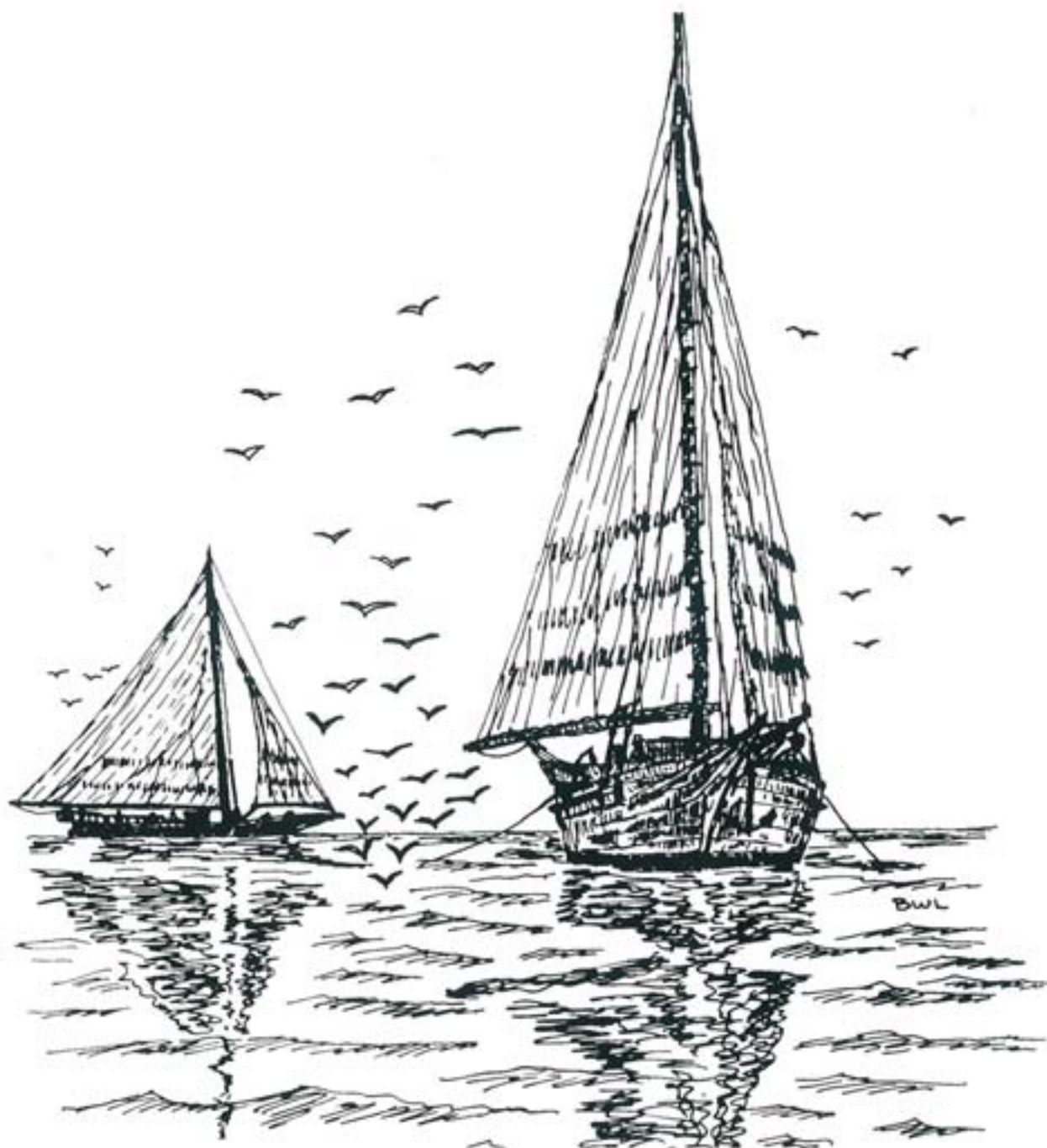


Modeling Guide For Model Shipways Kit

WILLIE L. BENNETT

Chesapeake Bay Skipjack, 1899

by Ben Lankford



CHESAPEAKE BAY SKIPJACK
WILLIE L. BENNETT
1899
SAILING OYSTER DREGE BOAT

INSTRUCTIONS FOR CONSTRUCTIONS OF
A MODEL SHIPWAYS KIT,
WITH INFORMATION APPLICABLE TO SIMILAR
VEE OR FLAT BOTTOM CRAFT
AND
OTHER TYPICAL SKIPJACKS

By
BEN LANKFORD



Hollywood, FL 33020

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PUBLISHED BY
MODEL SHIPWAYS

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INSTRUCTIONS FOR BUILDING THE MODEL SHIPWAYS KIT OF SKIPJACK WILLIE L. BENNETT

BY BEN LANKFORD

HISTORY AND THE MODEL SHIPWAYS PLANS

Mr. Webster defines a skipjack as a bluefish, or other kind of fish that leaps out of, or plays at the surface of, the water, but the origin of the word as applied to the V-bottom Chesapeake Bay sailing oyster dredge boat is unknown. The name seems to have been associated with the development of the V-bottom craft in general. The nickname as used today typically describes a V-bottom (or deadrise) shallow draft centerboard craft with an extremely raked single mast, a jib, and a jib-headed (triangular or leg-of-mutton) mainsail. Though rare, some skipjacks have two masts, with the three-sail rig of the Bugeye, an earlier round-bottom log-built or framed craft which evolved from the log canoe. To clear up the confusion many Bay watermen simply refer to the V-bottom skipjack as a two-sail or three-sail Bateau as the case may be (Bateau, or Bateaux was apparently applied by lower Bay watermen of French descent).

Another noted characteristic of the skipjack as well as many other Bay sailing craft, is the clipper-type bow with its long cutwater stem, hogged bowsprit, and decorative trailboards.

The V-bottom skipjack was developed from flat bottom skiffs and boats around the Chesapeake Bay in the 1880s. Intensive development of the type occurred in the southern counties on the eastern shore of Maryland, and the Bay was soon credited as being the home of the V-bottom. At the peak of building, around 1910, there were some 2,000 skipjacks sailing the Bay.

The skipjack evolved because it was simpler and less expensive to construct than a round bottom boat like the Bugeye. The type, however, is also well-suited for its trade in dredging oysters; the hull form is ideal for control over oyster beds in shallow water and the large mainsail provides the necessary "power" for the dredging operation.

The average hull length of a "typical" skipjack is about 45 feet, but there have been some smaller versions built and some as large as 60 feet. The smaller skipjacks usually are open-well types for hand tonging, but most of the dredgers or "drudge" boats as they are called locally, have a flush deck fitted with hatches and cabins. The mid-sized boats are manned with six or seven men; the Captain tends the main sheet and steers, while the crew handles the sails, dredges, and culls the oysters.

The hull structure on most skipjacks is fairly typical but since no construction plans were used there were slight variations. The keelson, side and bottom plank, decking, mast, bowsprit, and booms were generally made of loblolly pine grown in the region, while the remaining structure such as the centerboard, rails, stem, and sternpost were of white oak.

The skipjack is the last sailing craft developed on the Bay for commercial operation. While the large early fleet has dwindled to about 39 remaining boats (1980), they are still operating for good reason. A 1865 Maryland law still in force states: "It shall be unlawful to use any powerboat or vessel of any kind in the taking or catching of oysters by dredge . . .". The only propulsive power permitted is the use of an engine-driven "push" boat. These small but powerful boats stowed on stern davits, are used to assist the skipjack at dockside and, as necessary, by actually pushing the skipjack to and from the oyster beds. The skipjack is completely under sail during dredging operations except that on Monday and Tuesday, the push boat may be used to assist during the actual dredging, an amendment to the law in 1967. Only 150 bushels of oysters can be taken on each of these days but oystermen still consider them glory-days, since lack of wind is no problem and a catch is assured. These restrictions are to prevent stripping of the beds by powered craft.

The push boat was introduced around 1904 when the small gasoline engine became readily available. Early push boats were simply the skipjack's yawl boat fitted with an engine. Today, push boats are heavier and use a more powerful engine.

Another power device in common use is a gasoline-driven dredge winch or "winder" which made its debut around 1906. Hand-crank winders were used before, but mostly on open or "sunken well" boats.

Skipjacks can still be found along Maryland's eastern shore. Good spots to visit are Cambridge and Tilghman Island, a short hop across the Bay Bridge. They can also be seen under full sail in annual skipjack races on Labor Day off Deal Island and the last weekend in October off Sandy Point Park, above Annapolis at the Chesapeake Bay Bridge. The skipjacks are in full trim for the latter race as it occurs just before the opening of oyster season. Beautiful sight!

The WILLIE L. BENNETT is a typical medium size skipjack built in 1899 in Inverness, once a small town in Somerset County, Maryland near Deal Island. Registered at 8 gross tons, 42.6' x 14.3' x 3.4', the craft is reported to have been an excellent dredge boat, fair sailer, seaworthy, and well built. The design is very appealing and is similar in size and general appearance to skipjacks which have survived and are remaining today.

The Model Shipways plans of WILLIE L. BENNETT were developed from the hull lines, deck arrangement and structural cross section taken off the craft at Cambridge, Maryland in 1942 by the late Howard I. Chapelle. At that time, the boat was reported to be in poor condition so it probably did not last much longer. The boat's history after 1942 is unknown. The Chapelle plan of WILLIE L. BENNETT, a detailed analysis of typical skipjack construction, and many other plans of skipjacks were published by Mr. Chapelle in the American Neptune Quarterly in 1944. The Chapelle plans are part of the Smithsonian Institute collection in Washington, D.C. The rig and framing system, other than what was shown on the cross section provided on the Chapelle plan, were reconstructed by the author based on other similar existing skipjacks, early photographs and the descriptions given by Mr. Chapelle in the American Neptune article.

Little data is available on skipjacks prior to the time Mr. Chapelle decided to record it, so as-built configurations of early craft are almost non-existent. Many changes took place during the very early 1900s: addition of push boats, decking over open well boats, power winders and dredge rollers, change from hemp to wire rigging and other improvements. Hence, the WILLIE L. BENNETT is reconstructed as the craft may have appeared in its more typical form during the 1930s. The detail shown, however, is typical of boats even today as little has changed since the early days. The rig and equipment could be used for any similar size skipjack model.

The skipjack makes a very beautiful model. Model builders should be pleased with the results and the effort to save a bit of the Chesapeake Bay's sailing craft history.

MODEL SHIPWAYS KIT

The model is to a scale of 3/8-inch to the foot. This size permits precise detailing, yet gives a model size practical for the average home. The kit is a built-up type model- the model is constructed from sheet and strip wood stock as opposed to the typical solid hull method. This approach enables a modeler to gain experience with a construction which is applicable to many similar types of small craft.

The WILLIE L. BENNETT is a "flush-deck" type skipjack. With hatch covers in place, no internal structure can be seen. The model can therefore be constructed without scale internal framing. On the other hand, the framing is interesting and you may wish to include it for fun or experience or to convey a partially completed boat with some deck planking or hatches removed. Consequently, both simplified and scale framing methods are discussed in the text. Of course, you could also carve a solid hull if so inclined, but no details or material are provided in the kit. Refer to other Model Shipways instruction books and the bibliography for procedures if a solid hull is desired.

The kit provides a set of cast-metal, brass and wooden fittings to eliminate problems in making or machining such parts from scratch, which may be beyond the ability or resources of many modelers. The cast metal fittings may require final finishing before they are suitable for installation on the model.

A list of wood materials and parts supplied in the kit is provided at the end of this booklet. Sufficient material is provided, including the optional internal framing members.

The kit model is a good building block toward scratch building techniques. As you proceed, substitute some of the kit fittings with those of your own making. The experience gained will be most valuable for future projects. The instructions illustrate some scratch building techniques that can be used. Full scale boat practice will be shown for the modeler interested in precise detailing, followed by some simplified modeling techniques. Refer to the bibliography for further reading on modeling techniques.

TOOLS AND MATERIALS

The following is a suggested list of tools required and essential materials you will need beyond that contained in the kit.

Tools

Carving tools—a small ¼-inch wide chisel to cut keelson rabbet, bevel plank edges, and shape the bow area. An Arkansas or similar stone for sharpening.

Clamps—some small clamps, clothespins and rubber bands.

Drills—a pinvise and set of small #60 to #80 twist drills and inch sizes (or equivalent numbered) drills.

Files—a set of needle files for finishing fittings.

Hammer—a small tack hammer for brads or pins.

Jigsaw, band saw, jeweler's or coping hand saw—to form the keelson and other parts.

Knives—X-acto with several blades, especially #11.

Pliers—flat nose, and round nose for forming small metal parts.

Rule—small 6-inch rule, and ¾-inch (or multi-scale triangular) architect's scale (see text for substitute "rules").

Scissors—small manicure type for rigging. Another type—WISS brand "quick-clips"—excellent, fine points and very sharp blades.

Soldering iron—small type with ⅛-inch diameter tip, solder and flux (see text for discussion on soft vs. silver soldering methods).

Tin snips—for cutting brass sheet.

Tweezers—small pointed type, both self-opening and self-closing.

Vise—small bench type, with own base so you can move it around.

Wire cutters—for cutting fine rigging wire and chain.

Additional materials

Bee's wax—small block for treating running rigging for moisture protection and to reduce fuzz.

Coatings—primers, paints, stains, thinner and brushes. Types are discussed in the text.

Glue—discussion in the text.

Pedestals—brass or make-our-own for mounting the model. (A simple wood type is described in the text.)

Sandpaper—aluminum oxide or garnet paper; medium to fine for the hull and general finishing; wet-or-dry type for sanding between paint coats.

Sewing thread—for rigging seizing (fine silk for serving line).

Wood—for building board; ½- to ¾-inch plywood or similar. For final baseboard; any "hand-

some" wood such as walnut, cherry or mahogany, or purchase a pre-made baseboard.

Wood filler—vinyl spackling compound (Spackle); any brand such as DAP. Easy to apply and sand. Other fine textured fillers also suitable, such as "Famowood". "Plastic Wood", is poor, rough for our purposes.

GLUE SELECTION

The following glues are recommended for the skipjack model:

White glue—any brand such as Elmer's Glue-All is satisfactory. This glue is also excellent for touching the ends of running rigging as it dries clear and will not rot the material. It is a reasonably fast dryer, water soluble before it dries, relatively strong and inexpensive. Recommended for most of the model.

Aliphatic resin—brands such as Franklin Titebond or Elmer's carpenter wood glue are similar to white glue but formulated for greater strength and faster setting.

Epoxy—Tube type catalyst-resin such as Weldwood and Devcon. Can be mixed in small quantities with good results, is very strong, and well suited to small, especially metal, parts. Careful to wipe off squeeze-out. Once dry, it is very hard. Recommend using the 4- or 5-minute quick-setting type where quick-set and strength is required, such as joining the hull sides to the stem and transom.

Application—Sand the parts to be joined, not too smooth but with a little "tooth". Align parts by using pins or dowels. Apply glue sparingly using a small applicator such as a toothpick. Make up some small wedge-shaped wooden scrapers beforehand so any squeeze-out can be quickly removed. Clamp parts as necessary with clothespins, rubber bands, or any type of homemade or commercial miniature model clamp. Be especially careful with white glue around items to be left natural and stained such as the mast. White glue dries clear but it will seal the grain and show up when you try to stain that mast, leaving ugly light spots.

When using 5-minute epoxy, do not diddle around. When it sets, it sets. Apply as soon as you mix it and assemble parts quickly. If you do not wish to move that fast, you had better stick with standard (2-hour cure) brands.

WHITE METAL FITTINGS

Several fittings in the kit are cast from lead—antimony alloy (white metal). These fittings are included for those who do not have the equipment or ability to make such fittings. They are cast from lead alloy to avoid excessive kit cost. There is, however, a potential problem with lead alloy fittings—oxidation. Just as steel oxidizes in the form of rust, lead tends to slowly deteriorate to a fine grey powder. The exact cause of this deterioration and what contributes most to the speed at which they deteriorate is a puzzle. Some say porosity in the paint permits oxygen to reach the lead allowing galvanic corrosion which takes place between the lead and edges of small holes in the paint. Whatever the reason, proper priming to prevent oxygen from reaching the lead seems to be the most appropriate answer to the problem. Double prime each fitting with grey auto primer or a diluted solution of white glue as a primer, or any type of metal primer. If properly primed, the lead alloy fittings should last indefinitely.

Finishing white metal fittings — Since the fittings are cast, they may contain some rough spots from the mold joints. Using a small needle file, or No. 11 X-acto blade, smooth out the fittings before priming.

Brass and wood substitutions — If you have the desire and ability, consider replacing manufactured white metal parts with brass or wood parts of your own making. Follow instructions for some scratch building ideas.

READING PLANS AND USING KIT MATERIALS

The kit contains a hull plan (Sheet 1), a masting/rigging plan (Sheet 2) and a template plan. The plans are drawn to the same $\frac{3}{8}$ -inch scale to which the model is to be built, except for the larger clarifying details. Scales are noted for each detail but most details are drawn to twice the model scale ($\frac{3}{4}$ -inch = 1-foot 0-inch). Most dimensions are to be taken directly off the plans by using a set of draftsman dividers or using a simple "tick" strip. Lay the paper strip over the plan and mark the length of items carefully with a sharp pencil. Transfer the strip to the wood or item to be made. You should also obtain a $\frac{3}{8}$ -inch to-the-foot architect's scale since all dimensions on the plans are full boat sizes, or obtain a triangular scale and you will have scales for all details as well. There is also a scale drawn on each plan. Instead of using the architect's scale you can make your own scale from a tick strip based on the plan scale. Conversion tables are given on the plans for rigging sizes, blocks, chain, etc., so the full boat sizes shown on the plans can readily be converted to the $\frac{3}{8}$ -inch model scale.

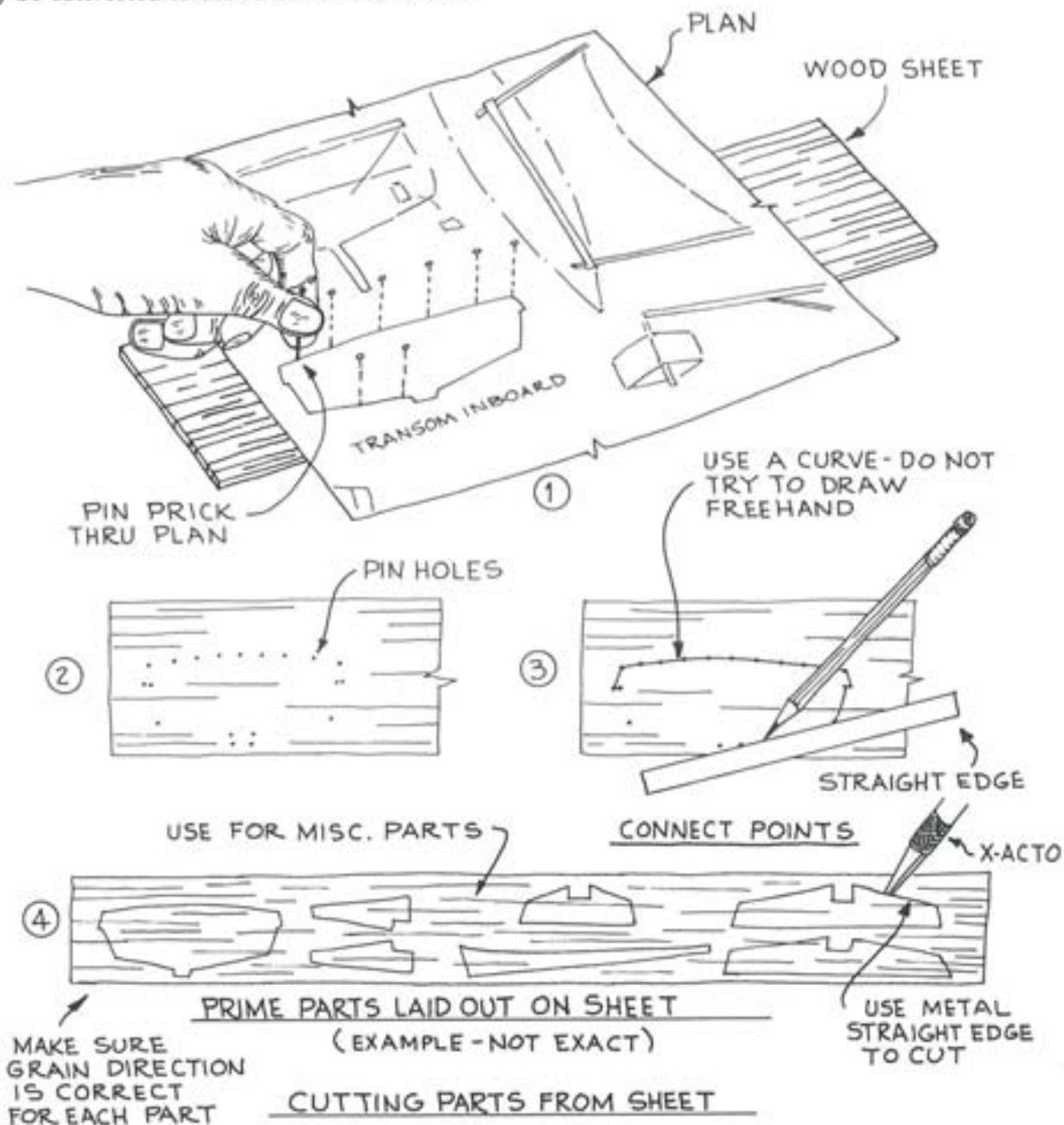


FIG 1

The template plan is an aid to model construction. Use of this plan will be described in the text. While more experienced modelers may not require these construction aids, beginners would do well to use the template plan and follow the procedures outlined in these instructions. The procedures are based on successfully constructed models.

The plans contain an unusual amount of detail as compared to most model plans, necessary because of the unique structure and equipment on a skipjack, and the fact that most of the detail has never before been recorded for model builders. Little has been left for guesswork.

Kit materials — The materials supplied with the kit are listed at the end of this booklet. Use of the wood strips should pose no problems since most of the strips are the correct size except for cutting lengths or in a few cases adding a slight taper such as the boat's log rail.

Odd shaped pieces are to be cut from sheet stock. The material list indicates the pieces to be cut from each size sheet. For example, the transom, knightheads, top mould pieces and the push boat skeg are to be cut from a sheet of 3/32" x 2" x 22" material. There is a certain amount of "excess" allowed for other miscellaneous parts but do not squander—use the material efficiently, laying out all the pieces on each sheet of wood before cutting. To do this, measure from the plans and layout the parts on the sheet or simply pin-prick through the plan onto the wood sheet and connect the points with a pencil line. After all parts are drawn on the sheet, cut out with an X-acto, or for thick pieces use a coping or jeweler's saw.

See Figure 1 for the example cited above.

PAINTING

The paint scheme is discussed first, since many parts should be painted as they are made. The mast, booms, blocks, centerboard, rudder, push boat and trailboards are typical items best completed before being installed on the hull.

Fill nicks, dents, or poor wood grain with spackle, sand smooth, and apply a primer. Gray (or red) auto primer can be used and is excellent for metal. A better primer for wood, however, is white enamel undercoater available at any hardware store. Most appropriate for the skipjack, since the finish coat will also be mostly white, eliminating a covering problem.

Sand the hull or parts, re-fill any further nicks (primer will show up defects which are difficult to see on bare wood), re-sand, re-prime, and sand again. If the primer coat can approach perfection, you will have little trouble with final coats. Clean the hull and parts with a clean rag (tack rag) just before you paint the final colors. Cleaning with "liquid sandpaper" is also a good idea and it helps prepare the surface to accept paint by eliminating grease and slick areas. It deglosses any painted surface. This product is available in most hardware or paint stores.

There are a number of good finish paints such as Floquil, Pactra, Humbrol, and Repli-Color. The flat, rather than gloss, neither brands should be used for the best effect. Work for a satin ("egg shell") finish, neither dead flat nor gloss. These paints, unlike house paints, have finely ground pigments and are made especially for miniature models to give a smooth grain and eliminate brush marks.

Use good quality red sable (expensive) or sableline (reasonably priced) brushes such as Grumbacher brand. Flat sizes 1/2- and 3/4-inch for the hull and No. 0 or 1 round or 3/8-inch flat for small parts and fittings should do the job. Avoid camel hair and Ox hair as the hairs break and fall out on the paint, although a well broken-in Ox hair brush is not too bad.

To avoid brush marks, apply paint in several thin coats rather than one or two thick out-of-the-can coats. Do not add too much thinner, causing runs. Paint with long even strokes overlapping each stroke as you proceed. Sand between coats lightly with extra fine wet- or-dry type sandpaper. Use the tack rag or liquid sandpaper before the next coat.

Stain natural parts like the mast with a light penetrating stain such as Minwax brand.

A Paasche, Badger, Bass or similar type airbrush paint sprayer is well worth the investment. These small sprayers are easy to use, work well with all the paints mentioned, and do an excellent job. The airbrush throws a narrow pattern but obviously you would still need a large work space such as a workshop. The skipjack is an ideal spray project because most all of the topside structure are white and most of the model can be assembled and painted at once.

Color Scheme — All skipjacks past and present have the same general overall color appearance. Like other Chesapeake Bay work boats, white is the name of the game. A recommended color scheme for the model typical of the 1930s (plus options) is provided first followed by colors used on more recent skipjacks.

Typical Colors of the 1930s

White — Entire hull above the waterline including the deck, wooden rails and stanchions, cabins, samson post, wheel box, winder engine cover, hatches, bowsprit, boom, jib club, mast up to the boom jaw rest and at the mast head, all blocks, all spar ironwork (where spar is also white), chain bobstays including that portion of the forestay below the bowsprit, and push boat topsides.

Option — On some skipjacks the cabin tops, hatch covers, the deck and cap rail were painted buff, but not typical.

Copper Red — Hull and rudder below the waterline, the entire centerboard, and bottom of push boat (for the model use Venetian or Indian Red).

Option — Copper Brown bottom but not typical.

Black (Iron) — Dredges, dredge rollers, dredge A-frame, power winders, windlass, anchor, steering wheel (bright handles), standing rigging, boat divits, rudder operating rods, and iron rails. (Some equipment actually painted black but mostly raw iron). Name on hull side and transom, deadeyes and lanyards — black paint. (For model use black or "weathered black" paint for all items. For brass you can also blacken with a chemical brass blackener available from hobby and gun shops.)

Gray — Main hull internal structure, centerboard case, etc.

Option — Copper Red.

Bright (Varnish or oiled)—Mast between boom jaw rest and the head, and mast hoops. (Hoops generally varnished. For model, Minwax Ipswich pine color is a nice stain, followed by satin finish polyurethane varnish.)

Option — Mast hoops could be white.

Orange — A decorative stripe, ½- to 1-inch wide just below the bends, full length of boat. Similar stripe around gunwale on push boat.

Option — Red, black, green, or yellow but never blue. (Blue, especially an all blue boat, is considered unlucky by Bay watermen.)

Buff (tan) — Interior of push boat.

Option — gray or white.

Other colors — For trailboards see plans for color description. The scheme shown is typical Chesapeake Bay. WILLIE L. BENNETT trailboards unknown.

Typical Colors of more recent times

Colors are same as 1930s, except as noted below These are typical options but widely used and add much to the appearance.

The boom, jib club and mast head are generally bright rather than white. White used for mast below boom jaws but this area also often bright.

The boat davits, iron rails, rudder operating rods, A-frame, anchor, windlass, and steering wheel are silver color (most generally aluminum paint). The steering wheel handles are bright or black. The dredges, rollers, and power winder are unpainted, an iron gray color.

The bottom of the push boat is often dark green and sometimes the cover on the wheel box is painted the same color. Other typical wheel box colors are bright, buff, or white.

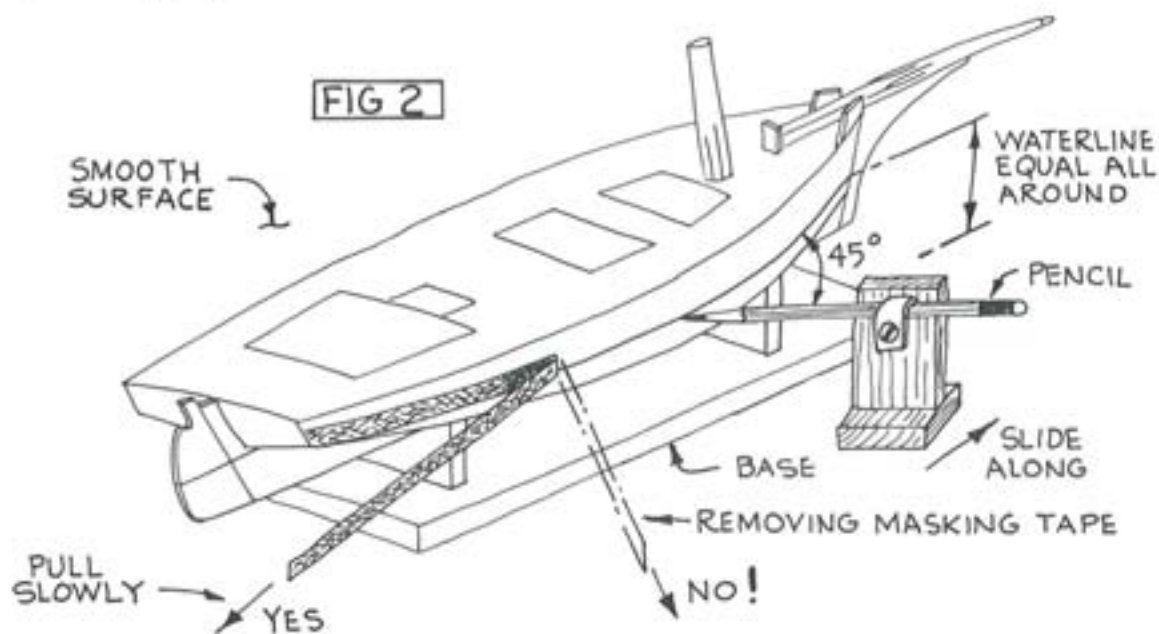
Cap rails (excluding the stanchions) could be reddish orange (more orange than red). This trim color adds a nice contrast with the predominantly all white boat and together with the dark green push boat bottom and wheel box cover really adds sparkle to the skipjack's appearance. The orange cap rails seem to have been used more in the 1960s than now, or perhaps used more for show because of the annual skipjack races. This reddish orange color has appeared on other workboats in Maryland and Virginia in recent years.

Application — The trailboards (flat board between the molding) are best painted off the model. The actual trailboard is carved but paint alone will suffice for the model. Touch on the colors with a 12-hair brush.

If painting the hull name on the side, transom, and on the trailboard is too difficult, try rub-on graphic lettering.

The kit contains a printed pattern for the trailboards. If this is used, cut out and glue to the trailboards, then paint over the pattern.

The decorative stripe will be a bit difficult to apply. Masking tape can be used but a more satisfactory result can be achieved by thinning paint and applying the stripe with a draftsman's ruling pen much like drawing an ink line. Thin just enough so the paint will flow. Also, you could use self-stick chart tape — the type used by graphic artists.



To paint the bottom of the hull you will need to mark the waterline. First paint the sides and bottom all white (finished coat). When dry, proceed to mark the waterline as shown in Figure 2. The model must be accurately aligned on a temporary or permanent base. Set the base on a piece of glass or formica table so the marking block will easily slide along. Move the block so that the pencil is at about a 45-degree angle to the hull (going forward then aft) so the point will not dig in or jump about. After the line is marked, set masking tape along the line. Use a flexible type tape such as plastic electrical tape, Chart Pak brand illustration film, or Bear brand type from Norton Abrasives. These tapes will give a sharp masking line preventing the paint from running under the tape as occurs with common drafting type tapes. In any case, burnish the edge at the waterline with a burnishing tool or round metal object. Paint the bottom color and when dry remove the tape immediately. **Pull the tape back on itself as shown in Figure 2 to avoid pulling the paint off.**

The rudder should be installed to mark the waterline but it can be removed for painting.

Wherever possible, it is advisable to use masking tape for any line between two colors or between a color and natural finish. Attempts to hand paint an edge are never satisfactory.

BEGIN!

BUILDING THE BASIC HULL

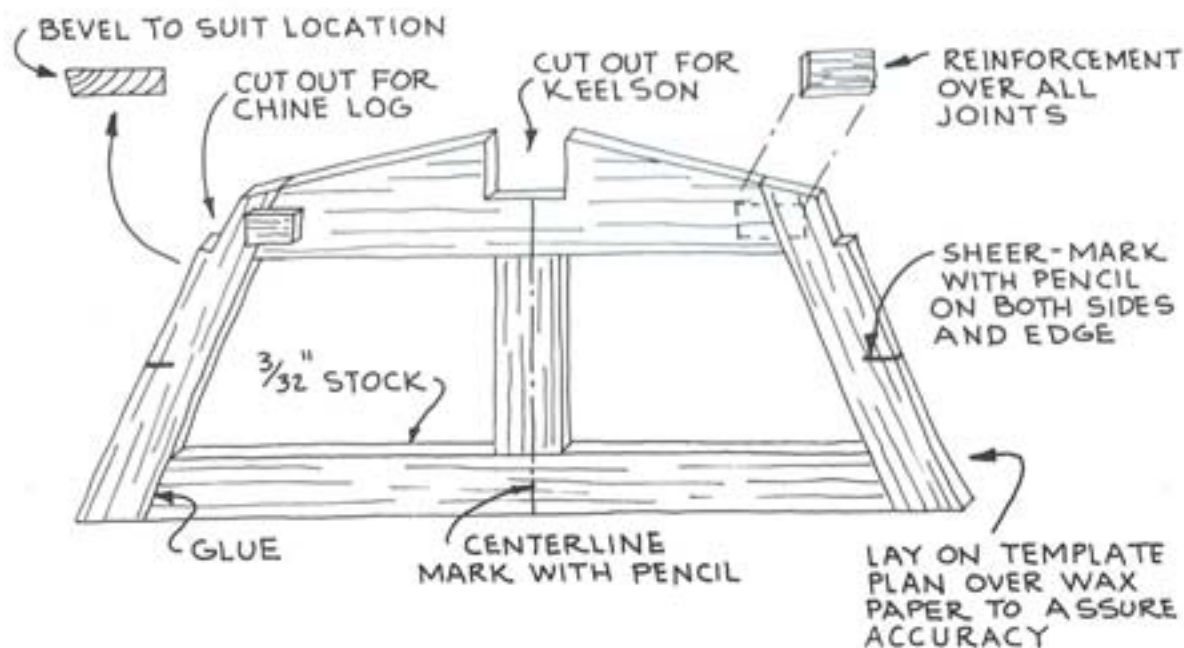
This is probably the most important chapter, so read and re-read carefully!

While V-bottom hull construction is relatively simple, the process should not be taken too lightly. You must assume correct overall alignment, and that edges of hull sides, transom, keelson rabbet, etc., are beveled correctly for components to fit well. Keep a close eye on alignment and everything will go smoothly.

As with a full size craft, the model hull will be assembled upside-down on a set of building "moulds". The basic hull will consist of the (1) keel "assembly", (2) chine logs, (3) hull sides, and (4) bottom planking. Remaining framing, deck beams, deck planking and topside structure will be installed after the hull has been removed from the moulds and can be worked in an upright position.

Templates — Since the model hull is a built-up type, the fitting of templates to a partially carved hull is not required. The hull form is developed by bending the hull planking over the moulds. The moulds themselves are developed from the hull lines plan.

The template plan included with the kit is to aid you in cutting parts and aligning the major hull items.



MAKING A MOULD

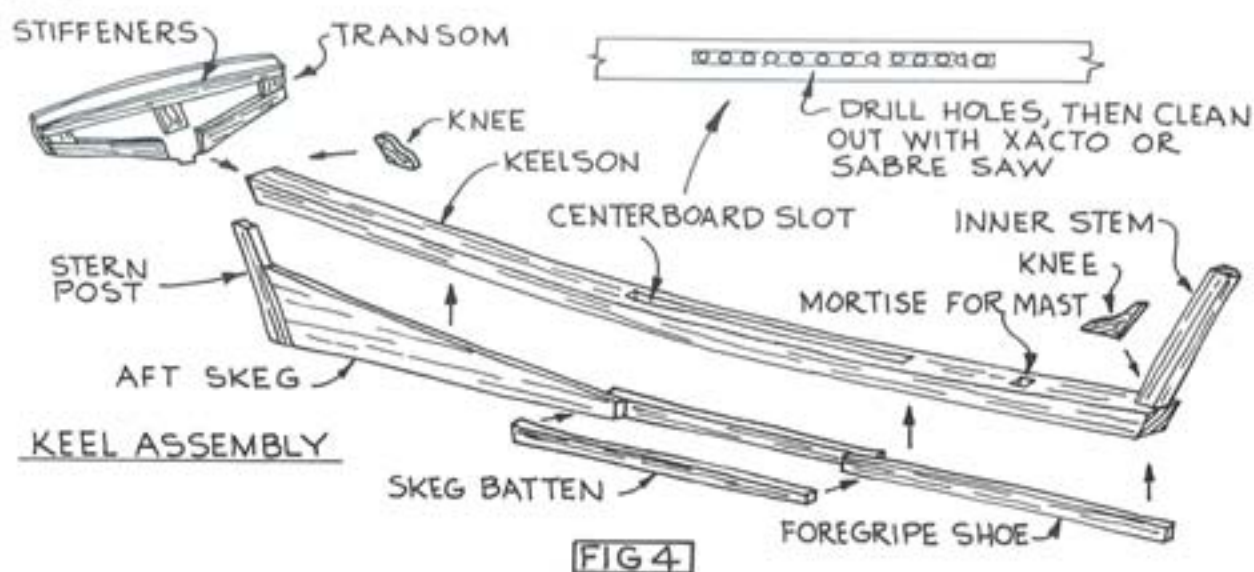
FIG 3

Setting up the moulds — The building board — The model should be constructed on a 1/2- or 3/4-inch plywood or other stiff, flat wooden board. Refer to plan sheet #3. From the template plan, cut out the "baseboard building guide" along the dotted line and glue this guide to the building board. Use contact or rubber cement. A glue like white glue wets and thus shrinks paper. The guide must not be distorted.

Make the moulds from 3/32-inch sheet stock. Moulds can be made right on the template plan. Use a piece of transparent wax paper to prevent glue sticking to the plan. Follow the plan precisely and do not fail to reinforce joints. Bevel the edges of the moulds as shown on the plan. Note that the mould at Station 6 need not be beveled. When the hull sides are bent around the moulds the sides should lie reasonably flat against the edges of the moulds. Mark the centerline on each mould. Mark the sheer line both sides and on the edges. See Figure 3.

After the moulds are made, nail and glue them securely to the building board in the locations shown on the building guide. Align the centerline of the moulds with the centerline on the building guide. The moulds should be set vertically (check with square) and braced with wooden fillets as shown on the template plan. You can also add a brace between the moulds for added strength.

The Keel Assembly — For descriptive purposes in this text, the keel assembly will consist of the keelson, transom, transom stiffeners and knee, inner stem, inner stem knee, aft skeg, stern post (part of aft skeg), forward skeg (or foregripe shoe) and the skeg battens (pieces on sides of centerboard slot). See Figure 4.



Using the template plan and other plans as required for measurements, cut out the keelson. A band or jigsaw will speed up this work but a jeweler's or coping saw will also suffice. Use a small block plane or sanding block to finish.

Drill several holes in way of the centerboard slot and clean out the slot with an X-acto or sabre saw (Figure 4.)

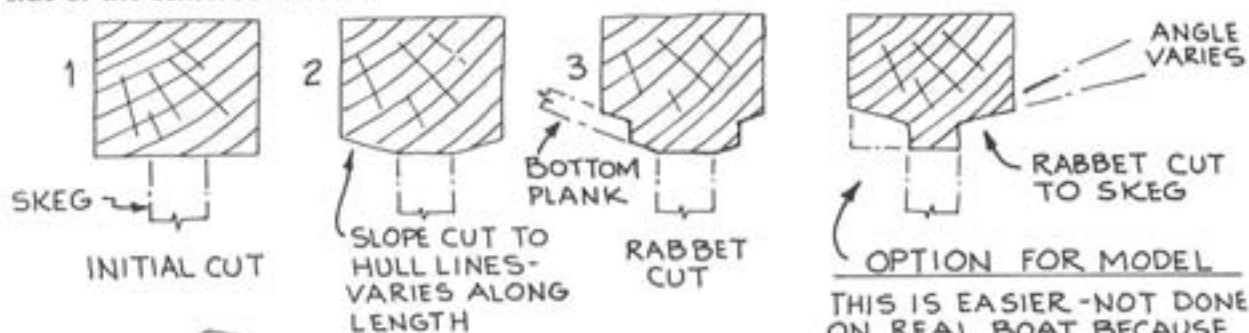
Locate and cut the mortises for the mast heel in the keelson and heel of the samson post in the inner stem knee.

At this stage **do not shape** the forward end of the keelson. This will be done along with the forefoot logs or "chunks" to be described later.

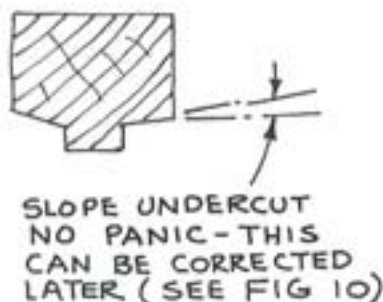
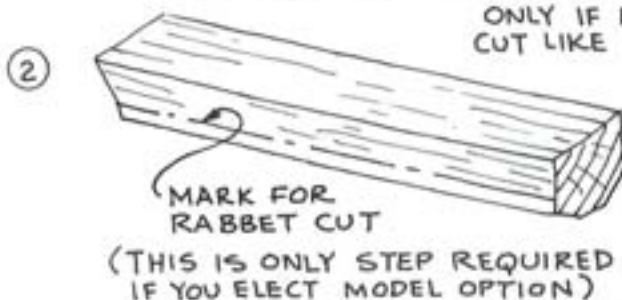
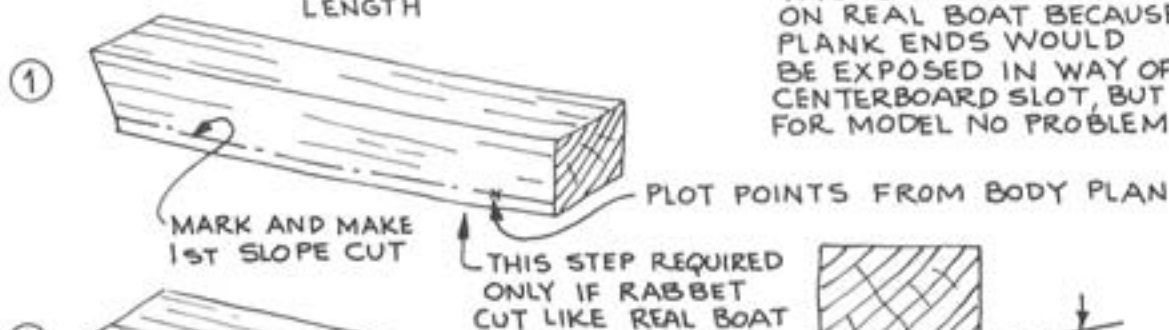
Now for the tedious job of cutting the rabbet for bottom planking in the keelson. See Figure 5. Consult the lines drawing to determine the changing angle of the rabbet. As you cut the slope in the rabbet you can have the slope a little less than necessary or not cut the slope at all at this time. After you install the chine logs you can take one plank and slide it along the bottom in the rabbet. You will quickly see where the rabbet slope is insufficient, and you can then shave with a chisel to the proper fit of the plank in the rabbet. At the same time you can bevel the chine logs. See later discussion and Figure 10.

Cut the stern post and aft skeg using the templates and glue together. Note the grain direction shown in Figure 6, necessary for added strength. The real boat skeg is made up of several pieces as shown on the

plans but only one piece need be used for the model. Make the foregripe shoe. Glue the aft skieg and the foregripe to the keelson using pins or dowels for alignment, then add the side pieces (keel battens) on each side of the centerboard slot.



THIS IS EASIER - NOT DONE ON REAL BOAT BECAUSE PLANK ENDS WOULD BE EXPOSED IN WAY OF CENTERBOARD SLOT, BUT FOR MODEL NO PROBLEM



KEELSON RABBET

FIG 5

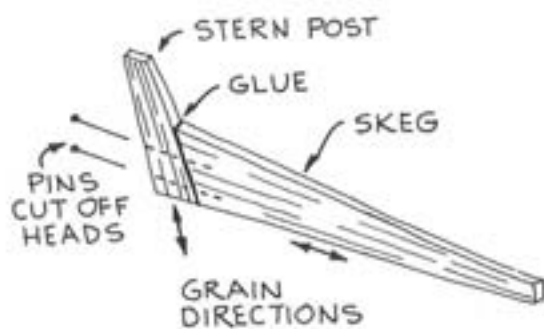


FIG 6

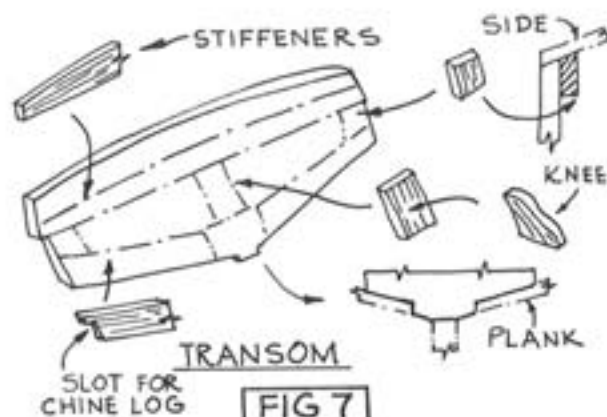
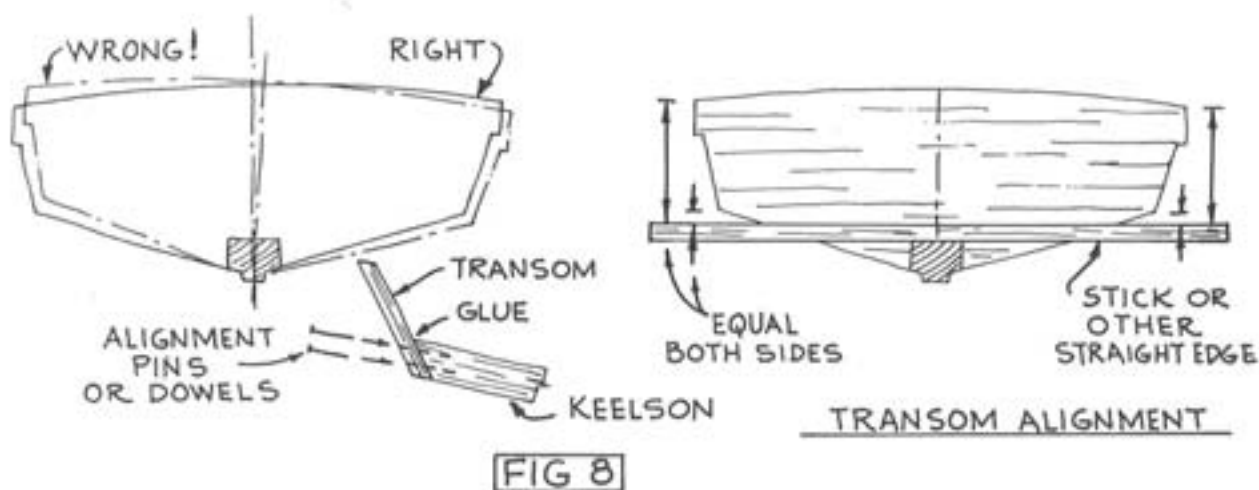


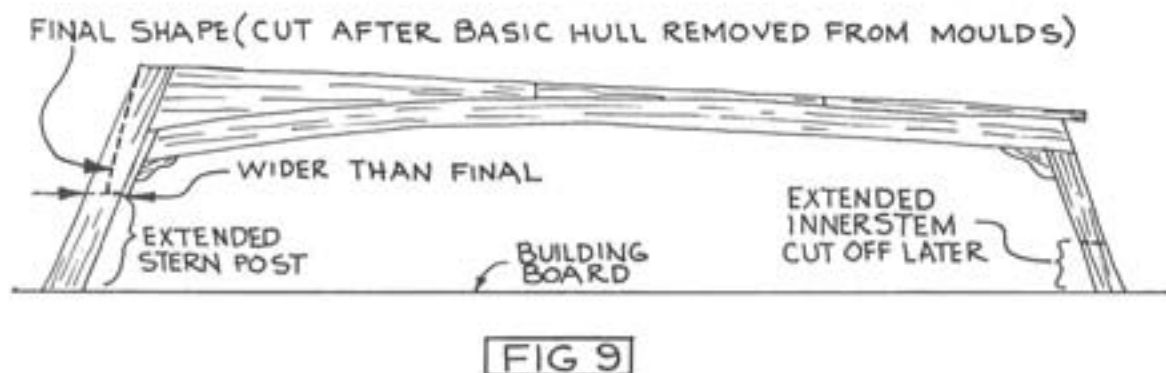
FIG 7

Keel battens were added on either side of the keelson centerboard slot to reinforce the area possibly for grounding or docking. Not all skipjacks have these battens.

Cut the transom and inner stem to shape. Add the transom stiffeners. (Figure 7.) Glue the transom and inner stem in place, then add the knees. Make sure the transom edges are beveled to the correct angle and properly aligned on the keelson. Figure 8.



Important! Use the templates, not the basic boat plan, to determine the length of the stern post and inner stem. During the building stage these parts are extra length so they can be secured to the building board. See Figure 9. The excess will be cut off after the model is removed from the moulds.

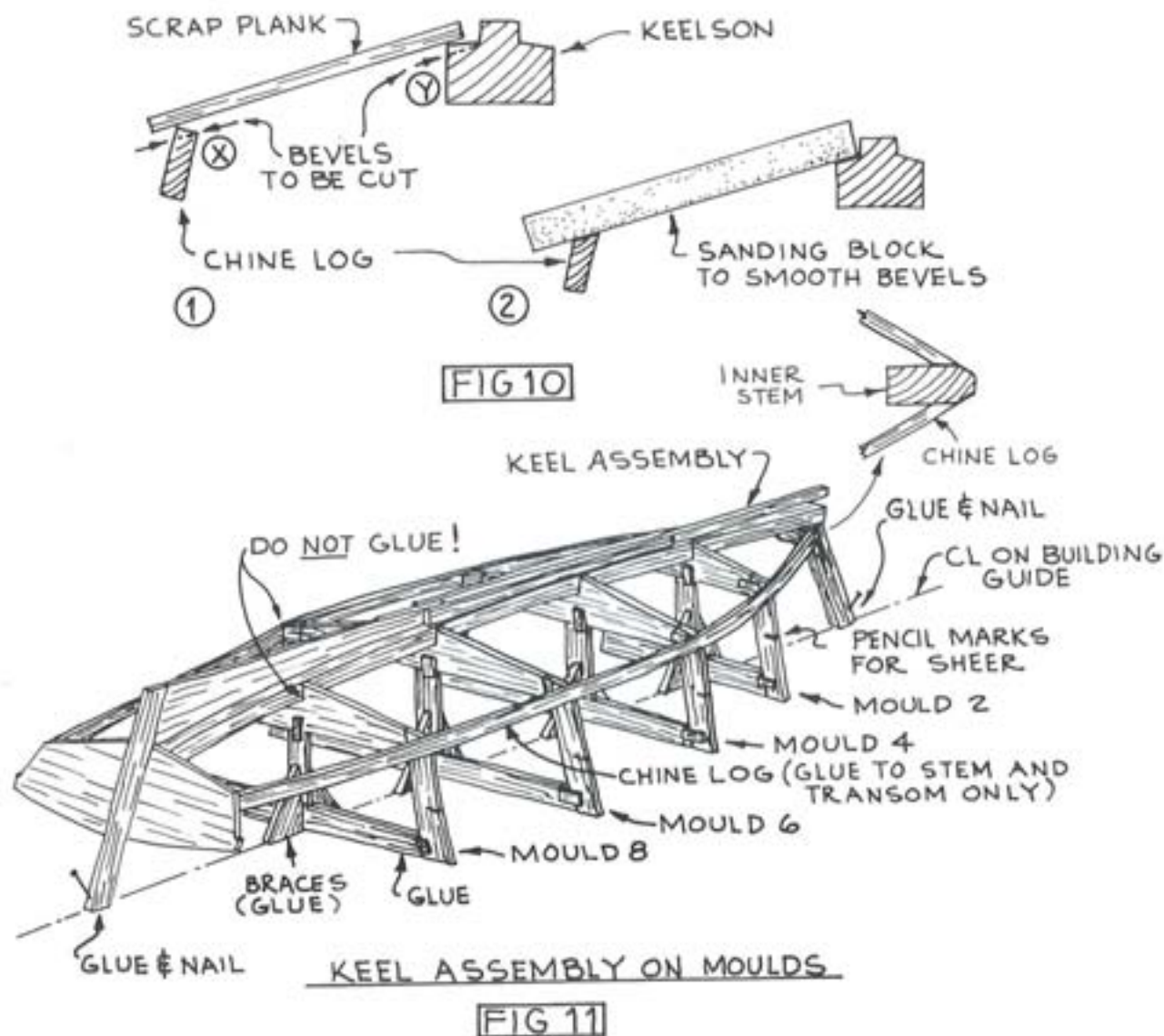


Sand the keel assembly and recheck all angles, and transom alignment. Install the completed keel assembly in the slots at the top centerline of the moulds. The extended ends of the inner stem and stern post should reach the building board and touch in the location marked on the printed building guide. The slots atop the moulds may need to be filed out a bit so the keelson fits snugly in the slots. Glue and nail the inner stem and stern post to the building board.

Chine logs — The chine logs are added to strengthen the chine joint on the model. When the hull is removed from the moulds much stress is placed on the joint. Also, with the chine log in place the hull sides can be added and held in place by clothespins as clamps over the chine logs.

Install the chine logs by fitting in the slots at the mould corners. Glue the ends to the stem and to the transom. The chine log at Station 4 may tend to bow outward slightly and require a lot of pressure to hold it against the mould. One solution is to drive a nail or pin into the top of the mould and bend over the chine log to hold it in place. Next, bevel the edges of the chine logs. Slide a plank along the bottom to aid in determining the slope of the bevel; Figure 10 at X. At this time check the keelson rabbet for proper slope as at Y. Sand the rabbet and chine log slope at the same time as shown in the sketch.

After the chine logs are in place the construction should appear like Figure 11.



Do not glue the keel, chine logs, or hull sides to the moulds. You must be able to remove the hull from the moulds.

Hull side planking — Real skipjacks used several planks for the sides but for the model only one piece is necessary for each side. Cut from 1/16-inch sheet.

The template plan shows an expanded view of the hull sides. Notice that there is a solid line (with bevels) which represents the approximate finished side. This is based on a completed model. However, to allow for any error caused by a variance in the projection or slight variance in the mould set-up, the hull sides should be cut initially along the dotted line.

One at a time, fit the hull sides to the inner stem, transom, and moulds. Clamp, but do not glue, in place. The sides cut to the dotted line will extend slightly above the chine logs and below the sheer line tick marks on the moulds. Next, as shown in Figure 12, clamp a temporary 1/8- x 1/16-inch batten, X, on the hull and locate at the sheer points on the moulds. This batten will establish the sheer line. In order to see what you are doing to locate the battens, you can cut away a small area in way of the moulds at the corner and sheer line as shown in the sketch, Y. When you are sure the batten is located properly, scribe a pencil line along the batten.

Cut the sheer line to the scribed line. It should be close to but not necessarily the same at the outside solid line on the template.

You can now proceed to glue the sides to the inner stem, chine logs and transom. As noted before, do not glue to the moulds. Clamp the sides at the inner stem securely. Glue with epoxy. Bend the sides around the moulds and clamp and glue to the chine log, then to the transom. Check to make sure the sheer lines up with the sheer tick marks on the moulds. A rubber band is a good "clamp" for holding the sides against the transom while the glue dries.

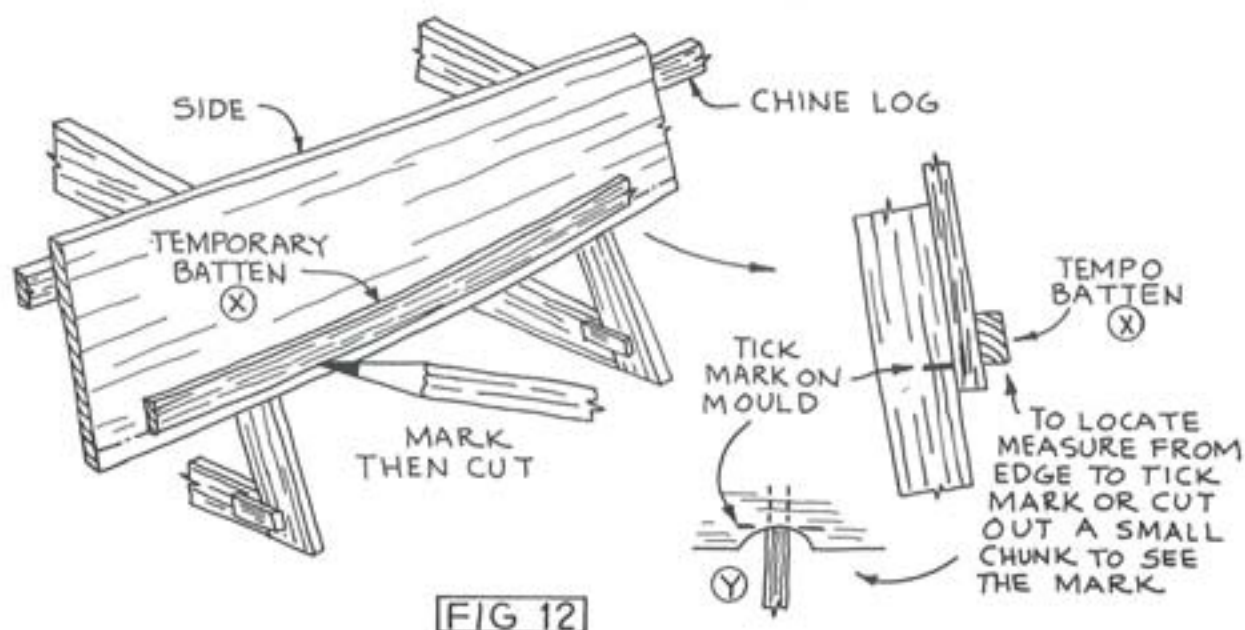


FIG 12

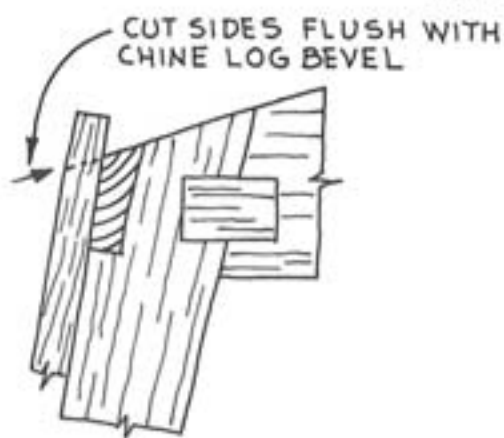


FIG 13

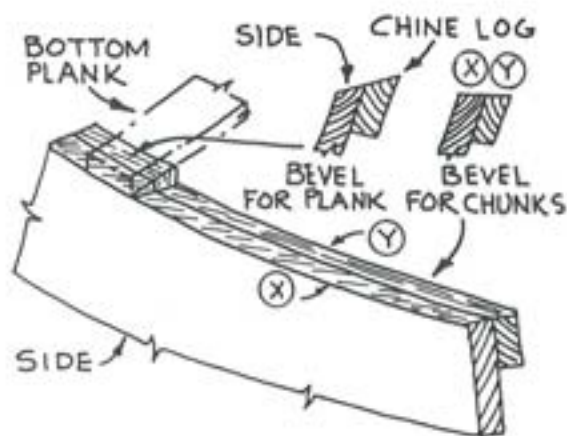


FIG 14

Beveling the hull sides — Bevel the sides at the chine as shown in Figure 13. This is simply a matter of beveling the side to be flush with the chine log which has already been beveled. A sanding block can be used to smooth the bevels for the rabbet and hull edge once again.

Stop the bevel at the aft end of the forefoot logs (see plans). Forward of this point the bottom edge of the side plank, X, is flat to accept the forefoot logs. The chine logs are also cut flat in this area; Y. See Figure 14.

The bevel at the sheer line will be sanded after the hull is removed from the moulds and deck beams installed.

Bottom planking — Starting at the transom, glue the 1/16-inch x 1/4-inch planks in place and proceed forward. Glue to rabbet, chine log, hull side edge and also glue planks to each other on the edges. Try to keep the glue from squeezing out on the inside. The planks are "herringbone" fashion (diagonal) rather than perpendicular to the keelson. This angle is pre-determined because the first plank is simply started at the transom edge. This eliminates twist in the planking to a large degree. See Figure 15. Notice that the last couple of planks toward the bow, X, fan out so the last plank fits flush with the forefoot logs.

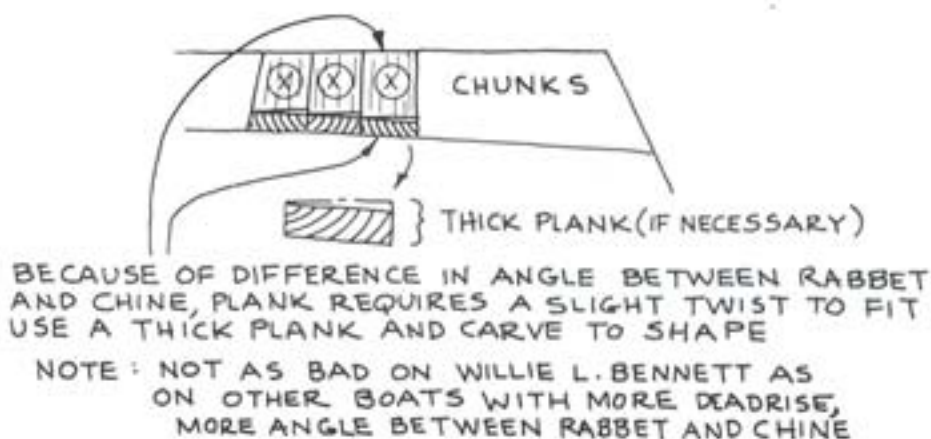
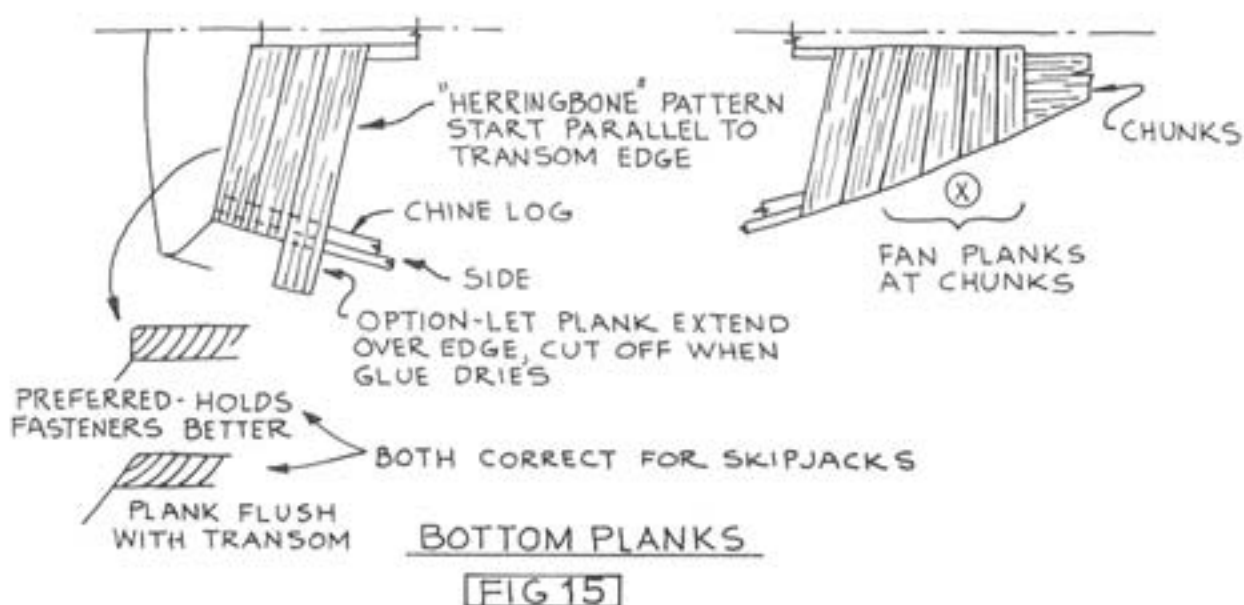


FIG 16

Figure 16. As you reach a point several plank widths aft of the chunks, you may notice that in order for the plank to sit on the rabbet and flush on the bevel at the hull side, the plank would require a slight twist. Since you may not be able to twist it enough you need to put thick planks, X, somewhat carved to shape, in this area. After installation, carve these thick planks to the proper hull form.

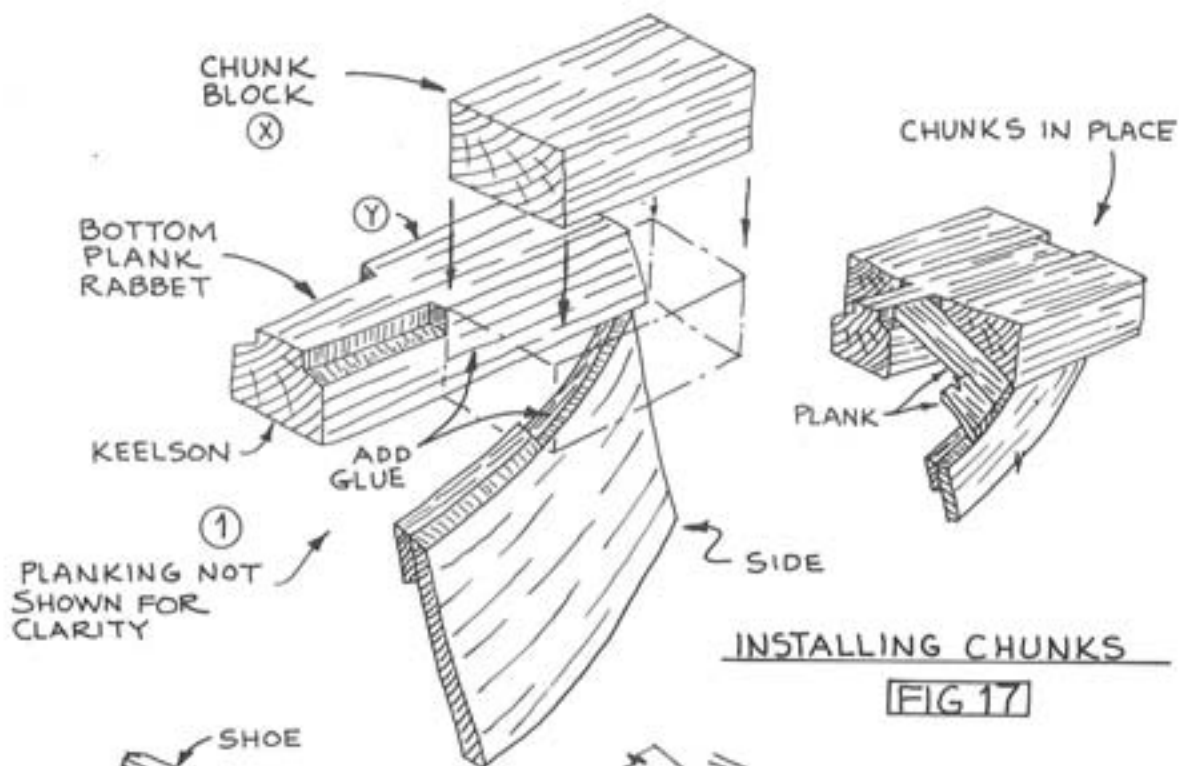
Fitting the "chunks" — Figure 17. The forefoot logs or "chunks", as they are often called, and a portion of the keelson replace the bottom plank at the bow. There are two chunks on each side of the keelson, but for the model only one piece, X, each side is necessary.

The chunks are used on many Bay boats since it is easier to fit and fasten a solid piece than planking.

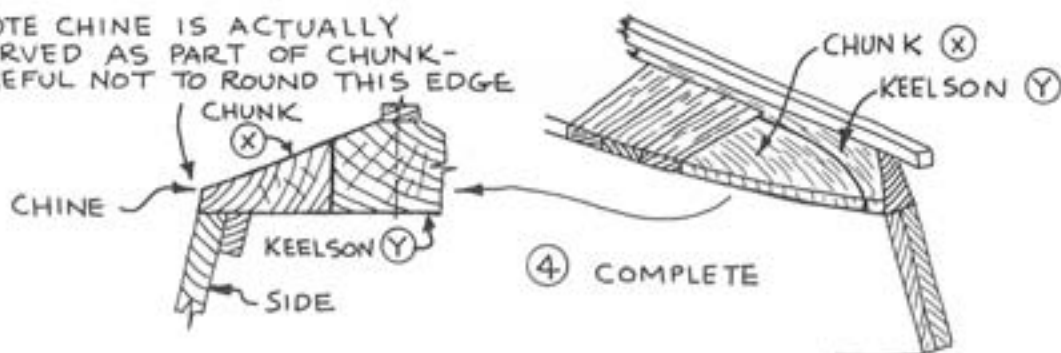
On some earlier skipjacks the chunks ran athwartship rather than fore and aft. In this case the keelson was deeper and notched for the chunks at the bow.

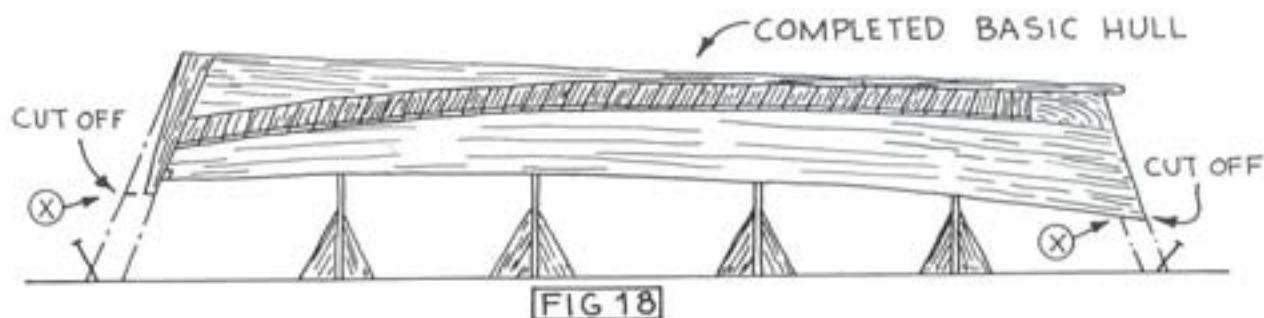
Glue the chunks to the side of the keelson, Y, and to the flat edge on the hull sides and carve as shown in the sketch.

Note on the plans that the aft edge of the chunks has a rabbet to accept the first bottom plank. This rabbet can be omitted on the model.



NOTE CHINE IS ACTUALLY CARVED AS PART OF CHUNK - CAREFUL NOT TO ROUND THIS EDGE





The bottom of the hull is now complete and may be sanded. Be careful not to round the chine edge. Use a sanding block on the sides and bottom.

The "basic" hull is now complete and the model can be removed from the moulds. See Figure 18. Saw through the inner stem and stern post at X and remove the assembly.

It would be a good idea to install one or two temporary struts (deck beams) at the sheer before the hull is removed from the moulds. The sides may tend to bow inward. The temporary struts can be removed after the deck beams or strongbacks are installed to hold the shape.

INTERNAL FRAMING OPTIONS

Two methods of internal framing will be described; scale and non-scale simplified. If scale framing is desired, you could take several routes. Construct the interior to scale completely including all framing members. You could even go to the trouble of outfitting the cabins. On the other hand, you could frame only a section. For example, complete the cargo hold only, so you can look into the hatch opening, or leave some deck plank off as if the boat were under construction. In this case, add frames only where they can be seen.

Most modelers are interested in the overall finished craft and could not care less about the inside. One thing to consider, however, is experience. If you intend to build an "open well" boat at a later date, the scale framing would be of value now even if it cannot be seen after the model is completed. Anyway, the choice is yours.

Knightheads — These are required no matter what type of framing you use, although you could add only the end above the deck. See Figure 19.

Non-Scale or "Fake" Framing — See Figure 20. Install as many fake deck beams, X, as you desire but suggest that they be no more than one inch apart to provide a firm base for the deck plank. Be sure to leave space for the centerboard. Should be no problem, however, since the centerboard should be in the down position. Remove the temporary struts added earlier.

Scale boat framing — The following description applies solely to scale framing shown on the plans. Before installing, scrape off excess glue and sand the hull interior. With a pencil, mark the location of the side frames, strongbacks and battens. Sand all framing members before installation. Scrape off all glue that squeezes out, using small wooden scrapers. Work out your clamping system beforehand. Use clothespins, temporary weights, or dowel pins as required.

Longitudinal battens — Figure 21. Install these members first. Glue the battens, X, in place over the planking in the location shown on the plans.

Option — The battens could be installed prior to adding bottom planks. To do this notch the moulds to receive the battens, then glue planks to rabbet, chine and to the battens.

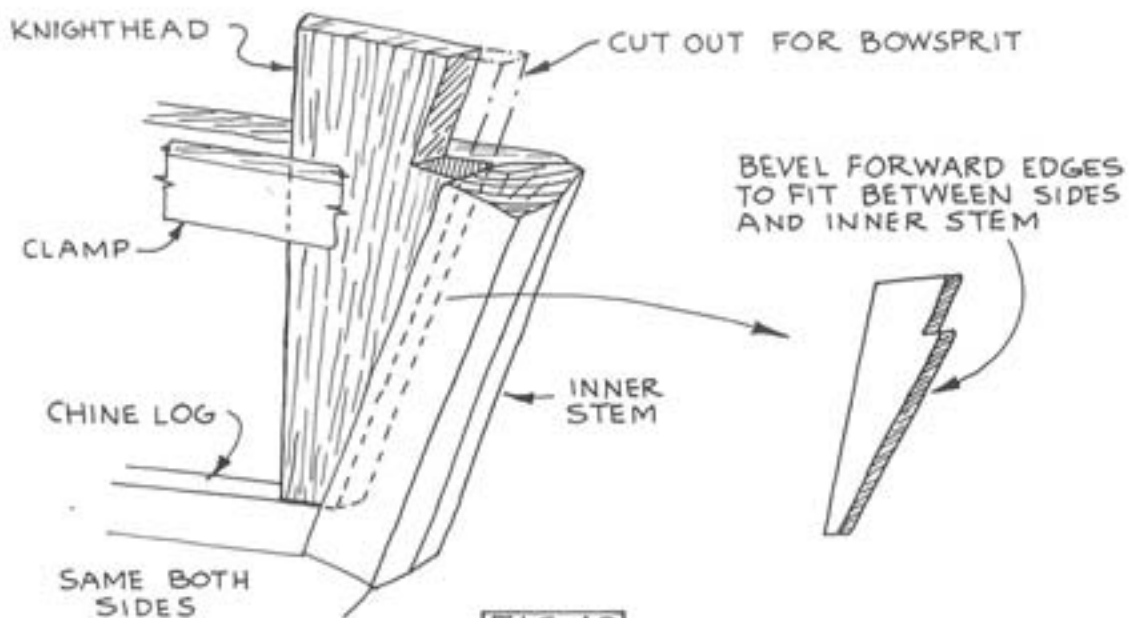


FIG 19

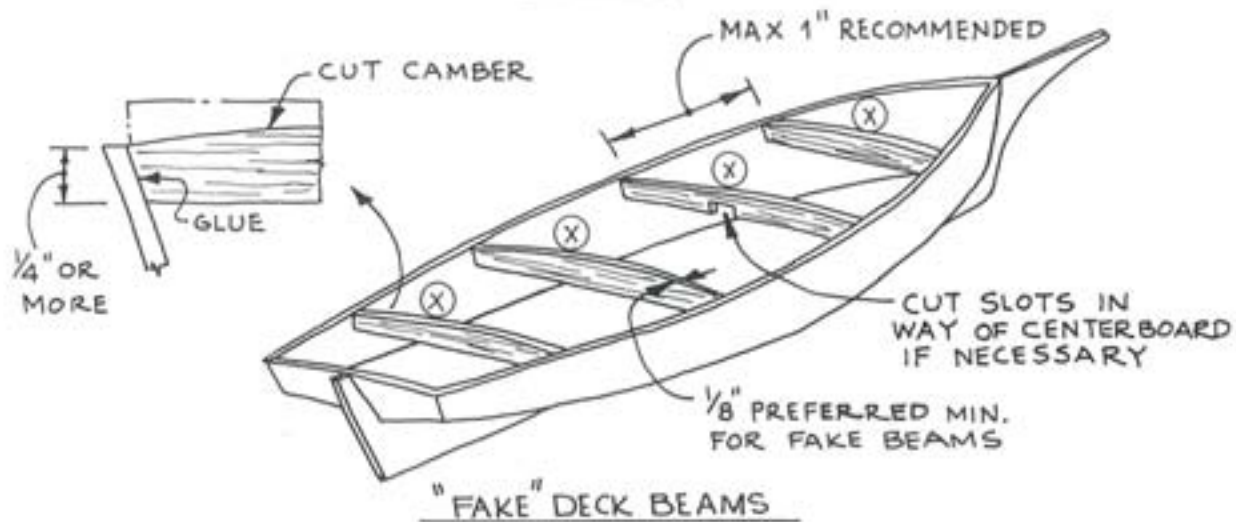


FIG 20

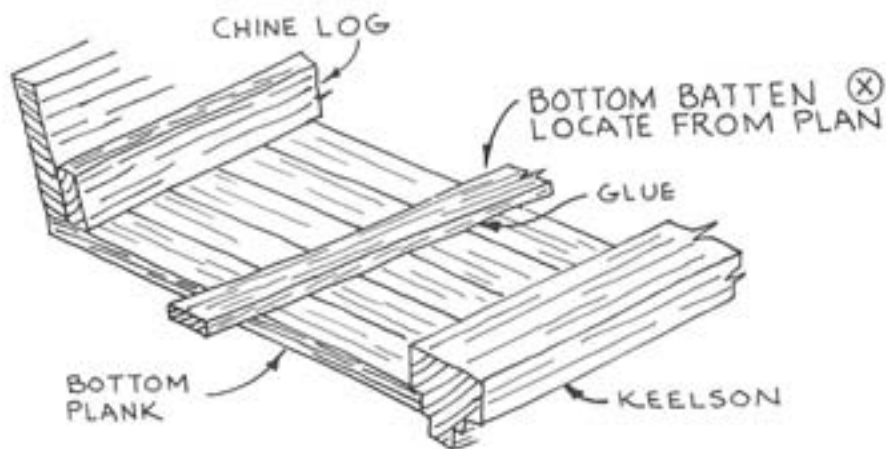
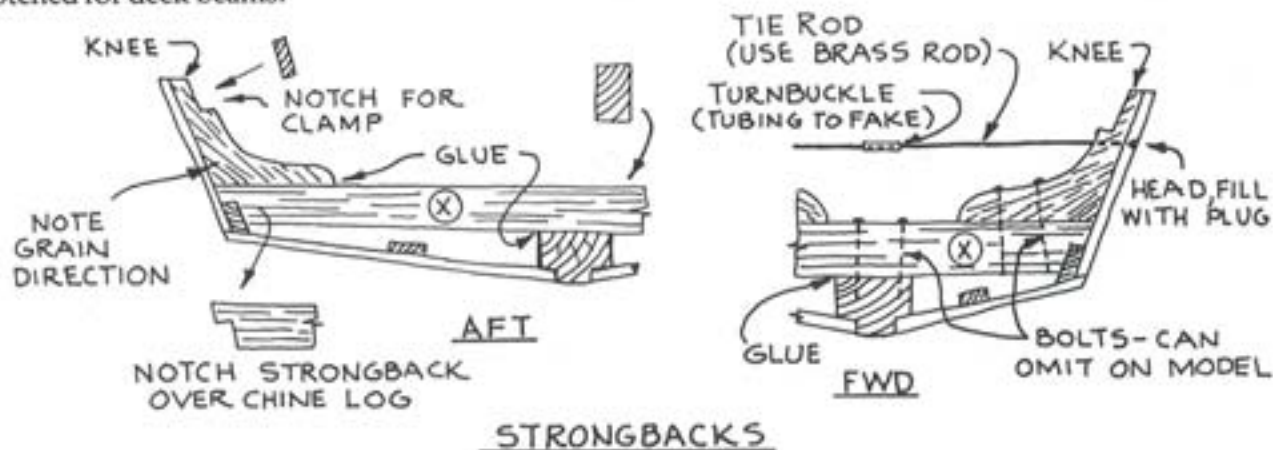


FIG 21

Strongbacks — Figure 22. To provide transverse strength, skipjacks used heavy timbers in two or more locations. WILLIE L. BENNETT had two such strongbacks, X, as do most skipjacks. Notice the tie rod forward which provides added strength in way of the mast.

Side frames — Add the frames per Figure 23. Note that the frames, X, lie normal to the side plank. This is typical Bay practice eliminating a need to bevel the frames. Note also that the tops of some frames must be notched for deck beams.



STRONGBACKS

FIG 22



SIDE FRAMES

FIG 23

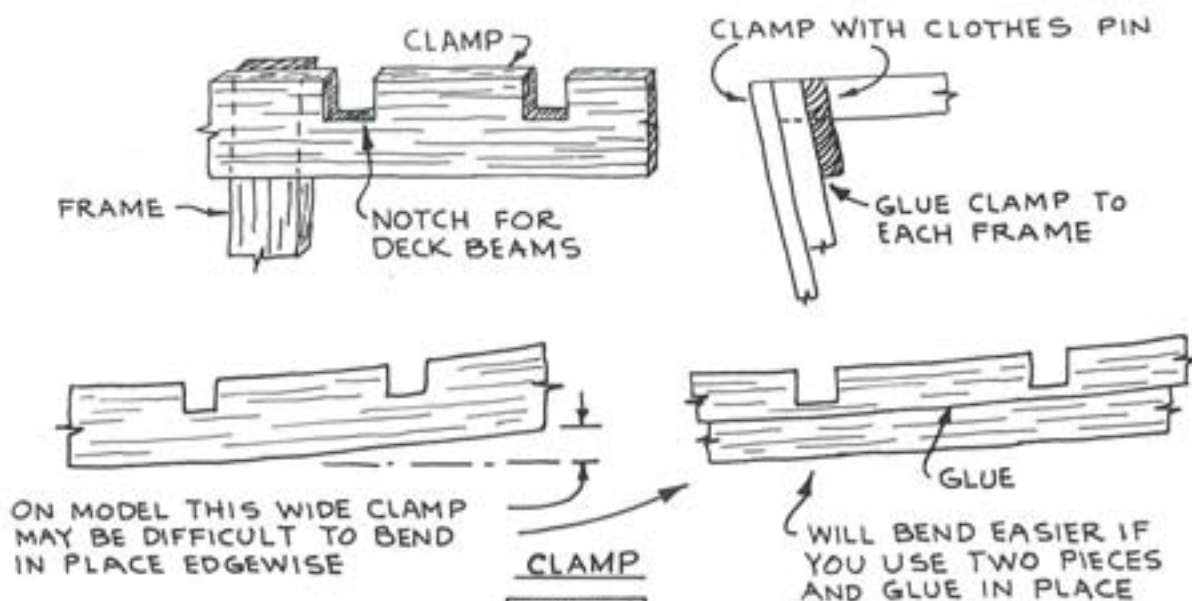


FIG 24

Clamps — The WILLIE L. BENNETT clamps for supporting deck beams are wide boards, notched out for the beams; Figure 24. Some skipjacks have a thicker member with the beam sitting on top of or only slightly notched into the clamp. Mr. Chapelle stated that the WILLIE L. BENNETT deck construction was more like a bugeye than a skipjack. He was probably referring to the deep clamp and to the fact that the deck beams are thin square arched members. Most skipjacks have deeper deck beams, some flat on the bottom and arched on top for the deck camber.

The 5/16-inch wide clamp may be difficult to bend edgewise in place. In this case two pieces can be bent, then glued together. See the sketch.

Centerboard case — Construct and install as shown in Figure 25. Notice that the bottoms of the vertical end pieces, X, fit into the centerboard slot in the keelson for rigidity. The case sides can be planks, per the real boat or a solid sheet on the model. The planks are more appropriate because the lowest plank is thicker than the others.

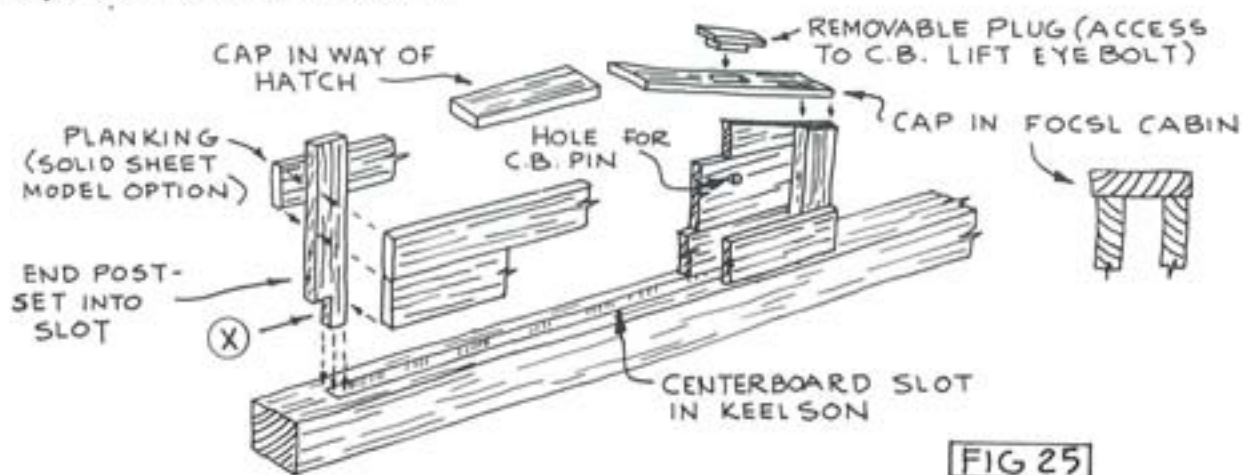


FIG 25

Don't forget to drill a hole for a pivot pin for the centerboard. You must have access to the centerboard pin so the centerboard can be installed later. A removable forward companionway would do the trick.

Transverse bulkheads — Two simple vertically planked bulkheads are required to separate the cargo hold from the cabin areas. Figure 26. Solid sheet could be used as an option on the model but strips are supplied in the kit.

Some skipjacks have a door or opening in the forward cargo bulkhead to permit access from the forward cabin without opening the large hatch on deck.

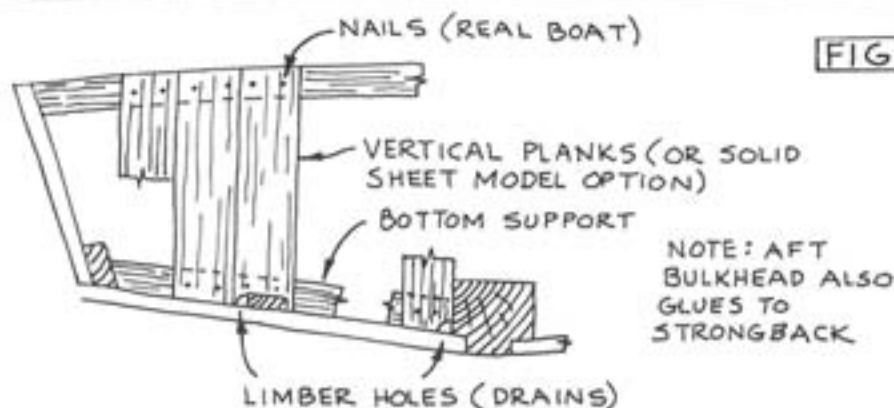
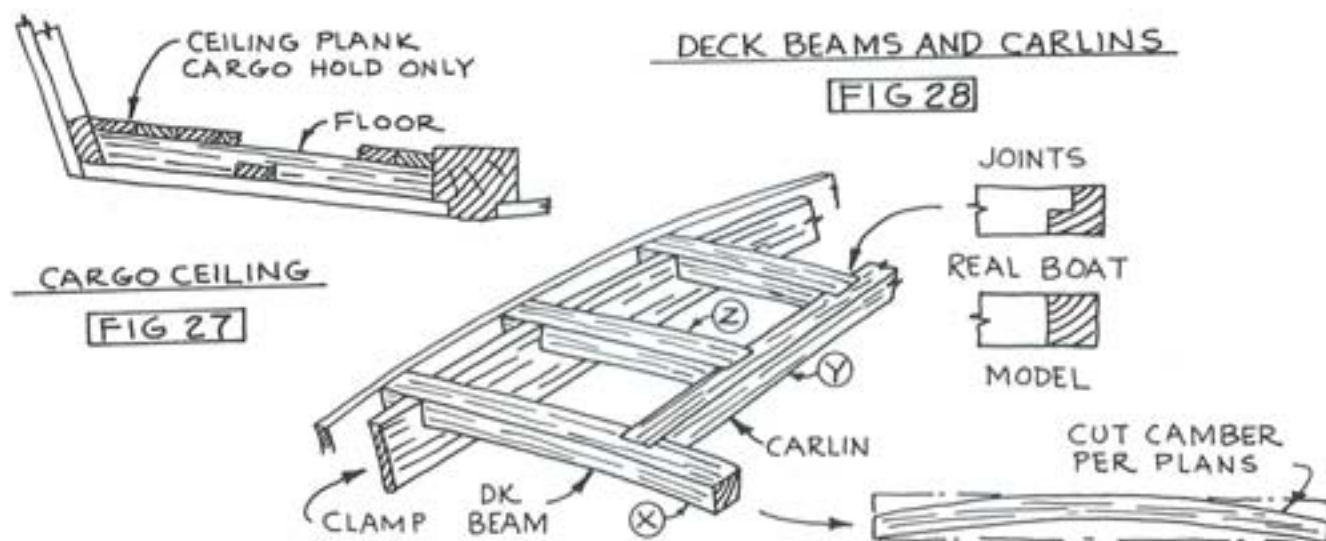


FIG 26

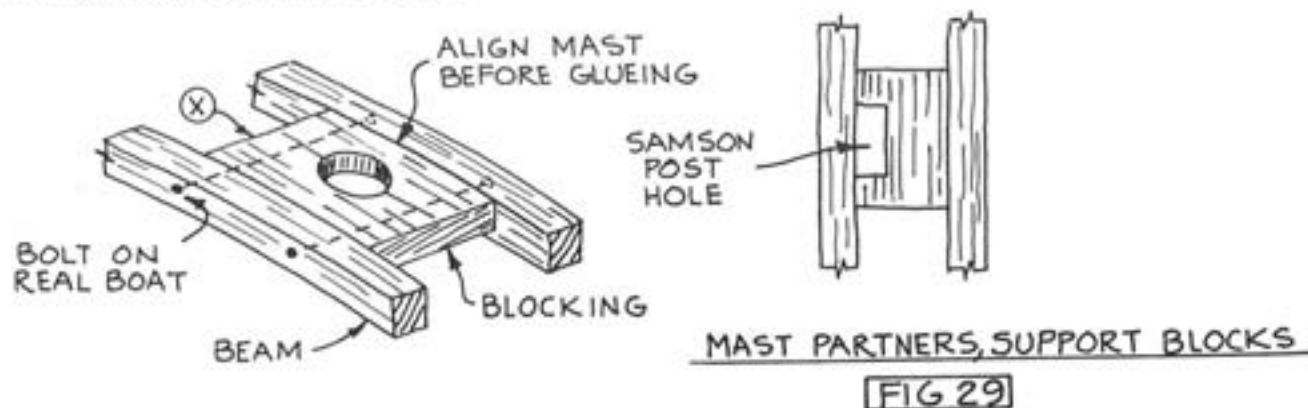
Cargo ceilings — Ceilings provide a deck for interior areas. The WILLIE L. BENNETT has a cargo ceiling, shown on the Chapelle plan. See Figure 27. Install the floors, then the ceiling plank.

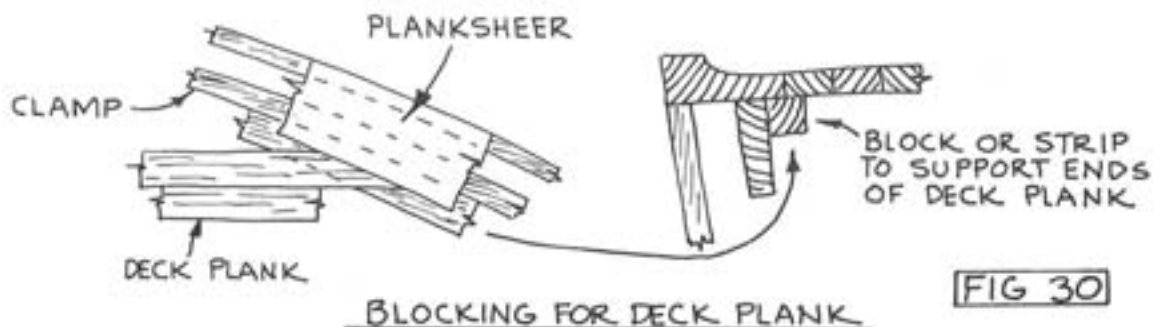
Deck beams and carlins — Cut beams to the correct size and camber and install. Add the complete beams, X, first then the carlins, Y, for hatches and cabins, followed by the short deck beams, Z, outboard of the carlins. On the actual boat the deck beam/carlin joint has a notch as shown on the plans. For the model the members can simply be butted together. See Figure 28.



Blocking — Install the mast partners and other support blocking. Figure 29. While installing the mast partners, X, insert the mast or temporary mast, through and into the mortise in the keelson (figure 4). Glue the partners only after the mast is aligned. Add the blocking between beams along the clamp which will provide support for the ends of deck planking. See Figure 30.

Much of the blocking, such as the blocking for the winders, A-frame and wheel box can be considered options as many skipjacks are not fitted with blocking. In all cases, however, the blocking for the mast and samson post is required.





BLOCKING FOR DECK PLANK

FIG 30

After all beams are in place, sand the entire topside with a sanding block including the bevel in the hull sides. Look for dips and bumps and correct. When you lay the planking, you want it to be fair.

Fitting out the cabins — The cabin interiors varied among skipjacks and were changed readily. Any simple type of seats, bunks, shelves, and racks are sufficient. See Figure 31 for typical layout of the aft cabin. In the forward cabin the sole (false deck) can be omitted. Not much room forward. Also, skipjacks today do not generally have bunks installed and may not have a stove forward. The forward space is primarily for storage of clothes and gear.

In the old days, skipjacks spent several days to a week at the oyster beds. Consequently, bunks were necessary and cooking and heating were a must. The boats would anchor nightly in clusters and the crews would visit via their yawl boats to tell old sea stories. The oysters were picked up daily by a "buy" boat. Today most boats return to port each day so the skipjack cabin need not be so elaborately finished. Such action has also put the buy boat out of business.

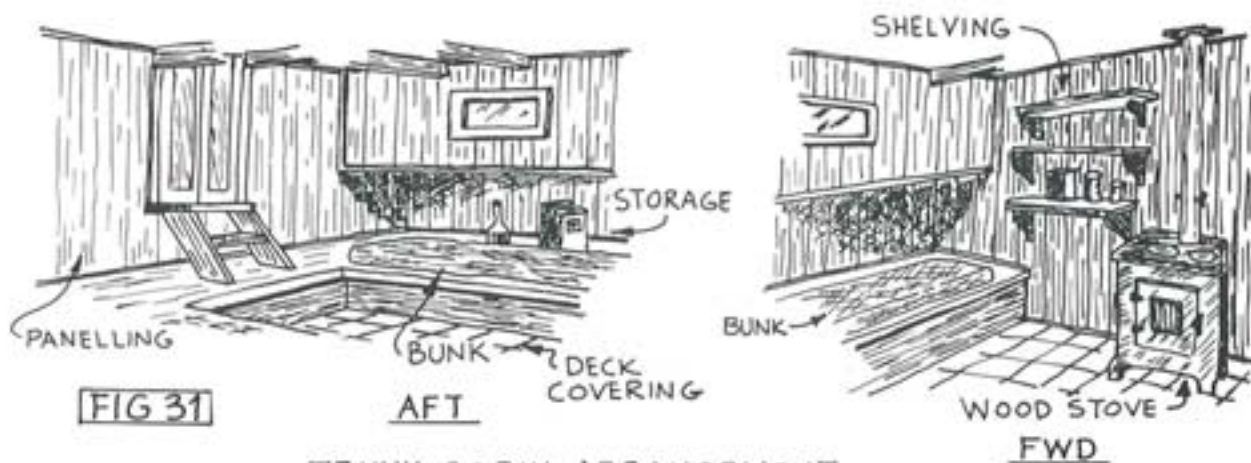


FIG 31

TRUNK CABIN ARRANGEMENT

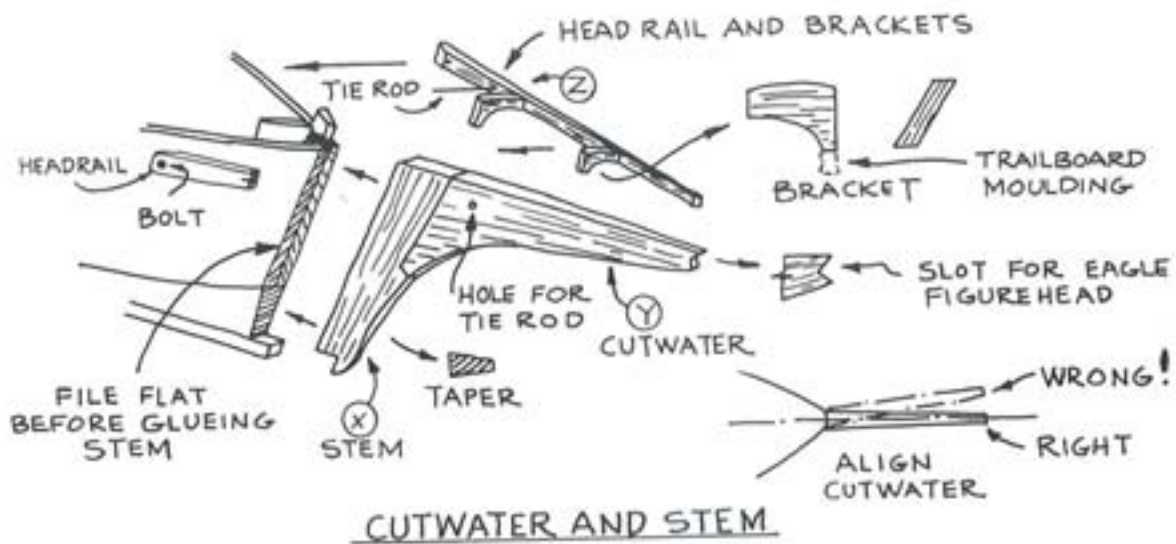
FWD

DECK PLANKING AND EXTERNAL STRUCTURE

Stem, cutwater and trailboards — Install the stem, X, cutwater, Y, and head rails, Z, per Figure 32. Trailboards can be added after they are painted but should be fitted at this time. The painting is tedious and best done with the trailboards in hand. (See **Painting**).

Bends — Figure 33. We cheated a bit by not making the bends (another term for wales), a separate heavy piece, X, per the plans. Instead for the model simply add a 1/32-inch x 3/16-inch strip, Y, on the outside of the hull.

Planksheer and log rail — Figure 34. The planksheer, X, must be cut to shape because of the curvature. Shape the inside edge of the planksheer per the plan. Drill locating pin or dowel holes through



CUTWATER AND STEM

FIG 32

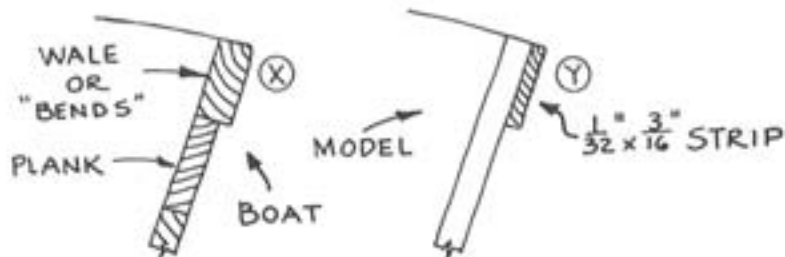
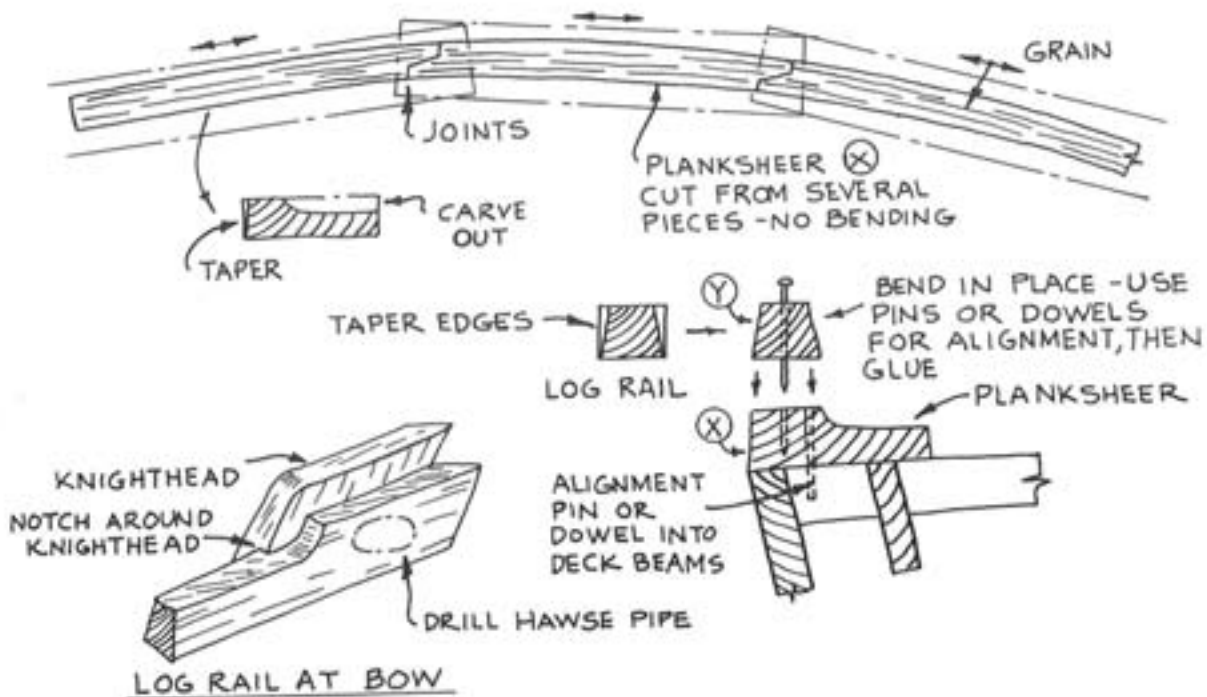


FIG 33



LOG RAIL AT BOW

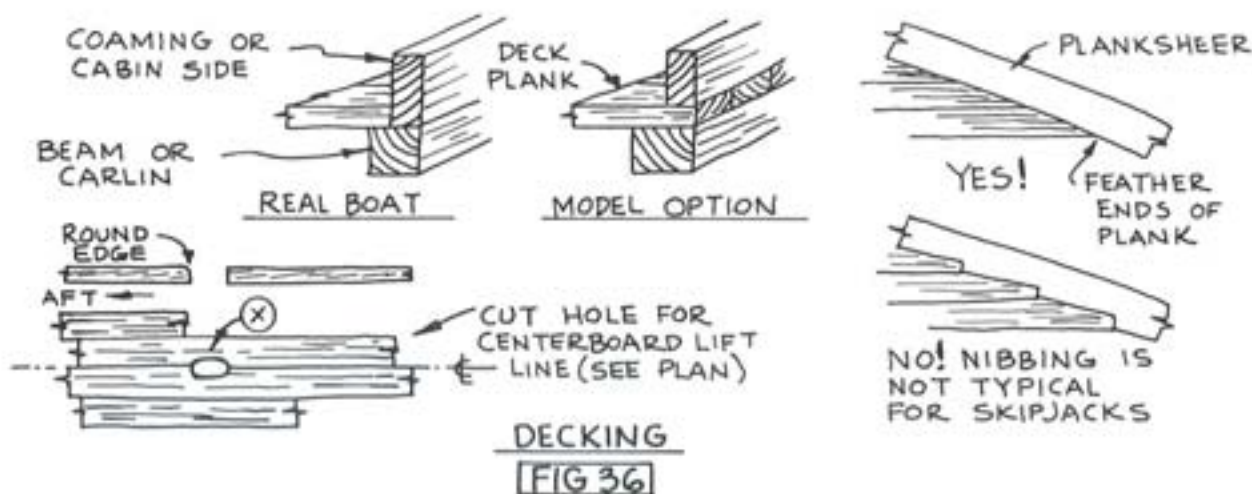
LOG RAIL AND PLANKSHEER

FIG 34

the planksheer into the deck beam ends. Glue the planksheer in place. Add the log rail, Y, locating and forming in a similar manner to planksheer. The log rail also requires some tapering but can be bent in place.

The cap rail and stanchions will be added after the deck is installed. They would be in the way at this stage.

Side guards — See Figure 35. Don't forget to leave a slot, X, for the dredge roller supports before you add the guards.



Decking — For the decking we have a couple of options to consider.

Near-scale — To simplify the operation use wider planks, 3/16- or 1/4-inch x 1/16-inch. Not to scale, but still fun to do. Deck seams are less important since deck will be painted.

For scale, install the 3/32- x 1/16-inch planks provided in the kit.

Planks run parallel to the centerline. Glue all edges and cut planks off flush with the beams and headers in way of cabins and hatches. Figure 36. On the real boat, as illustrated on the plans, the hatch coamings and cabin sides were installed first on the deck beams and carlins and the deck plank butted against the coaming. This can be done but for a model it is simpler to set the hatches and cabins on top of the deck. The sanding operation is easier with the cabins off. If non-scale framing was installed simply extend planking over entire deck.

Cut the hole, X, in the deck for the centerboard lift line (Figure 36). Round the aft edge of the hole. Skipjacks generally do not have a sheave in the hole; unusual but inexpensive. The line simply drags over the rounded edge.

After completing the decking, sand smooth with a sanding block and prime. **Hatches** — Make and install the hatches and hatchcovers per Figure 37. Notice the notches, X, cut into the coaming to

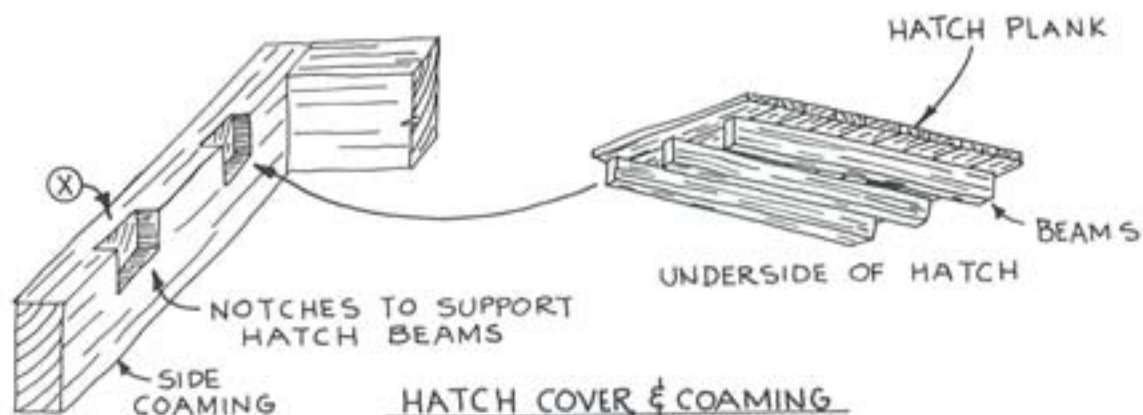
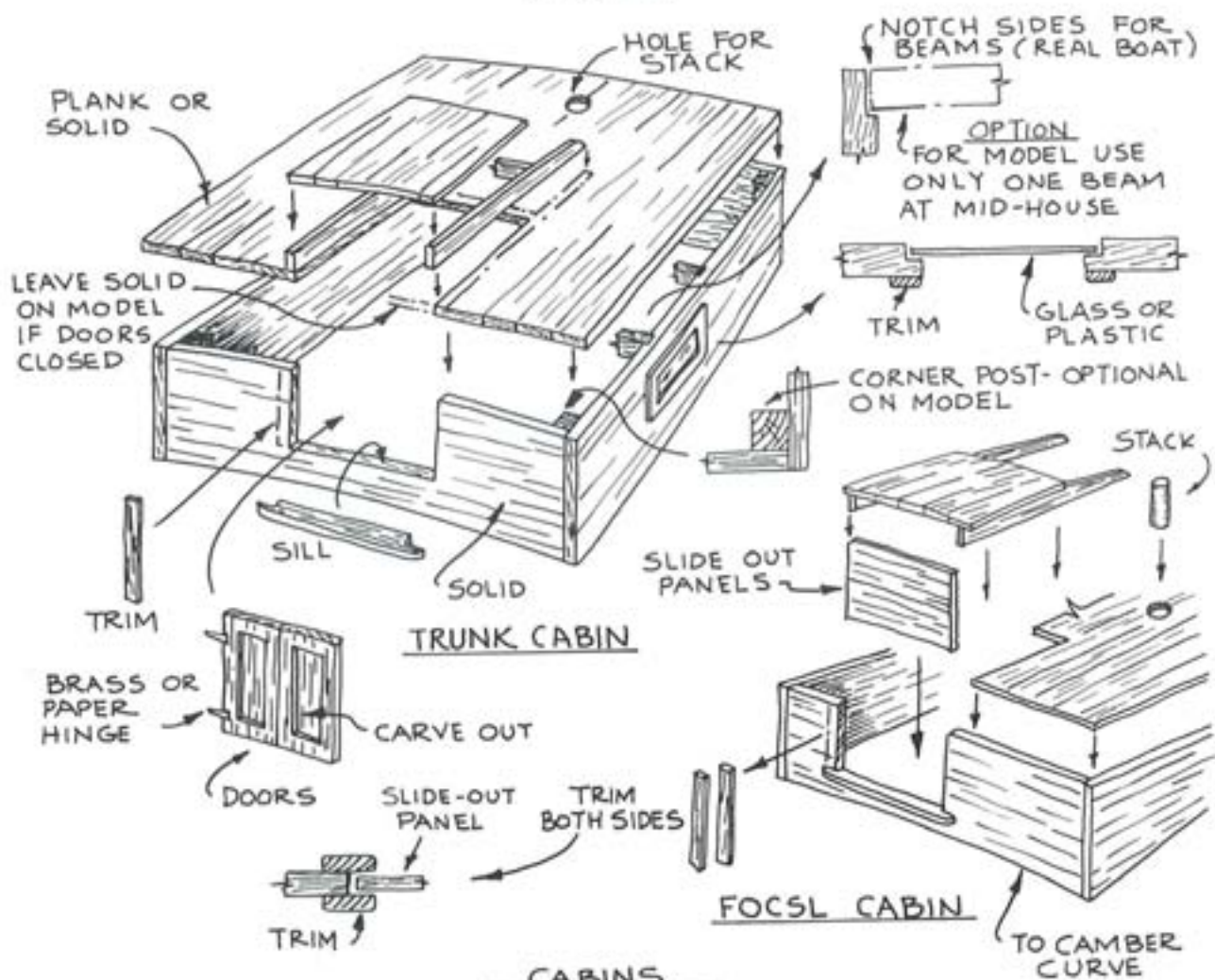


FIG 37



CABINS
FIG 38

support the hatch beams. This method is used quite often on skipjacks but sometimes the hatch has a beam around the periphery, support provided only by the hatch planking.

Deck cabins — Details of the cabins are shown in Figure 38. As noted before, keep the forward cabin portable so you can reach the centerboard casing (or other fixture if no casing was used).

The cabin tops (also hatch covers) can be planked or made from the solid sheet contained in the kit. Note that two pieces will be required glued at centerline because the 2-inch width supplied is not sufficient for a complete top.

Wheel box — The wheel box is shown in Figure 39. For information, the steering apparatus is shown but can be omitted on the model (must still install the rods to the rudder horns). Or have some fun and make a working model of the apparatus.

The type gear shown is the very earliest Lake gear, invented by John and Simon Lake in 1891. This was the Baymen's choice in the early days. Other types were invented such as the screw types. See Figure 40. Both the Lake and screw types are still in use today.

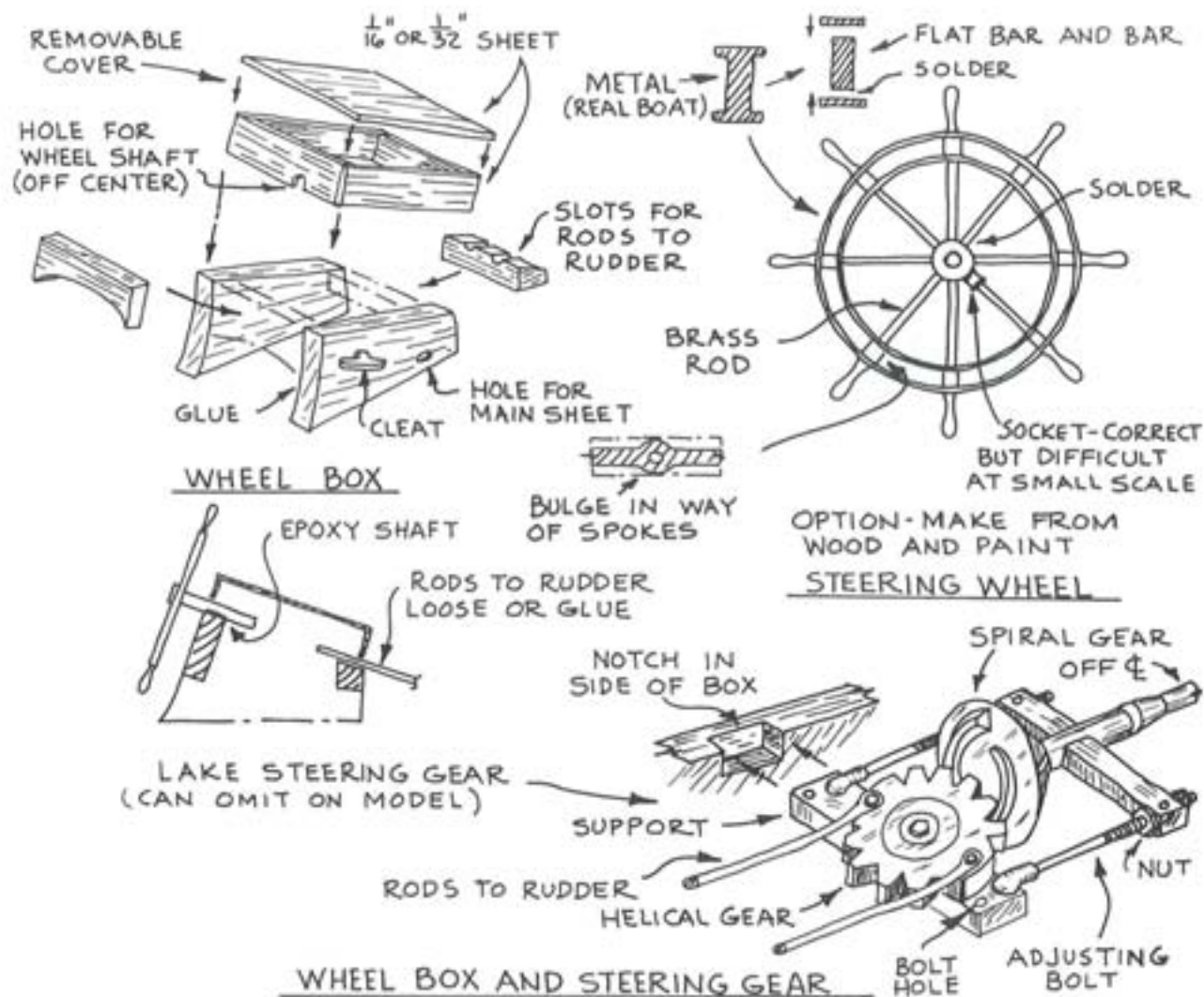


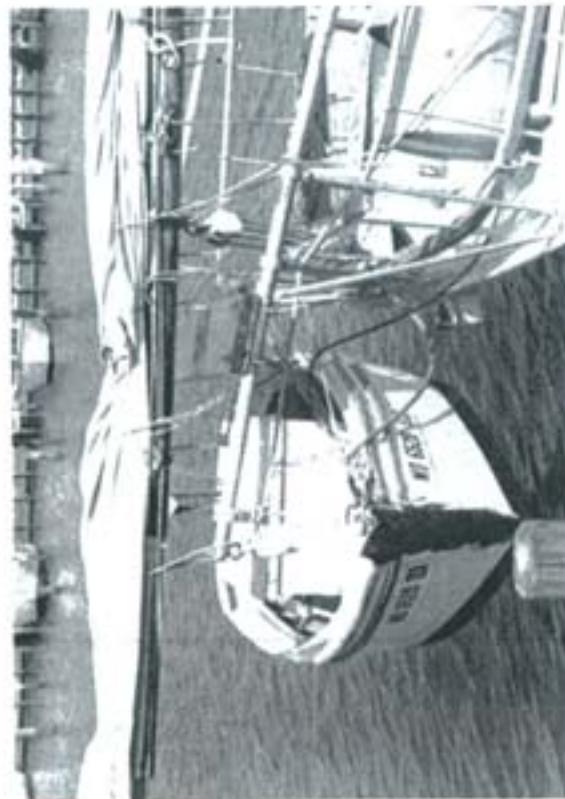
FIG 39



LATE FALL OYSTER DREDGING. In Dan Miller's photo note ice sheathing on hull, beat-up anchor, primitive running lights, reefed sails in brisk wind a downwind course, heavy clothing, a full dredge on starboard rail. A puzzle is the great distance between upper and lower deadeyes.

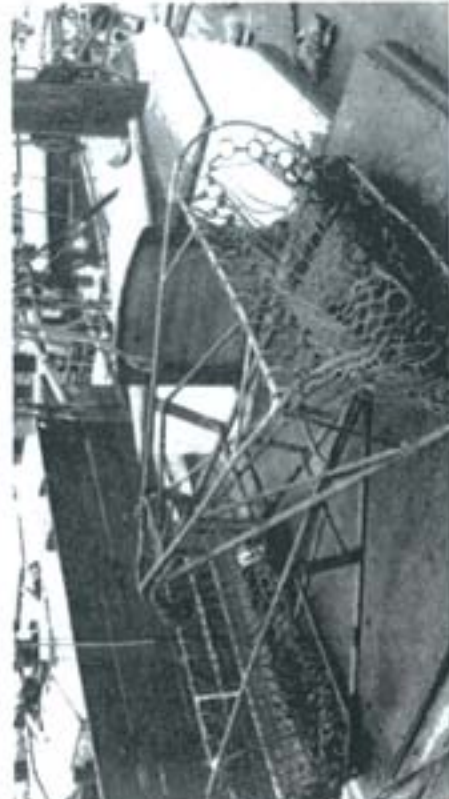


RUDDERHEAD DETAIL



PUSHBOAT ON DAVITS

Lankford photos.



DREDGES STOWED ON MAIN HATCH



CONSTRUCTION MOULDS SET UP ON BUILDING BOARD- READY TO RECEIVE KEELSON, STEM, AND STERNPOST.



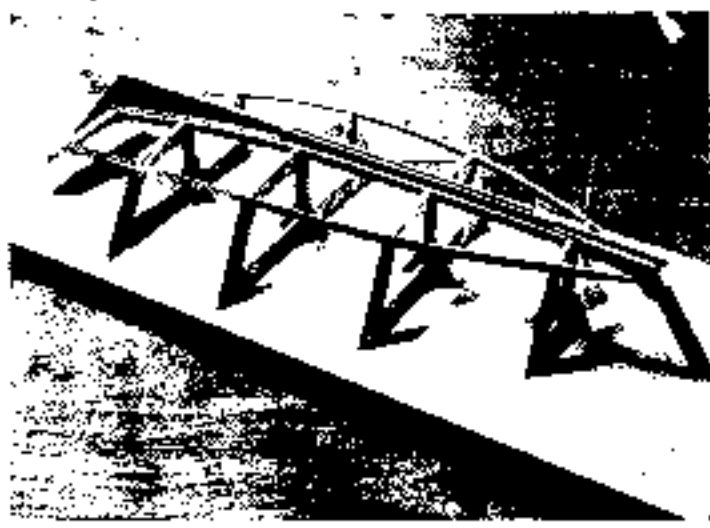
KEELSON AND STEM IN PLACE. STEM HEAD IS SPOT-GLUED TO BUILDING BOARD.



KEELSON & STEM SET UP OVER THE MOULDS. NOTE CLEAT ON KEELSON AND RABBET FOR BOTTOM PLANK.



STERNPOST AND TRANSOM BEING FITTED IN PLACE. NOTE NOTCHES IN TRANSOM STIFFENER AND BEVELS FOR CHINE LOG.

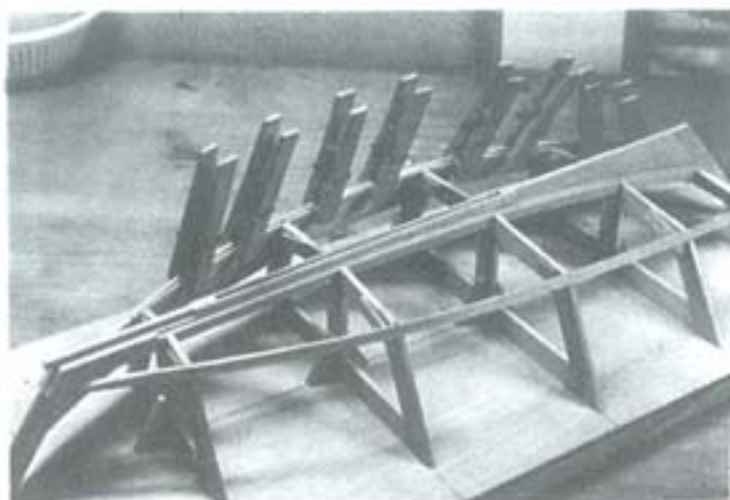


CHINE LOG IN PLACE. LOG IS GLUED AND PINNED AT ENDS TO TRANSOM AND STEM, PINNED AS NECESSARY TO MAKE IT LIE ON CHINE NOTCHES OF THE STEM.

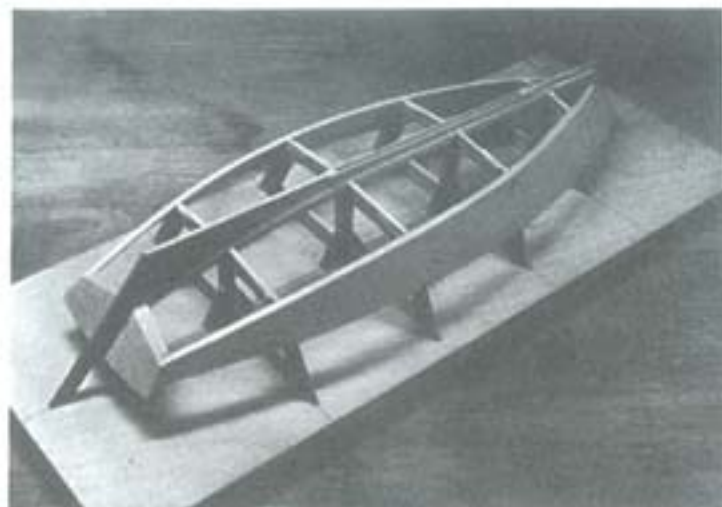


CHINE LOG AS IT JOINS TO THE STEM. NOTE TAPER FORWARD OF STEM MOULD; THIS IS VERY IMPORTANT TO INSURE PROPER "RISE" OF THE CHINE FORWARD.

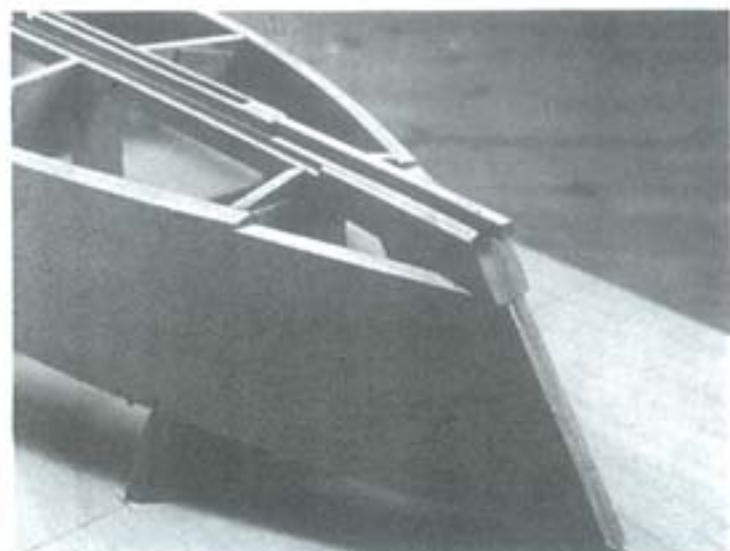
BOATBUILDING MOULDS AND PHOTOS



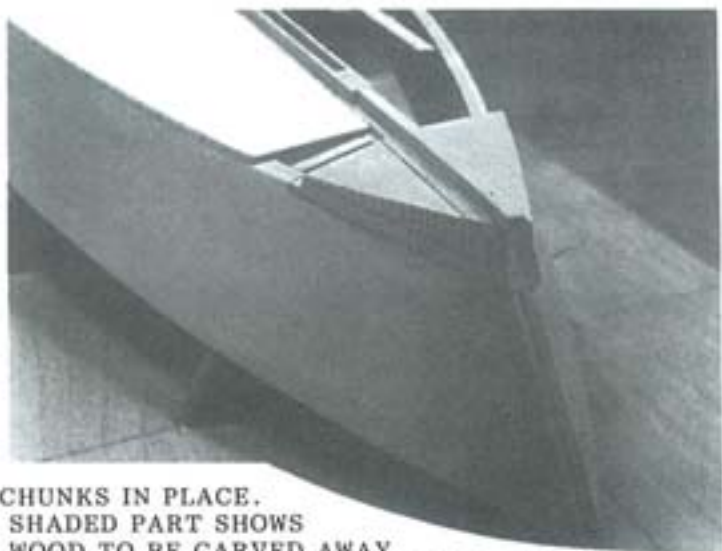
SIDE PLANKING BEING FITTED, IN ONE PIECE OF 1/16" VENEER, RATHER THAN SEPARATE PLANKS. CLOTHESPINS AID IN THIS GLUING.



SIDE PLANKING IN PLACE WITH BOTTOM EDGE TRIMMED FAIR WITH CHINE. TOP EDGE HAS NOT BEEN TRIMMED TO FINAL SHEER PROFILE.



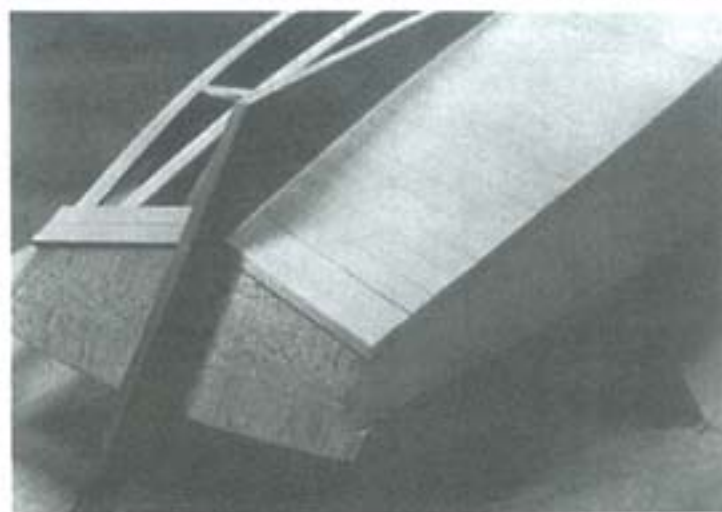
FORWARD END OF SIDE PLANKING, SHOWING CUT-AWAY FOR "CHUNKS".



CHUNKS IN PLACE. SHADED PART SHOWS WOOD TO BE CARVED AWAY TO FAIR WITH BOTTOM. NOTE AFT END OF CHUNKS ARE RABBETED TO RECEIVE THE BOTTOM PLANK, WHICH IS NEARLY FINISHED ON PORT SIDE



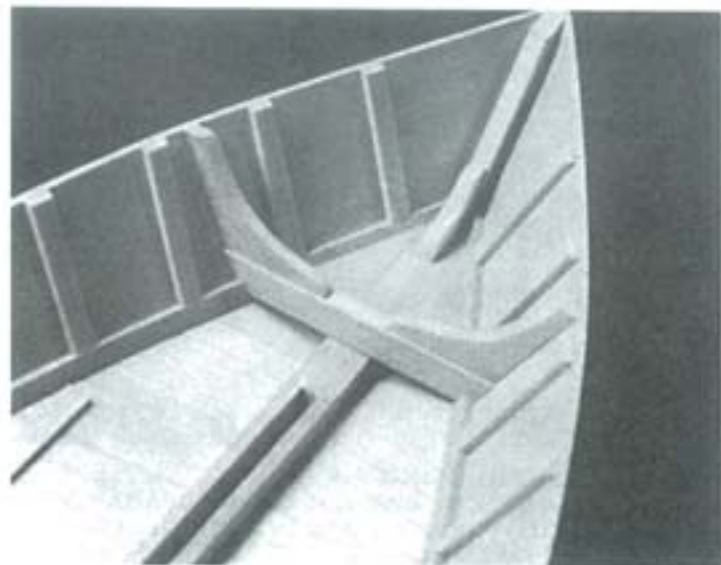
BILGE BATTEN FITTED TO MOULDS PRIOR TO PLANKING THE BOTTOM. THIS REQUIRES NOTCHING THE MOULDS AND PINNING THE BATTEN IN PLACE. PINS ARE REMOVED AS BOTTOM PLANKING PROGRESSES.



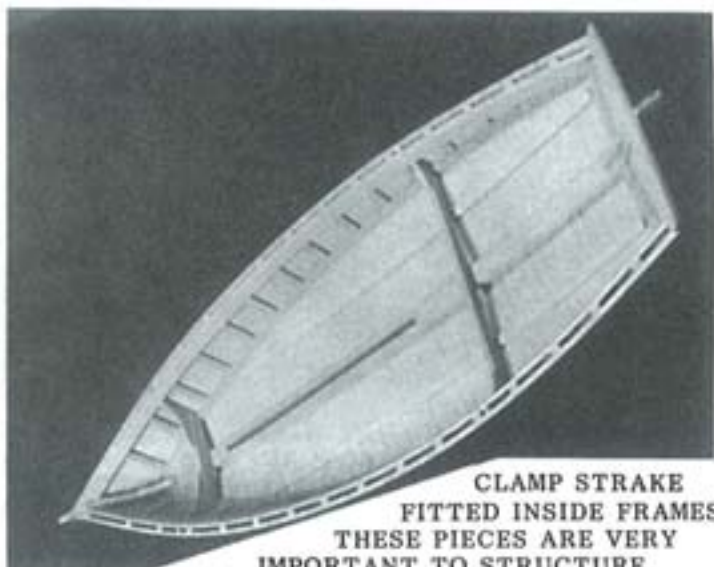
BOTTOM PLANKING FINISHED ON PORT SIDE, GETTING STARTED ON STARBOARD SIDE THE PLANKS LIE PARALLEL TO AFT BOTTOM EDGE OF THE TRANSOM.



HULL REMOVED FROM MOULDS, WITH FRAMES, STRONGBACK KNEES FITTED. A "SPREADER" HAS BEEN SPOT-GLUED AND PINNED IN PLACE, JUST ABAFT THE FORWARD STRONGBACK, TO PREVENT THE TOPSIDES FROM COLLAPSING. THIS CAN BE REMOVED WHEN THE STRONGBACK KNEES ARE SECURELY IN PLACE.



VIEW OF FORWARD STRONGBACK AND ITS KNEES. SPREADER HAS BEEN REMOVED.



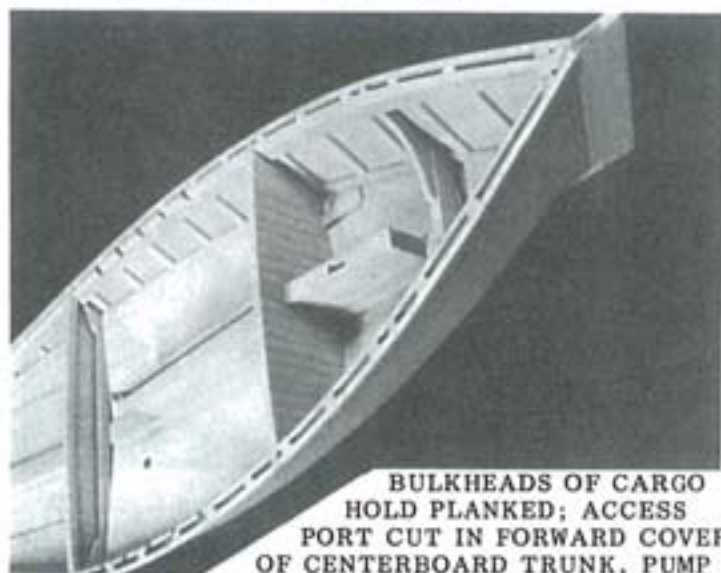
CLAMP STRAKE FITTED INSIDE FRAMES THESE PIECES ARE VERY IMPORTANT TO STRUCTURE, STRENGTH AND STABILITY, AND SHOULD BE FITTED AS SOON AS POSSIBLE.



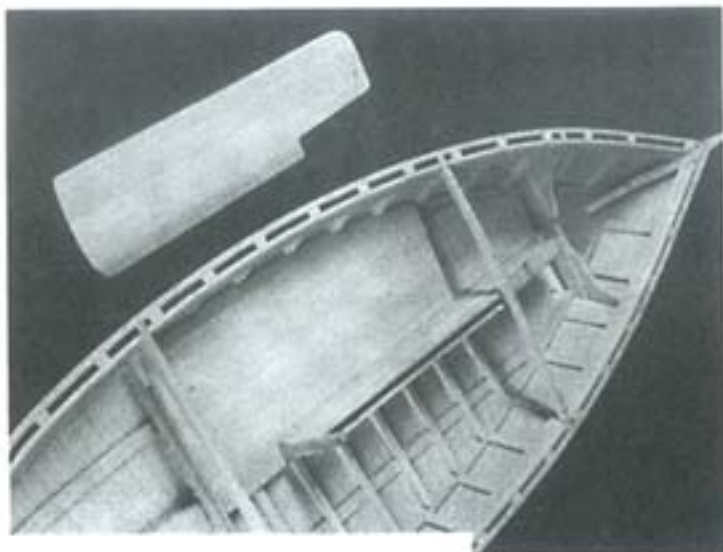
CENTERBOARD TRUNK FITTED; ALSO TWO DECK BEAMS TO MAKE TOPSIDES MORE RIGID.



CEILING FLOORS FITTED AND CEILING PLANK LAID ON PORT SIDE.



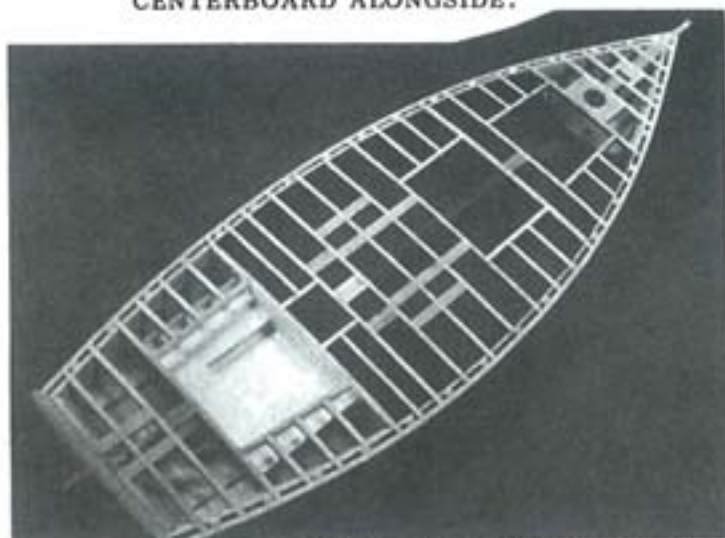
BULKHEADS OF CARGO HOLD PLANKED; ACCESS PORT CUT IN FORWARD COVER OF CENTERBOARD TRUNK. PUMP WELLS (SQUARE HOLES) CUT IN CEILING.



**VIEW OF HOLD CEILING.
CENTERBOARD ALONGSIDE.**

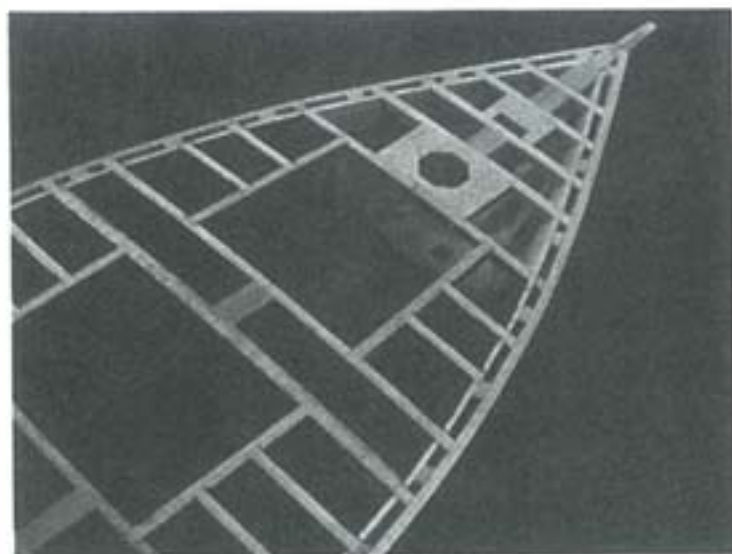


**QUARTER VIEW SHOWING AFT SIDES OF
HOLD BULKHEADS.**

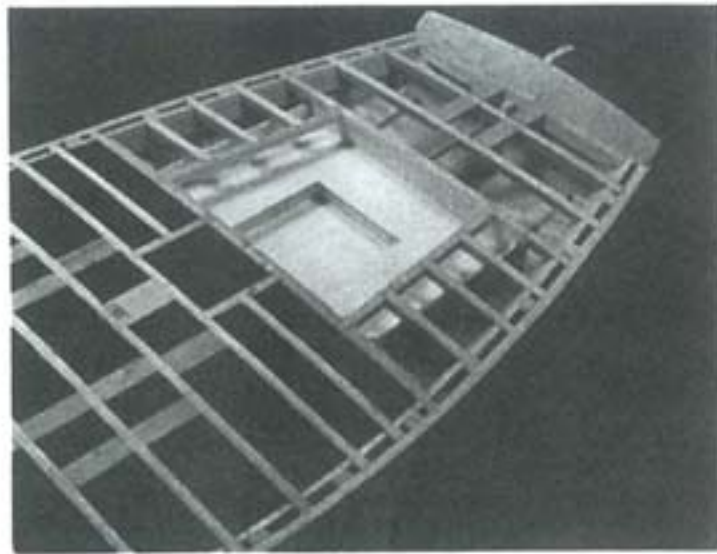


**FRAMING AND BLOCKING OF DECK COMPLETE.
CABIN TRUNK SOLE AND BUNKS FITTED AND
PAINTED WHITE; CARGO HOLD HAS BEEN
PAINTED RED LEAD COLOR.**

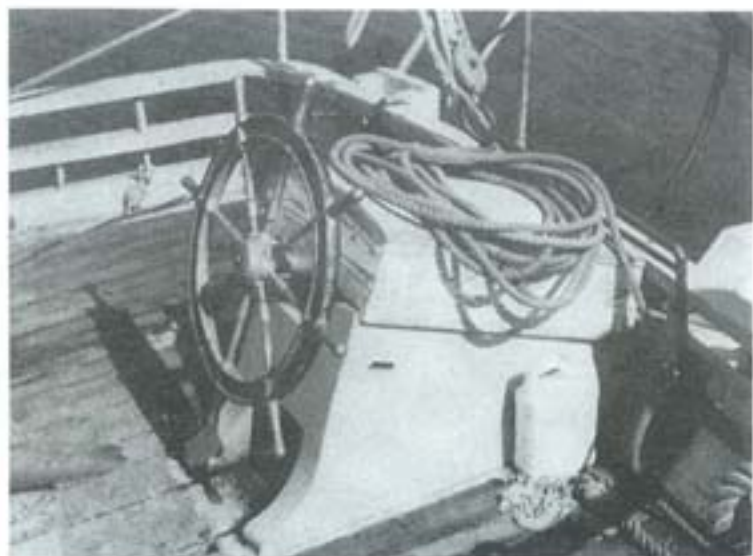
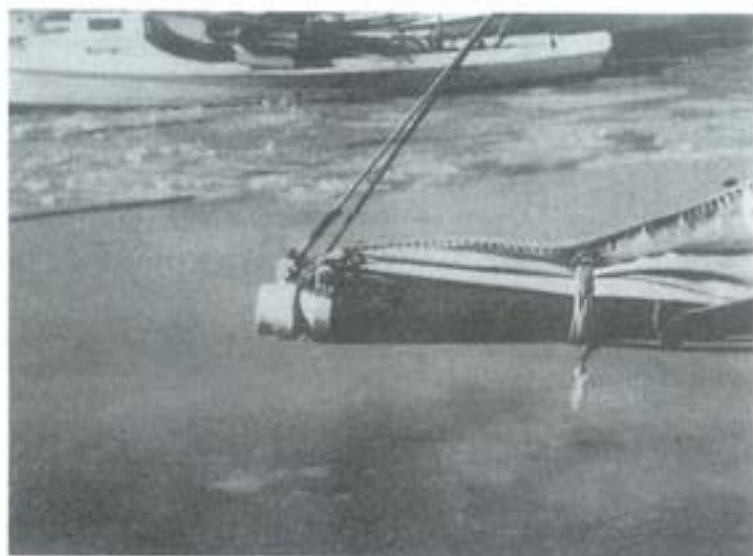
**INTERNAL CARPENTRY AND FRAMING -
Optional. Almost all of this pleasant labor
will be hidden under the deck.**



**DECK FRAME FORWARD. NOTE MAST PARTNERS,
MORTISE IN MAST STEP, NOTCHING OF DECK
CLAMP FOR BEAMS.**



**DECK FRAME AFT. NOTE CABIN JOINER WORK
AND LEDGES ON TRANSOM FOR DECK
PLANK ENDS.**



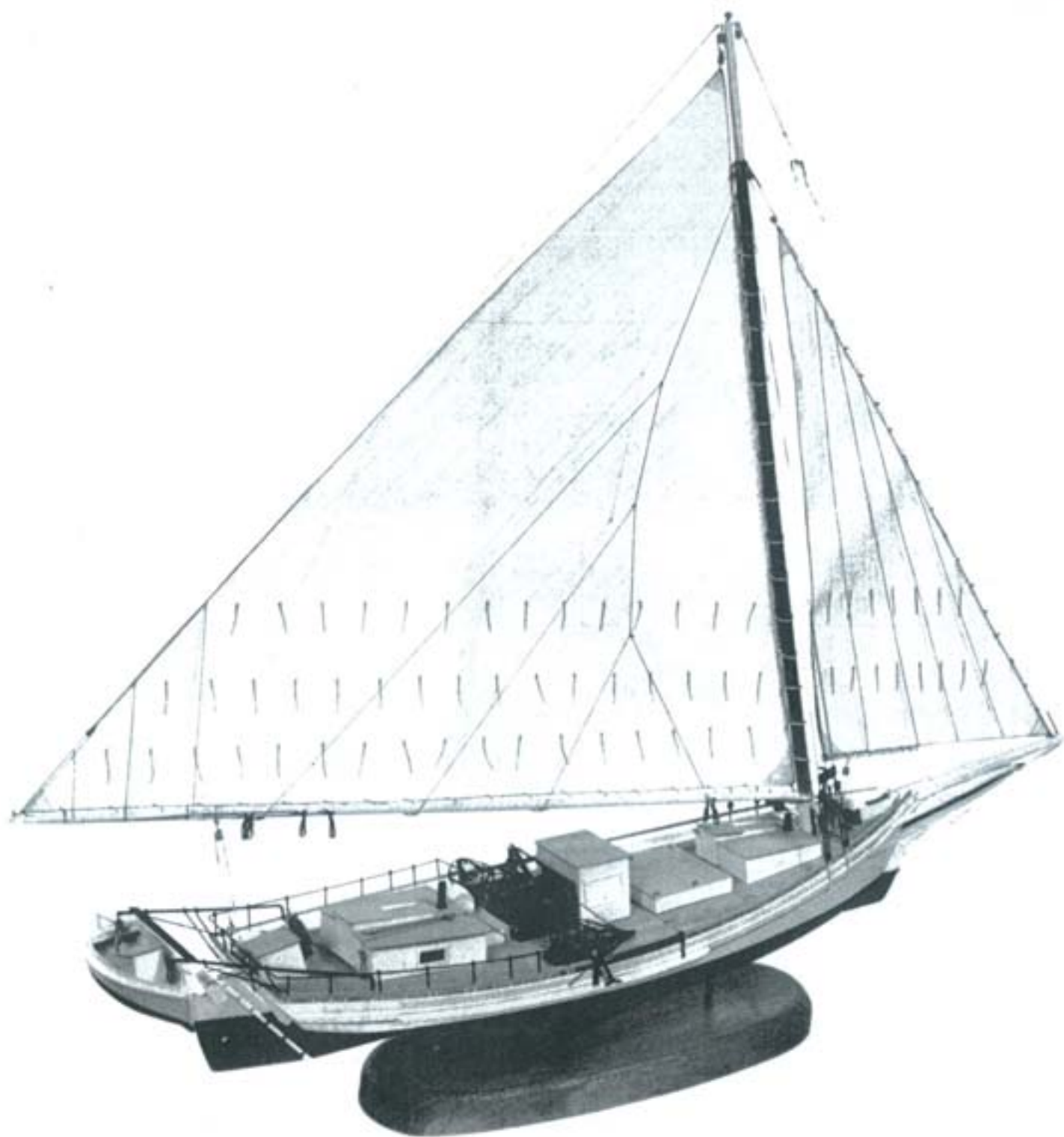
LAKE PATENTED STEERING GEAR



WINDERS, WITH DREDGES STOWED

MODEL SHIPWAYS

Kit of the Chesapeake Bay skipjack
WILLIE L BENNETT





Model by W.E. Hitchcock

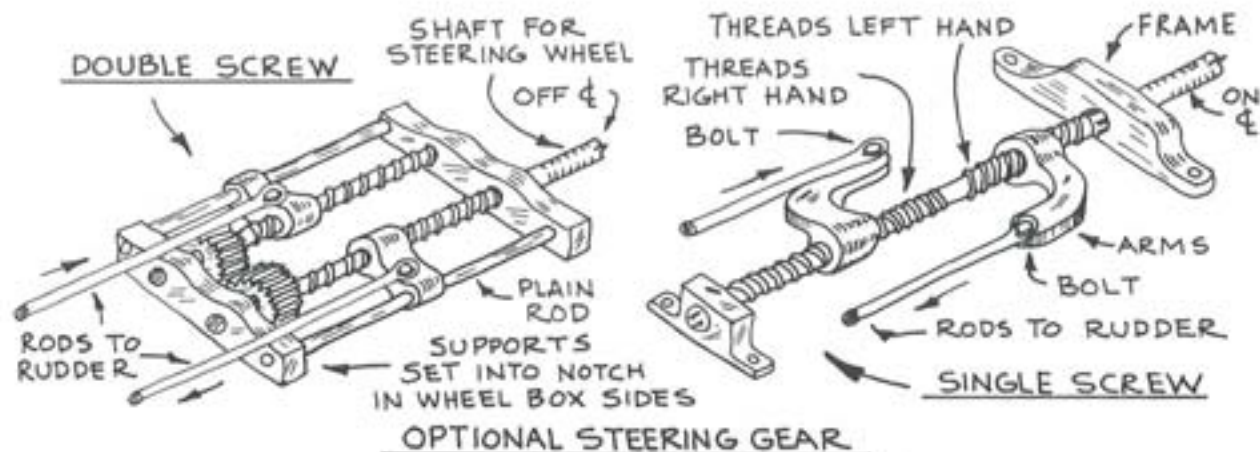


FIG40

Cap rail and iron rail — The cap rail can be installed now. The real boat uses iron pipes for cap rail stanchions through which a drift bolt is driven. For the model, 1/32-inch brass rod can be used. The iron rail is made up of brass rod and painted. See Figure 41.

Bilge pump pipes — Use brass tubing inserted in a hole in the deck according to Figure 42. On some skipjacks a square wooden box is used instead of the iron pipe. An old-style galvanized hand pump fits through the openings to pump the bilges. While these are usually stowed below, Figure 43 shows what they look like.

This completes the basic topside wood work except for the winder engine cover and spars. Sand everything, apply a coat of primer and re-sand. As always, be careful not to round edges which should be distinct and sharp.

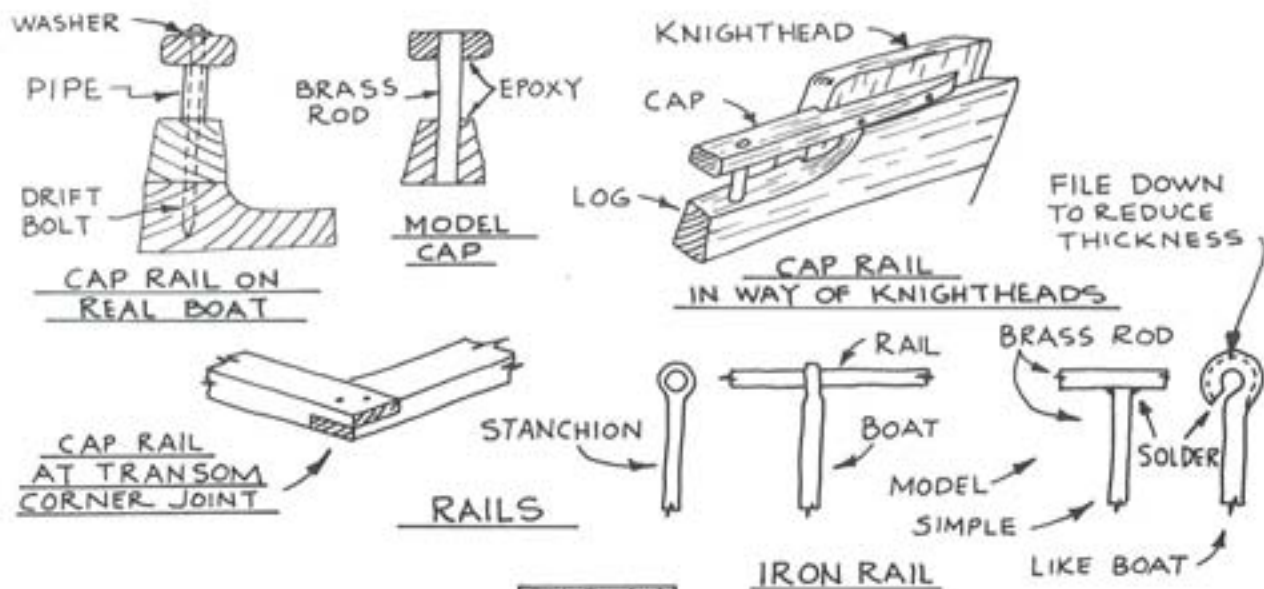


FIG41

Deck protective sheathing — The deck area between the side dredge rollers and the dredge winders is usually covered with portable sheathing to protect the deck from the dredges. The sheathing directly in way of the winders is actually a portable platform with a level surface to provide a better working area. The platform stiffeners are cut to conform to the deck camber. See the plans.

On many skipjacks, additional temporary sheathing (1-x 6-inch planks) is laid directly on the deck forward, aft, and inboard of the platform. This sheathing protects the deck from oyster shell damage and can be easily replaced as necessary.

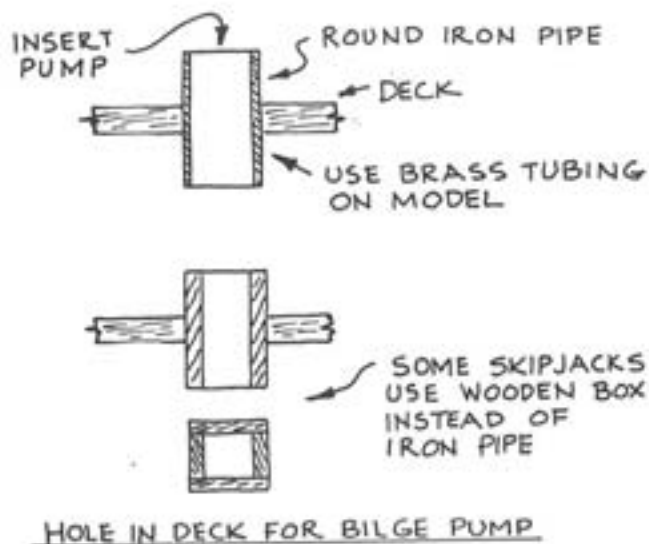


FIG 42

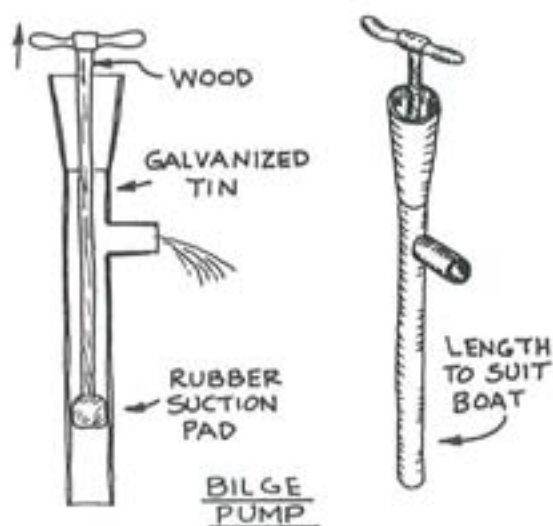


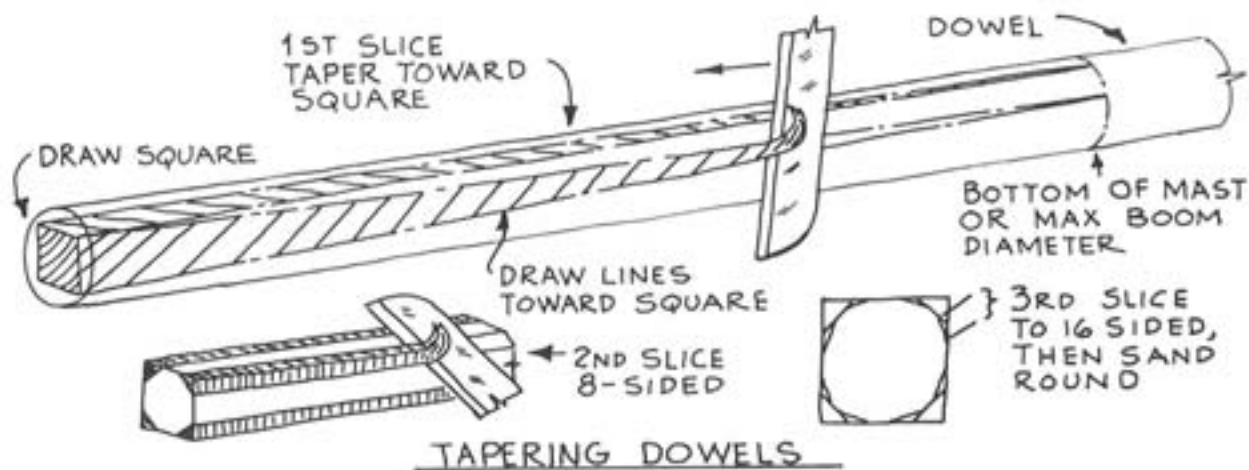
FIG 43

MAST, BOOM, JIB CLUB AND BOWSPRIT

Dimensions are shown on the plans for all spars. The mast, boom, and jib club are round except for the lower end of the mast which is an octagon shape. The bowsprit is unusual in that it is square at the bow, transitioning to an eight-sided (octagon), then to a round shape. It is interesting to note that the shape varies among skipjacks. Some bowsprits are V-shaped on the bottom and flat on top. Others are octagon all the way and some transition from the eight-sided shape to 16-sided. In all cases, however, the bowsprit hogs down as it goes forward.

Tapering the mast, boom, and jib club — If round dowels are used for the mast and booms they must be tapered to plan dimensions. A dowel is difficult to taper because it is already round. The best approach is to slice the dowel from a round shape at maximum diameter to a square shape at the end, then to an eight, then sixteen-sided shape. Final rounding is achieved by sanding. This will prevent turning a round dowel into an oval. See Figure 44.

Tapering a spar from the square stock supplied in the kit and as shown in Figure 45 is easier because the cutting lines can be marked more easily and precisely.



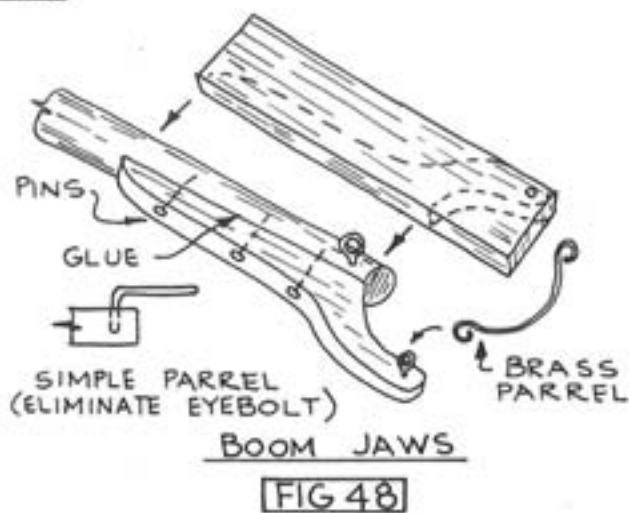
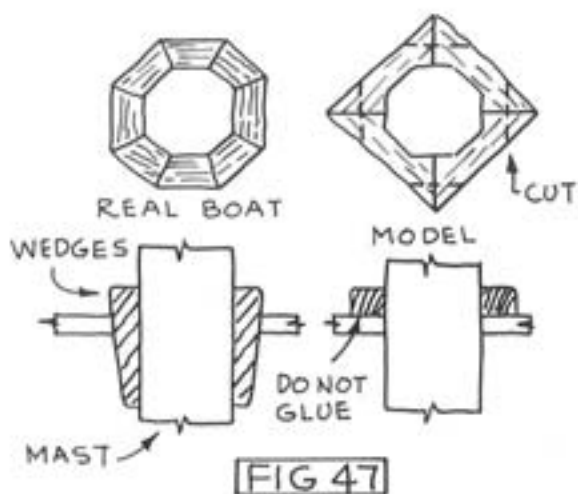
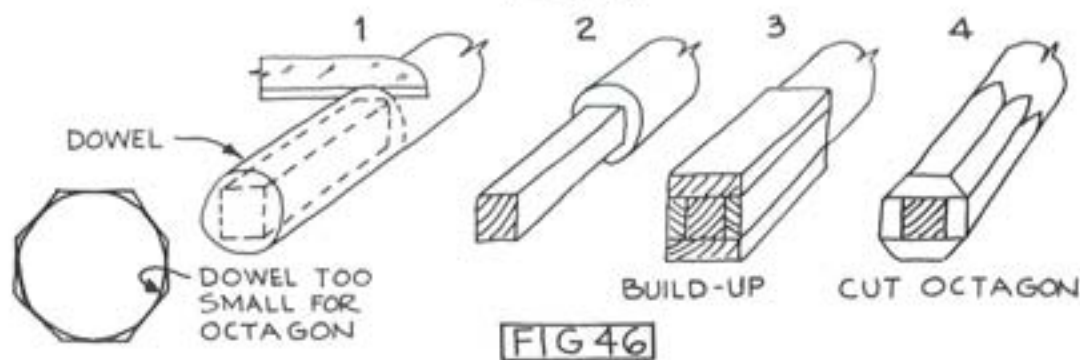
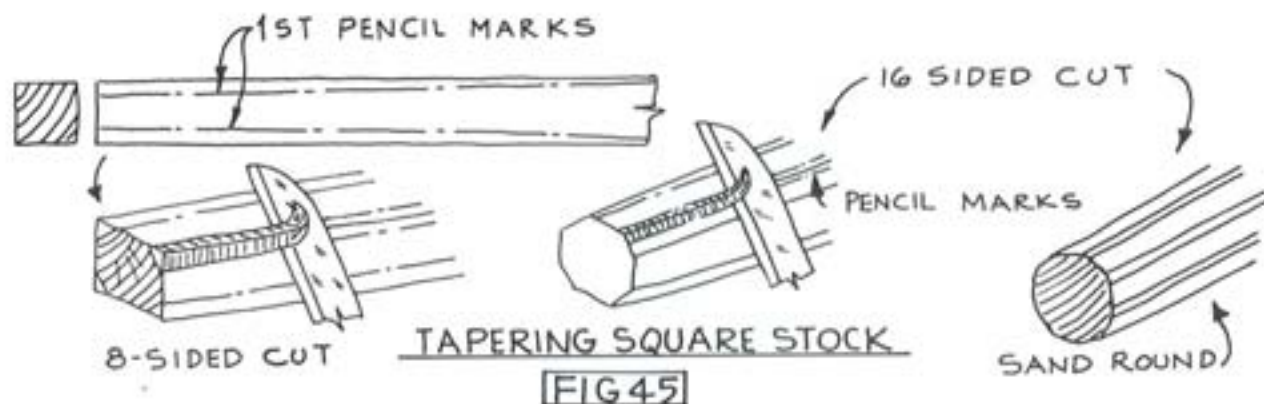
TAPERING DOWELS

FIG 44

The tapered round mast can be used for the entire mast if desired, but for precise detailing the lower end should be octagon-shaped per the plan. If you start with a square stick, there is no problem, but by using a dowel, the dowel diameter may be smaller than the required distance across the points of the octagon. If this is so, the lower portion of the mast must first be built up, then shaped. See Figure 46.

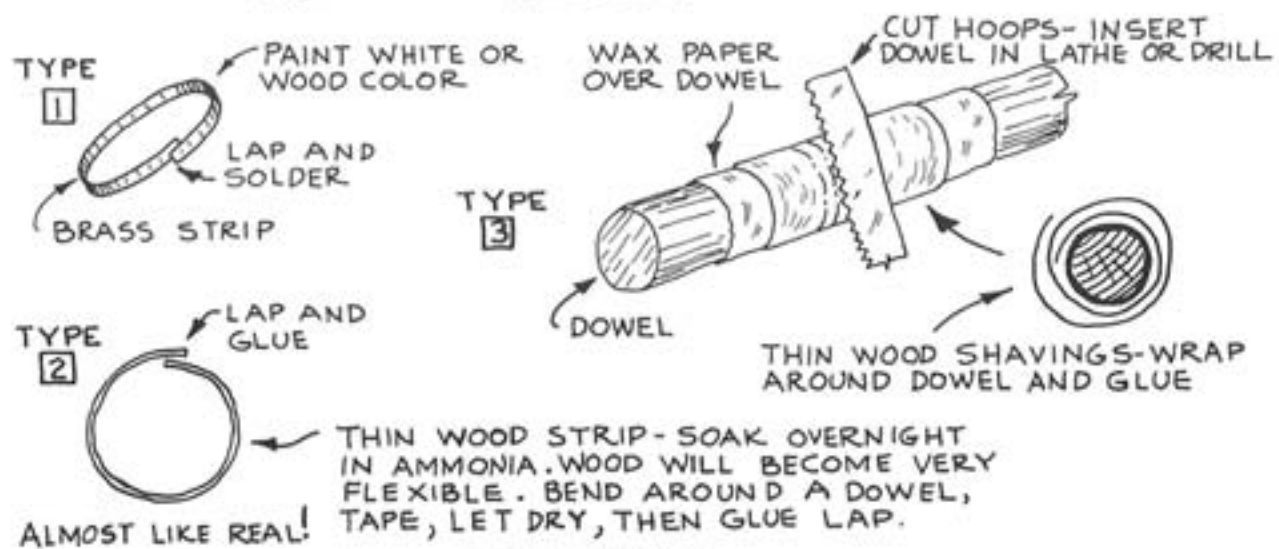
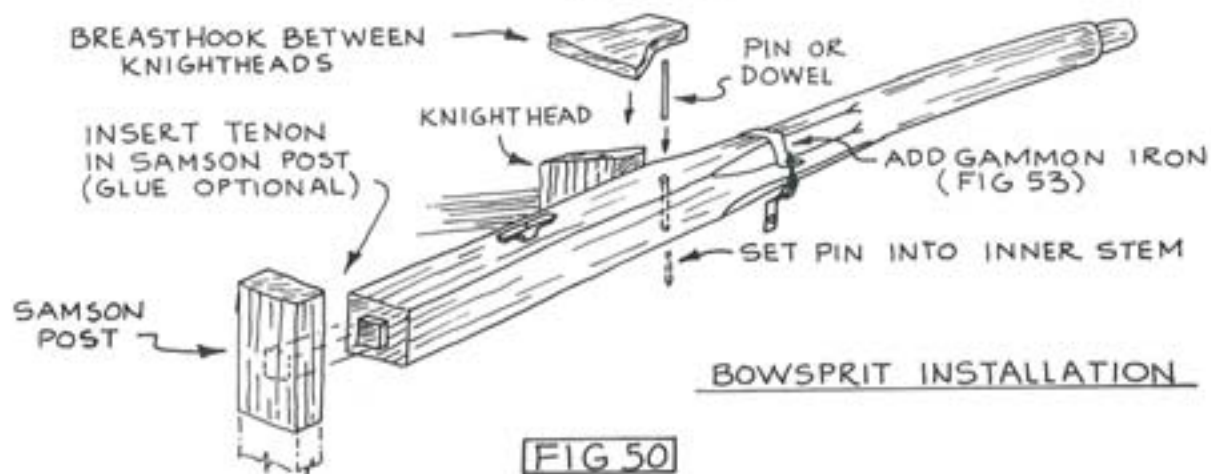
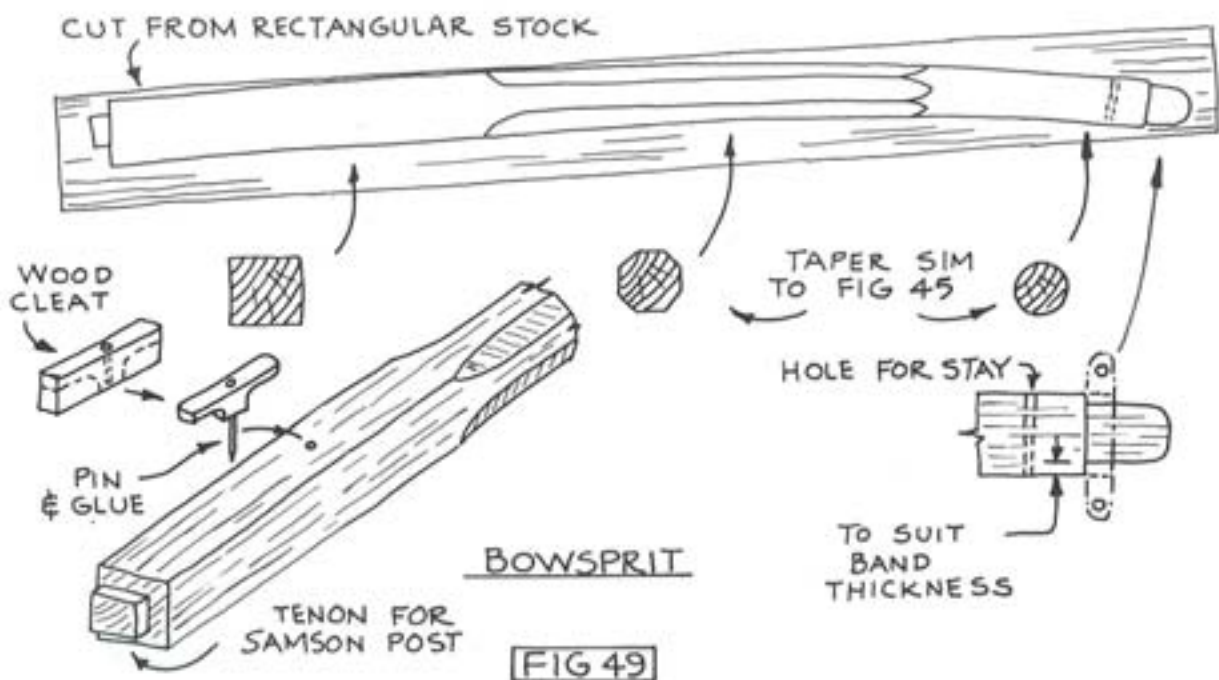
Mast wedges and boom rest — Install permanently to the mast. The wedges are faked on the model. See Figure 47.

Boom jaws — Make the jaws as shown in Figure 48.



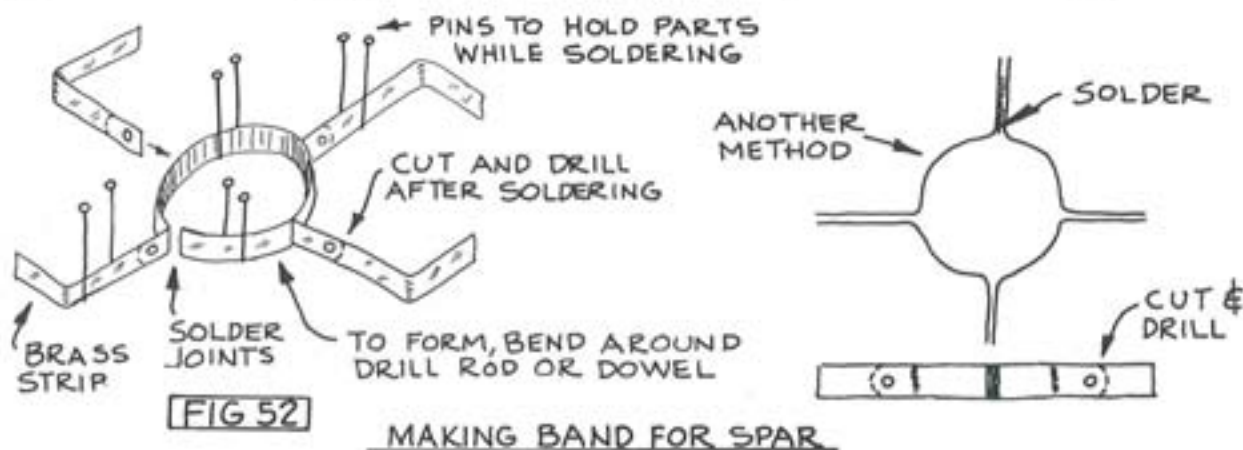
Bowsprit — Figure 49. The bowsprit is cut from rectangular stock so it should be easy to taper. The round outer end can be tapered by first cutting to 16 sides and sanding round. Use a sanding block on the square and 8-sided shape to avoid rounding the edges.

Install the bowsprit and samson post as shown in Figure 50. Suggest adding the windless beforehand.



Ironwork — It is suggested that white booms, bowsprit, and mast ends be given an undercoat and sanded prior to installation of the ironwork (ironwork discussed in next chapter). The ironwork gets in the way while sanding. Install the ironwork and then apply the final color. After the basic work is done, you can add the blocks.

Stepping the mast — Insert in the hole in the deck and into the mortise in the keelson but do not glue the mast in place. You may want to remove it at some later time. The mast will be held in place by the rigging. Before the mast is rigged, add the mast hoops (Figure 51). Too late after the rigging is installed!



IRONWORK AND BLOCKS

Some fittings for the model, such as mast, boom and bowsprit bands, and the oyster dredges, must be made from brass wire and strips. Hence, a certain amount of metal working and soldering will be required. Brass can be cut with a small pair of tin snips or heavy scissors. After cutting, all edges should be smoothed with needle files and fine wet- or-dry sandpaper.

Drilling holes in brass can be done using small drills and a pin vise but the process is slow. A Dremel Moto-Tool mounted on a Dremel drill press is ideal. This tool is worth the cost. Use a small center punch to start: otherwise these small drills tend to wander. Lubricate with a light oil and **drill very slowly** to avoid drill breakage & burning. When using the Dremel, clamp the pieces in place or hold down with a stick of wood, not your fingers — **HOT!**

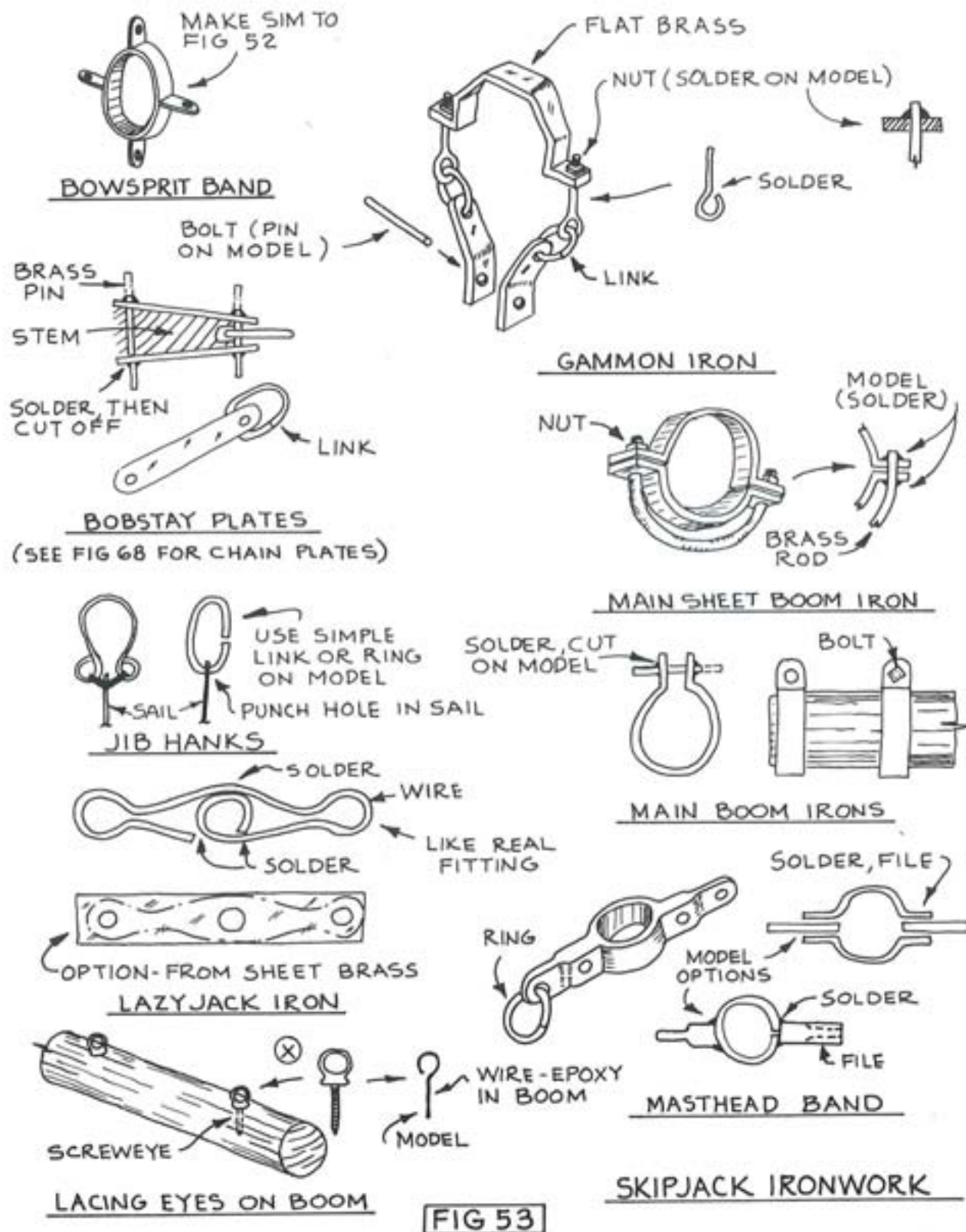
Soft Soldering — Keep all brass parts clean. Use a solvent, lightly sand, or both. Keep your fingers off to avoid grease spots. Soldering is easy if care is taken to set up properly, using jigs or other holding devices so the parts do not move around. Soldering can be done with small torch or pencil soldering iron. First, add just enough flux to the joint to do the job. The solder will flow where the flux is applied. Next, heat the joint, then apply the solder. The larger the parts, the longer it will take to heat the brass before the solder will flow. If you get too much solder on the joint, file it off with needle files, shave or peck off with an X-Acto blade, then briefly reheat for smooth solder.

Carefully bathe or wipe soldered parts with a damp cloth to remove all remaining flux and chemical.

Silver Solder — Not really necessary for the skipjack but if extra strength is desired, silver solder can be used. A propane torch is a must as the melting point of silver solder is much higher.

Clean the metal and apply the flux. (Liquid silver solder flux is better than the borax type.) Cut a very small piece of solder and lay it next to the joint. This is necessary because, unlike soft solder, silver solder will not break away from the coil. It tends to ball up on the end. Heat both the joint and solder at the same time. When the correct temperature is reached, the solder will jump into the joint. Be careful to remove the heat as soon as possible. The brass is also near its melting point.

Figure 52 illustrates how to make a typical band.



The skipjack ironwork is interesting and fun to make. Figure 53 illustrates the iron fittings that are required. Notice the eyebolts, X, atop the main boom for securing sail. Drill a small hole and use 5-minute epoxy. Wipe off the excess.

The skipjack's ironwork is fairly well standardized in general appearance but does vary slightly, boat to boat. Most typical are the mast head band, lazy jack iron, and bowsprit gammon irons. The lazy jack iron comes in a variety of shapes but it consists essentially of three eyes, the center eye around the head stay and the outer eyes holding the lazy jacks up and apart.

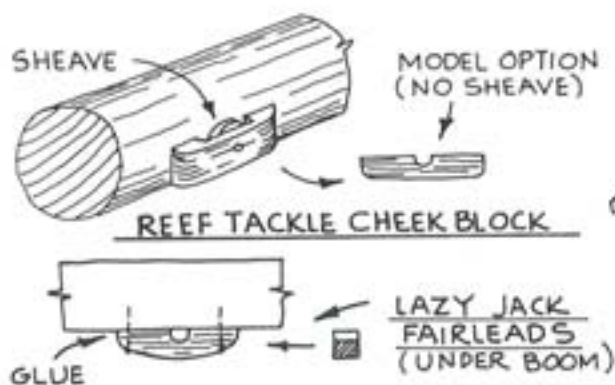


FIG 54

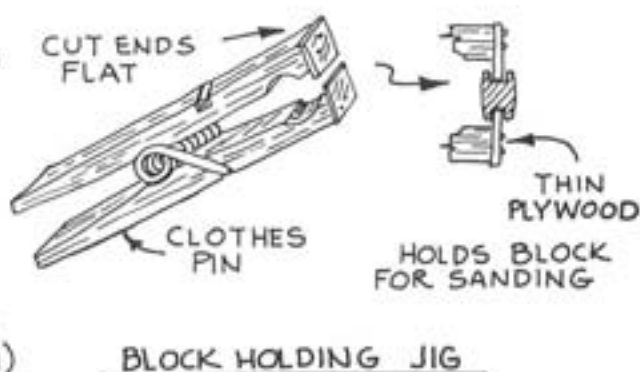


FIG 55

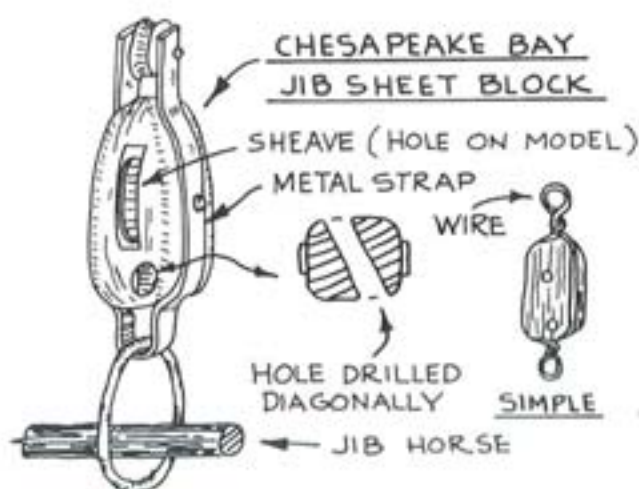


FIG 56

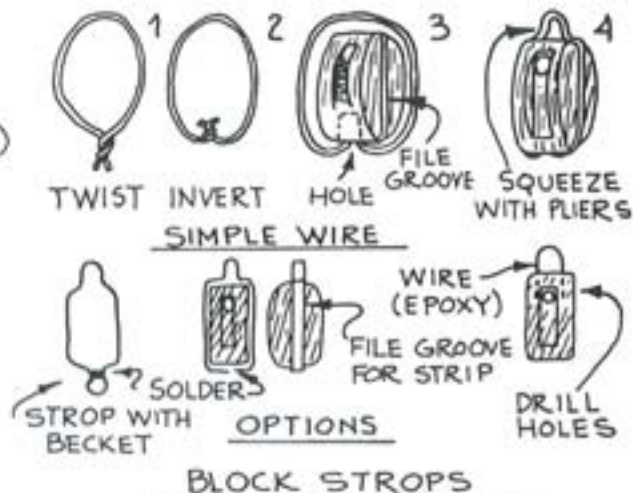


FIG 57

Cheek blocks and fairleads — See Figure 54 for the main boom reef tackle cheek blocks and lazy jack fairleads.

Blocks — The plans show all blocks and sizes required for the model. Using the conversion tables on the plans, you can determine the proper model size to use.

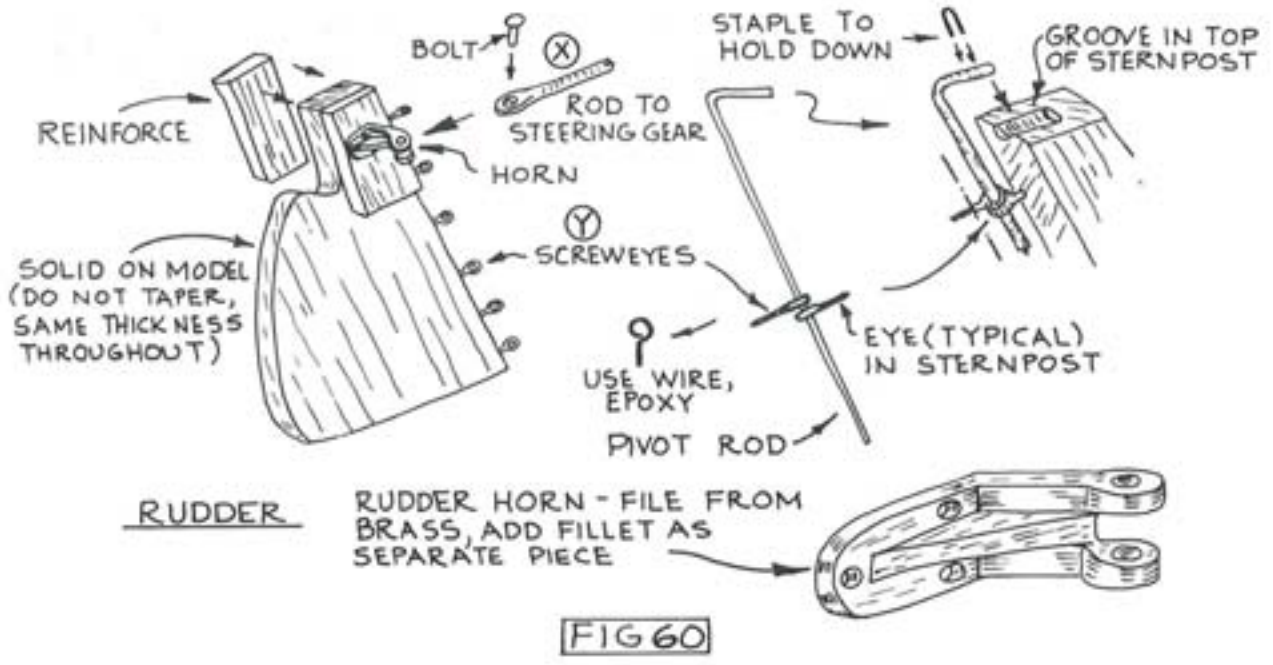
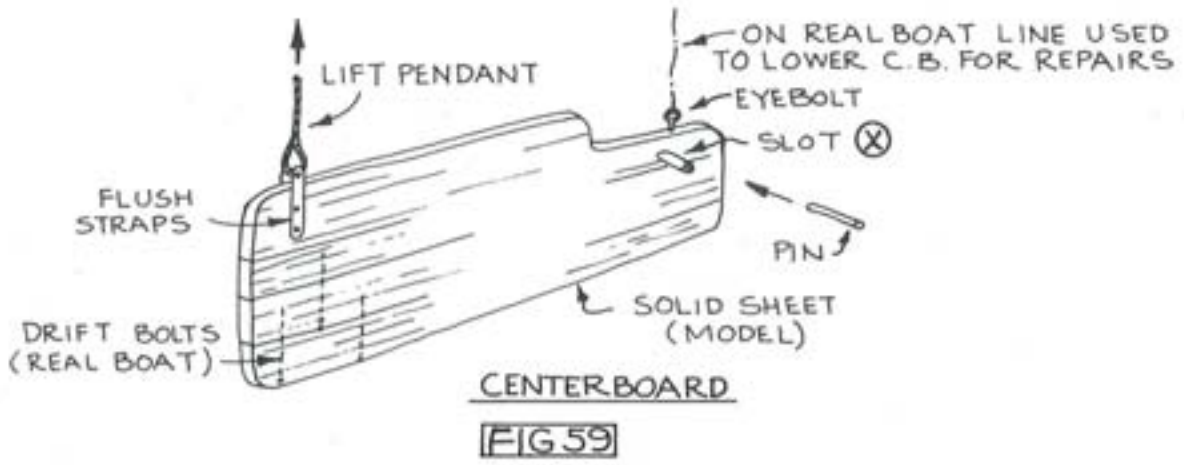
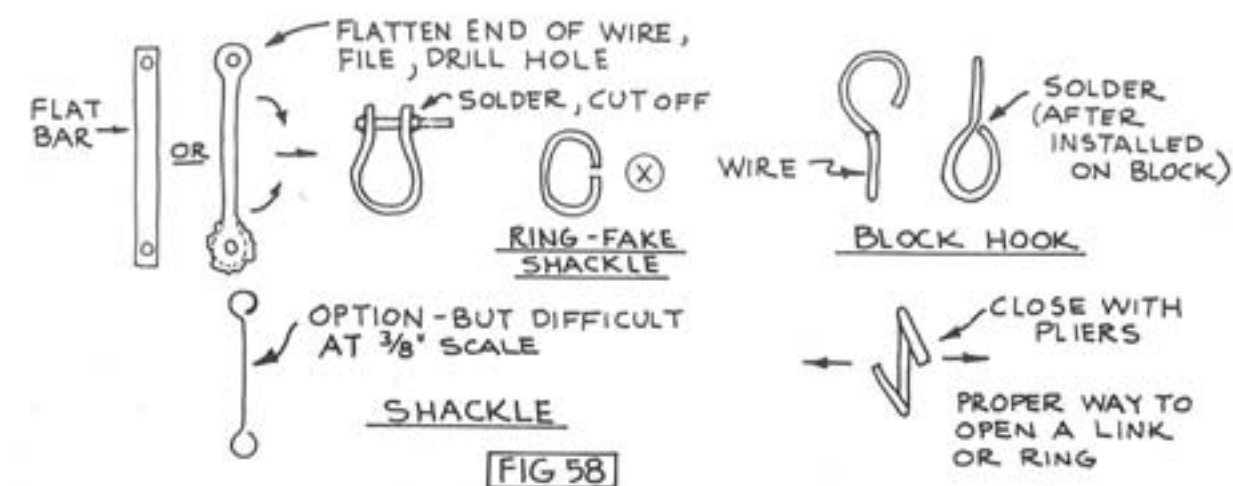
Commercial blocks need to be sanded and the holes reamed larger so it is easy to reeve lines. Make a jig as shown in Figure 55; an indispensable tool for holding small blocks. Notice the jib sheet traveller block, Figure 56, a Chesapeake Bay specialty.

Stropping blocks like the real thing is difficult at small scales. Figure 57 shows some ways. Paint (or stain) all blocks when completed.

Attaching blocks — See Figure 58. The simple link, X, is a good substitute for a shackle. The link should be soldered after installation to prevent it from coming loose.

CENTERBOARD, RUDDER, DECK EQUIPMENT, AND PUSH BOAT

Centerboard — The full size craft centerboard is made up from oak planks. For the model, cut from 1/16-inch sheet stock. Figure 59 shows the centerboard. Notice the long slot forward, X. The slot is

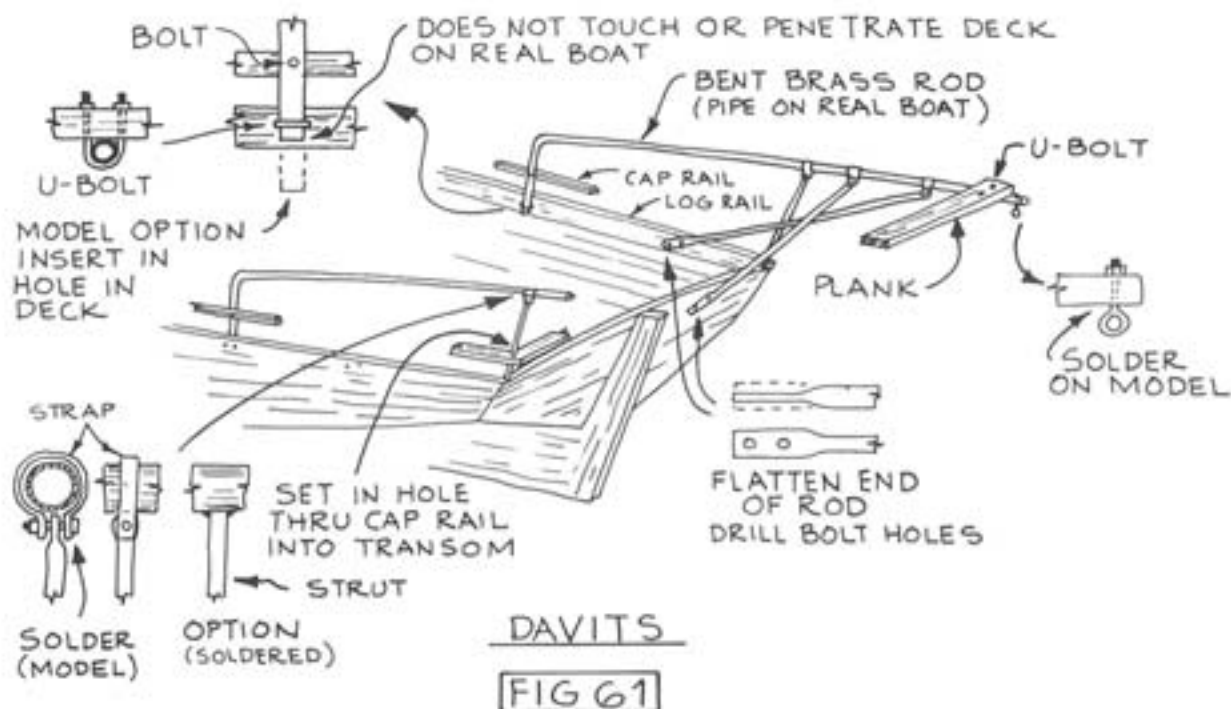


used instead of a round hole so if the skipjack runs aground the centerboard will lift above the keel line to prevent damage to the centerboard. For the model, you can use a round hole if desired.

Rudder — The rudder is shown in Figure 60. Iron rods, X, lead to the steering mechanism. On the model, fix the rods into the wheel box or allow them to slide freely so you can move the rubber.

In lieu of the screweyes, Y, which form the rudder hinge (correct for this boat), many skipjacks use a strap or a combination of both.

Push boat and davits — See Figure 61 for davit construction.



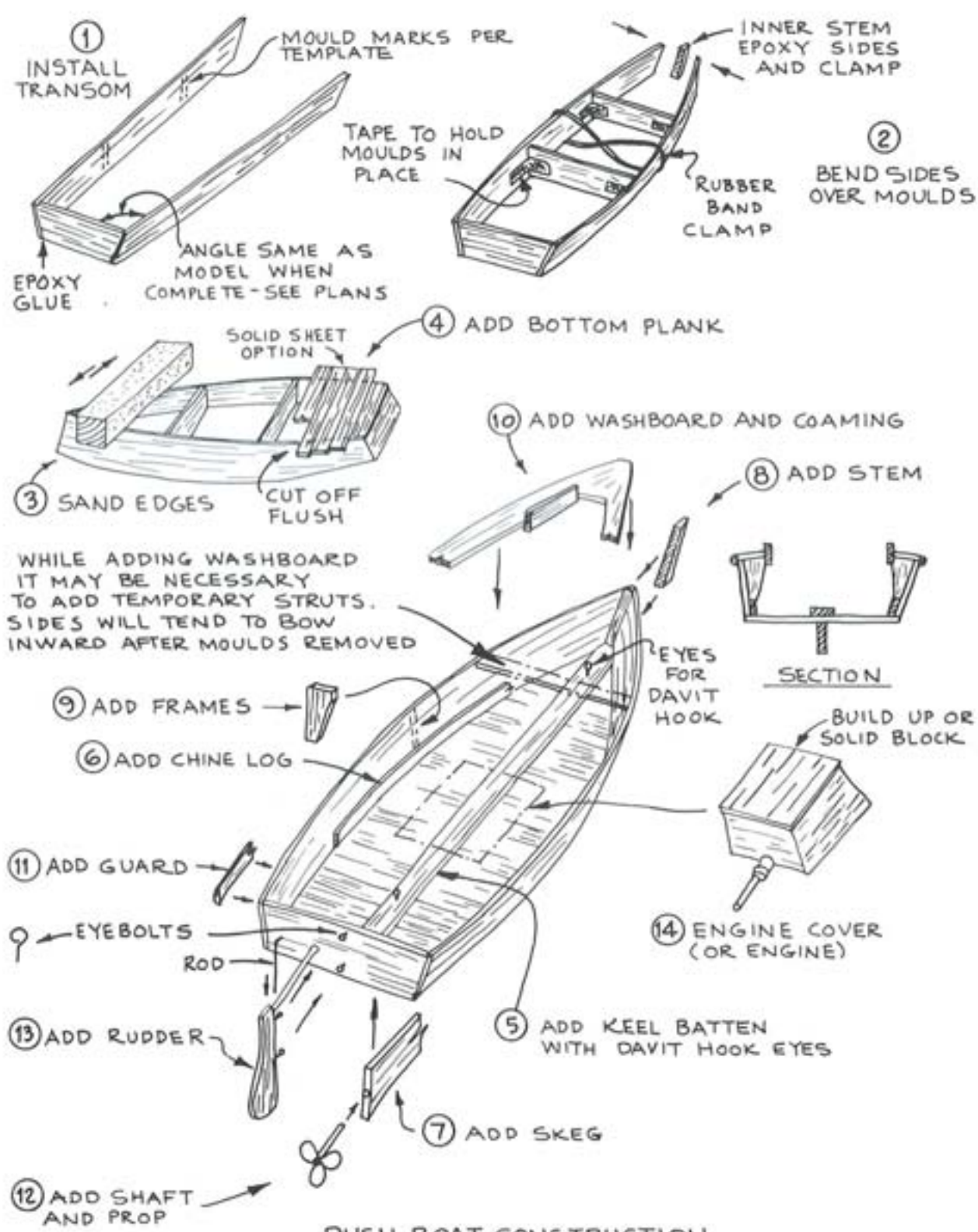
The boat davits have evolved from a patented device. The davits were originally developed as a part of a square platform which was designed for the sharp-ended bug-eye stern. The inventor was J.E. Robbins, who patented the idea in 1908. While the shape and number of supports vary, the davits are fairly typical on all skipjacks which carry a push boat across the stern.

The push boat can be constructed using a simpler approach than used for the skipjack. The flat bottom boat eliminates the problem with rabbets and tricky bevels and also permits the installation of the keelson after the bottom plank is added rather than before. There is no need to build the hull over moulds on a building board. The model can be assembled in hand and aligned by eye. See Figure 62 for the process.

The template plan provides templates for the push boat sides, two moulds and the transom. First, cut these parts to the templates. Use 1/32-inch material for the sides and moulds. Glue the transom to the sides first — see step 1. When thoroughly dry, bend the sides around the moulds. Locate the moulds indicated by the dotted lines on the template. Tape (do not glue) the moulds to the sides with masking tape so they will not fall out. Use a rubber band around the sides as shown in the sketch, then clamp and glue the inner stem in place. When dry, sand the chine edges flat all at once with a sanding block.

Add the bottom plank. If desired, you can use larger pieces or one solid sheet for the bottom. Remove the moulds, then add the keel batten (including the davit hook eyes) and chine logs, followed by the skag and outer stem.

Add the side frames, then the washboard and coaming. (Before installing the washboard, re-check



PUSH BOAT CONSTRUCTION
FIG 62

the beam at the sheer and brace with short pieces if necessary. The sides probably will bow inward when the moulds are removed.)

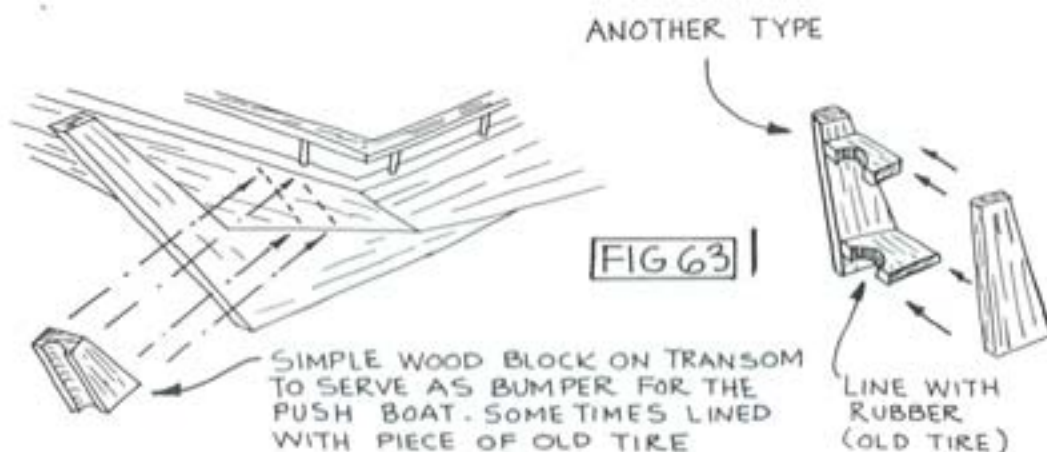
Complete the model by installing the guards, the shaft and propeller, rudder, and engine cover.

You can prime the parts as you go along. It is easier to sand the inside if primed prior to adding the washboards.

Mark the waterline in the same manner described for the skipjack.

Options — If you want to cheat a little, you could avoid making a push boat by purchasing a pre-made hobby shop boat. Try to find something between 10- and 13-feet (3¼ to 5 inches); typical range of sizes. It can be flat, Vee, or round bottom type. Skipjacks carried all sorts of boats so the shape is not sacred. Push boats today carry very large engines, not a very good boat in its own right because of the large engine required to push the skipjack. Also, the lower davit blocks are permanently fixed to strongbacks in the pushboat so the tackle is always attached. The boats are used only to push, nothing else.

A reinforcing block, or bumper, is required where the push boat pushes against the skipjack's transom; see Figure 63.



Many skipjacks today have the push boat remote-controlled so the Captain can operate it from skipjack. A small control box is fixed on the side of the steering wheel box.

Power winders — The power winder, illustrated in Figure 64, was manufactured by the Hettinger Engine Company, Bridgeton, N.J. as early as 1900. They are still used today. The only notable modification is that the drive shaft, X, has been removed where shown and welded in various other locations around the drum gear to accommodate various types of engines.

Early photographs show that a gypsy head, Y, was fitted on each of the drum shafts probably intended to hoist the mainsail. Today, these gypsies are not used (or even found on the winder) probably because the speed is too fast.

From the plans it is impossible to determine exactly how the dredge winder is used so a little explanation is in order. As shown on the plans, there is a clutch but no brake. The drum is free-wheeling to let out the dredge line. When the clutch handle is pulled it forces the clutch plate onto the end of the drum, so by friction the drum rotates. The big question — what holds the dredge line stationary during dredge? The answer is a "becket". There are two types. The first, most simple, and "fail-safe" is a short piece of rope. The dredge line is let out, drum rotating freely. The clutch is activated to drag so the drum

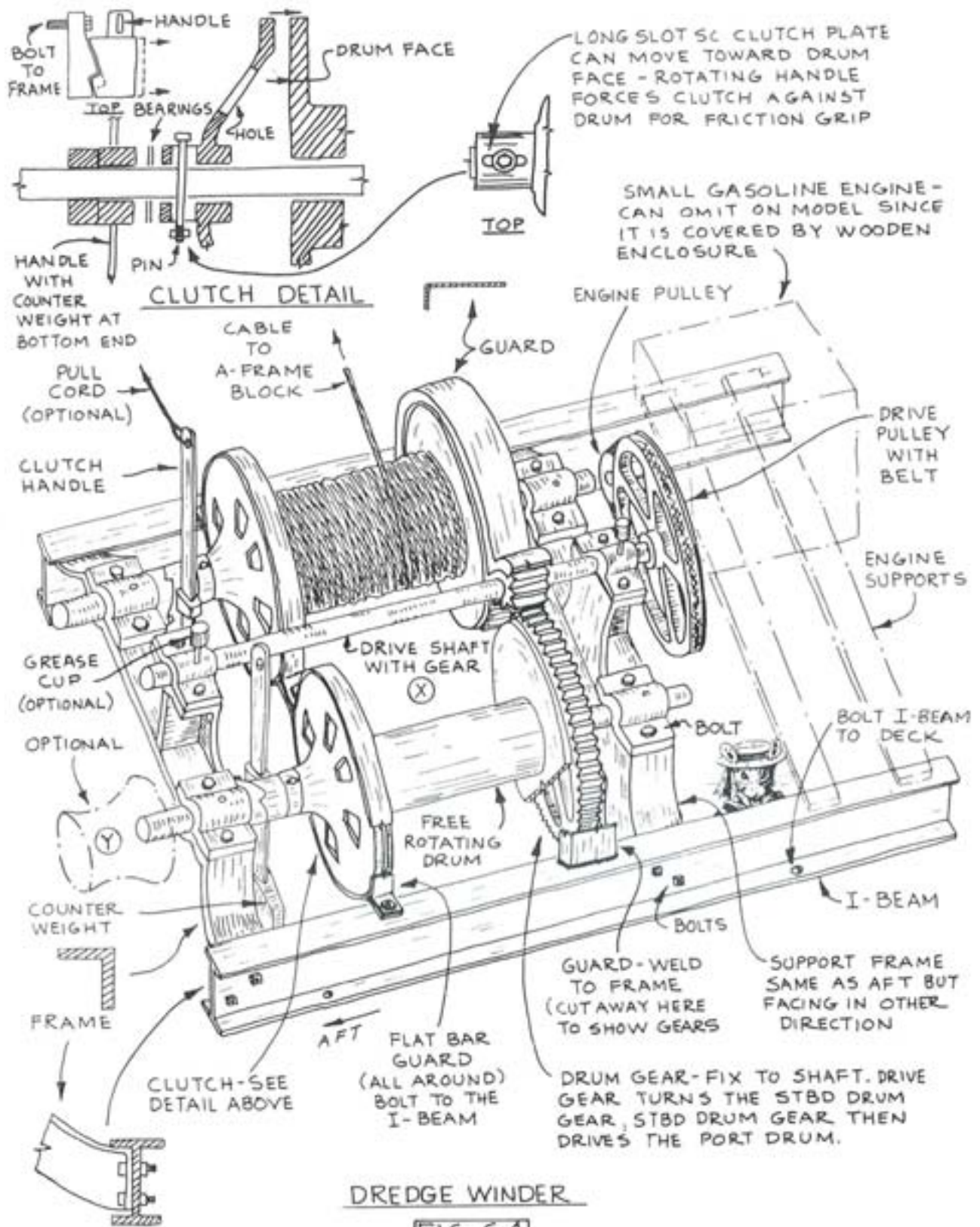


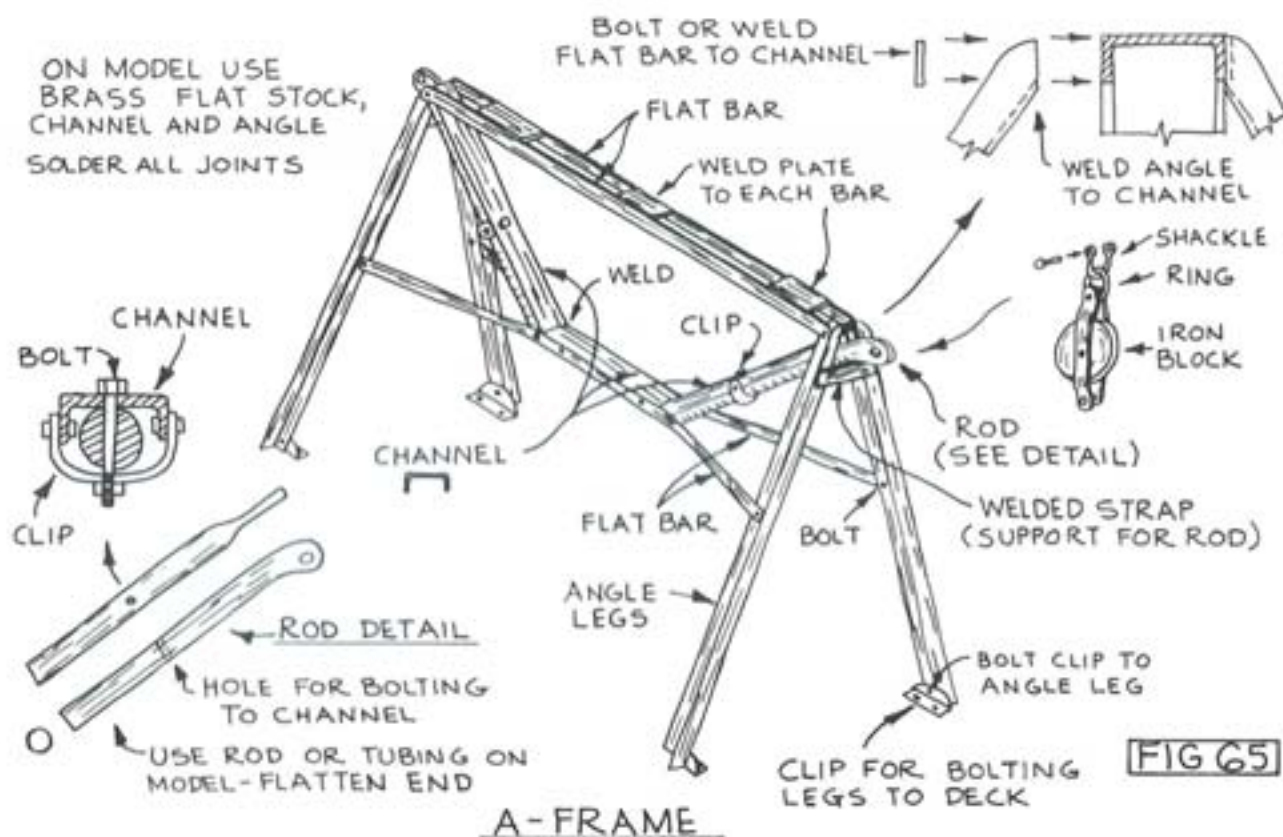
FIG 64

stops. The end of the becket rope is laid under the wire rope at the drum. The clutch is put hard on and the wire rope wound up slightly. The wire rope thus is securely holding the end of the becket. The drum is stopped again and the other end of the rope tied around the wire rope. The clutch is backed off; now the wire rope cannot unwind further and the dredging begins. (Method would never pass Navy safety standards.)

Sometimes a chain becket is used. This is a short chain with a ring in one end a hook on the other. The chain is passed around the drum. The hook end is passed through the ring which secures the becket to the drum, then the hook is hooked over the wire rope preventing it from unwinding.

The chain becket is never used on a rocky bottom. If the dredge snagged it would pull the winder off the boat. The rope becket is better and generally used since if a snag occurred, the rope would break before the winder or wire rope was damaged.

The winder shown on the plans is the most typical and earliest Hettinger winder. Another Hettinger type is very similar but has the clutch handle on the outside of the frame. A photograph of this type is shown in Robert Burgess' book, Chesapeake Sailing Craft (see Bibliography). This type probably came about when gypsy heads were omitted from the drum shafts.

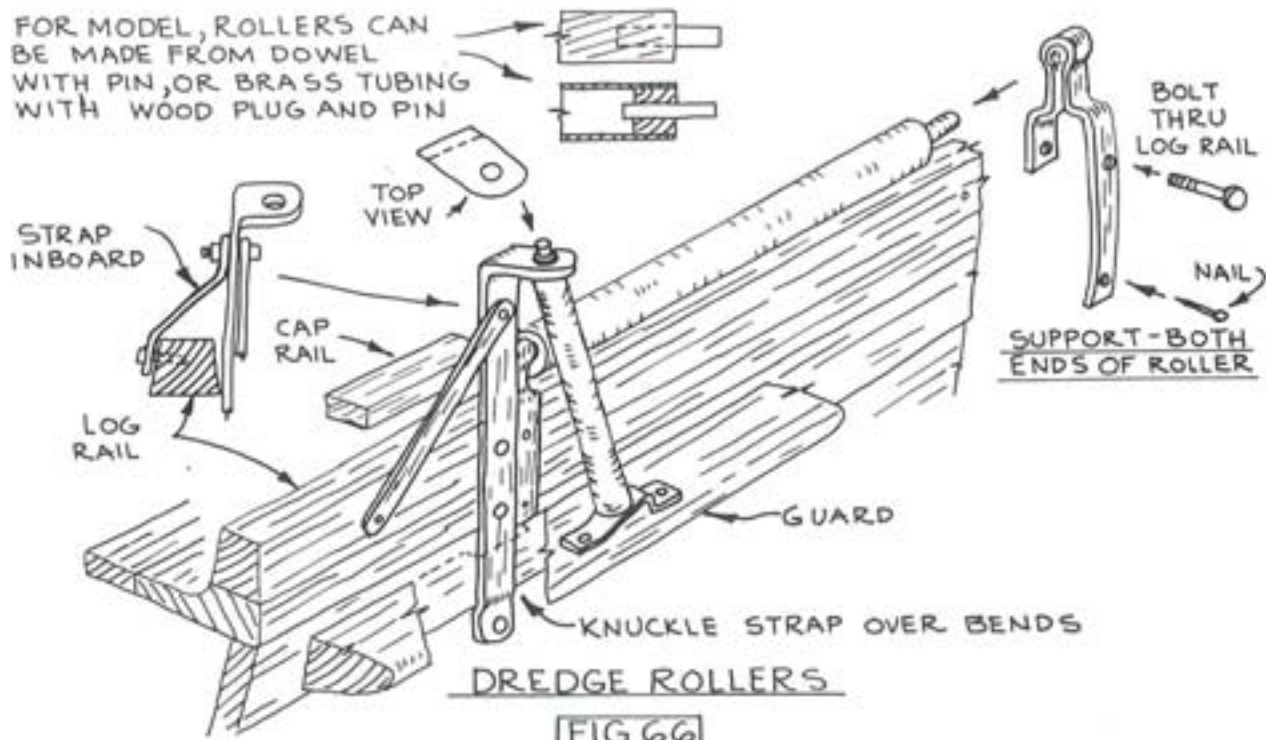


Yet another type of Hettinger winder is a smaller size (16- x 13-inch diameter drum) winder, same configuration, used on 30 to 35-foot skipjacks.

The A-frame, Figure 65, which holds the large metal lead blocks for the dredge line is another patent (1907) by inventor Capt. William C. Todd. A-frames today come in all sizes and shapes but the function is the same. The Todd frame design is still found on existing boats.

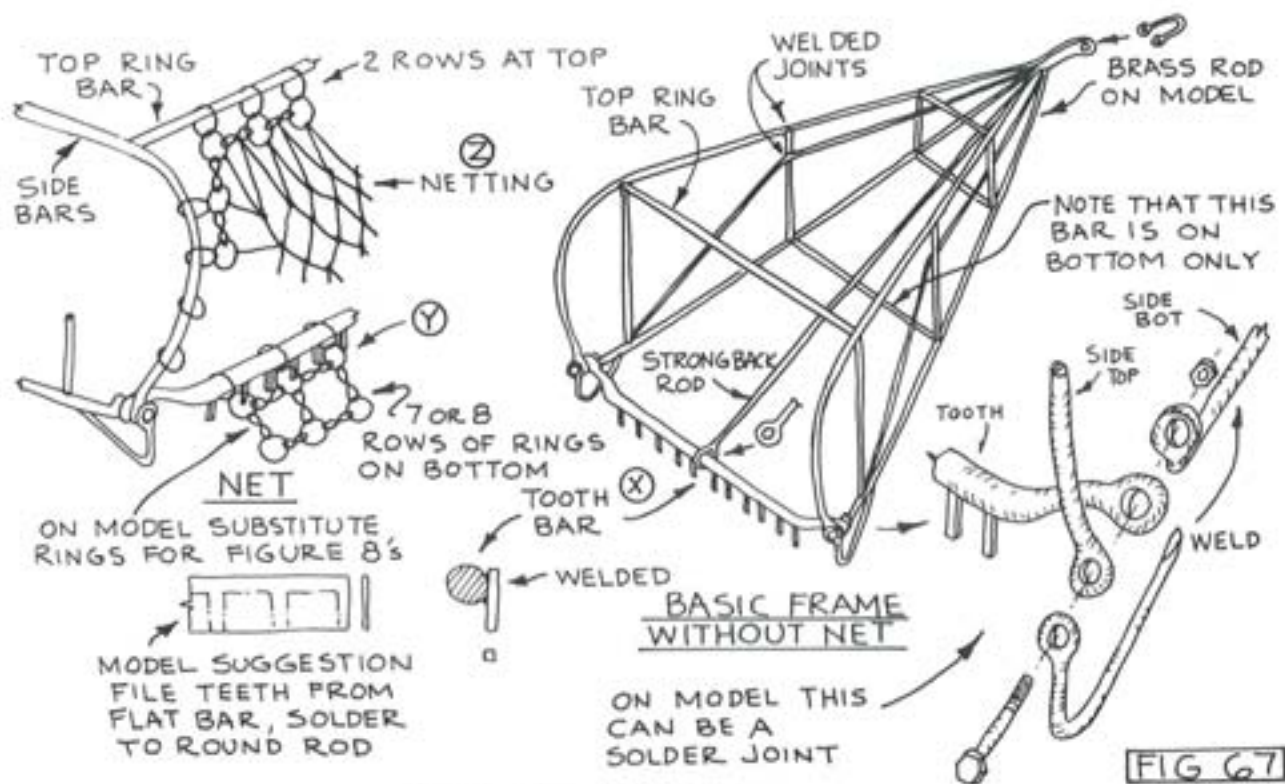
Dredge rollers — See Figure 66. After the power winder was introduced, the rollers became a necessity to prevent rail chafe.

FOR MODEL, ROLLERS CAN BE MADE FROM DOWEL WITH PIN, OR BRASS TUBING WITH WOOD PLUG AND PIN



DREDGE ROLLERS

FIG 66



OYSTER DREDGE

FIG 67

Dredges — Skipjacks carry at least two dredges and usually more. See Figure 67. Two sizes are used; the law restricts the width of the tooth bar, X, to 42 inches for rock bottoms and 44 inches for mud bottoms, weight not to exceed 400 pounds.

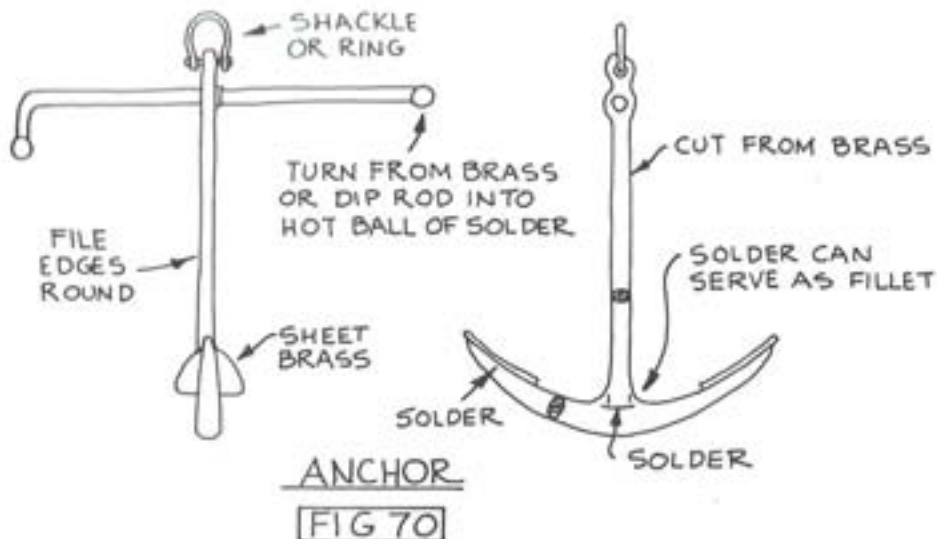
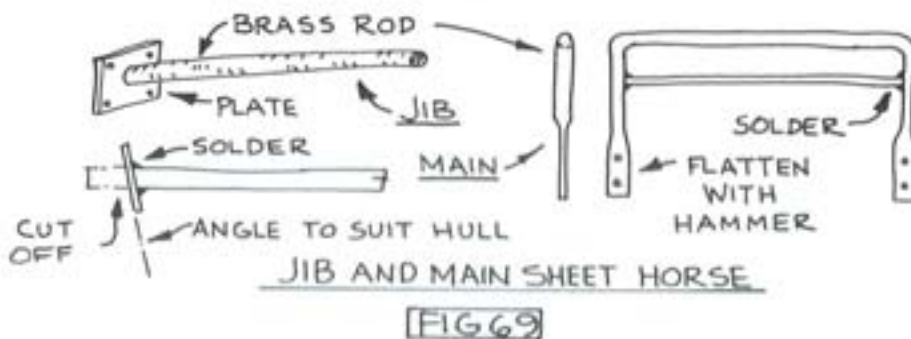
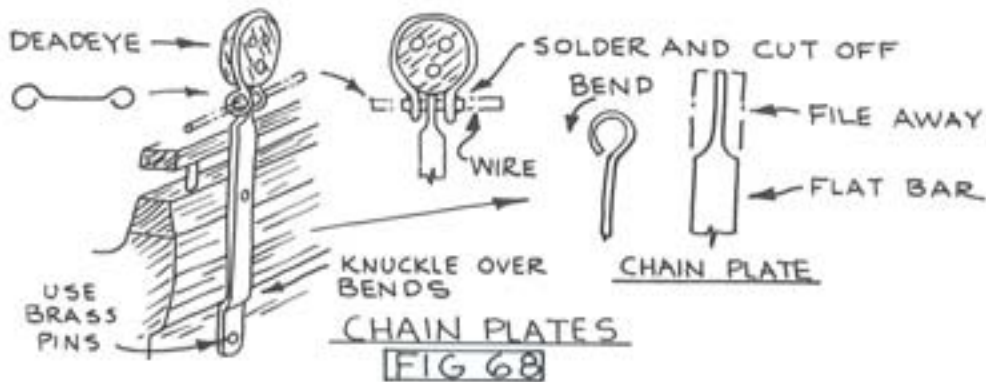
Making the dredges from brass rod is not difficult if you set up a jig first. Try to secure all parts from

moving. The problem comes when you heat one joint for soldering and a joint you have already soldered comes loose. Use heat sinks as needed.

Notice the set of iron rings and figure eights, Y, attached to the dredge. These rings take the beating on the oyster beds. The net, Z, in between can be made by using thread and making it like the real thing, or visit a florist and obtain some mesh netting for flower corsages. Another method is to use twisted fine wire to fake a rope mesh. Paint rope color.

Fit the winder drums with linen or cotton line to represent the wire rope. Reeve over the blocks on the A-frame and onto the dredges. For stowage, the dredges usually lie on the deck with the end resting on the winder drums, or they sit anywhere on the deck.

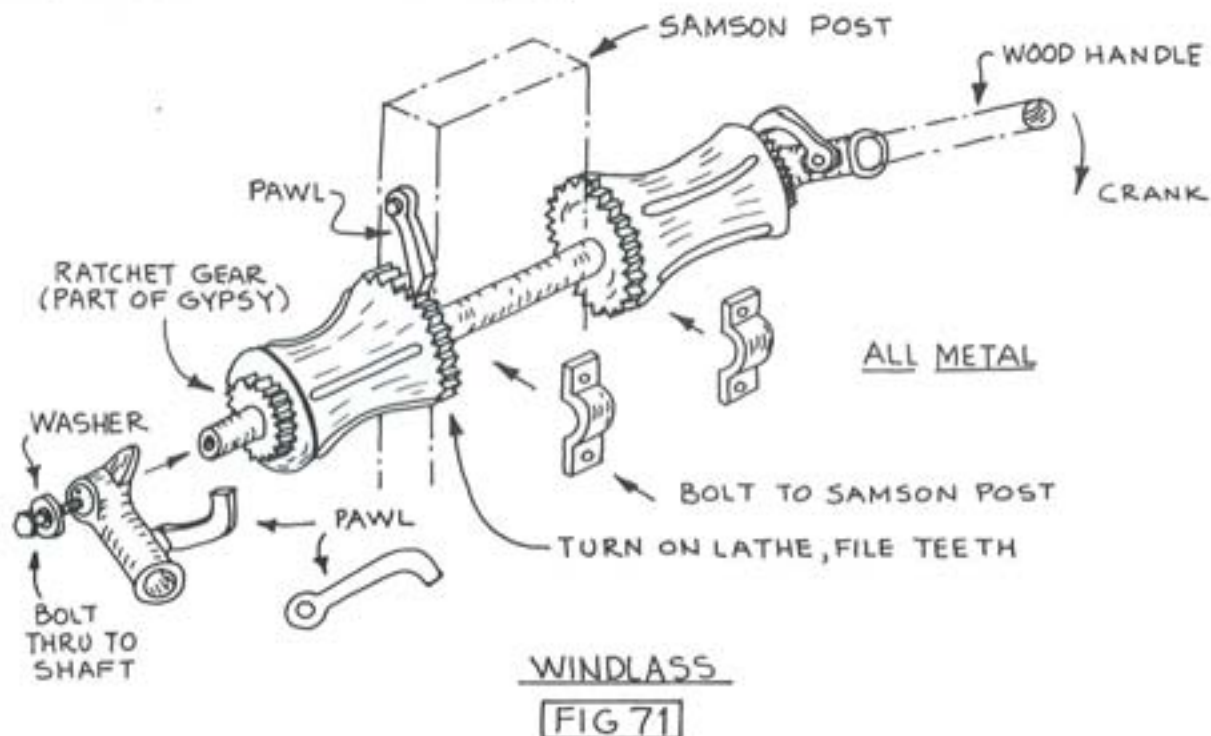
Chain plates and deadeyes — Make the plates from brass wire and strip and install as shown in Figure 68.



Jib sheet and main sheet horse — Figure 69. Make from brass rod and sheet as shown. Epoxy in place or use pins.

Anchor — Only one anchor is necessary, although some skipjacks carry two. Figure 70. Anchors were generally secured to the port cap rail but while working they were often hung from a hook or through a ring at the outer end of the bowsprit with the bottom of the anchor pulled up slightly with a line so it did not drag in the water. See the plans. This method is for quick release of the anchor.

Windlass — See Figure 71. The windlass shown is a typical early type. Another similar type has the cranking ratchet on the inner end of the gypsy head. For very large boats the windlass may have a double crank forward of the windlass on the bowsprit, similar to an old schooner windlass.



Ice sheathing — Skipjacks have metal sheet attached to the hull about one foot below to one foot above the waterline to protect the hull from light ice damage (see plans). This sheathing can be omitted on the model. The sheathing is painted along with the hull.

SAILS

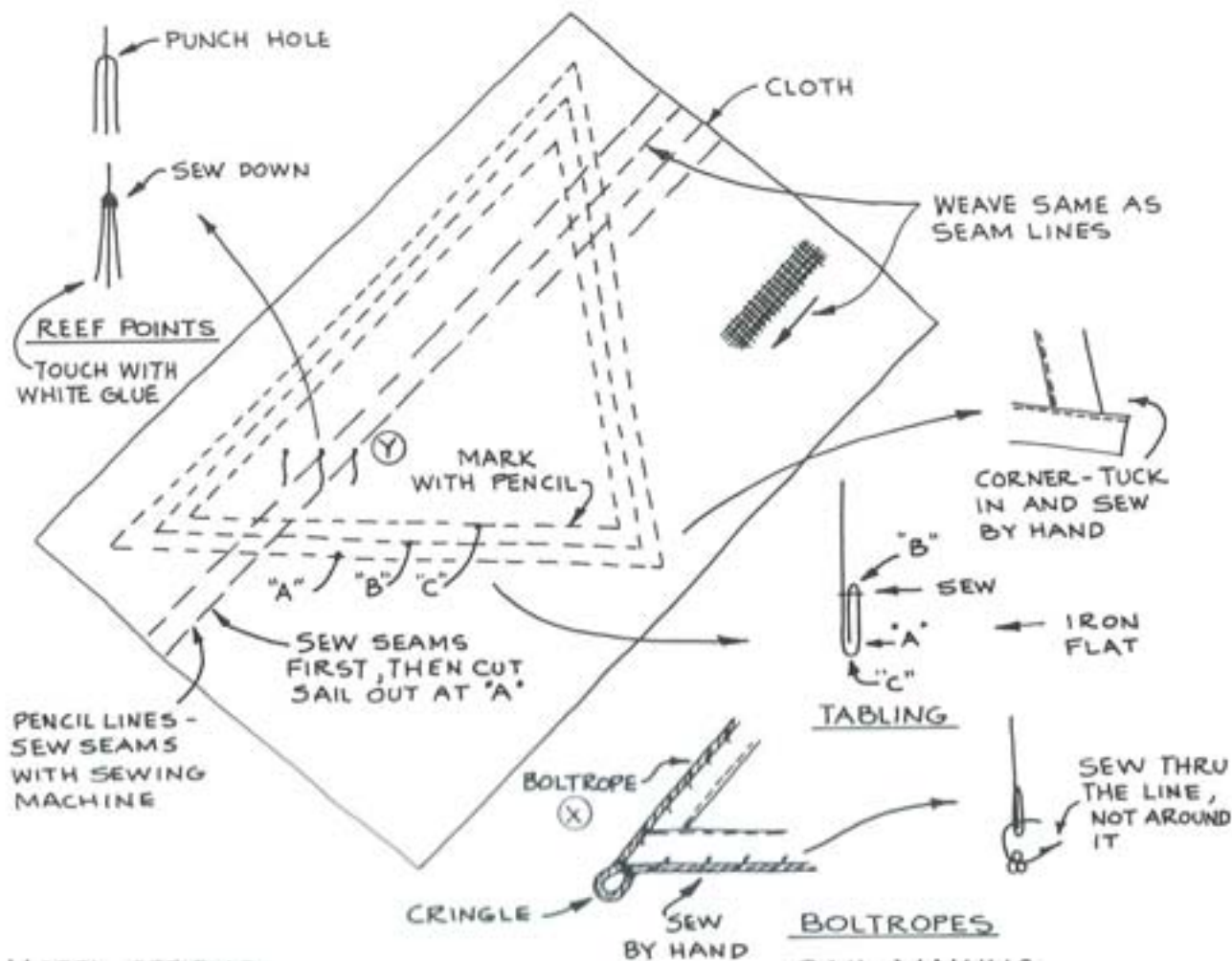
Sails on square rigger models can sometimes be overbearing, but for the WILLIE L. BENNETT and similar small craft, sails add that final professional touch. The sails are relatively easy to make and the large scale of the model helps to control over-scale of available sail material. The skipjack is a very beautiful craft and the leg-of-mutton mainsail helps define the rig which is so well known on the Chesapeake Bay.

Sailmaking should be developed along with other modeling techniques. Sewing machine work should not be thought of as a foreign process, limited to the 'sewing circle'. If you are still not inclined to jump into this new thing, at least have someone else make the sails.

Sailmaking — See Figure 72. The seams which join the individual cloths would normally be a double stitch on a real sail but a single stitch will suffice on the model. The seams can be sewn with a sewing machine using a light tan cotton thread so the seams show up nicely. Make some trial passes on a piece of scrap cloth and set the number of stitches per inch so it does not make puckers in the stitch line. The more stitches per inch, the more likely wrinkles will occur.

First, wash your cloth several times to pre-shrink and iron when dry. Draw the seams and tabling lines in light pencil and sew the seams. Iron (but careful not to burn) after the stitching is complete. Cut the sail out at line "A" as shown in the sketch. Next, roll the tabling per sketch, iron flat and sew (as close to "B" as possible). Tuck the ends and hand sew the corners as shown.

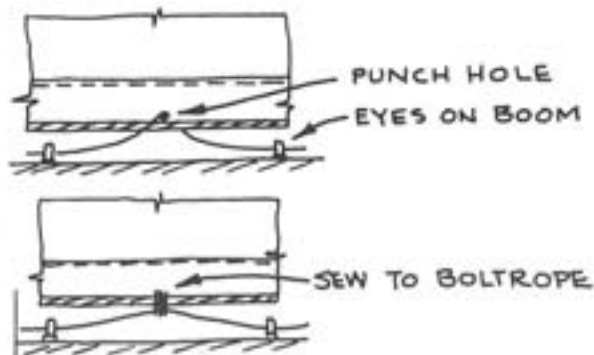
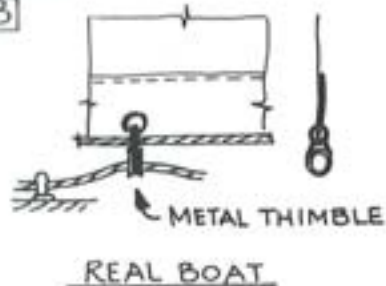
Cover the rigging plan with a plastic sheet and lay on a soft wooden board or cork. Now wash the entire sail again. While still wet, pin the sail to the plan. The sail will dry to the proper shape. This step assures that the sail shape is correct since it may have been altered during sewing. Iron when dry.



MODEL OPTIONS

SAIL THIMBLES

FIG 73

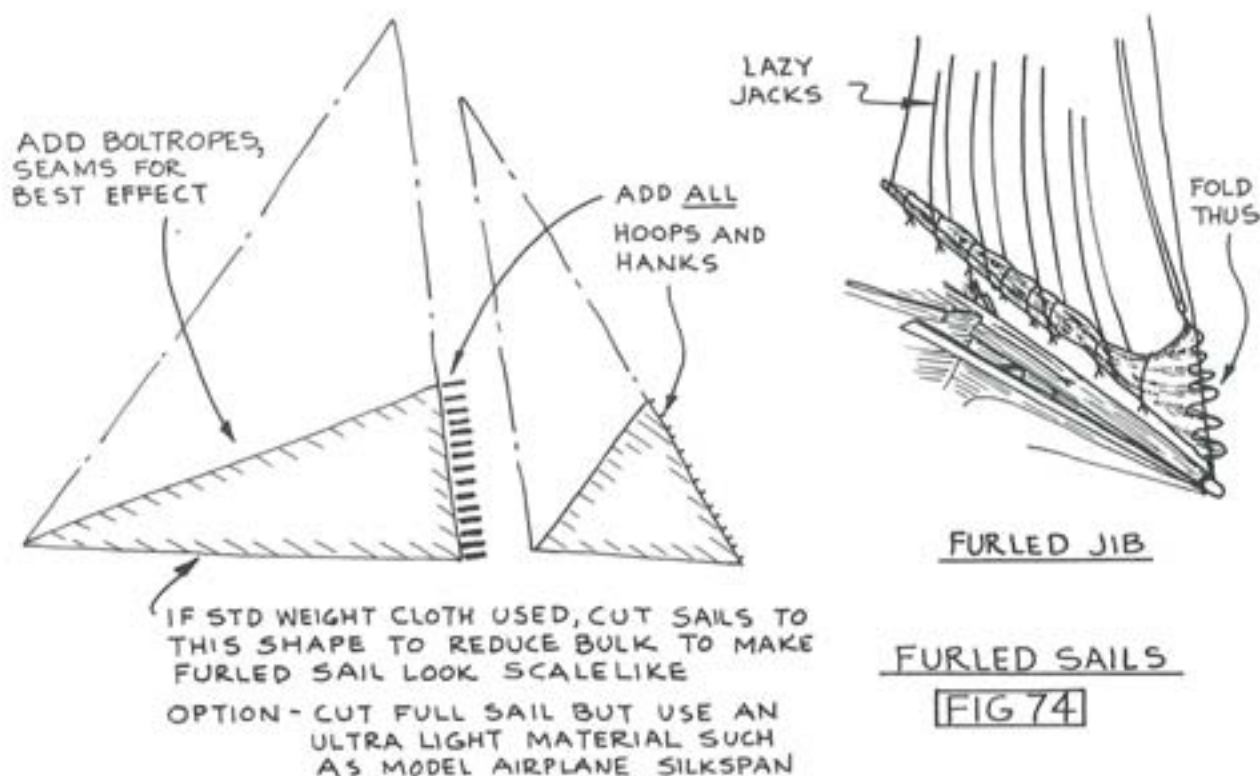


Just for the record, sails were once cotton canvas but today are dacron.

Add the boltrope, X, and reef points, Y, as shown in the sketch. Re-iron if necessary. Boltropes could be omitted if too tedious to sew on, or glue it to the edge.

The thimbles on the sail for lacing are quite small at $\frac{3}{8}$ -inch scale. They can be faked as shown in Figure 73.

Furled sails — Not the ultimate but furled sails also look good on a skipjack because of the presence of the lazy jacks. See figure 74.



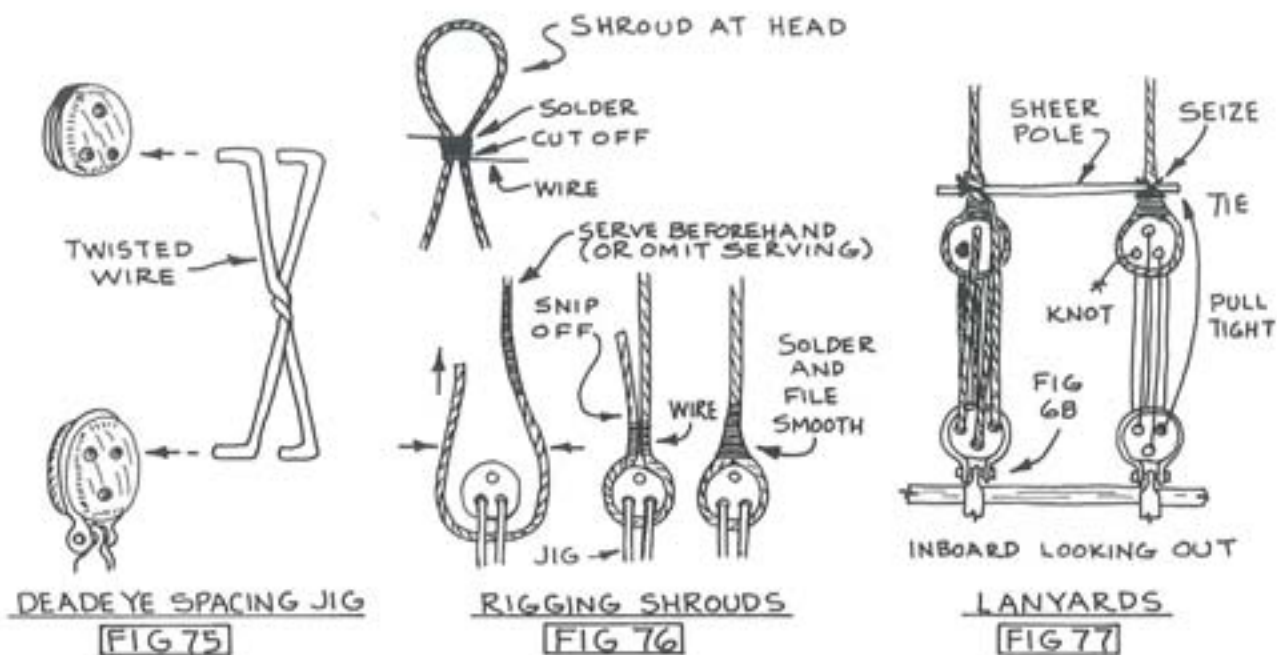
RIGGING

Some very early skipjacks had hemp standing rigging but the most typical rig is done with wire rope. For the model you could use regular linen or cotton as a substitute. Actually, while the scale is small, wire still will look best and more like the real thing. Linen or cotton has a certain amount of bulk, heavy twist or fuzz and therefore does not really fake wire as well. Twisted stainless steel wire which is sold in hobby stores for U-controlled model airplanes is excellent material. Several different sizes are available. The only drawback for modeling is the stiffness but it can be bent rather easily with pliers so it should not provide any substantial problems. Solid or stranded copper or brass wire is also suitable. All types require painting. (See Painting).

Standing rigging — The shrouds should be installed first; starboard then port. Be accurate with measurements. After rigging deadeyes it will be difficult to stretch the wire in place. Use a spacing jig between deadeyes as shown in Figure 75. Secure the shrouds at the head and at the deadeyes with fine brass wire and solder as shown in Figure 76. You can seize the eye of the shroud and then slip it over the mast but you may need to have the mast head band removed. The wire can be served like the real boat or omitted on the model. If you do serve, use very fine silk thread.

The lanyards are manila; linen or cotton on the model. Rig the deadeyes and install the sheer pole, per Figure 77. The sheer pole can also be served.

Rig the forestay and forestay chain pendant below the bowsprit next, followed by the bobstay, mast head stay and bowsprit shrouds. See Figure 78. Be careful not to stretch and pull the mast forward. You



could add a temporary line aft to prevent this. After the sails are installed the main sheet will pull everything up tight so do not worry that the forestay may slack a little.

When installing chain use a "long" connecting link, X, to help pull the chain tight. This is a sneaky but effective model technique. See Figure 79. Links can be used as fake shackles, and turnbuckles can be turned from brass rod. See Figure 80 for turnbuckle ideas.

Paint the wire standing rigging. Floquil is a good selection for wire rigging paint.

Add running lights to the shrouds. Figure 81. These could also be omitted. In the early days running lights were not required on the Bay. Sorry, cannot give you an exact date.

Running rigging and sails — Years back running rigging was manila, but today nylon or a combination of hemp and nylon is used. Actual sizes have not changed to any extent.

Draw all running rigging over a cake of beeswax, then through your fingers. Friction will warm and force wax into the fibers. Daring modellers will make a quick pass over a stove flame or warm briefly in oven.

All lines should be attached to the sails and sails secured to the booms before installing the sails. Leave enough line to make the coil at the belaying points, or make coils separately.

Rigging the jib — The jib complete rig is shown in Figure 82. Secure the tack, X, then reeve the halliard. Add the jib hanks, which can be simple brass rings. Next, add the sheet. Notice the Chesapeake Bay jib sheet block which is also used on earlier bugeyes. The bottom hole, rather than a sheave, provides friction on the line so the line will not run out rapidly, permitting easier one-man operation.

To complete the jib, install the lazy jacks. Lazy jacks are found on most Chesapeake Bay craft and in some other areas; San Francisco scow schooners, for example. Sails are dropped and contained within the lazy jacks. Less men required and keeps sails off the deck.

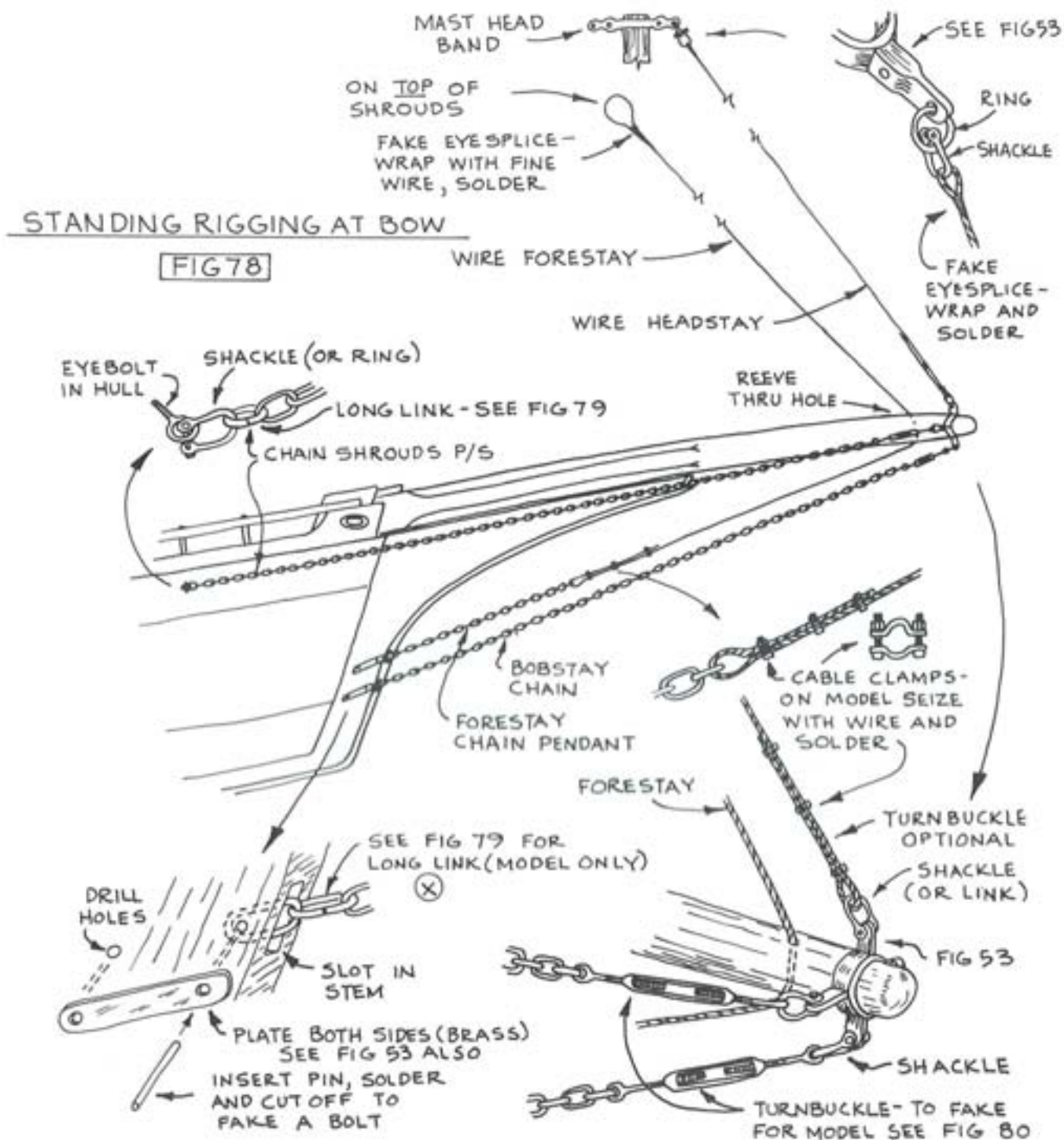
Rigging the main sail — See Figure 83. Set the boom in place and reeve the halliard. Add the lacing, X, securing the mast hoops. Add the topping lift, the standing part of which is wire rope. Reeve and set the main sheet and pull tight to take any slack out of the head stays. Finally, rig the boom lift, lazy jacks and reef tackle. The reef tackle could be fitted on the two lowest reef cringles only. When pulled in, the tackle really "furls" the sail on the outer end of the boom not easily reached from the deck.

Rigging the centerboard — See Figure 84. A typical rig. On some skipjacks the fairlead, X, may be a block located forward of the small hatch or to the side. The lead chock, Y, on top of the cabin could be

wood or metal. The centerboard rig covered here can be rigged at any time if you desire to install the centerboard earlier.

FINISHING TOUCHES

Figure 85 shows a very simple pedestal system for the skipjack or you can use brass pedestals. After mounting the model, look it over for any errors and correct. Check all paint work and touch-up with paint as necessary. Before painting, however, try to wash off smudges with a moist cloth on the end of a small stick or cotton Q-tip. Check to see if any paint spots spattered on bright work. Scrape or sand off lightly and touch up with the stain you used. The model is now ready for a glass or plastic case, which is a must if you want to protect the model from damage and dust.



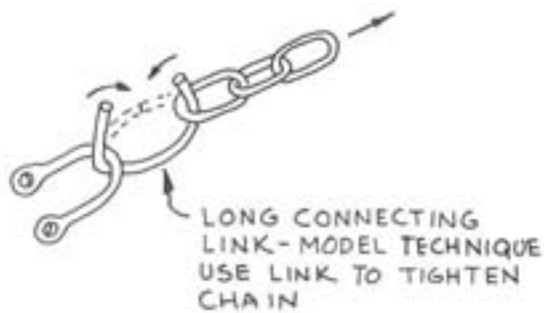
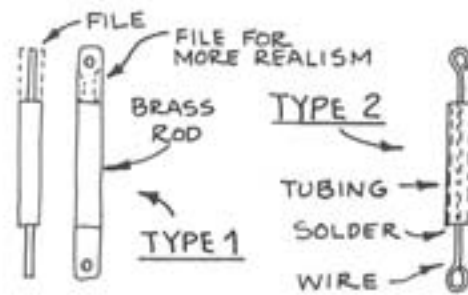
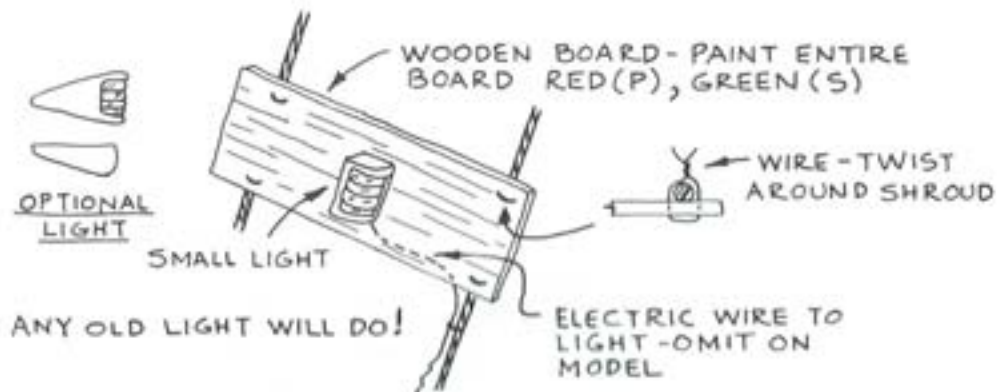


FIG 79



FAKE TURNBUCKLES

FIG 80



RUNNING LIGHT

FIG 81

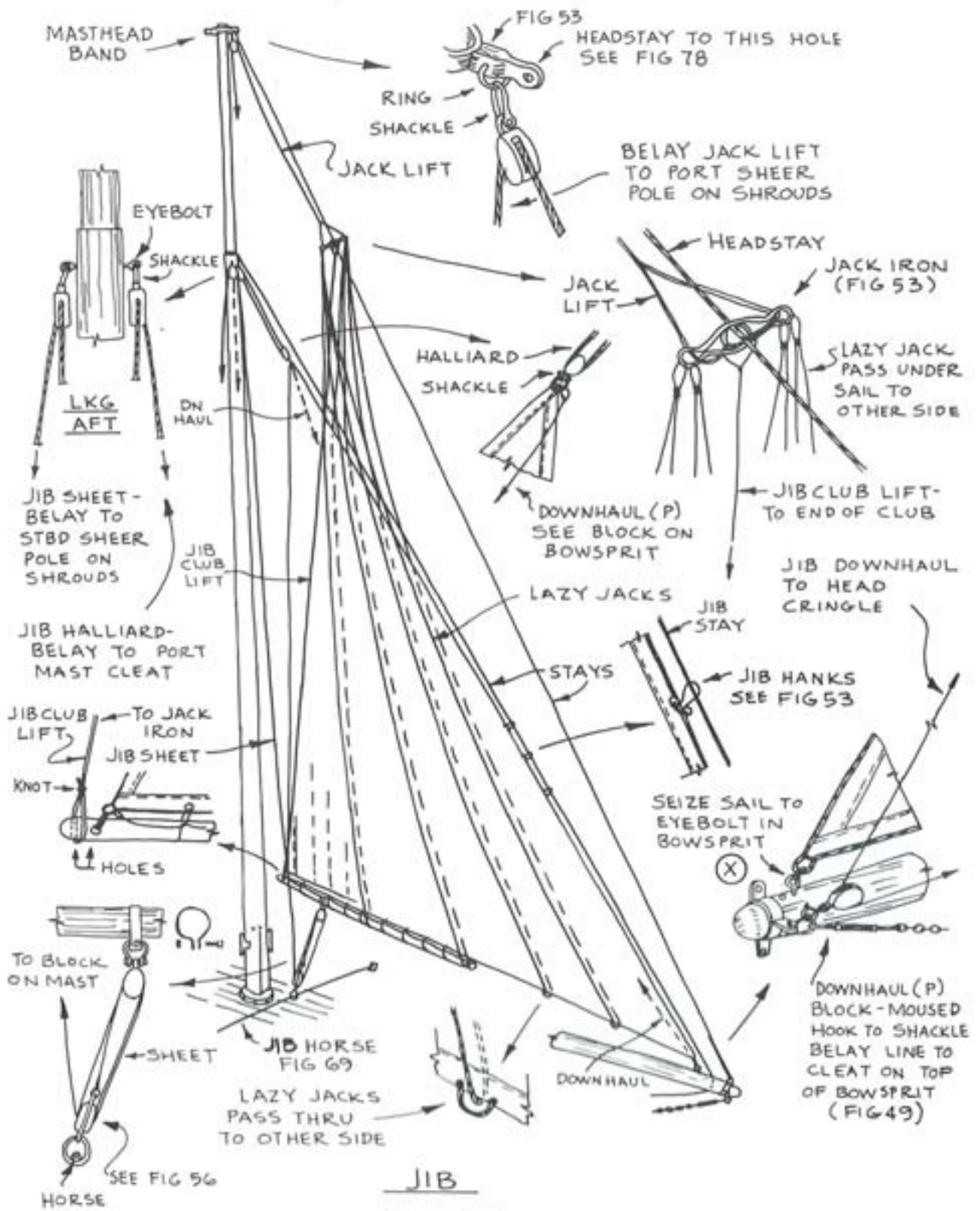
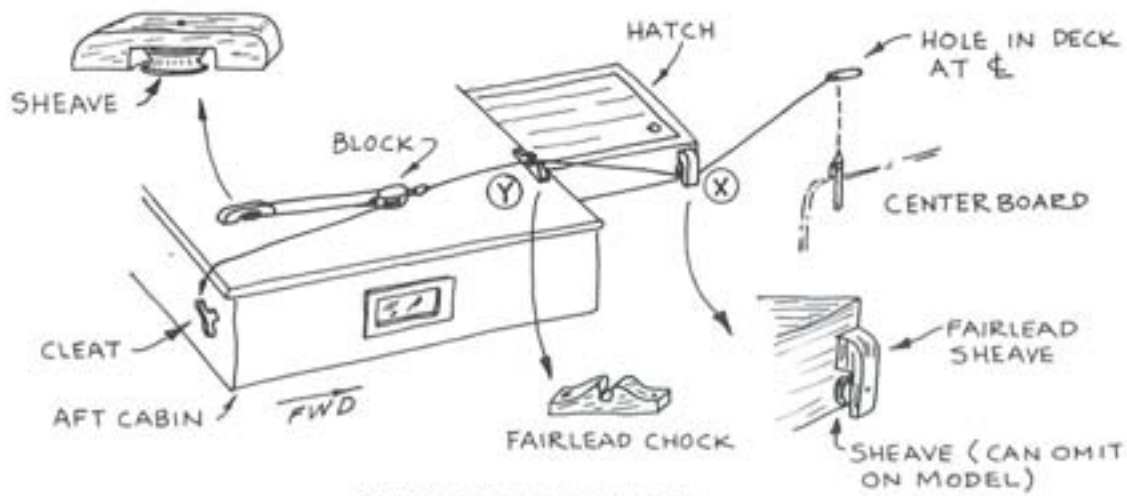
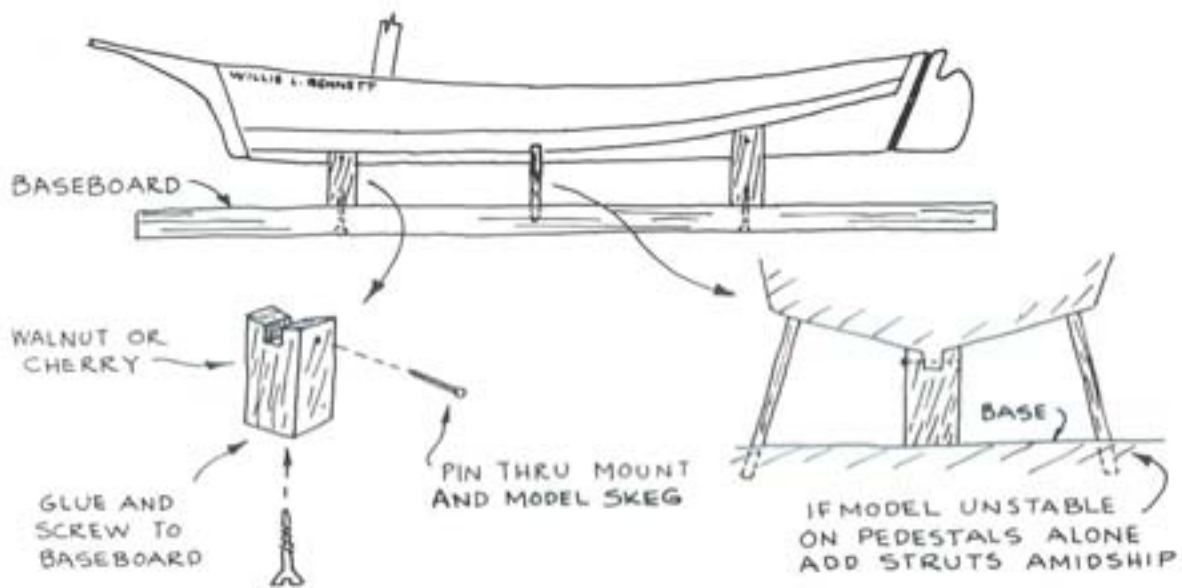


FIG 82



CENTERBOARD LIFT
FIG 84



SIMPLE MOUNT
FIG 85

ACKNOWLEDGMENTS

I would like to thank the following, who have contributed their time and effort toward the **WILLIE L. BENNETT** project:

Jim Knowles, and the Smithsonian staff for making H.I.Chapelle's drawings available for reference.

Jack Berner, Annandale, VA for assisting with data collection during some cold times on the Chesapeake Bay.

James Murphy, Tilghman, MD for his assistance and permission to board the skipjack **SIGSBEE**.

Buck Garvin, owner of Buck's Seafood, Tilghman, MD and the skipjacks **RALPH WEBSTER** and **LORRAINE ROSE**, for his valuable information on dredging operations, skipjack construction and history.

Merritt Edson, Nautical Research Guild, for providing skipjack photographs and other research information.

George Stuntz, Silver Spring, MD and **Al Beal**, Norfolk, VA for information on skipjack framing methods.

Erik Ronnberg, Jr., Rockport, MA for the **WILLIE L. BENNETT** model photos, his construction suggestions and review of the drawings.

Betty Harding, Oxon Hill, MD for her typing and editing assistance.

Eugenie Lankford, my dear wife, for traveling with me and holding all my camera gear, tape measures, and other junk. She had a motive other than boats at Tilghman Island, however. Best oysters on the half-shell you ever tasted!

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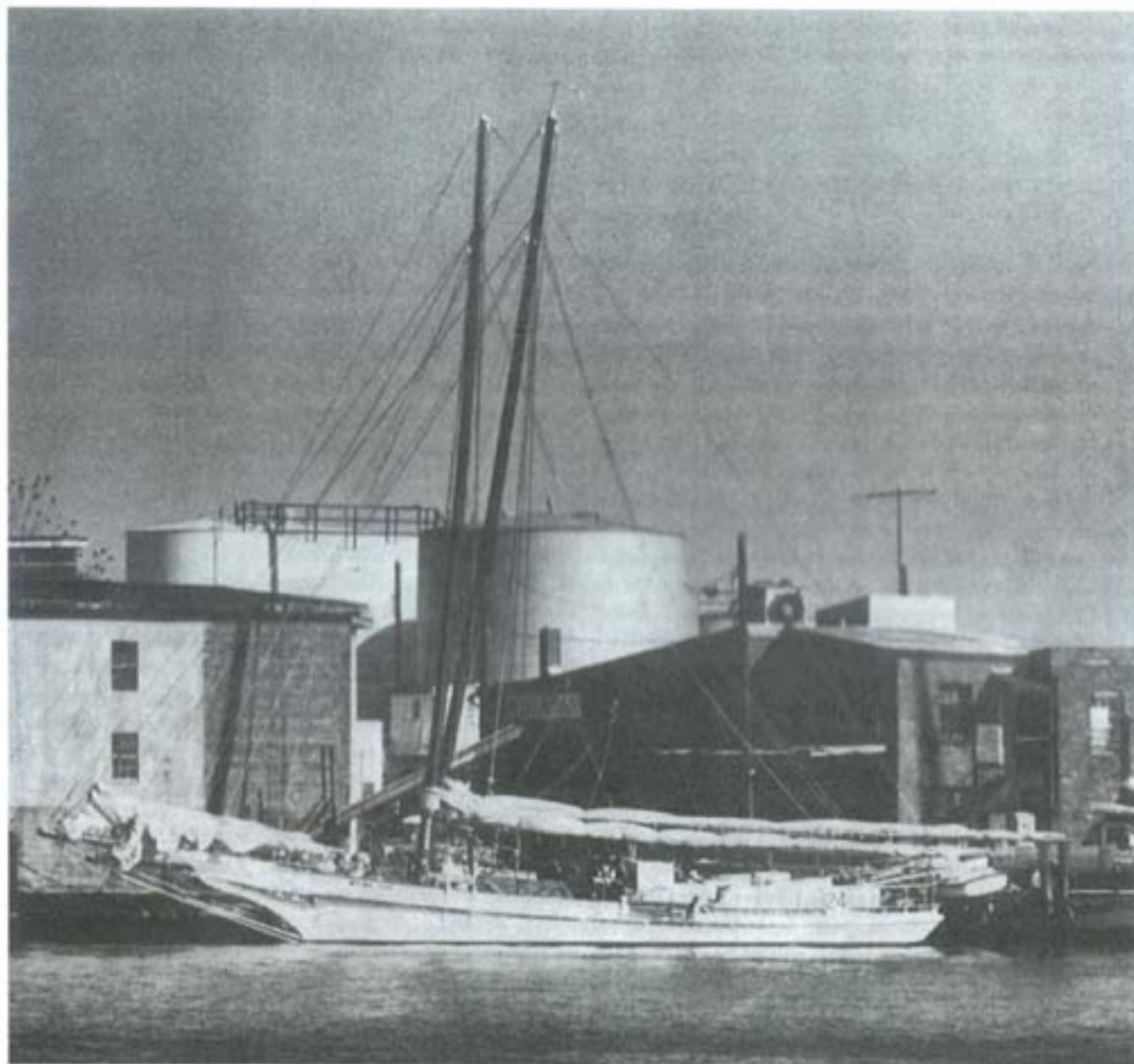
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7. Chapelle, H.I., **Notes on Chesapeake Bay Skipjacks**. Chesapeake Bay Maritime Museum, St. Michaels, Md. Originally printed in the *American Neptune Quarterly*, 1943. Excellent description and plans of Bay skipjacks, details of ironwork. Includes basic **WILLIE L. BENNETT** plan, among 11 others showing design variations of the boats. (Note: Full size plans shown are in the Smithsonian Institute collection — available for cost of reproduction.)
8. Chapelle, Howard I., **American Small Sailing Craft**, W.W. Norton, NY 1951. Excellent history, description of V-bottom craft and the skipjack **MESSINGER**. Much smaller than **WILLIE L. BENNETT** but a well-detailed description, plans of structure. Makes a nice model. (Note: Full size plans shown are in the Smithsonian Institute collection — available for cost of reproduction.)*
9. Chapelle, Howard I., **The National Watercraft Collection**, Smithsonian Institute Press, 1976. A catalog of models in the Smithsonian, listing the skipjack models, both rigged and half models. A few plans are included.
10. deGast, Robert, **The Oystermen of the Chesapeake**, International Marine Publishing Co., Camden, ME 1970. Don't miss this one. Skipjacks galore, oysters piled high. Excellent black and white photos of the craft today.*
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*In print 1981

MODELING TECHNIQUES

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4. Wingrove, Gerald A., **The Techniques of Ship Modeling**, MAP 1974. For advanced model makers; use of tools, machines, tricks of the trade.
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Waterfront, Cambridge, Md. 1980

KIT MATERIAL AND PARTS LIST

WOODEN MATERIALS

The following cut from strips:

Push boat (chine logs, bottom plank and coaming)	14 pcs	1/32" × 1/8" × 22"
Bends, cargo hold ceiling plank, deck protective sheathing	11 pcs	1/32" × 3/16" × 22"
Trailboard moulding, pushboat guards	2 pcs	1/16" × 1/16" × 22"
Deck plank, cap rails, hatch cover beams	29 pcs	1/16" × 3/32" × 22"
Cabin top beams, cargo hold bulkheads, bottom battens	4 pcs	1/16" × 3/16" × 22"
Bottom planking	10 pcs	1/16" × 1/4" × 22"
Hatch coamings, clamps	3 pcs	1/16" × 5/16" × 22"
Head rails, log rails	3 pcs	3/32" × 1/8" × 22"
Side frames, chine logs	4 pcs	3/32" × 3/16" × 22"
Guards	1 pc	3/32" × 1/4" × 22"
Planksheer	2 pcs	3/32" × 1/2" × 22"

Foregripe shoe, jib club, cargo hold floors

2 pcs 1/8" × 1/8" × 22"

Deck beams, carlins

5 pcs 1/8" × 1/4" × 22"

The following cut from sheet:

Push boat (sides, washboard, moulds rudder, engine cover), cabin bunks, etc., trailboards, hatch covers, wheel box cover, winder cover

2 pcs 1/32" × 2" × 22"

Cabin tops, pushboat (transom and keelson)

1 pc 3/64" × 2" × 22"

Hull sides, cabin sides, centerboard, skeg battens, transom stiffeners

3 pcs 1/16" × 2" × 22"

Die-cut, from plywood, 4 moulds and transom. See p.11 et seq.

Special sizes:

Chunks	2 pcs	1/2" X 3/4" x 1 5/8"
Mast	1 pc	3/8" × 3/8" × 20"
Boom	1 pc	1/4" × 1/4" × 17"
Bowsprit	1 pc	3/8" × 1/2" × 7"
Keelson	1 pc	3/8" × 1" × 15"
Inner stem, stem cutwater	1 pc	3/16" × 2" × 7"
Skeg and sternpost	1 pc	1/8" x 7/8 x 11"

The following items cut from excess and scraps from other pieces:

Head rail brackets, breasthook, barrel cradle, rudder doublers, cabin doors and framing, winder levelers, mould bracs, mast wedges, deck blocking, pushboat (stem, inner stem, frames, rudder handle), push boat bumper on stern, centerboard case.

Fittings and Materials List - WILLIE L BENNETT kit.

Castings-

1	Anchor	#890
1	Barrel	#891
1	Windlass	#892
1	Winder (set)	#893
1	Steering wheel	#894
2	Rudder horn	SK
1	Sheet block	SK
1	Prop, pushboat	SK
Pr	Running lights	SK
3	Turnbuckles	#698
1	Figurehead	SK

Brass materials -

18	Stanchions	#427
12"	Chain	#435
12"	"	#480
6"	"	#481
3 doz	Eyebolts	#429
2 doz	Split rings	#952
4	Brass strips	#985
2	" "	#986
1	" "	#987
14	Hoop rings	#496
8	Strap rings	#438
6	Cleats	#415
2	Sheaves	#493
6"	'L' brass	

Wood blocks & deadeyes -

1	Block, 3/32" S	#301
7	" 1/8" S	#302
1	" 1/8" D	#308
3	" 3/16" S	#304
4	" 3/16" D	#310
1	" 3/16" T	#315
8	Deadeyes, 1/8"	#339

.072" brass wire - for stern davits.
 .040" " " - for rails and struts.
 .031" " " - for stanchions, dredge structure
 Stranded wire - .012" dia.
 " " .020" dia.

Cordage - .017" dia. (approx), .025" dia. (approx.)

Sail cloth

This brass wire is half-hard grade, not amenable to stretch-straightening. To straighten, cut your length, place on a firm, uniform surface such as polished fiberboard or plastic-tiled floor, and roll under the face of a hammer or other hard, flat tool.

The shrouds are made from stranded copper wire. For the deadeye, a loop is formed around the deadeye, and soldered closed.

Soft brass wire may be straightened by a short stretch. Clamp one end of a 2 ft (say) length in the vise and give a short sharp tug on the other end.

Please note that kit material specifications and printed matter are subject to change without notice. This option may be exercised by us for the betterment of the kit.