts inserted through chine into frame's chine knee; forward ends of chines are slightly rabbetted into stem and screw-fastened. The sheer clamps are next sprung into position on each side and then they are similarly fastened to the frames.

The frame work is now partially set up. This is the time to insert between every main frame an intermediate frame, making these intermediate frames the same size as the main frames and fastening similarly. It is an easy matter to measure for the intermediates with all the main frames already positioned. These intermediate frames seem like considerably more work but if this boat goes aground and its almost sure to some time, it will withstand almost any amount of pounding with these extra frames inserted.



Looking aft into the Gypsy's steering compartment.

Continue by fairing and smoothing the entire framework so that all planking will lie evenly at every point of contact. Finish the framework by attaching the chine fillers on each side and installing the breast hook and all transom knees.

We are now ready to plank the framework, and here again some explanation of the processes concerned may be of vital assistance in this job. Plywood could be used to plank this hull but is not recommended because it would upset design calculations. The best planking material is

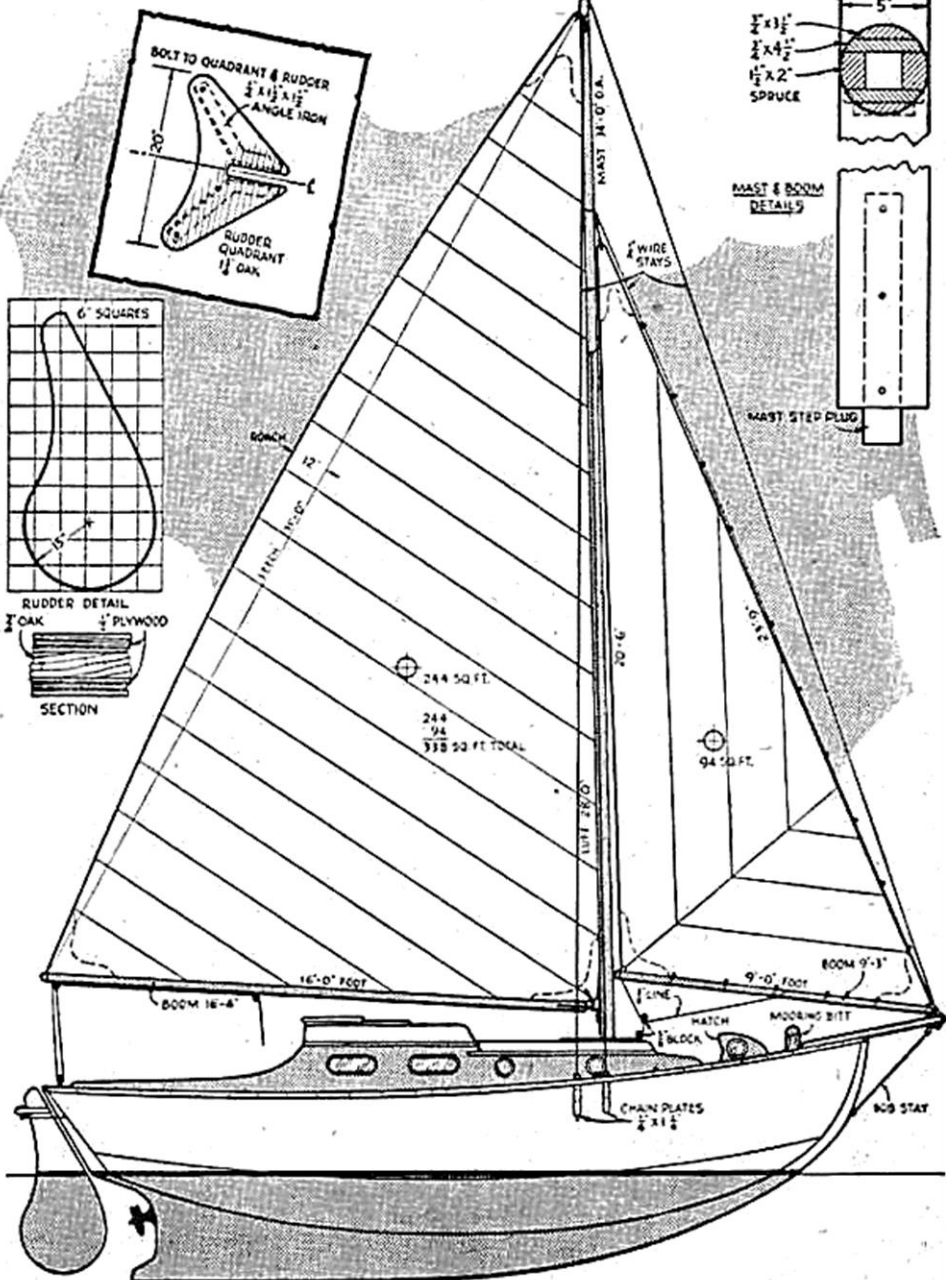
Douglas Fir—the standard thickness as sold in lumber yards anywhere as 1 inch thickness (which actually measures $1\frac{3}{16}$ inch) and is thoroughly satisfactory for either fresh or salt water. As it is necessary to piece the planking strakes (full length planking not being ordinarily obtainable) provide butt blocks behind every planking joint as indicated, and do not have any two joints in the same section. Start with the bottom and decide how many strakes are necessary—the original hull utilized 8-inch width planking (which actually measures $7\frac{1}{2}$ inches.) Strakes were butted against one another, marked, and cut to shape, so seams would be uniformly curved. It is beyond the intent of this magazine article to fully cover the process of planking and if this job causes any difficulty, a line to the boat editor will take care of any troubles you may have with planking. Planking widths should not exceed 8-inches with the exception of the gar board plank, which is the plank next to the keel, and this plank may be a 12 inch width, shaped to fit its position. Allow an $\frac{1}{8}$ inch caulking joint between strakes; the joint should fit tight on the inside and be open on the outside $\frac{1}{8}$ inch, forming a V joint, so that caulking and seam compound may be inserted to make a water tight joint.

Fasten planking in place with $2\frac{1}{4}$ inch #12 flathead screws, countersunk and plugged as indicated. Of if you prefer, use $2\frac{1}{2}$ inch Anchorite nails (nails with annular grooves that hold like a screw) and plug these fastenings similar to screws; space fastenings about 3 inches apart. With both bottom and sides planked, coat the entire hull interior with Cuprinol and the fir planking outside with Firzite. The outside will then take a smooth paint finish and the interior will be thoroughly protected from destructive rot.

Caulk all seams with cotton lamp wicking, running cotton into the seams with a roller to within $\frac{3}{17}$ inch of the surface. Then apply a thin coat of paint to the caulked seams, and allow it to dry. Fill seams level to surface with Jeffry's Seam Filler, which remains elastic over a period of years, and will not crack, crumble or fall out due to intermittent drying out and soaking. Now

Short of Lumber?

● If you have trouble getting the necessary lumber to build your boats, Mr. Jackson can furnish you with timbers or knock-down frames and full-size pattern drawings. For further information on this, write to Boat Editor, SCIENCE AND MECHANICS, 49 E. Superior St., Chicago 11, Ill.



LIST OF MATERIALS

PLYWOOD REQUIRED

Partial Bulkheads—1 pc.— $\frac{3}{4}$ " x 4' x 8'
 Gusset—1 pc.—1" x 4' x 6'
 Cabin sides, top, decking and rudder—12 pcs.— $\frac{1}{2}$ " x 4' x 8'
 Interior cabinets—4 pcs.— $\frac{3}{8}$ " x 4' x 8'
 No. 6 after-cabin siding—1 pc.— $\frac{3}{4}$ " x 4' x 10'

FRAME PARTS FOR GYPSY

Planking— $\frac{13}{16}$ " fir 6"-8" width 475 board ft.
 Chines—2 pcs.— $\frac{1}{4}$ " x $3\frac{3}{4}$ " x 24'
 Chine knees—3 pcs.— $\frac{1}{4}$ " x 6" x 12'
 Chine filler—1 pc.—1" x $1\frac{7}{8}$ " x 24'
 Frames—16 pcs.— $\frac{1}{4}$ " x 4" x 14'
 Floor frames—2 pcs.— $\frac{1}{4}$ " x 9" x 14'
 Roof chines—2 pcs.— $\frac{3}{4}$ " x $1\frac{1}{2}$ " x 12'
 Clamps—2 pcs.— $1\frac{1}{2}$ " x 3" x 28'
 Keel—12 pcs.— $\frac{1}{4}$ " x 4" x 16'
 Keel cheek—1 pc.— $\frac{1}{4}$ " x $2\frac{1}{2}$ " x 20'
 Stern—1 pc.—4" x 10" x 10'
 Transom, stern knees, breast-hook and engine bed—1 pc.— $\frac{1}{4}$ " x 12" x 12'
 Molding—1 pc.— $1\frac{1}{2}$ " x 2" x 26'
 Toe rail—1 pc.— $\frac{1}{4}$ " x 2" x 26'
 Cabin carlines—4 pcs.— $\frac{3}{4}$ " x $1\frac{1}{2}$ " x 12'
 Cabin side supports—4 pcs.— $1\frac{1}{2}$ " x $2\frac{1}{2}$ " x 12'
 Cabin beams and deck beams—10 pcs.— $\frac{1}{2}$ " x 12" x 10'
 Mooring bitt—1 pc.—4" x 4" x 6'
 Bowsprit—1 pc.—2" x 8" x 5'

MAST AND BOOM MATERIALS

Mast—68 lineal ft. $\frac{3}{4}$ " x $3\frac{1}{2}$ "
 68 lineal ft. $\frac{3}{4}$ " x $4\frac{1}{2}$ "
 68 lineal ft. $1\frac{1}{2}$ " x 2"
 Boom—32 lineal ft. $\frac{3}{4}$ " x $2\frac{1}{2}$ "
 32 lineal ft. 1" x $1\frac{1}{2}$ "
 Jib boom—1 pc.— $\frac{1}{4}$ " sq. x 10'

INTERIOR OR CABIN EQUIPMENT

1—2 hole pressure gasoline or oil stove
 1—galley sink and pump

1—ice-box
 3—inner spring mattresses to fit bunks
 1—marine toilet
 1—1 qt. fire extinguisher
 Cabin lights as needed
 1—barometer
 1—battery radio
 1—30 gal. gas tank—12" dia. 5 ft. long
 1—30 gal. water tank
 Life preserver for each passenger

MOTOR AND ACCESSORIES

1—10 to 20 H.P. 2 or 4 cylinder heavy duty marine motor.
 4 ft. 1" dia. shafting
 1—inside stuffing box
 1—outside stuffing box, heavy duty
 1—propeller to fit motor and hull
 1—jib and 1 mainsail
 150 ft. $\frac{1}{4}$ " dia. stranded rigging wire rope
 150 ft. $\frac{1}{2}$ " dia. manila rope or $\frac{3}{8}$ " nylon
 30 ft. $\frac{3}{8}$ " dia. manila rope or $\frac{1}{4}$ " nylon
 12 jib snaps
 6— $\frac{5}{16}$ " turnbuckles
 1—boom sheet traveler 30" long
 1 jib sheet traveler 20" long
 8—blocks for $\frac{3}{8}$ " or $\frac{1}{2}$ " line
 4—chain plates $\frac{1}{4}$ " x $1\frac{3}{4}$ " x 18' long
 40 ft. $\frac{5}{8}$ " sail-trap and slides
 1—goose-neck fitting
 1—mast-head sheave—3" dia.
 2—8" cleats
 2—boom straps
 2—pintles and gudgeons
 1—combination running light for class 1 boat
 oil or electric or separate side lights to attach to rigging.
 1—anchor 20 lb. Danforth or Northhill or 1—75 lb. navy anchor
 100 ft. anchor line 1" dia.
 2—25 ft. $\frac{3}{4}$ " dia. mooring lines
 1—24" steering wheel 5 spokes
 25 ft. $\frac{1}{4}$ " dia. flexible tiller line gal. steel
 4—4" dia. sheaves for steering gear
 1—5" compass
 1—bowsprit and bobstay fitting

let's work on the boat interior. The first step is to install engine bed and the bore shaft alley, and now when these parts may be more easily worked upon is the time to install the engine, gasoline and water tanks, and also make preparations for installation of the steering gear.

Prepare to deck the hull by installing all side plate gussets and bolting in place. Install both forward and after deck beams. Now decide whether or not you want an open cockpit or the bridge deck; the deck is preferable since it strengthens the hull materially at that point. Measure and install the partial bulkheads each side, and then bolt side supports and cabin beams into position. Next notch and screw-fasten the carlings in place. Trim and fair all deck and cabin joints and install mast partner and mast step. Be sure to provide for a hatch in after cabin roof and a forward hatch opening.

The decking, cabin sides and cabin roof consist of $\frac{1}{2}$ inch plywood laid in position, and marked and cut to shape. Lay plywood on decks and cabin top with a joint in the center of

boat. Joints should be backed with a $\frac{3}{4}$ x2 inch white oak batten. Coat all adjoining surfaces with Cascophen glue and screw-fasten with $1\frac{1}{4}$ inch #9 flathead screws. Plank the cockpit in like manner and fasten similarly. When finished with the plywood decks and cabin roofs, smooth with a plane and sand any sharp corners. Then apply a coating of canvas cement and roll 8-ounce canvas in position onto roofs and decks. Next paint to provide a thoroughly waterproof finish. Attach moldings on each side.

The arrangement shown for the interior will provide the greatest comfort and conserve space to the greatest advantage. Sail should be made by a professional sailmaker although anyone may make the spars as indicated. For a really beautiful finish paint the bottom green with a red boot topping and white sides. Deck and cabin tops are finished in buff and cabin sides in white.

● Craft Print No. 53 in enlarged size for building the "Gypsy" is available at 25¢ each. Address Craft Print Dept. B-48, SCIENCE AND MECHANICS, 49 East Superior St., Chicago 11, Ill.

