

How To Build H 28

Twenty-Eight Foot Auxiliary Cruising Ketch

Designed by

L. FRANCIS HERRESHOFF

H 28 was not designed for racing, so she is not spoiled by the influence of any rating rule. She also is not one of those seagoing can buoys, or half-tide rocks that you pass when you go for a sail and meet again in the same place on your return. This design should not be contemplated or criticized by those who want all inside ballast, sawn frames, deadeyes, bowsprits to dangle an anchor from, etc. This type of sea lawyer should get those things for himself, load them on some abandoned fishing boat, moor himself securely at the head of some harbor out of the way and let those who want to, sail in their own chosen way.

All designs are a compromise on the designer's attempt to combine certain desirable features without sacrificing too much safety, comfort and cost. H 28 was designed for the man who has only a limited time to sail, but would like to go somewhere and back in that time. It was designed to be a boat that could be quickly gotten under way for a sail on a summer evening, a boat that could ghost along in light breezes as well as stand up to anything she might get caught out in along our Atlantic coast in the summer time. She is wider on deck than an ideal sea boat should be (particularly aft), but that is to secure maximum deck space and to make her drier in a chop. A lively sea boat is no disadvantage on short trips such as H 28 would take.

Some of the principal objects of the design are to secure the maximum usable room for the cost without sacrificing looks and speed, and to have the boat of as simple construction as is consistent with strength and long life. Whereas it is often said that a vee bottom boat is easy to build because the frames are straight and don't have to be steam bent, still in the end the work amounts to nearly the same, for a vee bottom practically has to have three keels (two chines and a keel) and many more joints to make watertight or they are apt to give trouble. A boat shaped like H 28, if half carefully built, should stay entirely tight even if exposed to considerable strain or twisting.

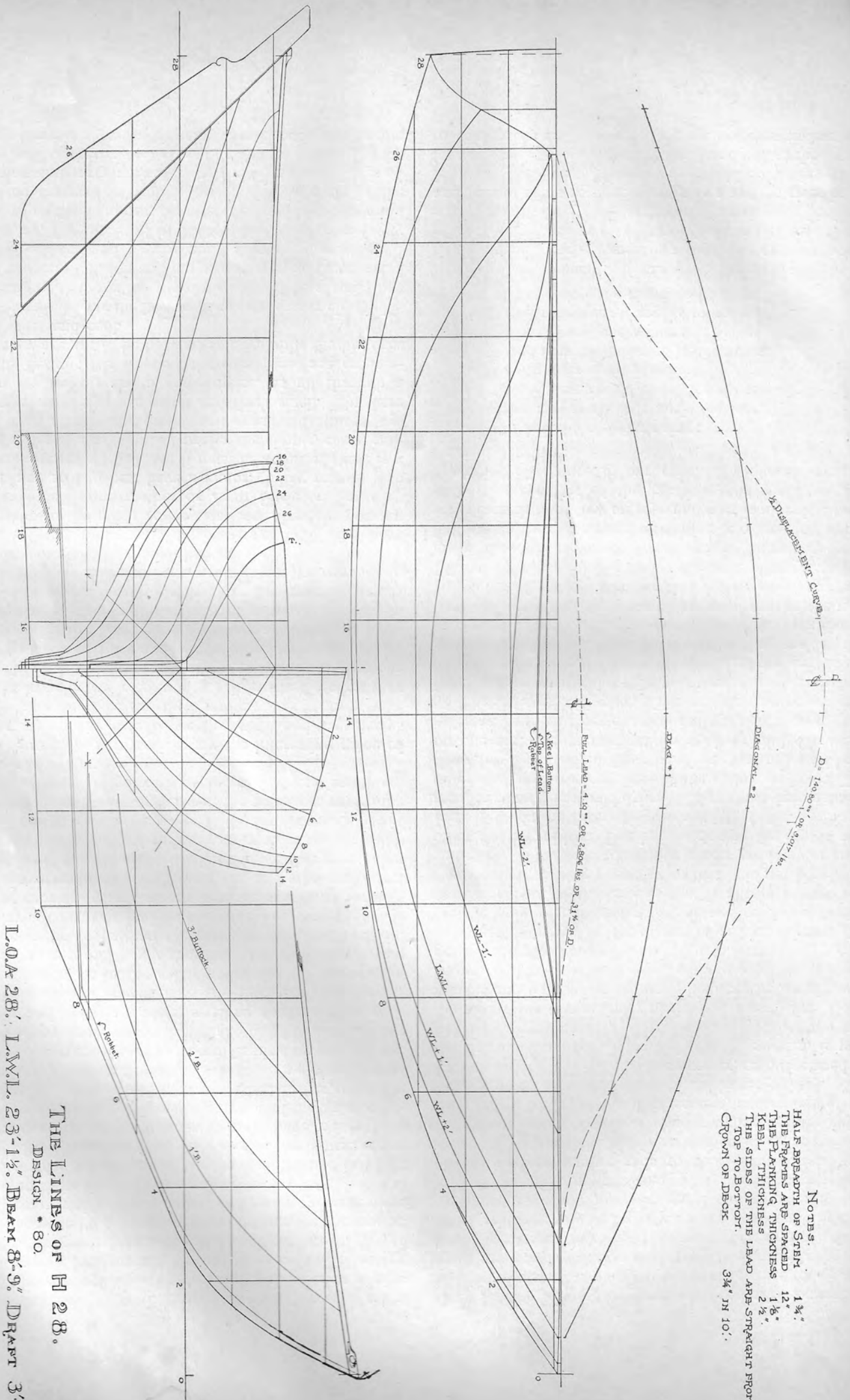
The ballast, or lead keel, of H 28 is nearly all on the outside, with a small amount inside to allow for differences in the weight of various power plants. A boat of this moderate draft, three feet six inches, should have her ballast all outside if she were forced to claw off a lee shore in a gale when stability to carry some sail is much more desirable than the easier motion of a less stiff boat. And besides, if she should take bottom in a seaway with the ballast all outside to take the shock without transmitting the strain through the wooden parts of the hull, she can pound a long time without starting a leak. But when much of the ballast is inside, the stoutest keel will soon

come to grief when pounding on a rock or hard bottom. The first crack or shock usually starts a serious leak in the garboard and if she should pound long or hard she would open up like a dump scow and let her load out. All boats run aground or take the bottom sooner or later and an inside ballasted boat is hardly trustworthy after that occasion. Besides that, inside ballast is one of the greatest nuisances in a boat of this size, for the bilge is always a mess, and all the ballast should be removed when the boat is laid up in the winter or serious results from frost and rot will be a consequence.

As for the proportion of beam and draft, we could not suit all unless we had a rubber boat, and this designer has no prejudices in these proportions, but to one who has become enamored of the craft used for cruising in England and Scotland she will seem wide and shallow, and it must be admitted that the deep, narrow boats give a sense of security in night sailing and have greater headroom. But, for the man who lives in a shallow water district, light draft is not only a virtue but an absolute necessity, so that to some Floridians H 28 would seem too deep for navigating the swamps of their native state. H 28 is about as shallow as is practical for good windward performance without a centerboard, and deep enough to really be noncapsizable.

The construction plan of H 28 will go into considerable detail. All sizes and materials are given on the plan so that no specifications or description will be necessary. The construction plan will not show cabin arrangement, for this designer believes different families require quite different accommodations. Besides, if the owner has had little experience in cruising he will invariably want every possible complication including every advertised gadget such as radios, toilets, electric lights and spring bottom berths. Whereas the experienced cruiser wants the simplest interior possible—no wires to short circuit, plumbing to freeze up or toilets to clean—and a good pipe berth to sleep in so he can use all his time sailing. He has learned the art of using simple things and can perform miracles with them, as the skilled woodsman can make himself comfortable with a frying pan and an axe; whereas the tyro, if dumped into the Maine woods with all the hardware in Abercrombie and Fitch's store, would spend a miserable night, and the sight of his camp in the morning would be as amusing to the experienced woodsman as the cabin of most small cruisers to a sailor who has learned to take care of himself in a small vessel.

I am afraid we are digressing from the description of H 28, but I am only trying to describe why it is difficult to design a cabin plan for someone else, and not for one moment would I try to explain to one of the younger



L.O.A 28'. LWL. 23'-1 1/2". BEAM 8'-9". DRAFT 3'-6".

THE LINES OF H 2 B.
DESIGN * 80.

NOTES.
 HALF BREADTH OF STEM 1 3/4"
 THE FRAMES ARE SPACED 12"
 THE PLANKING THICKNESS 1 1/2"
 KEEL THICKNESS 2 1/2"
 THE SPICES OF THE LEAD ARE STRAIGHT FROM
 TOP TO BOTTOM. 3/4" IN 10'.

generation how to trim, clean and fill a kerosene cabin lamp; how to roll in a blanket and turn over in a pipe berth twenty inches wide; how to use a cedar bucket for a toilet; or how to bake a cod in a small coal stove. Why? Well, because he does not want to believe that he can be more comfortable in a simple cabin; so why waste time trying to show him?

Some day he will learn. In the meantime he had best design his own cabin plan, with hair in the butter, coffee grounds on the radio, battery-acid in the bilge, wet bathing suits on the bunks, clothes underfoot, and the toilet overflowing . . . topped off with unwashed dishes, cigarette butts and a sword fisherman's hat. Why more young ladies are not seasick on small cruisers is a mystery to me.

When yachting was yachting, and people wore yachting clothes and lived in a sweet smelling spotless cabin with all clothes neatly stowed high and dry, then, oh then, it was a joy to sit in the cabin under the soft glow of a kerosene lamp and study the chart for even more snug and romantic coves than the one you were anchored in, and lay a course to regions even farther from the maddening crowds—places where men are sailors or farmers and converse directly with the gods, and who could feel the pulse of nature and tell what the weather was going to be without benefit of radio or cinema. I can, or think I can, design a cabin plan for H 28 for those who want to go to where the water is clean, the pine trees green, the offshore breeze laden with ozone, and where breathing, living and sailing are joys.

The motor. I, myself, enjoy the interesting game of pitting my wits against the weather gods, and they always show their hand before they strike. Yes, I even take delight in using their energy to sail in the direction they have shown is to be the most advantageous, but unless one likes to think of tides and winds and clouds, and has so arranged his life that he can go where and when he likes, he cannot indulge in this delightful game of cruising in the old-fashioned meaning, where one disconnected oneself from business and family ties and went to worship in temples not made by human hands.

It is feared that most of the owners of H 28's will have to report to the office without fail on Monday morning and even telephone mother or Aunt Susie on Saturday night, and so had best have a motor. Now motors, like women, are not all bad, but it must be admitted there is a great difference in them. I prefer the simple, clean, reliable ones, admire the economical ones, and almost love the quiet ones that are small and don't smell. But here again we must make a compromise, as all through a yacht's design; for whereas the small ones are economical, they are apt to be hot and smelly, while the big ones keep quiet and cool.

It would be far the best to have each owner choose his own engine, but for me the choice would be a small one with magneto ignition and impulse starter, as there would be no batteries and a very small amount of wiring. I might lay, for instance, in Menemsha Bight on a foggy night when the dampness penetrates everything, but would want an engine that would start positively early in the morning and carry me safely by the Graveyard Reefs of Cuttyhunk if there was a cross tide and no wind. On the design there is shown a bobtailed Sea Scout made by the

Gray Marine Motor Company, equipped with a magneto and impulse starter. Very few owners realize today how much noise and vibration come from the reverse gear and how unnecessary they are to maneuver this kind of a boat, which will generally be brought up to a float under sail.

There are also some very good one cylinder motors made today with counterbalanced crankshafts and light pistons and connecting rods so their vibration is very small. They are to be highly recommended on account of their great economy (a one cylinder engine has less cylinder surface for its piston displacement, and so less of the heat or power is wasted through the water jacket). The Lauson model Z W-926 4.5 horsepower, manufactured by the Lauson Company, New Holstein, Wisconsin, is particularly recommended. The Universal Fisherman and the Red Wing two cylinder model KK are all fine, clean, reliable and economical motors which can be bought with many combinations with and without clutches, reverse gears and reduction gears, all magneto ignited.

And this brings up the matter of reduction gear. To me the only real important advantage of the reduction gear in a boat of this size is that it allows a large and slow enough turning propeller so that it is not hopelessly ruined on its first contact with a lobster pot buoy or some other floating object. But before closing the motor subject, it might be interesting to note that the last three mentioned motors would drive H 28 at about four nautical miles an hour on about five-eighths gallon an hour. The Gray Sea Scout might drive her 6 nautical miles an hour on one and one-quarter gallons an hour and 4 nautical miles an hour on three-quarters gallon.

The Sails and Rigging. The real driving power of a boat of this type is the sails and they should be judged by their reliability and nautical miles an hour per dollar, as well as the motor. But most of all to be considered is the joy of being noiselessly propelled over the ever changing magic carpet of the sea and contemplation of the restful nights of relaxed slumber that follow an all day sail. Like the Arabs, folding their tents and silently stealing away, the night clouds fold back before the golden dawn, lighting up the cockpit and streaming into the companionway; each drop of dew on rope and spar is a perfect pearl with all the colors of the rainbow, and the dawn has awakened all nature in our cove. To quote from the Ancient Mariner:

"I heard the skylark sing:
Sometimes all little birds that are,
How they seem'd to fill the sea and air
With their sweet jargoning!
And now 'twas like all instruments,
Now like a lonely flute;
And now it is an angel's song,
That makes the Heavens be mute."

These are moments of life when the soul absorbs its nourishment. Each moment is a pearl-like gem composed of millions of atoms of energy which will release themselves months later and carry you through your business and human trials as nonchalantly as a walrus rises in an ice floe. These gems of energy are not like vitamins which let you down before noontime and leave you at the mercy of cold germs and whatnot; they are not even understood

by the medical profession. And why should they be, for the doctors with all their anatomical studies have not yet located the soul, so of course know nothing of the main-spring of energy.

Well, we are under way again and have passed the harbor mouth. We have a long summer day ahead of us, for daylight starts at 4 a.m. now. Ye gods! What is that I smell subtly stealing from the companionway, now faint, now strong? Is it java or is it mocha? Now we quote from the Ancient Mariner again, and the songs of the shore birds have passed away:

“It ceased; yet still the sails made on
A pleasant noise till noon,
A noise like of a hidden brook
In the leafy month of June,
That to the sleeping woods all right
Singeth a quiet tune.”

But you, patient reader, must not for an instant imagine that these things often happen on a boat so very different from H 28, and if her design is only slightly changed the whole balance may be thrown out. If you equip her with deadeyes, build her with sawn frames or fill her virgin bilge with ballast, the birds will no longer carol over her, nor the odors arising from the cabin make poetry, and your soul will no longer be fortified against a world of war-lords, politicians and fakers.

You may not think this description of H 28 very helpful to a builder, and it may not be so, but first of all you builders or owners must be charged with sufficient ambition or desire to carry you through the disappointing moments of delay and expense, and the exact description of each piece and part will be shown on the construction plan where it can be readily found without referring to some index of specifications.

I have now had enough years of experience in observing and inspecting the construction of small wooden yachts to know that the equipment or lack of it has such an influence on the technique of building that it is best for each builder to work the things out according to his likes and prejudices, so that final results may be quite equal. For instance, two quite good violins might be made in distant countries and a century apart, and the procedure of each step of manufacture be quite different, but

if each of the builders had exactly the same picture in his mind of the finished article, in all probability the instruments would be very nearly alike. And if either of these instruments came into the hands of one who loved and cherished it and studied its peculiarities, even though the owner were a Canadian wood chopper or a Baltimore belle, he could finally make it respond to all his moods and draw from it delightful melodies even when playing in the dark. But if, dear reader, they listened to someone who could not design a violin or had changed it or mutilated it with parts belonging to some other type of music box (deadeyes and inside ballast) it could never be tuned again.

So, too, with H 28. If you love and cherish her you can learn to draw sweet melodies from her and she will carry you through all the scale (Beaufort scale) of gales and calms, for she is based on well proven principles. She will lay to well into the wind, under the mizzen, or steer well in a following sea and ghost along in light weather.

If the design of H 28 is criticized by some of the self-appointed authorities who write destructive criticism, don't let this bother you, for at the present time, the designers who can plan a successful, well balanced boat of this kind can be counted on the fingers of one hand and it is a coincidence that none of these write destructive criticism, for they are all versatile and can produce successfully a sailing canoe, a racing yacht or the large and small power craft. The planners of junks can hardly be classed as yacht designers even if they have had a hand in the creation of some crate that has made a long voyage (and taken a long time to do it) for, after all, illiterate negroes, Indians, Malays and Chinamen have all done this for centuries. Some of these junk designers call themselves naval architects in their ignorance, for they do not know that the only ones in the United States who can acquire this rank or title are the few highest standing members of each graduating class of the U. S. Naval Academy, who are detailed to post graduate special studies of naval architecture in some of the universities throughout the world and then hold the rank of N. A.

As to my personal reactions to the criticism of H 28 by junk designers, I feel like that merry miller, The Miller on the Dee, — “I care not a damn for any man, for no man cares for me.”

(To be continued)



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LAST month I tried to write something about H 28, but as the Editor didn't think it so hot, he has asked me to try again and get down to brass tacks on keel, bolts, garboard, strakes, etc. So here goes—

Well, first of all it is usual to lay the lines of the yacht down on the floor, full size, and if you want to do this the most satisfactory way in most cases is to get some building paper (enough to cover a space about twenty feet by eleven feet). The building paper is what is generally used on a house under clapboards or between flooring. It comes in colors of light green and brownish pink. Get a grade which has a surface hard enough to draw on. Of course if your floor is smooth enough to draw on, the paper will be unnecessary, but the floor will have to be either painted black to be drawn on with soapstone chalk, or painted white if you are to use a lead pencil, so that the paper is often the best in the end, for it can be rolled up for future use if the yacht is set up on the floor where the lines were laid down and so cannot be gotten at.

Before tacking down the strips of paper be sure the floor is swept well and the heads of protruding nails are driven down. On this design the length waterline is the base line and all elevations are given in distances above and below the same. After snapping the chalk line for the length waterline you can tack a batten along the line for temporary use of a large square for laying off the stations. It will probably be best for you to make up a light but stiff wooden square with one limb about six feet and the other about four feet because there will be many other uses for this square as the work goes on.

Of course I cannot here give full instructions for laying down a yacht, but be sure you have many battens, some very stiff for such lines as the sheer and some very light and flexible for the sections. Many yachts which I have designed were built without being laid down, as the builders had confidence in the table of offsets and simply laid off the sections for making the molds, keel, etc., full size. I would recommend this if you are familiar with every step of what you are doing. For most people, however, it is safer to lay the whole of the lines down full size.

The Lead Keel. Lead is a wonderful material to make a keel from for it gets along well with the bronze keel bolts. It is ductile enough to absorb shocks when running aground. It can be melted at low temperature and is heavy. It also can be planed with a carpenter's plane. But I advise you to have your local foundry cast the keel for you, or you may find yourself in the same predicament that Cellini was in when he was casting the statue of Perseus, and have to tear down your neighbor's houses and fences to keep the pot boiling at the last minute.

The lead on H 28 is purposely shaped so it will be easy to make a pattern, or a wooden mold to flow it into.

In the latter case flat boards about one inch thick can form the sides, but the frame outside must be very strong, for the melted lead will press down and outward about 700 pounds for each square foot. So, besides strong cross pieces above and below the mold, it is well to have a few iron rods passing right through where the lead will be to hold the two sides from spreading. These rods, if heavily painted with graphite paint, will drive out easily when the mold is removed.

The mold should be backed up with tightly tamped earth on the outside to help support it between braces and to prevent the lead's running far if a leak is started when the side boards shrink or crack under the heat of casting. If the lead is cast for you by a professional foundryman he will mold it right in the earth (probably dig a hole in his foundry floor) so he will require a pattern to cast from just the same as if it were to be of iron. And, by the way, for those who prefer an iron keel, it can be made the same size and shape as the lead one and the difference in weight simply made up by inside ballast. At any rate, in casting the lead keel be sure that at least one per cent of antimony is added to it, for this stiffens up the lead enough so that it drills well and even planes better. On this design the keel bolts are tapped into the top of the lead and it is almost impossible to tap pure lead, for it balls up the tap so that a clear thread is unlikely. When antimony is added to the lead, or junk lead used which has some tin, solder or pewter in it, it seems to tap O.K. Be sure to drill a hole larger than is called for when tapping bronze or iron, because some of the lead will squeeze out and make a full thread, and remember that, as these bolts go into the lead about six times their diameter, a perfect thread will not be necessary. In drilling and tapping, use kerosene for lubricant; in screwing down the bolts use heavy oil.

Setting Up. There are many different methods of setting up the framing of a yacht and they all have their advantages and disadvantages, but it is likely that most amateurs would prefer to build her right side up and bend the frames inside ribbons or battens bent over the molds. This is the commonest way in most places. A perfectly good job can be done on a yacht of this size and shape by simply planking her up over the molds and, as each mold is removed one by one, frames are steam bent over the mold to approximate shape and fastened in place by fastenings in the same holes that held the planks on the molds. Be sure to keep battens or temporary deck beams across the yacht so she will not spread at the deck line when the molds are removed. This is the simplest and cheapest method I know of and perfectly satisfactory. It is the method that was used by the late John Harvey, who for many years had charge of the small boat building department of the George Lawley Sons Corporation.

No matter what system is used for setting up or bending the frames, it is well to have the floor timbers bolted in place on the keel first so they can have their outer faces correctly lined up and beveled to receive the planks, for much of the strength of the yacht will depend on a good wood fit between the planking and the floor timbers. The first few frames at the bow can be sawn frames as they are so straight that the grain can run a long distance on them and so they will be as strong as steam bent frames and they can be beveled so their lower ends will fit on the floor timbers and the upper end on the clamp. This is not so with the usual bent frames near the ends of a yacht where the planking is not very parallel with the center line.

The clamp of H 28 is made in two pieces as is done on larger yachts and sometimes referred to as a shelf and clamp. It is done on this design as it is thought to be much easier for the amateur to bend in two light pieces than one stiff, square one and, as this boat has such a long cockpit and cabin house, the deck beams need the additional support this arrangement gives.

Materials. There are a great many varieties of oak and most of them are very poor indeed, for they soon rot. The true white oak is one of the best things God gave us here in New England, and I will try to describe it because every lumberman will attempt to palm something else off on you. He (for the white oak is very masculine) is not called white oak because the wood is white or light color, but because as you walk through the woods his bark has quite a light shade in contrast with the rest of the forest, and when the breeze lifts or turns the leaves, their under side is quite light. His botanical name is *Quercus Alba* and I would call him *Quercus Alba Connecticuticus* because the best ones grow in Connecticut, though there are many in Rhode Island and Massachusetts, and he is found all the way from Canada to Cape Hatteras. The farmers sometimes call him a pasture oak and the small trees are called basket oaks, as the old time bushel baskets and many articles for hard use were made of it. It is without doubt the best wood in the world for the frames of small boats.

The wood itself is a brownish green color and I cannot describe it better than to say it resembles laminations of cat gut and horn in thin, alternate layers, and it acts like it. Patient readers, I apologize for taking so much space for *Quercus Alba*, but he is an acquaintance worth making for he can be bent into frames without breaking and will last indefinitely. You will practically have to use white oak for the frames and, if you can, use it for the stem, keel, floor timbers and stern post; it would also be good for the deck beams and transom, but here yellow bark oak will do.

The so called hurricane pine—that is, our native soft pine—is a little different from the regular large forest white pine named *Pinus Strobus*, but as no two botanists agree as to the exact number of varieties in any region we shall have to go by local names. The hurricane pine around here (Massachusetts) is the variety the old-fashioned cabinet makers and boat builders called punkin' pine. It is of a pinkish, yellow color and one of the nicest woods to work. It does not swell or shrink much, or rot easily, but do not confuse it with some of the western and California pines which rot very quickly. If you can get some of this hurricane pine, even if it has some knots in it, it will make most excellent decking, very good planking, and the very best interior trim.

For planking, if you use fir which is called for on

the construction plan (because it is the cheapest satisfactory wood for the purpose), be sure that it is all rift-grain and of fine texture and has been kiln dried down to the same moisture content that commercial flooring is. Of course there are a number of very good woods for planking, but in most cases they are expensive.

As for the metals, you will do well if you stick to Tobin bronze for everything, except the screws which we will speak of later. Tobin bronze is like white oak—it will bend without breaking and last indefinitely. It also is a pleasure to work. Most all boat builders today agree that Everdur screws are the cheapest in the end, for so few of them break in driving even if the hole is not exactly the right size; and, of course, Monel screws are very fine, also. But no matter what sort of screws you use, do not rub them on soap, as so many writers advise, but use a heavy grease to lubricate them. Soaps nearly all have strong chemicals in them which shorten the life of the screws while the grease preserves them.

The canvas for the deck and deckhouse is another material on which many builders go wrong. The proper thing to use is loosely woven light cotton sheeting, and if this material is set on a deck well coated with white lead and oil paint, the paint will penetrate up through the sheeting and meet, or amalgamate, with the later coats of paint on top so that a solid, long wearing and watertight cover is made. Strange to say, this is the place where the cheapest material is the best and, besides, the cotton sheeting can be bought in very wide strips.

Paints. A whole lot could be said about paint, for on this subject in particular, there is a lot of misinformation. You hear some people say, "Save the surface and you save all", but this is far from the truth in boat construction. Many of the modern paints and lacquers are quick and easy to apply, but they do not penetrate. They make a hard shell on the surface so that at the seams, and particularly at fastenings, the water gets below the surface and causes the wood to swell and gives a chance for rot to start. No doubt you have noticed how the fastenings will stain and corrode under these hard surface lacquers. When a penetrating paint like linseed oil, lead and turpentine is used, the texture of the wood for some distance in is sealed or filled with a water repelling substance.

It is very easy to mix your own paints and you can vary them to meet your own needs by only using a little common sense. If you are bound to use the more modern paints with a cellulose base, or the varnishes used today, be sure to first put on a filler coat of a mixture the paint makers recommend and sell for this particular purpose, and that will, to a certain extent, seal or fill the wood underneath.

The Engine Installation. The propeller is set off center for the six following good reasons:

1. The propeller shaft does not interfere with the normal keel bolts which are very important in this region.
2. The yacht is faster and more economical under power.
3. The yacht is faster under sail.
4. The yacht steers better under power.
5. The yacht steers better under sail.
6. If it is decided to remove the motor to make a straight sailer, or to set up a different shaft line for a different motor, the matter is much simplified with the off center screw.

As to Number 2. Actual experience has proven that the off center propeller increases the speed or economy from ten to twenty per cent over a center line propeller. The reason for this is that as a vessel passes through the water she gathers up a swirl of eddies caused by skin resistance, and under the stern at the center line considerable water is following along with the vessel. Now if you place your propeller in this wake and upset its natural eddies which are decreasing surface resistance, and put in its place a propeller slip stream going thirty per cent faster than the vessel, then you will probably increase the total resistance some fifteen per cent. To check on this, ask some ex-skipper of one of the last war 110-footers how his center engine compared with his wing engines for power.

The Engine Bed. I should prefer to have the engine bed made of angle iron or pipe properly folded, forged or welded at the engine lugs, etc. The ordinary wooden engine logs prevent one from reaching around and wiping off the crankcase and are a fire menace, as they are often saturated with oil and gas. On H 28 the after, outer engine lug or support comes right out to the planking, so that a properly shaped block at this point will hold the engine from fore and aft and sidewise motion, if there is a diagonal brace to one of the other supports, so that the other supports can be run directly to a floor timber. With a little ingenuity a quite simple metal engine bed can be made and sometimes it is advisable to do away entirely with the shoe the engine maker has furnished for a wooden log.

Other Metal Fittings. Throughout the design I have tried to use stock fittings, but in the case of the rudder

pintles and gudgeons I am unable to find a suitable pattern, so that these and the spar fittings I have designed and they will only require three quite simple patterns and little machine work.

The Spars. All the spars are of rectangular section and so are about as easy to make as a long box. Their flat sides make the attachment of the shrouds more efficient. These reasons are why I invented the rectangular spar construction some twenty years ago, and their use is now quite universal. On H 28 the forward and after staves of the masts and upper and lower staves of the boom have a slight rabbet cut in them which you can easily do with a rabbet plane by tacking a batten along to guide the plane. This is done to hold the side pieces in place when gluing up. The principal trick in making this sort of spar is to hold them straight and stop them from twisting when gluing up, and this can often be done along the side of a building by nailing pieces of wood out at right angles to the studding so the building and the strips hold the staves straight in two directions and leave room for clamping between.

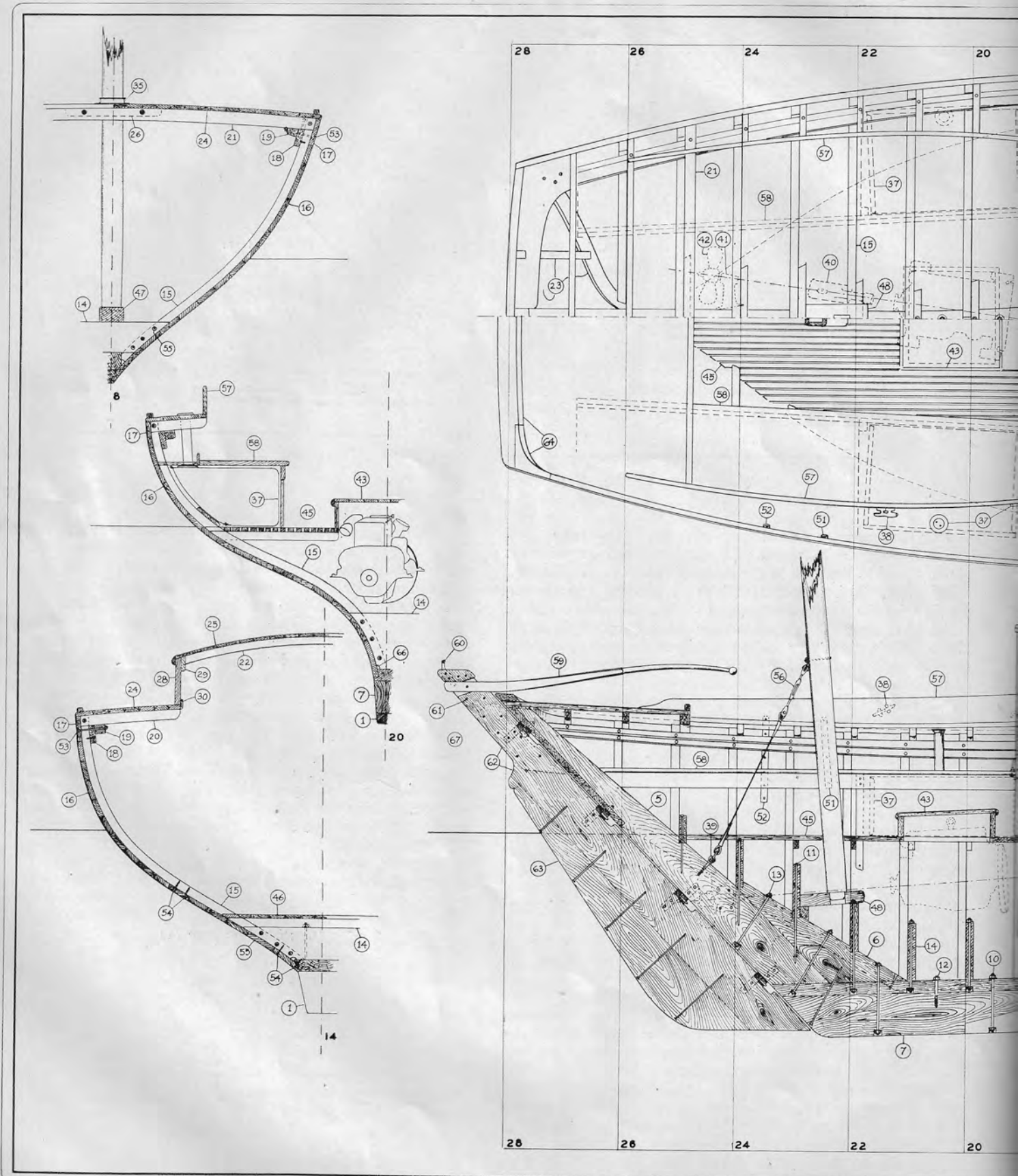
This account has only touched on some of the highlights of the construction and has tried to help on points where many are apt to go astray. It would take a whole book to cover the complete construction of a yacht of this type, but a little common sense and Yankee ingenuity should cover the rest. And remember, the drawings are only a guide to shapes and sizes so that the owner can make variations in cabin arrangement, etc., to suit himself. For instance, someone might want a narrower cockpit, or a self bailing cockpit, and all such things would be improvements for certain uses. So, here's wishing you luck!

(To be continued)



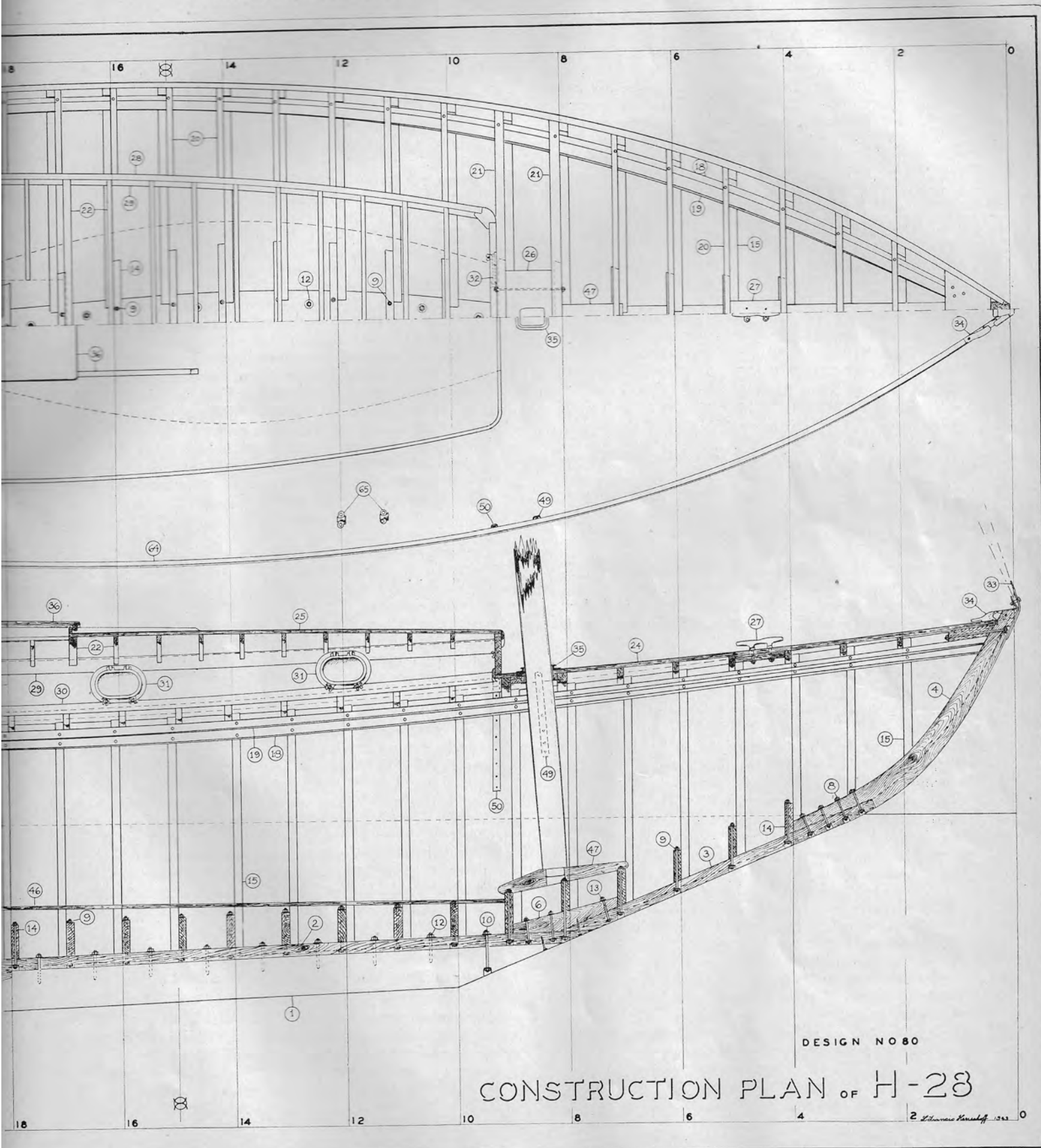
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DESIGN NO 80

CONSTRUCTION PLAN OF H-28

2 L. Francis Herreshoff 1933 0

Editor's Note: In this issue the construction details of the H 28 are presented. They are drawn with great care by the designer and should prove valuable to those earnest students of yacht construction who would like to know more about how a modern boat is put together. In following issues the cabin plan as well as rigging details will be published. This is of importance, since it has been observed that the average amateur builder manages well with the hull, but encounters insurmountable obstacles when the time comes to install the rigging. The designer has gone to great pains to clarify and explain this part of the H 28 so that no one should feel hesitant about tackling the job himself.

* * *

1. Lead keel, 2,800 lbs.
2. Main keel, oak, $2\frac{1}{2}$ " x 13" x 16'.
3. Fore keel, oak, $2\frac{1}{2}$ " x $4\frac{1}{2}$ " x 6'.
4. Stem, white oak natural crook, $4\frac{1}{2}$ " x 6'.
5. Stern post, oak, $4\frac{1}{2}$ " by 9" x $7\frac{3}{8}$ ".
6. Knees, oak, $4\frac{1}{2}$ " athwartships.
7. Deadwood, hard pine, 7" x 9" x $5\frac{3}{8}$ ".
8. Scarf bolts, $\frac{3}{8}$ " Tobin, nut and washer both ends.
9. Floor bolts, all $\frac{7}{16}$ " Tobin, nut and washer both ends, two on floors 10 to 17.
10. Lead through bolts, $\frac{1}{2}$ " Tobin.
11. Drive bolts, $\frac{3}{8}$ " galv. iron or Tobin (self heading or clinch ring).
12. Hanger bolts for attaching lead, $\frac{5}{8}$ " Tobin, U.S.S. thread, let into the lead 3" or more, staggered. See deck plan.
13. All other bolts through keel, $\frac{7}{16}$ " Tobin.
14. All floor timbers, oak, $1\frac{1}{2}$ " thick. Take depth from plan.
15. All frames, white oak, $1\frac{5}{8}$ " x $1\frac{5}{8}$ ". Those on station 6 and forward can be sawn and beveled, the others steam bent. The frames, floors and deck beams change at 15 where the midship section, or dead flat mark, is.
16. Planking. Rift grain fir, 1" thick. If cedar or soft pine, $1\frac{1}{8}$ " thick. If mahogany or yellow pine, $\frac{7}{8}$ " thick. The plank above the W.L. should not be more than 4" wide, with the exception of sheer strake.
17. The sheer strake should be of fairly hard wood to take the shelf bolts; hard, fine grain fir, oak or yellow pine will do, 5" or more wide amidships.
18. Clamp, fir, spruce or hard pine, 1" x $3\frac{1}{2}$ ".
19. Shelf, fir, spruce or hard pine, 2" x 2".
20. Regular deck beams, $1\frac{3}{8}$ " x 2", crown $3\frac{3}{4}$ " in 10'.
21. Strong beams, three, 2" x 2", crown $3\frac{3}{4}$ " in 10'.
22. House beams, $\frac{3}{4}$ " x $1\frac{1}{2}$ ", spaced 9", and one at hatch $1\frac{1}{2}$ " x $1\frac{1}{2}$ ", crown 6" in 6', or a radius of 8'3". All beams can be white oak, ash, elm or yellow-bark oak, or even red oak, for they are larger than usual.
23. The transom can be planked up of 1" thick oak over the stern post, frames and aprons as shown. Planks about 6" wide fastened and caulked same as planking.
24. Main deck, $\frac{3}{4}$ " or more, tongue-and-groove pine 3" or less wide, canvas covered.
25. House deck, $\frac{5}{8}$ " or more, tongue-and-groove pine, $2\frac{1}{2}$ " or less wide, canvas covered.
26. Mast partner, oak, $1\frac{1}{2}$ " x 10" x 20", with $\frac{3}{8}$ " through bolts.
27. Mooring cleat, Wilcox, Crittenden Fig. 4020 or similar. 10" long on oak block, 1" x 6" x 10".
28. House sides and forward end, soft pine, if painted $1\frac{1}{4}$ " thick; if varnished, mahogany, oak or teak 1" thick.
29. Lodging piece for deck beams about 1" x 3", oak or mahogany.
30. Finish piece to cover the deck canvas where turned up—any wood to match interior trim.
31. Wilcox, Crittenden Fig. 5252, size 5" x 9" or 4" x 7", as owner desires.
32. Wilcox, Crittenden Fig. 523, size 4", port and starboard.
33. Stem band in two parts for attaching both the forestay and the headstay. Inner piece $\frac{3}{16}$ " x 2" x 27"; outer piece $\frac{3}{16}$ " x 2" x 13". Hard Tobin or Phosphor bronze $\frac{7}{16}$ " pin for thimble of forestay. The outer layer extends up to take the clevis of the headstay turnbuckle and has a $\frac{5}{16}$ " hole.
34. Cast bronze bow chocks.
35. Mast collar to take the mast coat, can be either cast bronze or shaped up of sheet copper. Mast is $4\frac{1}{4}$ " x $5\frac{1}{2}$ " at deck.
36. Hatch and slide of hard wood, opening 20" x 26".
37. Gas and water tanks, alike of tin lined copper. The size shown will hold about 23 gallons and is shaped to fit the yacht on the outer sides. They have filler pipes and vents outside the coaming as shown to allow the gas to settle outboard when filling tank. If smaller capacity is sufficient, round or oval tanks can be used. It is recommended to have the water tank on the side the stove will be on (if the stove is near the cabin bulkhead), very firmly secured.
38. Jibsheet cleats, port and starboard, Wilcox, Crittenden Fig. 4020, $5\frac{1}{2}$ ".
39. Screw eye bolt for mizzen brace or backstay. Wilcox, Crittenden Fig. 2181, $\frac{1}{2}$ " x $3\frac{1}{4}$ ". See rigging list for other parts.
40. Special cast bronze inside stuffing box, depending on size of motor used.
41. Special one-legged strut of cast bronze bolted through stern post.
42. Hyde 2-blade, feathering propeller, 12" diam.
43. Removable box cover over engine, top same as house deck, canvas covered.
44. Threshold is a removable board, $\frac{3}{4}$ " x 9" x 21", of hard wood to lift out when cranking motor.
45. The best cockpit floor would be of slats about 1" wide, $\frac{3}{4}$ " thick spaced about $\frac{1}{4}$ ", of teak, elm or oak, with removable section near the center line.
46. The cabin floor can be tongue-and-groove soft pine from $\frac{5}{8}$ " to $\frac{3}{4}$ " thick, painted or varnished.
47. Mast step, oak, $3\frac{1}{2}$ " x 5" x 2'5", cut mortise for mast tongue way through to drain water. Tongue of mainmast is 4" x $1\frac{1}{4}$ ".
48. Mast step, oak, $2\frac{1}{2}$ " x 6" x $13\frac{1}{2}$ ", tongue of mizzen 3" x 1".
49. Main upper shroud chainplates, $\frac{3}{16}$ " x $1\frac{1}{4}$ " x 18".
50. Main lower shroud chainplates, $\frac{3}{16}$ " x $1\frac{1}{2}$ " x 24".
51. Mizzen upper shroud chainplates, $\frac{3}{16}$ " x 1" x 15".
52. Mizzen lower shroud chainplates, $\frac{3}{16}$ " x $1\frac{1}{4}$ " x 18". All chainplates of hard rolled Tobin or Phosphor bronze and fastened through planking with $\frac{1}{4}$ " stove bolts, spaced to clear seams of planking.
53. If the shelf and clamp are well through bolted, there will be no need of hanging or lodging knees to support the deck beams. On the drawing there is shown a $\frac{5}{16}$ " x 6" stove bolt which can be

either galvanized iron, Everdur or brass. The clamp can be fastened with wood screws of about 2½" — #14. The head of the frames and deck beams can be joined with ¼" bolts or slightly smaller copper rivets.

The ends of the deck beams can be secured to the clamp with 3½" — #16 Everdur wood screws, and it would be well if the ones through the strong beams were larger.

54. Planking fastenings, #14 Everdur screws 2¼" long, into frames with a ½" bung. The fastenings through the garboard into the back rabbet of keel may have to be shorter. Be sure to fasten the planking to both the frames and the floor timbers as this relieves the strain on the bolts through the frames and floors #55.
55. These should be 5/16" bronze bolts or copper rivets about ¼" diameter.
56. We are sorry to say the mizzen will need an after brace or stay, and this will be shown on the rigging plan. If preferred, the mizzen can be supported by a stout thwart between frames 22 and 23. The springstay from the mizzen to the mainmast head will hold the mizzen forward.
57. The cockpit coaming, from ¾" to 7/8" thick, depending on hardness of the wood; of mahogany, oak or teak, and would look nice if it matched the other deck trim, if varnished. The forward end is fitted to a shaped block to avoid the necessity of steaming.
58. The cockpit seats can be soft pine about 1" x 19" x 7'8" with lighter sheathing back of them. The apron or skirt near the inboard edge must be quite strong unless there is more than one support as shown. The apron can be 7/8" x 3" if soft wood, and smaller if hard wood. Aft of the tanks there can be some athwartship cleats, if desired. Very good seats can be made like the cockpit floor and slats let the rain or water through quickly. Also they prevent one from slipping sideways somewhat. But remember 19" is about the minimum width to sleep on.
59. The tiller can be of ash, oak or locust, 2" square at rudder head, about 1⅜" and 1½" at fluting, 7/8" at the neck, with 1½" ball.
60. Cast bronze bale for attaching mizzen sheet, about ½" diameter where round.
61. Copper rivets through the rudder to secure the cheek pieces.
62. The forward plank on the rudder, or rudder stock, is 2" x 9" x 8'5" and the cheek pieces 7/8" x 5½", 2'10" and well beveled off forward to allow the rudder to swing 45° each side of center line. Some kind of oak is the usual material for rudders of this size.
63. The after piece of rudder is 1½" x 10½" x 6'1" and secured with 5/16" self heading drive bolts of either galv. iron or bronze, the trailing edge of rudder about 1¼" at W.L., 7/8" at widest part of rudder.
64. Toe rail, quarter knees and taffrail, either the same material as coaming and house sides, or teak, mahogany, oak or yellow pine—about 1" wide, ¾" deep amidships, increasing at ends to about 1" x 1" taffrail as shown.

65. Jibsheet leads—Wilcox, Crittenden Fig. 5811, size #2.

66. Don't forget the limber holes. They should be cut in the floors before they are set in place, and cut in the heels of the frames before planking. Large, smooth limber holes are a great convenience and quite worth while making right in the first place, and quite difficult to enlarge later.

67. Rudder pintles. See detail. There is a way to fit an oak block in the cavity below the upper pintle and gudgeon so that the rudder cannot rise and unship. This block can be about 1¼" x 2" x 3" and held in place by gravity as the cheek pieces of the rudder will hold it sideways, but it can be lifted out when the rudder is at 45° or more.

In a great many ways H 28, I suppose, will be a successor to the Sea Bird, designed by the late C. D. Mower for the editor of THE RUDDER, Mr. Thomas Fleming Day, who was familiarly known as the Old Man (this being the term used on shipboard to designate the captain), and no doubt because he had some strong opinions. However, the Old Man took an unusual interest in Sea Bird and Mr. Mower made some nice drawings of her which have been hard for me to equal in draftsmanship.

Sea Bird's drawings were published in THE RUDDER in the year 1901, and I would recommend that those interested in building look them up and read the very fine description of building on page 429, November, 1901, for the boats are very much the same size and compare as follows:

Editor's Note: Full description now available in book form.

	Sea Bird	H 28
L.O.A.	25' 9"	28'
L.W.L.	20'	23' 1½"
Beam	8'	8' 9"
Draft	2'	3' 6"
Sail Area	340 sq. ft.	343 sq. ft.
Headroom	4'	4' 8"
Length of cabin house	8' 9"	10'
Cockpit area	18 sq. ft.	36 sq. ft.
Frame spacing	12"	12"
Size of frames.....	1¼"x2½"	1⅝"x1⅝"
Deck beams	1½"x2½"	1⅜"x2"
House beams	1"x1½"	¾"x1½"
Planking	1"	1"
Deck	7/8"	¾"
House deck	½"	5/8"

As for speed in sailing H 28 has the advantages of greater length of entering edge of sails (modern, high, narrow sail plan); more stability and lateral resistance with an easier form to drive through the water.

The greatest difference is in the amount of displacement—about 50 per cent more on H 28—and usable cabin room, maybe 100 per cent more.

The present editor of THE RUDDER has taken a great interest in the development of H 28, perhaps as great an interest as the Old Man did in 1901, and it has been a great pleasure to develop the drawings for him. It is hoped that the H 28 will give as much pleasure as the Sea Bird did in its day.

(To be continued)

H 28 — Or the Building of the Snarke

By

L. FRANCIS HERRESHOFF

THE Editor came up to call on me about a week ago and we fell to discoursing on the H 28 and devious things—to wit: Some of our early American fishing craft, and of the time when he owned the Block Island boat, Roaring Bessie. We talked of the progress of THE RUDDER, etc., and he said the nonsensical article about H 28 went over well and had amused many, and asked if I would write something more, as he said during these trying times people seem to like a change—something to take their minds off the war work for the evening so that they would work all the better for it. Tell of some “incidences” which might come up during the construction; give them something to laugh at—a conversation piece—or even one of those stories you love to tell so much.

“But,” I said, “I don’t think the ladies would like that very well.”

“Well,” he said, “the ladies, if any, who read THE RUDDER are broad minded. Make it sort of a ‘Just So’ story, telling of the benefits or joys one might experience during building.”

“That,” I said, “is a big order for one who made a complete failure of English at school.”

But now, this evening, after fortifying myself with one or two fingers of New England rum, I start:

Once upon a time, and to be more exact, it was two hundred and one thousand years ago of a Sunday afternoon, God didn’t have much to do so He thought He would amuse Himself by designing a new sort of creature for that planet of His which lay somewhere between the sun and the moon, and as He walked over to the drawing board He thought of the horseshoe crab He had designed several thousand years before. To be sure, that was an amusing creature which had withstood all the earth’s changes. Still it had very little nerve and brain structure. Then He thought of the little sea horses and how they jiggled back and forth in the shafts of sunlight between the seaweeds, and these had given Him much pleasure to design. But of late He had developed some land creatures which had amused Him mightily. These were the monkeys and apes, and as He thought of them running through the woods, raving and throwing coconuts at each other it occurred to Him that by leaving off the tail and lengthening the hind legs, a very droll creature might be made. So He set to work.

Now it so happened that the last creature He had designed was the pig, and to save Himself the trouble of several new detail drawings, He took the liver, the lungs, and the heart just as they were. Then He changed the scale of the other principal glands slightly and said to Himself, “These will do quite well enough”. The skin also He took, but instead of having the hair evenly distrib-

uted, He arranged it in a few amusing bunches, so that on the head and face it grew quite long. Now, as this beast was to stand on its hind feet and had no tail to balance with, it seemed quite necessary to greatly increase the number of nerve cells in its feet—otherwise it would be unable to walk in the dark; and while at this work, it occurred to Him how amusing it would be if the beast had as many nerves and some long digits on its front feet.

In due course all these things were worked out, but so many nerve connections had called for a large cranium, and as He looked over the lines He thought, “Well, with this multiplicity of nerves and these digits, it would be well to greatly increase the brain, and particularly that part that had to do with the imagination, for, peradventure, if he should use those hands to their utmost he would accomplish devious things, and if by chance he should work diligently with both the hands and the brain he might even achieve a certain state of happiness. But I fear Me that will not often come to be. And, what with the loins of a pig, and the frame of an ape, his lot will not be an enviable one.”

And, as He prophesied, so it turned out to be. And of all the beasts of the field and fowl of the air he was the most unhappy, as not one in ten thousand worked with both his hands and his head. And those who worked with their hands alone lost the use of the brain, so that some walked among them saying, “Look ye at the man who worketh with his brain, how he has a factory and a yacht and waxeth rich, while ye laboreth all to no avail.”

And they talked of strikes and violence and were verily an unhappy lot. And those who worked with the brain alone were no happier, for it was their lot to have neuritis, headaches, and devious ills, both imaginary and real, and their digits hung at their sides and were only used for eating and drinking. But worst of all, before them at all times, appeared the twin spectres of death and taxes; and think as they could their brains never could quite adjust these things to their liking.

But there were among men a few, a very few, who used both their hands and their heads, and they achieved a happiness which nigh unto passeth the understanding. Such a one was Praxiteles as he stopped to sharpen his chisel, looking out over the blue waters of the Aegean. Such another one was Grinling Gibbons as they hoisted him in a basket to carve on the inner dome of St. Paul’s (but he had the advantage of starting life as a ship’s carver). So, too, were the fashioners of the rod screens, choir stalls, corbels and hammer posts of the great cathedrals. These men felt neither cold nor hunger, pain nor weariness. To be sure their teeth fell out and they had

the other weaknesses of the flesh, but their work shows the perfect harmony that they lived in, for they worked with both their hands and their heads.

Now after many years it so came to pass that there was another whose content and happiness passeth the understanding, and we find him in a shed on the outskirts of a town and not far from the water front. He has before him on two saw horses the stem of an H 28. It has been beveled from the rabbet line to the face line, and he is now cutting down to the back rabbet from the bearding line. Beside him lies the keel with its floor timbers attached, and Joe, his helper, is getting out the molds. There is quite a heap of shavings on the floor and these, together with piled lumber, give off the romantic odor of the shipyard. It is cold outside and icicles hang down from the windows but the stove sings a merry tune as it is fed with crackling spruce and simmering yellow pine. He is beginning to feel the great content of accomplishment, for to know is all right for talkers and boasters, but to do bringeth satisfaction.

At first the work was hard for him and made him sore and stiff, but now the exercise makes him tingle with a pleasant feeling, and as he has to keep his wits about him the time seems to fly and the days go by apace, and the H 28 takes shape.

The molds are set up and the ribbons sprung. Her shape, as it developed, fascinated him and so as to spend as much time as possible with her he now brought his lunch with him. It was pleasant sitting beside the stove and the steam box to eat for they now had a roaring good fire, and that afternoon they were going to bend frames. Joe, his helper, was a very good worker and had worked some years in the local yacht yard; he was quite an amusing conversationalist but the only fly in the ointment was Joe's profanity—he used swear words for descriptive adjectives and punctuation, or at times for each alternate word. Joe was a French Canadian and, although he had not quite mastered the English language, he was an excellent wood worker. As they were eating their lunch Joe said "That frame, she is about $1\frac{5}{8}$ square, maybe she take half-hour to steam. Every steam box, she is different, but if I work this shop long she no fool me. I think I have time to tell you wan Canuck storee while that frame she cook some more.

"I hunt muskrat, I hunt wildcat, sometime I hunt de hare. Wan time I tak' de ax an' go to hunt de skunk pole cat. My fren' Beel he say he's very good fur, sometime he's good for eat. And so I go to get fur coat, same time get some meat. I walk two-three mile, den I get de awful smell, I t'ink dat skunk has go and die and fur coat she go to hell. Den I see he is down by wan beeg tree. I sneak up close behind. I t'ink he no see me. Den I raise de ax up high, but de skunk he's t'ro somet'ing, stricket jus' in my eye. Gee-cri, I t'ink I see blind. Mon dieu, I cannot see. I go roun' and roun' till I strike de good dum tree, den I t'row way de ax and light out for de shack. I t'ink about one thousand' skunk she's climb up on my back. My wife she's meet me at the gate. She sick on me de dog. She say 'You can't stay here tonight—go stay out with the hog'. And so I hunt de skunk no more to get its fur and meat for if he's bees he smell so strong I don't t'ink I like that meat." (With all credit to the unknown author and apologies for leaving out certain words for the benefit of the ladies.)

Well, they worked hard all the afternoon. To start with, Joe had four frames in the steam box and each

time he pulled one out he replaced it with another. As he pulled the hot frame from the box he handled it with a piece of burlap bag and handed the frame to the Man (as we will thus call him hereinafter, for there will later be one called the Woman, in the case, also), who grasped it and stood it nearly upright while Joe clamped the heel against the floor timber. Then the Man bent the head of the frame toward the upper ribbon and, grasping the same with one hand, he walked up the steaming frame, so that it bent perfectly on the ribbons, making the reverse curve as intended, and all this was done even more rapidly than it has been written. Joe clamped and dogged the frame in place and so as to not use too many clamps (as they didn't have many), as soon as the frame had cooled some, they put screws through the ribbon into the frame after the frame had been slid and twisted into exact line, which they determined with several little measuring sticks, the exact length of the bay between each frame. Well it was fast work and hot work and almost before they knew it the sky in the west grew pink and the east gray. Across the harbor the lights popped into view, one by one, and the icicles in front of the window stopped dripping. As Joe was putting on his coat to go home he said, "That is some of the best dam frame I have ever bent and the reason for it is the frame is square. Each time I han' you a frame I turn it so she come slash grain (that is so the grain of the wood is in layers parallel with the planking). Now if you try to bend him in rift grain (that is with the grain of the wood) at right angle to planking you find plenty of him break. I think designers of that H 28 work in shop some tam' so he can know somet'ing. Lots of designers he don't know he call for frame so much molded, so much sides, that is O.K. for saw frame but no dam good for steam job."

As the Man walked home the air was crisp and clear and the evening stars shimmered in the heavens, but he felt not the cold for a great contentment was on him, and as is so in such cases his perceptions were keener. How different, he thought to himself, this all is from the way I felt a month ago. Yes, the bending and stooping, sawing and drilling, were good for one after he had grown used to it, and my! how you did have to keep your wits about you. But then he thought of his wife. (Enter the Woman.)

It so happened that a young lady had lived not so far from the Man, and in fact just two streets up from the yacht club, and she, having heard devious words that some of the neighbors let fall about the time that his uncle died (to wit: that the Man was in good case, well heeled, and the like), she took it upon herself to show him good countenance and he, finding her of pleasant demeanor and comely of person, took her to wife. Now, as often happens in such cases, as the months went by she became less and less pleasant of demeanor, so at the time of which we relate, coincident with the bending of the frames, she, noting the great content which the man found himself in, took it upon herself to be gravely perplexed and as the man rested himself before the fire in the evening, thumbing over the Merriman catalogue of yacht fittings, and Sands catalogue of marine fixtures, she said unto herself, "Woe unto me that I ever married this stick-in-the-mud who spends his evening roasting his feet while other husbands take their wives to the play and the night clubs and are merry, and dance."

The Man, perceiving this disorder, put it to one side saying, "This is naught but the ways of a woman." But

one afternoon the Woman called on the wife of a man in the travel business and seeing various and sundry pamphlets lying about, she took to looking at them, and in sooth one of them pleased her mightily and as she was departing the lady pressed it upon her. Now this aforesaid pamphlet was intended to describe a West Indies cruise, but it gave none of the information a prudent traveler would know, such as where the ship was built, what rating she had with Lloyd's, what type of lifesaving equipment she had, or whether her paintwork and interior trim were fire resisting. In lieu of this, on the cover was depicted a great white steamer whose proportions and height would make the heart jump into the mouth of one used to nautical matters. Worst of all, hard under her starboard bow where one of her stockless anchors would fall, was a miniature palm-clad island, and about where one would expect the steamer's port screw to be was the shelving beach of another.

But the second page was what took the Woman's eye for there the artist had depicted a woman in a very low-necked gown, holding a fan in one hand, in the act of descending a broad flight of stairs flanked by royal palms. In the distance and hardly discernible were some pigmies dancing in a saloon about ninety feet high with a domed skylight like the apse of a cathedral. Under this artist's drawing was the simple caption "Orchestra 4:30 and 8:30 daily".

Now the Woman took great store by this picture and many afternoons after she had finished her housework she would take to looking at it, would mull over in her mind what kind of a hair-do she would have if she were the woman descending the stairs, and even made up imaginary conversations with the passengers. About this time the Devil, passing that way on his regular rounds and seeing the lay of things, said to himself, "This seemeth a fertile field to sow in". He got the Woman by the ear and began quoting such sooths to her as "A woman is young but once", "Catcheth you fish while the bait has an allure", etc., which, though the Woman did not know it, were not sooths but really wiles. For, though it is true that strumpets and harlots are young but once, still those who keep themselves interesting are young always, and those who work with their hands and their heads are always interesting. Michaelangelo was the life of the party at seventy, and for that matter still lives.

Well, in the meantime the H 28 prospered and grew. They lined off the planking—that is, they marked on each frame where the seams of each plank should come. The garboard or lowest plank was rather triangular so that its upper edge was quite parallel with the water line. To divide up the area above that they took a piece of white elastic webbing, such as is used to make children's garters, etc., about one inch wide. This they stretched over the longest frame amidships and divided it off with pencil lines where they wanted the seam of the plank to come, making the lower planks widest and gradually decreasing them up to the sheer strake which again was a little wider, to be sure to take the shelf bolts. Then they re-stretched this elastic over each frame above the garboard and transferred the plank divisions thus. To carry the line of the plank out to the bow and stern which were beyond the top of the garboard, they tacked a batten along each line and carried it out, and this took some care and skill, but as Joe said, nothing was much homelier than a vessel with poorly lined-off planks.

The Man grew happier and healthier as the days went by, but the Woman was sorely perplexed and even

got to the point where she considered doing the Man some grievous mischief. At one time she even considered disposing of a large pile of back numbers of THE RUDDER, which the Man kept in a cupboard beside the fireplace and solaced himself greatly therewith. At last the Woman, in despair, after many an "Ah, me" and the like, turned to cooking to quiet her nerves (and she was a good cook) and made herself a couple of mince pies. Now it so happened these pies turned out wondrous good. So, at the supper table, after first saying to herself, "I don't care about my figure any more" and such like, she did take of the pie a measure rather more than was her wont. As the evening wore on, feeling herself in slight distress, she bethought herself of some elder-berry wine her aunt had given her for medicinal reasons, but not knowing the potency of that remedy she dealt herself such portion as was more befitting of a wine than a cordial.

Soon, after feeling a certain drowsiness on her, she excused herself and said good night and retired, whereupon she fell into a heavy slumber and a dream came unto her wherein she heard two voices discoursing. One said to the other, "Know ye the man that buildeth himself an H 28?" The other voice answered, "Verily I do, and a happier man it would be hard to find." First voice, "Know ye his wife?" Second voice, "Aye, of a surety, I do." First voice, "What think ye of her?" Second voice, "Now so as to not mince my words, I think she is a ——— fool." First voice, "Why judge ye so harshly of her?" Second voice, "In the first place she nourisheth herself at the same loaf as the Man, and sheltereth herself under the same roof, but is too much of a fool to share his pleasure of working with the hands and the head. In the second place she is beset of a cruise on a steamer where she would only come in contact with trippers, card sharks, ham actors and adventuresses, that human dross that frequents public places to pass away the time, for they can neither work with their hands nor their heads." First voice, "But this woman would like to go places and see things." Second voice, "Those who travel the fastest see the least, but he that would see, feel and hear the most of life, nature, and God, let him go down to the sea in a small sailing vessel." First voice, "But the Woman would like to feel the romance of the moon rising over a tropical sea with music and dancing." Second voice, "The same moon riseth over the H 28, though it appeareth differently. Over the steamer it is cold and lifeless, as it takes its course up the heavens, while over the H 28 it is a merry thing that now peereth in through the starboard sidelight, and now through the nether end of the port hatchway, as she veers back and forth at her mooring, dancing to the tune of the incoming tide which chuckleth under the forefoot."

Well, the Woman spent the rest of the night rather restlessly but in the morning, putting on a more pleasant demeanor than of late, made ready the breakfast things. Now the Man, as he sat down, noting the change, said to himself, "What does this forebode? I hope it is no ill omen on this the day that we were going to spring in the shelf and clamp." So he shielded himself back of the morning paper expecting momentarily the West Indies cruise to come to the fore. But as he put his coffee cup down for the second time, the Woman said in a very unconcerned voice, "Now about that curtain in front of the toilet, and the covers for the bottom of the pipe

(Continued on page 58)

BUILDING Buoy Boats FOR THE NAVY...



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COLUMBIAN PROPELLERS



SNARKE (Continued from page 39)

berths on the H 28." "I beg your pardon," said the Man, but to his great astonishment they fell to discoursing most amiably on the whys and wherefores of various arrangements and the Woman did not contradict him even once, of that which he had to say, and he marveled greatly thereat.

But Joe was waiting to bend in the shelf and clamp and this was a job for two, so he hurried down to the H 28, but often during the morning he fell to pondering about the unusual turn that the Woman had taken; and fearing lest some grievous ill was upon her he took his lunch in his hand when the noon hour approached and went home where, much to his astonishment, he found the Woman sitting among various and sundry materials suitable for curtains, cushions, and the like, and so much did he enjoy that noon hour that he ate his lunch at home thereafter.

And the Woman, on her part, wrought wondrously well with the needle and being one of good taste, as even some women are, began working with both hands and her head so that she, too, began to feel a measure of peace and contentment, nearly equal to that of the Man.

After the deck was laid, and the house built, the Woman helped with painting of the cabin, and she, being nearly as good a conversationalist as Joe, got to asking him where he went when he first came to the States, and how old his wife was at that time. Joe said, "Well, first we come to New Ham-sheer. That time my wife, she was dirty and I was dirty, too. We live in dat state for about two year. Then we come thi' place. My wife, she get job in laundry and I do somet'ing, too. Was pretty hard at first but now we do pretty good. I think we clean everyting up in about 'nother year."

The days now were getting longer, but the work was well advanced. The spars were glued up; the rudder and tiller finished and hung. One Saturday afternoon a rigger came up from the local yacht yard and was getting out her gang of rigging. Everything certainly was bustle and excitement, and little had they realized before how many parts there were to a small vessel, what with the shackles, the thimbles, the blocks, deck hardware and all. Well, everything looked pretty good, and that afternoon an old uncle, a brother of the one who had died, came to look things over. Now this uncle was an eccentric old man who collected clocks; not so much for their cases did he value them, but rather for the design and excellence of their works, and like many another who has had a hobby for years, he had acquired quite a knowledge of this hobby and even could be said to be an authority on horology. In his younger days, however, he had had a yacht. Well, as he looked the H 28 over, he thought, "By golly the planking is pretty good—nearly as good as they used to make it." When he climbed inside he was quite surprised to see the Woman painting, for he had always put her down as one who would neither fish nor cut bait.

All this pleased the old boy no small amount, and he said to himself, "My nephew is coming right along and after this work with his hands and head he may even have an appreciation of some of the real things of this life." So he called his nephew over to him and said, "I have at home a Chelsea clock or two, and the one which I have in mind I had on my yacht about thirty years ago. I have so regulated it from time to time that

its rate is within one minute a month. It is one of their striking

models. If you tell me the name the yacht will carry I will have it engraved on the flange of the bezel."

Man speaking: "Uncle, that is the one thing I wanted most of all but noticing the prices of them in the back numbers of THE RUDDER, I had thought them beyond my means. Now as to the name, let me call my wife down." Woman climbs down ladder and is a little cross at being summoned. Man speaking: "Uncle is going to give us a Chelsea clock for the H 28." Woman speaking: "What do you want a clock for when you have a wrist watch?" Man speaking: "Now, now, we were wondering what to name the H 28 and thought you might help us." So the Woman, coming to her senses, said: "Uncle, what would you name her?" Uncle speaking: "I had always thought if I had another yacht I would name her the Snark, for Jack London had such an amusing time with the one he tried to build so named, and a few years ago looking in Lloyd's Register I found none of that name." So they all did agree the Snark she would be, and every one went home happily.

That night the Woman cut a stencil for the name and she was quite deft at such work, but the next day when they went to try it on the stern they discovered, much to their chagrin, that they had forgotten all about the rudder. Joe happening around under the stern and seeing the quandary they were in said, "Well, why not put another letter on him?" At first they laughed, then the Woman said, "An old English way of spelling it might have been Snarke", so they adopted that, and the Man said, "I bet that one isn't in Lloyd's."

Well, the days went by till it was light after supper and one warm spring evening they walked down to see her. It was one of those still June evenings when all nature seemed pregnant with life. You could almost feel the grass growing, and the apple blossoms falling. In the distance could be heard the rhythm of the frogs as they tuned up for their evening concert, and now and then the cadence of a robin's evening song. They opened the big door at the end of the shed and the evening lights and shadows, as they played along the Snarke's topsides, made her seem almost opalescent with the reflections of the green grass and the pinks of the sunset. My! how she stood out against the somber background of the shed. As the Man and the Woman stood arm in arm looking at her, they suddenly realized how they loved her.

Nearly everything was completed now and the paint quite hard. They had the local mover set her on the shore at low tide, down to the water's edge. It wasn't a very thrilling launching, to be sure, but they liked it. They expected her to float at about seven in the evening, so the Woman (who might now even be called the Bonnie Lassie) had put up a lunch. Uncle was there and the three of them sat in the cabin, as the evening had turned cool. The stove was going so they had tea with their sandwiches, and lay back comfortably enjoying themselves, when suddenly they heard the pleasant sound of the Chelsea clock as it struck six bells, and they thought, she ought to float any time now. But when the Man looked over the side it occurred to him he had forgotten about daylight saving time, so they had an hour before them to sit and talk.

The Woman, to make conversation, said "My husband tells me a clock like our Chelsea costs about one hundred dollars. Now, Uncle, how can that be?" Uncle speaking: "I am glad you asked me that for I think I can tell you. Now to make a weight driven pendulum clock that keeps fine time is a comparatively simple matter for the driving power is constant, and the pendulum meters out the time most accurately, but when you try to equal this accuracy of time keeping with a clock which will be subject to motion, vibration, and changes in temperature, there are some great difficulties to overcome. You will say, 'Well how about the watch?' Now, while the watch is a wonderful thing, the Chelsea clock is in reality only an enlarged fine watch with a spring large enough to drive it eight days. The escapement is full-jeweled—in fact it has jewels in some of the important places that many watches do not. Every other gear in the Chelsea is of hardened and polished steel; the intermediate ones are of carefully cut, wide-faced bronze. Your clock here has run thirty years or more and shows absolutely no signs of wear. I do believe, with proper oiling, it may run for several centuries. The Chelsea clock is one of those unique things that is made and finished just as well all through as it is on the outside. It is manufactured with just as much care and skill today as it was fifty years ago. Now, if you take a mechanism, as carefully designed and made as this, and put it in a cast bronze case which is dust, fog and water-tight, you have something dependable to take to sea with you."

Woman speaking: "Uncle, do you mean to say all those other clocks are good for nothing?" Uncle speaking: "Well, most of them might be used to throw at the cats on the back fence of a moonlit night, but I can't think of what use they would be at sea."

The Snarke began to jiggle on her cradle; then she lifted aft. Gradually she was water borne, and floated off and became that



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As far as we know, nobody was ever before crazy enough or smart enough (take your choice) to concentrate on just one hull model—one size. Result? Mass production—applying the automotive mass manufacturing technique to boatbuilding. Advantage? Just look at an Owens 30-footer and you see more room, more seaworthiness, more fine materials and workmanship, more boat all-round for LESS cost—in inevitable result of turning out more 30-foot cruisers on a production line. Ever spend a week end in an Owens? You've some learning coming to you!

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Wait a While. Right now we are up to our scuppers in mass production of landing boats and aircraft rescue boats for the war. Just keep on wishing for that Owens, and when the Hitler and Co. are jugged, we'll be offering you a new and finer Owens. Keep wishing while you wait!

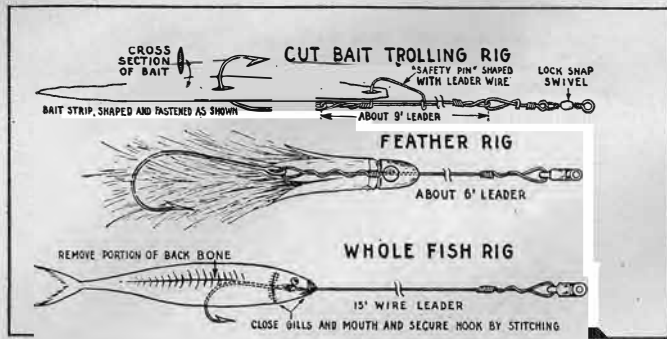


OWENS

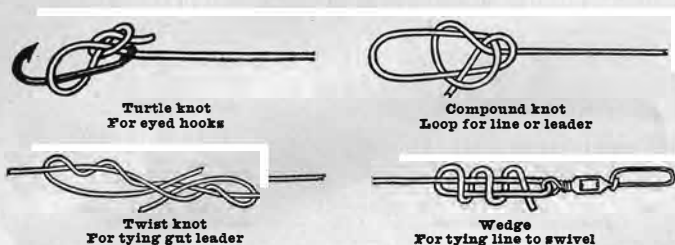
30 ft.

The Ideal Cruiser

—THE OWENS YACHT COMPANY, BALTIMORE, MD.—



Trolling rigs



... thing of life which they had so yearned for. After several trial sails, and getting well acquainted with her, they took a cruise to the eastward. They got down as far as the Isle au Haut and Frenchman's Bay the first year, and cruised happily many years after and it so happened that a son and daughter were born to them so the two pipe berths abreast the mainmast were not all in Yaín. They always hoped sometime to get down to the Bras d'Or Lakes, and even to visit St. Pierre and Michelon, but I can't say whether they ever did or not. But one thing I am sure of. the Chelsea clock kept going and so this yarn endeth more truthfully than it began.

How To Build H 28

Twenty-Eight Foot Auxiliary Cruising Ketch

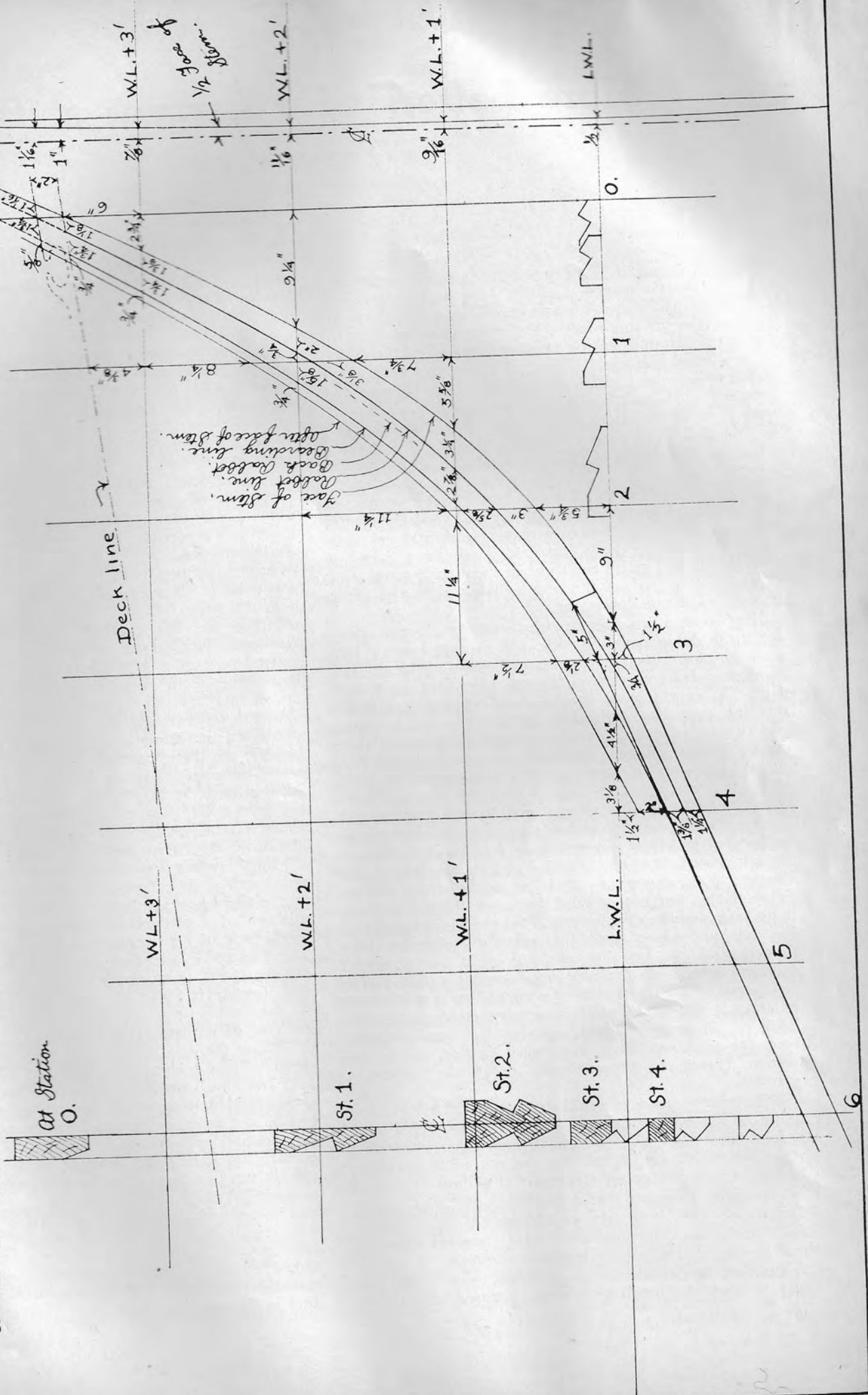
Designed By L. FRANCIS HERRESHOFF

TABLE OF OFFSETS FOR H-28
 GIVEN IN FEET-INCHES-AND EIGHTHS OF INCHES

Stanchion Number	ELEVATIONS above and below				HALF BREADTHS										DIAGONALS		Stanchion Number			
	Top of Side	Buttock 3'	Buttock 2'	Buttock 1'	Ratchet Lead	Top of Deck	WL+3'	WL+2'	WL+1'	WL	WL-1'	WL-2'	WL-3'	Face	#1	#2				
0	3-6-0				-8-2	3-6-0	0-1-0							0-1-6	0-1-0		0			
2	3-2-5			2-6-0	0-9-0	0-5-6	1-4-3	1-3-0	0-9-2	0-3-3				0-1-6	0-0-4	0-8-4	2			
4	2-11-4		2	2-6-6-7	0-5-3	0-6-3	2-4-4	1-10-4	1-3-4	0-6-6				0-1-6	0-0-4	0-5-0	1-7-1	4		
6	2-8-6		2-5-6	0-6-7 0-6-1	1-3-1	1-4-2	3-1-2	2-9-5	2-3-2	1-6-1	0-5-3			0-1-6	0-0-5	1-0-6	2-5-3	6		
8	2-6-2		0-10-0	0-4-6 1-2-7	2-0-5	2-2-2	2-2-1	3-7-5	3-5-7	3-1-1	2-4-7	1-3-3	0-2-2	0-1-6	0-0-6	0-0-6	1-7-1	3-1-7	8	
10	2-4-0		0-10-6	0-11-7 1-8-2	2-2-4	2-3-1	3-0-0	3-11-7	3-11-3	3-7-7	3-0-6	1-11-1	0-7-4	0-4-3	0-3-6	0-1-0	1-11-5	3-7-7	10	
12	2-2-1		0-6-4	1-3-7 1-11-2	2-3-4	2-4-0	3-1-0	4-2-5	4-2-4	4-0-1	3-6-1	2-5-4	0-10-7	0-6-0	0-5-1	0-2-7	2-2-6	4-0-1	12	
14	2-0-1		0-9-1	1-4-7 2-0-0	2-4-4	2-5-0	3-2-0	4-4-0	4-4-0	4-2-2	3-9-2	2-8-1	0-11-6	0-5-7	0-5-1	0-3-1	2-3-4	4-2-4	14	
16	1-11-5		0-9-3	1-4-2 1-10-7	2-5-4	2-6-0	3-2-7	4-4-3	4-2-4	3-9-6	2-7-7	0-10-5		0-4-6	0-4-4	0-2-6	2-2-4	4-2-6	16	
18	1-1-0-7		0-6-7	1-1-1 1-7-5	2-6-3	2-6-7	3-3-7	4-4-0	4-2-4	3-8-0	2-2-4	0-7-5		0-3-5	0-3-3	0-2-2	1-11-5	4-0-7	18	
20	1-10-4		0-2-6	0-8-7 1-3-0	2-7-3	2-7-7	3-4-6	4-2-6	4-0-5	3-3-5	1-5-0	0-4-5		0-2-3	0-2-2	0-1-4	1-7-4	3-9-4	20	
22	1-10-7		0-3-0	0-3-0 0-8-4	2-2-4	2-8-7	3-5-6	4-4-0	3-8-4	2-6-5	1-7-2	0-2-0		0-1-6	0-1-2	0-1-2	1-1-7	3-4-2	22	
24	1-11-5		0-10-2	0-3-3 0-1-2	1-0-1		3-4-3	3-8-1	3-2-0	1-3-1	0-1-7			0-1-6	0-1-0		0-8-0	2-9-6	24	
26	2-0-6		1-6-6	0-10-7 0-6-0	0-1-4		3-2-4	3-2-5	3-2-3	2-3-0				0-1-6	0-2-6		2-1-6		26	
28	2-2-3			1-7-2 1-1-5			1-5-3	2-8-0												28
Transom			1-3-2	0-8-0			2-8-0		2-7-1	1-6-7	0-1-2	0-1-0	0-1-0	0-2-6			0-1-6	1-10-0	Transom	

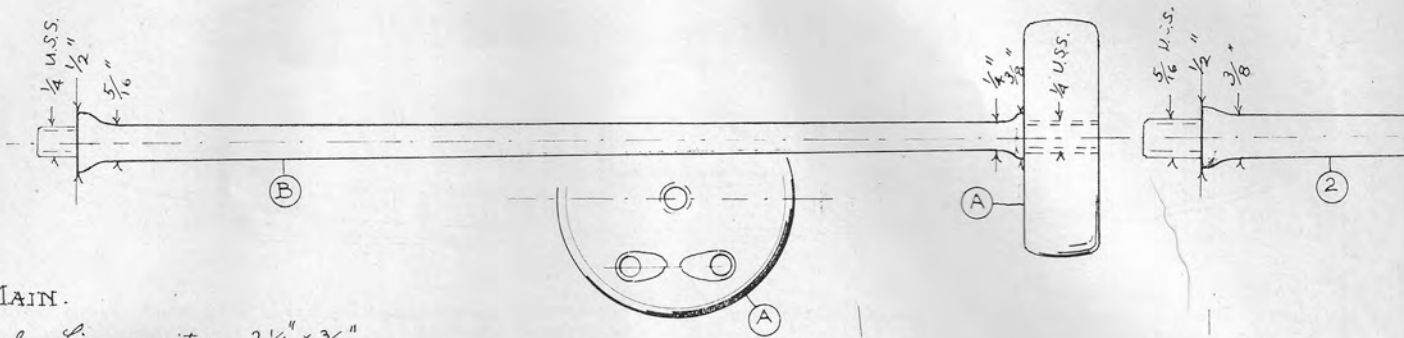
STEM OF H 28.

The Stem has a half breadth of $1\frac{3}{4}$ " at its Rabbet line, Bearding line and after face for its full length. The Back Rabbet is not shown. It is customary not to cut the Rabbet above the Deck line till the Bow chocks are fitted. (These lines are for planing $1\frac{1}{8}$ " thick)



How To Build H 28

Designed by



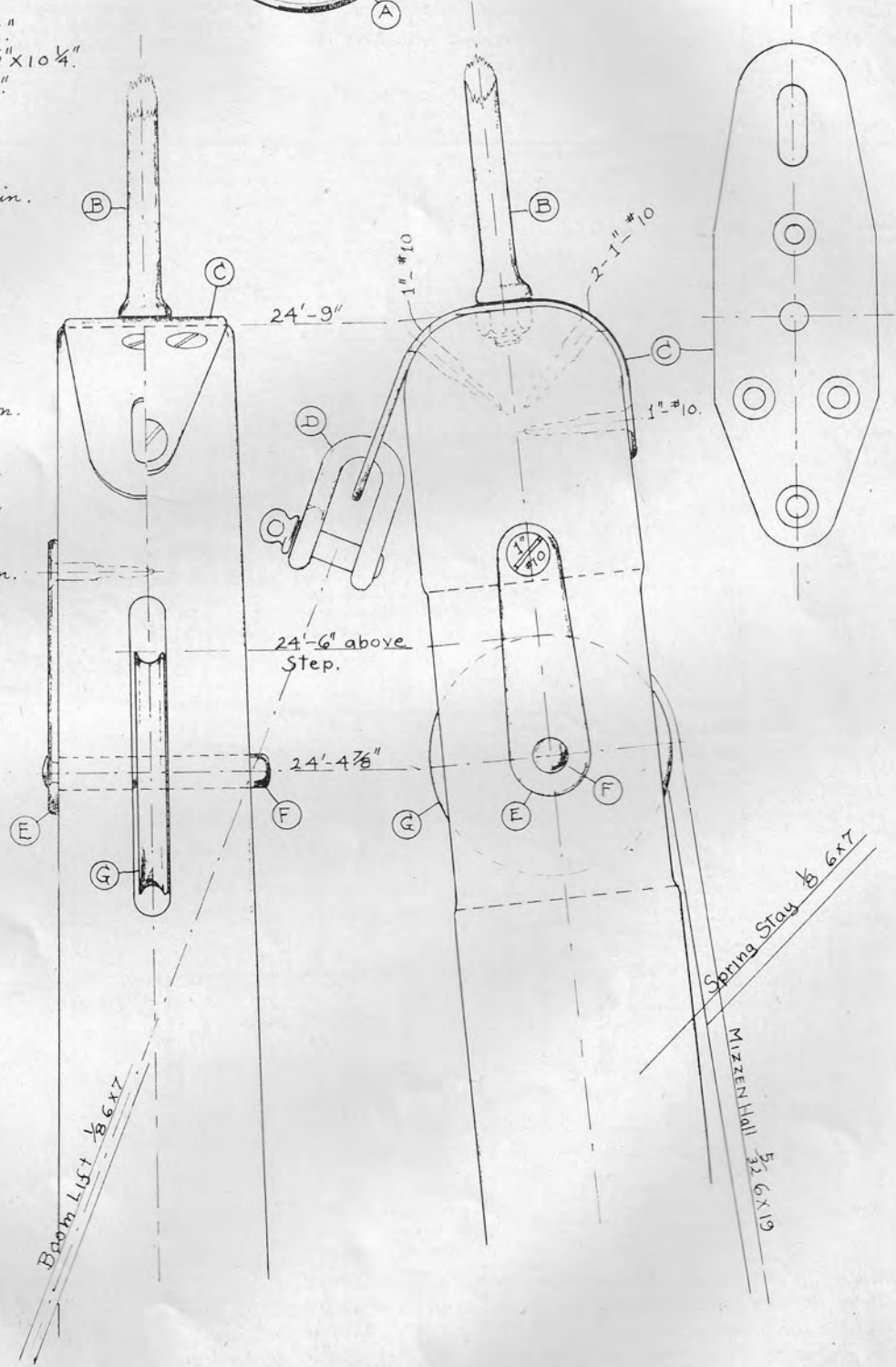
MAIN.

- ① Truck, Lignumvitae $2\frac{1}{4} \times \frac{3}{4}$ "
- ② " Staff Tobin Bronze $\frac{1}{2} \times 10\frac{1}{4}$ "
- ③ Phosphor Bronze $\frac{1}{16} \times 1\frac{1}{2} \times 6\frac{3}{8}$ "
- ④ " " $\frac{1}{16} \times 1\frac{1}{2} \times 9$ "
- ⑤ $\frac{1}{4}$ " Tobin Pin $\frac{3}{8} \times \frac{1}{16}$ "
- ⑥ Pin clips Bronze $\frac{1}{16} \times 1\frac{5}{16} \times 3$ "
one side loose, one rivited on pin.
- ⑦ Sheave Pin, Tobin $\frac{3}{8} \times 2\frac{3}{8}$ "
- ⑧ Bronze Sheave $2\frac{3}{4} \times \frac{3}{8}$ "
- ⑨ Meniman Fig-363-#0, If
Balloon Job is used.

- ⑩ Forged Bronze Bail for
Boom Lift - $2 - \frac{3}{16}$ Rivits
- ⑪ All Shackels $\frac{3}{16}$ " Chain, Galv Iron.

MIZZEN.

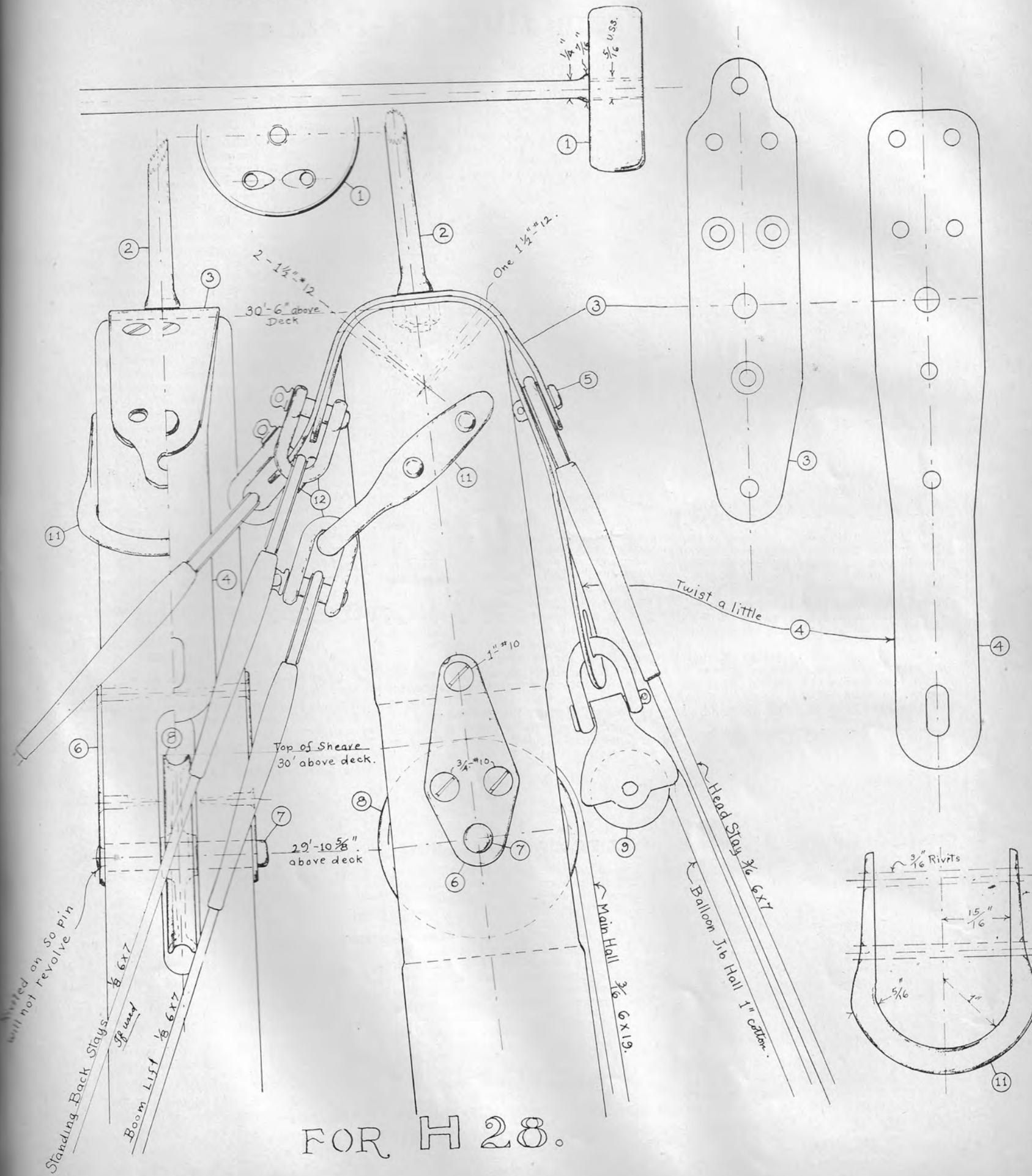
- Ⓐ Truck Lignumvitae $2 \times \frac{5}{8}$ "
- Ⓑ " Staff Tobin Bz $\frac{1}{2} \times 9$ "
- Ⓒ Phosphor Bronze $\frac{1}{16} \times 1\frac{1}{2} \times 4\frac{5}{8}$ "
- Ⓓ $\frac{3}{16}$ " Chain Shackle galv Iron.
- Ⓔ Pin clip (one side only) Rivited
on $\frac{1}{16} \times \frac{3}{4} \times 2\frac{1}{2}$ "
- Ⓕ Sheave Pin $\frac{5}{16} \times 2\frac{1}{8}$ "
- Ⓖ Bronze Sheave $2\frac{1}{4} \times \frac{1}{4}$ "



MAIN AND MIZZEN HEADS.

Twenty-Eight Foot Auxiliary Cruising Ketch

L. FRANCIS HERRESHOFF



How To Build H 28

Twenty-Eight Foot Auxiliary Cruising Ketch

By L. FRANCIS HERRESHOFF

CABIN PLAN

THE Editor has been hounding me for a cabin plan for H 28 and several of THE RUDDER subscribers have requested one. Now it is much easier for me to write about cabin plans of a boat of this size than to draw them up, and in the first article about H 28 I told why. Also, if I drew two hundred different plans, none of them would be ideal for each family, climate or purse. An old bachelor like myself, living north of Cape Cod, could start out on a cruise with remarkably simple equipment. It could be divided up into two categories—

1. Those things normally kept on board.
2. Those things jammed into a duffle bag or two which might be called expendable supplies.

The things kept on board might be the stove, pressure cooker, pipe berths, Hudson Bay blankets, oilskins and a clam hoe and, because a cabin does not look homelike without it, also a gun. Oh, yes; and the cedar bucket. The expendable supplies would be clothes, shoes, food, some reading material and a camera.

I will take most of these items of equipment up later and describe their particular functions. But first, if you can bear with it, I will tell you some of the reasons how and why I have made their selection. If I appear egotistical and use the word *I* rather often, this is not intended to give the impression of self appointed authority but rather because it is nearly unavoidable in describing the experiences of the first person singular.

It has so happened that I have made short trips or cruises in about fifty different small craft that ranged from open boats to steam yachts, and lived two whole winters on them in New England waters. Several of these craft were of my design. My first cruises were all on steam yachts and it is told that the first time I boarded ship was in a baby carriage. This was in the eighteen-nineties. I can't say I gained much nautical knowledge then, being under the watchful eye of a nurse and a mother. Life on board was very much as on shore. Since then I have gradually descended 'till my last cruises were in kayaks which have had the advantage of bringing me much closer to the water—in fact I could sit right in it without having my diapers changed, the thing I wanted to do from the very beginning. I have never made any long ocean voyages in small craft or had the least desire to do so, preferring rather to anchor each night in a well sheltered cove, walk along the waterfront of its picturesque village and pass the time of day with some waterside character who was whittling a plug for a bunghole that never existed.

I was first initiated into the virtues of simplicity as a lad of about sixteen, when I went on a couple of trips on the Q boat Dorothy Q owned by Hollis Burgess. Dorothy Q had about the same cubic feet of cabin as H 28 though twice her draft and three times her sail area, but her paid hand is our present subject (for he was

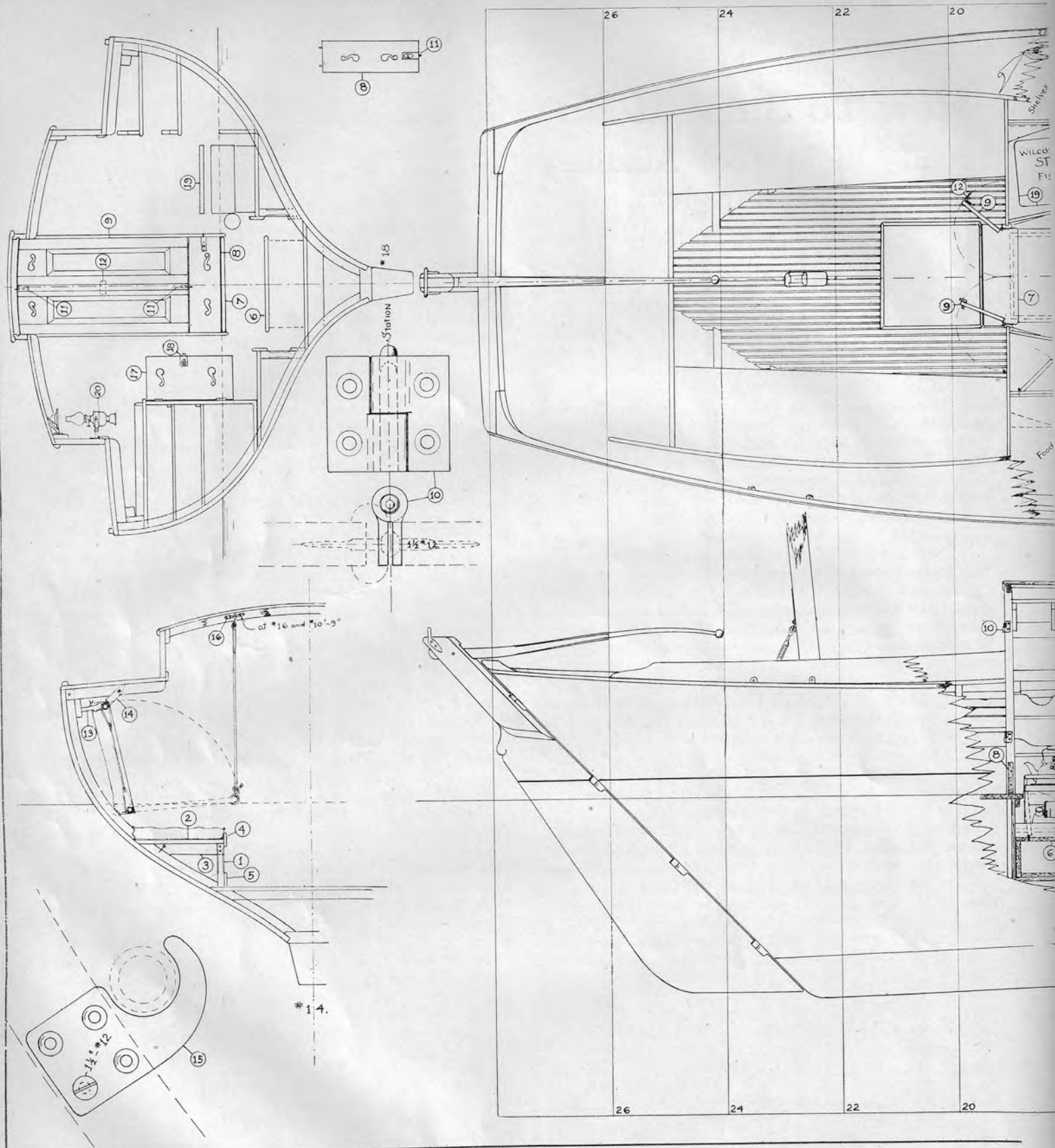
my mentor). This son of the sea of about seventy winters Hollis annually took from the Old Sailor's Home at Boston. He was one of those hardy perennials who subsisted mostly on rum and tobacco. In his voyage through this life he was not hampered by any other possessions than the few things attached to his body, which were his clothes, a glass eye, a steel hook in lieu of a right hand, a sheath knife and a plug of tobacco. His body seemed as immune to germs and the ravages of time as some copper sheathed teak planking. Not one piece of clothes would he take off on the hottest day, or add to in a rainy nor'easter. He could make a pier head leap, arrive on board en masse, complete, ready for instant action. He lived aboard the Dorothy Q without benefit of heat, light or pillow. But what I am getting at is his cabin arrangement. He had an exact place for everything; the anchor warp, ditty bag and reefing tackle were as reverently displayed as the chalice and relics on some high priest's altar.

The chart, compass and binoculars—these symbols of his calling—he placed and rearranged as carefully as a lady arranging a bouquet of flowers. When in port these decorations were enhanced by a tasteful addition of the marline spike, fid and serving mallet as he sat arming the sounding lead and rechecking the mark and deeps on the lead line. And so the olfactory nerves could share this enchantment, a ball of marline, a hank of okum and some tarred hemp lay on the transom. What a setting this was for the yarn which was always forthcoming, for this son of the sea was both playwright and actor. As he approached the point where the great tragedy was to be re-enacted (it might have been the fall of the mizzen as the waterspout passed over them in the Bay of Bengal) he pounded on the foghorn with his steel hook and removed his glass eye lest that orb, like the mizzen, should crash in the confusion. But as the weather cleared and a jury rudder was rigged he snapped it back in place, for he handled this optic as though he were a Hindoo magician.

Since that time I have designed many cabins, some paneled in teak, upholstered in leather; others in Chinese Chippendale style with *toile de Jouy* covered walls and blue leaded-glass cupboards, tiled bathrooms and streamlined galleys, sometimes assisted by an interior decorator or guided by a "dry" architect, who specialized in onshore construction, but never have I equaled the pure nautical simplicity of the Dorothy Q's cabin or its charm, where each decoration was a sailorman's symbol, for what is there pleasanter to contemplate than the polished log and its rotor, or the folded trysail—that auxiliary motor. Well, to get back to the H 28's cabin.

Pipe Berths. So few people nowadays are acquainted with the many tricks of a pipe berth that I will give them some space. In the first place a pipe berth can be made the most comfortable of all beds, for as you use it it sags at the shoulders and hips 'till it is molded to your particular shape. It can be triced up or let down so the weather or leeward berth is level when sailing. It is cool in the summer and warm in the winter. When closed up it makes a comfortable back behind the cabin seat or transom. When in folded position it makes a convenient press which can hold all one's clothes and belongings so nothing will clutter up the cabin and one can instantly get at any of his personal gear which is wanted with a change of weather.

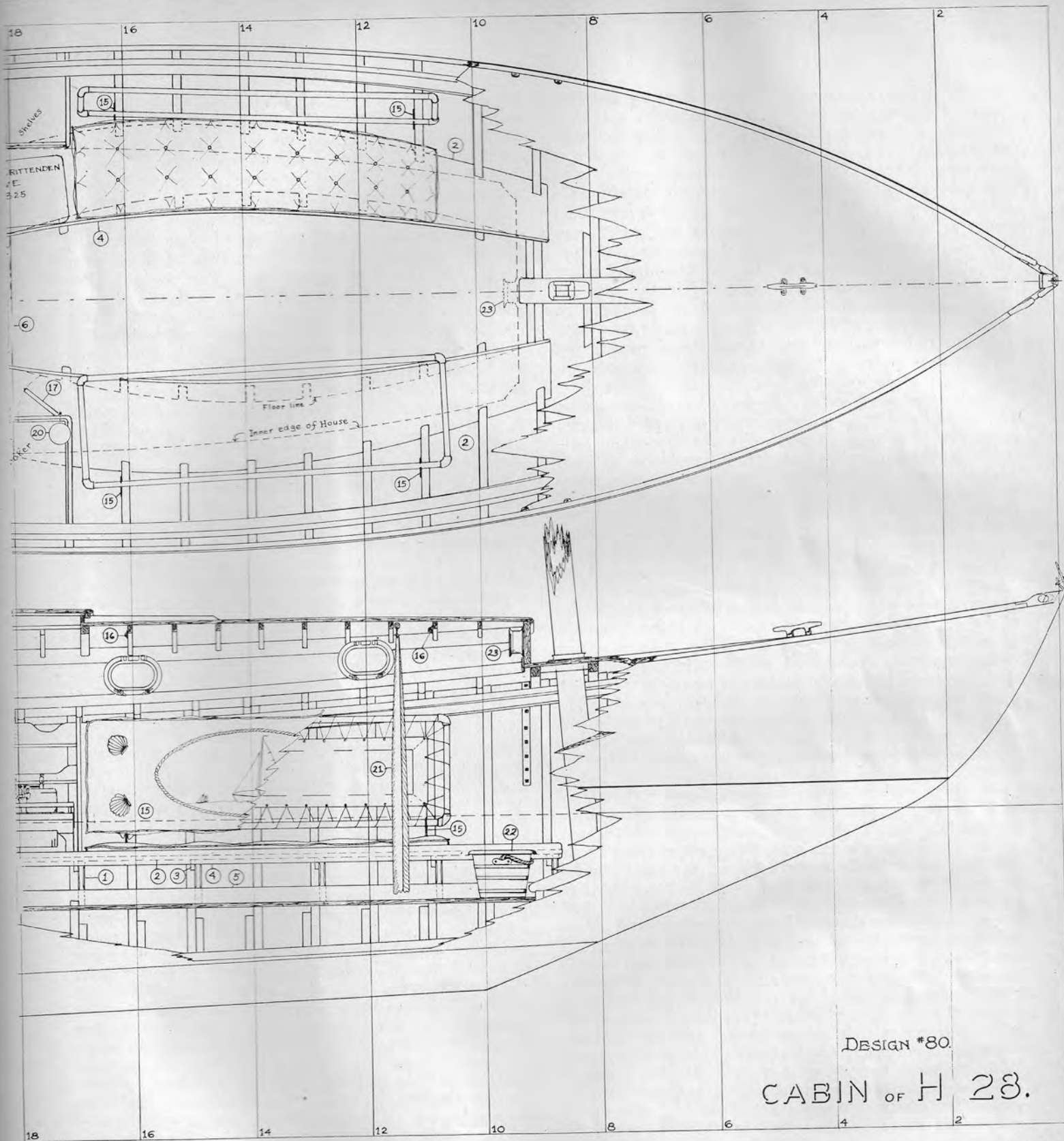
When a pipe berth is let down it should be three or four inches above the transom under it so you can stow



1. Oak stanchion, about $1\frac{1}{4}$ " x $1\frac{1}{4}$ " x 9".
2. Transom seats, pine about $\frac{3}{4}$ " thick, or $\frac{1}{2}$ " laminated wood.
3. Cross pieces, any wood about $\frac{7}{8}$ " x 2".
4. Upper face piece, $\frac{5}{8}$ " x 3".
5. Lower face piece, $\frac{5}{8}$ " x 3".
6. Combination tool box and step with hinged top. Outside of box about 18" long, 8" high, 11" wide. After corners may have to be cut away for frame 19.
7. Removable threshold for cranking motor.
8. Removable section to raise cabin doors above motor cover.

One end Wilcox, Crittenden Fig. 3600, other end two No. 14 screws with head sawn off. Ventilation holes, if wanted.

9. Cabin doors are best if paneled up so as to reduce shrinking and swelling. They can be about $\frac{3}{4}$ " thick. Cabin doors should be un-hung when sailing and can be stowed under the cockpit seats aft, if desired.
10. There are no commercial unhooking hinges that have the butts covered so thieves cannot unscrew the screws, so a full size drawing of proper ones is given. They must be made up in pairs, right and left hand, with the pins or pintels of the lower hinges longest to facilitate hanging the doors. The pin is best if of $\frac{5}{16}$ " Tobin bronze, either



DESIGN #80.

CABIN OF H 28.

- threaded or driven in, with well rounded upper end. (Maybe Wilcox, Crittenden will make some up.)
11. Wilcox, Crittenden Fig. 3600, brass.
 12. Wilcox, Crittenden Fig. 475, polished brass.
 13. Berth stop, oak $\frac{3}{4}$ " x $1\frac{1}{2}$ " x $4\frac{1}{2}$ ".
 14. Ratchet action clip to hold berth in folded position. Oak $\frac{3}{4}$ " x $1\frac{1}{2}$ " x about 7 or more inches. No. 14 round-head screw over washer.
 15. Berth hooks of sheet brass or bronze from $\frac{1}{6}$ " to $\frac{1}{8}$ " thick.
 16. Merriman Fig. 431—No. 2.
 17. Food locker doors, flush for back rest when cooking, pine about $\frac{3}{4}$ " x 9" x 18".
 18. Wilcox, Crittenden Fig. 358.
 19. Wilcox, Crittenden stove Fig. 825.
 20. Suggested position of Wilcox, Crittenden lamp Fig. 99—No. 1.
 21. Curtain, if wanted, can be tied back against shelf and clamp at frame No. 10, or privacy can be had by putting on the cabin doors.
 22. Wooden bucket with wide rim removable top—both to be hung normally under after deck.
 23. Suggested position of Chelsea clock, marine $4\frac{1}{2}$ " dial, and set hand.

here the things normally kept back of it during the day. Some of the best features of a pipe berth are that they are cheap, light and easily removed for washing the cabin or painting. They can easily be taken on deck for a sunning or drying. But best of all, with a pipe berth you can have several cabin plans. Their only attachments to the hull are quite simple hooks, so by having these hooks at various places on the frames you can change your cabin plan on the H 28 so she has two, three or four berths as the occasion arises (of course, leaving the unused berths ashore), maybe the berths way aft and a coal burning stove forward. I use seizing wire for lacing on the berth bottoms because they require less adjustment from stretching. On English yachts the berths are often made tapering so at the foot they are only about 16 inches wide.

Be sure to use a cotton rope for a lanyard to support the inboard end for the chains, as manila ropes used by some are quite disagreeable against the face when suddenly getting up in the dark. It is customary to have a plain hook at the upper end of the lanyard, so when folding the berth up in the daytime this rope is out of the way.

To me the bottom of a pipe berth is not an unpleasant sight, particularly if the lacing of the berth bottom has been neatly done and the ticking of its mattress is well covered with a good Hudson Bay blanket (one of their green ones to starboard and a bright red to port). However, the bottom of a pipe berth presents a surface adapted to decoration. The oldtime sailors could make some drawn work on the style of a gangway cloth for here, but they served their apprenticeship with palm and needle, while the present monkey wrench sailor lacks all creative ability, so this may have to be left to some member of the fair sex. The Woman, the wife of the Man who built the Snarke, the one who had good taste and wrought wondrously well with the needle, made their covers of blue denim boxed up around the edges so it covered the mattress. The seams were piped with a white binding. To hold them on the pipe berth frame she had several tabs which snapped over the tubing which stretched and held the cover in place, for these attachments were quite close together along the topside. She had stitched or embroidered a design that the Man had drawn out for her showing H 28 under way, and a few aquatic objects in the corners, as is shown on the plan.

Stoves. It seems as if the pressure cooker has changed the whole galley arrangement and particularly the stove. With its use good meals can be cooked in less than one-quarter the time generally taken, but best of all you can cook those things like beans, lentils, salt cod, prunes, which are easy to stow (pack away) and keep indefinitely. With me most everything that goes into the pressure cooker comes out tender and succulent, although I am no cook. The cooker I use is a Flex Seal. Be sure to get one that is all of stainless steel for they are much the easiest to clean and they resist scratching. With the pressure cooker it is generally unnecessary to cook when under way for you can cook things so quickly—several good vegetables one minute, a good lamb stew twenty minutes. What is needed for a stove is a flame or heat capable of quick adjustment for after the pressure cooker has been brought to working pressure the heat can and often must be turned down quite low.

On the cabin plan there is shown an alcohol stove which acts much as a gas stove; it can be started up and

stopped quickly. This is called a Sea-Cook. It's the small one you want (which may be called the Son of a Sea Cook, for all I know), but it is Fig. 825 in Wilcox, Crittenden & Co.'s catalogue. It can be bought in gim-bals if desired. With a pressure cooker the cooking can be done so quickly it will probably be done when at anchor, so gim-bals are unnecessary.

Eating to a great extent is sort of a mental process. You hear one say "I feel faint", and almost falter in their tracks, but after throwing a load on their stomachs they feel revived just as if the food were instantly digested and assimilated, had made its thirty mile cruise of the circulatory system and built up new muscle tissue, a process requiring hours if not days. We have so accustomed ourselves to eating at certain times that many are seriously upset by any change in the schedule. The salivary and digestive glands have been so used to pouring forth their juices at certain periods that if retarded the whole nervous system is affected. Even our domesticated animals have acquired our habit. I used to plow with a pair of horses (for I have plowed other things than salt water) which, as the noon hour approached, slowed down and came to a determined stop and while I was remonstrating with them to recommence, often faint but clear in the distance could be heard the factory whistles and the town clock summoning the townspeople to their noonday meal, but the horses knew better than I when to unhook the traces and let down the whiffletree. As I sit here writing at this moment my two dogs sit looking at me with beseeching brown eyes plainly speaking of an urgent inner need, for it is a few minutes past their eating time.

You will say, "What has this to do with the cabin plan of H 28?" Well, it is really most important for if you can keep your nerves and your companion's nerves quieted and rested much has been done toward the success of a cruise. As for nourishment, most of us are overfed anyway and should not hesitate to miss a meal now and then if it should interfere with a long run. One of the healthiest men in spirit and body that I ever cruised with never ate unless he was hungry. This occurred at irregular intervals, never interfering with sailing. He was a Greek, an ex-sponge diver, and I learnt much about life on small craft from him. While he never went swimming for pleasure he would think nothing of going down to visit the anchor on bottom, if there were any question about its holding, and insert its fluke or palm in some subterranean crevice.

There are some other things about eating and, without going into too much detail or taking you for a cruise through the alimentary canal with rod and gun, so as to say, I will speak of some things near the entrance and exit of that tortuous channel. The teeth. Teeth, like the blacksmith's arm, are only developed and kept in vigor by use. If you want to you can pour a thousand gallons of orange juice over them or plaster them with all the vitamins in the alphabet but it won't make much difference. What they want is to be used, some setting-up exercises. The best way to do this is the way the Great Designer intended: chew with them. If you throw the butter overboard (it's a nuisance to keep on board anyway) you will have accomplished a lot, for butter is a pleasant tasting grease which lubricates the food so lazy people can swallow it without chewing. If you give the toothbrush a sea toss now and go over your teeth with a

(Continued on page 52)

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H 28 (Continued from page 28)

freshly whittled soft wood peg or the chisel shaped end of a match, life will be simplified and improved.

As for the other end of the canal, in youth the walls are surrounded with healthy muscles which, if they decided an empty house was better than a poor tenant, would cause a complete evacuation, but after thirty or forty years of idleness because their owner only ate soft refined foods which were completely absorbed before they reached the end of the canal—well, it is just too bad. It was not so with my friend, the Greek sponge diver, who lived on hard dry bread, cheese, salami sausage, raw onions and figs. When he was nearing fifty one winter day, being on Long Wharf, Newport, a careless driver who was dumping a load of snow overboard backed his team over the edge, horses, tipcart and all. Manuel, for that was his name, without hesitation dived into the icy water after them and, being a Mediterranean sailor had a strong, sharp knife with him, soon cut the harness so the struggling horses swam ashore. One of our societies, hearing of the deed, gave him a medal either for braveness or kindness to animals. It was quite a pretty thing on a ribbon but Manuel gave it to one of the girls, for the girls liked him as well as he liked them, though he was often thirty years their senior.

Patient reader, you may wonder what I am driving at—well, it is the icebox. Manuel lived many happy, healthy years aboard small craft without an icebox and so can you if you are a mind to. To me an icebox seems a terrible thing—too often have I had to clean out of them ossified lamb chops or some other concoction which resembled a pre-Cambrian custard. So on the H 28 no icebox is shown, but opposite the stove is a removable box shaped to fit the side of the yacht with a shelf or two to hold those dry foods which keep each end of the canal in working order—potatoes, onions, rice, beans, lentils, prunes, figs, salt cod, dried beef in jars, canned goods, tea, coffee, sugar, dry Italian bread, hardtack, etc. It is not difficult to keep eggs a few days, or well cured unsliced bacon. If you can get it that hard, black salami sausage is wonderful; it will keep indefinitely. Manuel could make from it most anything from a thin soup to an Hungarian goulash. It is good fried with the eggs at breakfast, or on sandwiches for lunch, or a last snack at night. Take my advice—eat your potatoes with their jackets on; eat your whole apple, skin, core, seeds and all; chew everything well. Don't forget the prunes.

(To be continued)



NAVIGATION (Continued from page 35)

objects which may be stowed in a cabin or lazarette immediately beneath the compass may cause a decided change in deviation. A new motor surely will. And this error may vary according to whether the motor is running or shut off.

One ship I sailed on had been berthed against a dock for some days. When the compass was checked shortly after sailing a 5°E error had crept into it. This was probably due to the electric wires running up and down the docks which had set up magnetic fields of their own.

But at sea we have no landmarks. We cannot swing ship. But it is fully as important at sea to know our compass error as elsewhere, otherwise we will not steer the correct course. What do we do?

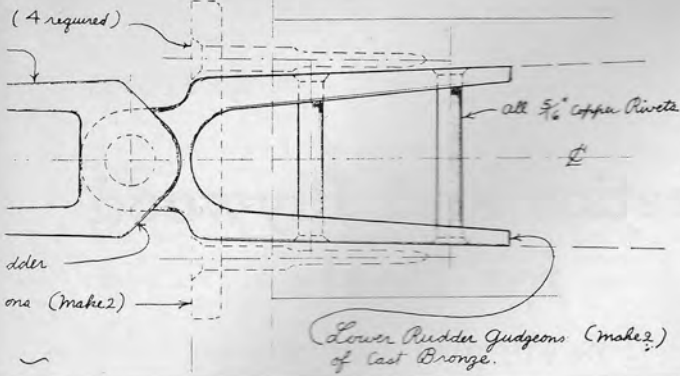
Fortunately celestial navigational means will disclose this error. Our sextant and the sun, together with computations known as azimuth tables, will give it to us and in a far quicker and in fully as accurate a manner as other methods. Just how this is accomplished will be described in a later chapter. The importance of the method can best be appreciated when one realizes that it is the one and only means the navigator equipped with ordinary equipment has at his disposal when at sea.

Answers to Compass Error Problems

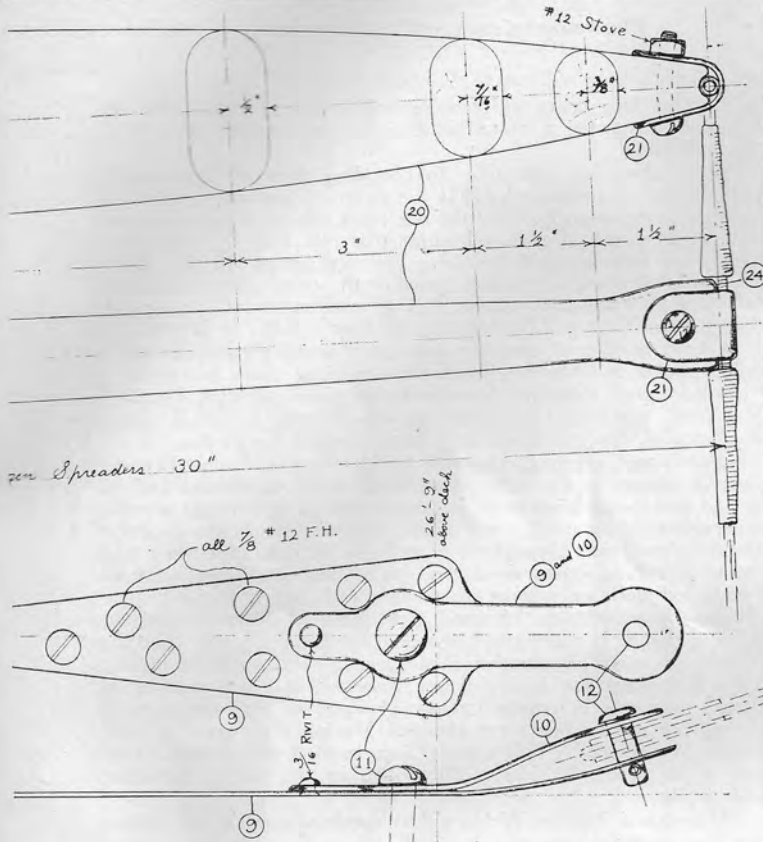
Question		Question	
1.	104°	6.	6°W
2.	241°	7.	177°
3.	9°E	8.	7°E
4.	24°W	9.	99°
5.	357°		

(To be continued)

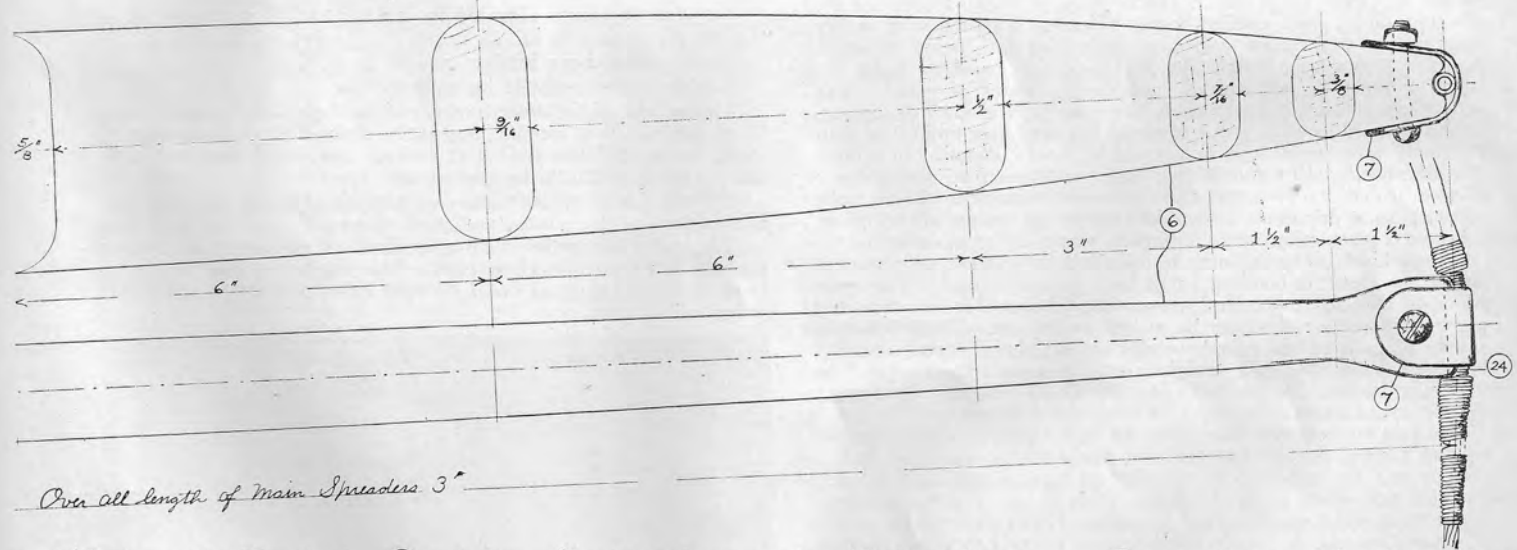
Arthur Petersen of the firm, Julius Petersen, Nyack, New York, boat builders, died suddenly. He is mourned by his relatives and many friends.



Lower Rudder Gudgeons (make 2)
of Cast Bronze.



Main Spreaders 30"



Over all length of Main Spreaders 3"

1/8" or thicker x 3" x 9 3/16" (make 2)
attachment (Phosphor Bronze)

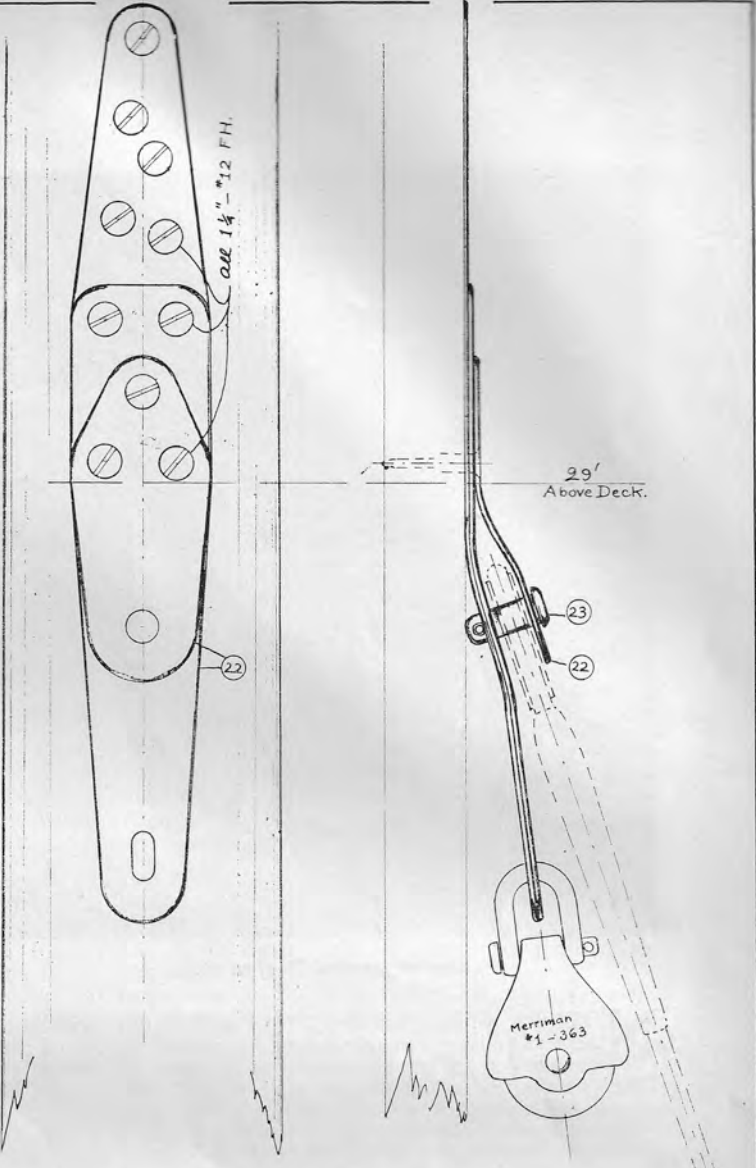
(make 4)
size 1 1/4" x 3" x 3" (make 2)
size bolt 1 1/2" long (make 2)

size 1/2" x 2" x 9 1/16"

- ⑩ main Upper Shroud Attachment, outer layer 1/8" x 1 1/8" x 4 7/8" (make 2)
- ⑪ Round-headed Stove bolt, about 3/8" x 3 1/2" (1 needed)
- ⑫ 3/8" Bronze Pin 1" long 1/2" head. (make 2)
- ⑬ Mizzen Upper Shroud Attachment, both layers 1/8" Bronze, 1/2" Pin and one R.H. Stove bolt 1/4" x 2 1/2" - layers (1/8" x 1 1/2" x 8 1/16") and (1/8" x 7/8" x 3 5/8")
- ⑭ Mizzen Lower Shroud Attachment 1/8" x 2 1/2" x 8 1/16" (make 2)
- ⑮ and Spreader Attachment 1/8" x 2 1/2" x 6 3/16"
- ⑯ 3/8" Tobin pin 7/8" long 1/2" head (make 2)
- ⑰ Spreader bolt Bronze 3/8" x 2" (make 2)
- ⑱ " Washers Bronze 1/8" x 1 3/8" x 2 (make 4)

- ⑳ Mizzen Spreaders 1 1/8" x 2 1/2" x 30" (make 2)
- ㉑ Spreader tips Bronze 1/8" x 3/8" x 2 3/16" (make 2)
- ㉒ Fore Stay Attachment Phosphor Bronze
Inner layer 1/8" x 1 1/4" x 11 1/2" (make 1)
Middle " 1/8" x 1 1/4" x 8" (" " "
Outer " 1/8" x 1 3/8" x 4" (" " "
㉓ 3/8" Tobin pin, 1" long 1/2" head (" " "
㉔ Serve the shrouds for about 5" where the
Spreaders bare and make a tapered stop
above and below as shown.

FORE STAY ATTACHMENT.



29'
Above Deck.

Merriman
#1-363

STANDING RIGGING

RIGGING AND BLOCK LIST FOR H 28
DESIGN # 80
9,000 lbs Displacement.

NAME OF PART.	NUMBER REQUIRED	ARRANGEMENT.	SIZE	MATERIAL	FITTINGS.	BLOCKS ETC.	RIGGERS NOTES.
HEAD STAY.	1	 About 30'-11"	3/8"	6 X 7 Korodless.	2 minimum Shackle Fig 383-#3	1 minimum Turnbuckle Fig 377-1/2"	
FORE STAY.	1	 Exactly 24'-9"	1/4"	6 X 7 Korodless.	2 minimum Shackle Fig 383-#4		
MAIN UPPER SHROUDS	2	 About 27'-3"	3/8"	6 X 7 galv. Cast steel.	4 minimum Turnbuckle Fig 383-#3	2 minimum Turnbuckle Fig 377-1/2"	
MAIN LOWER "	2	 About 17'	5/16"	6 X 7 galv. Cast steel.	4 minimum Shackle Fig 383-#5	2 minimum Turnbuckle Fig 377-3/8"	
MAIN STANDING BACK STAYS	2	 About 33'-9"	1/8"	6 X 7 Korodless.	2 minimum Turnbuckle Fig 383-#1	2 minimum Turnbuckle Fig 377-1/2"	
SPRING STAY.	1	 About 17'-3"	1/8"	6 X 7 Korodless.	2 open Shackle 1/8"	1-3/8 galv. steel chain Shackle	
MAIN BOOM LIFT.	1	 About 27'-9"	1/8"	6 X 7 galv. cast steel.	2 open Shackle 1/8"	1-3/8 galv. steel chain Shackle	
MAIN BOOM CROTCH	1	 3 1/4" dia. see detail on boom drawing	1/4"	6 X 7 Korodless.	2 open Shackle 1/4"	Attachment down on boom drawing	
MIZZEN UPPER SHROUDS.	2	 About 19'-1"	3/16"	6 X 7 galv. Cast steel.	4 minimum Turnbuckle Fig 383-#3	2 minimum Turnbuckle Fig 377-1/2"	
MIZZEN LOWER SHROUDS.	2	 About 12'	1/4"	6 X 7 galv. Cast steel.	4 minimum Turnbuckle Fig 383-#4	2 minimum Turnbuckle Fig 377-5/16"	
MIZZEN BOOM LIFT.	1	 Custom line About 18'	1/8"	6 X 7 galv. Cast steel.	2 open Shackle 1/8"	One galv. steel chain Shackle 3/8" or larger	
MIZZEN BACK STAY.	1	 About 18'-3"	5/16"	6 X 7 galv. Cast steel.	1 minimum Shackle Fig 383-#5	1 minimum Turnbuckle Fig 377-3/8" Short	
RUNNING RIGGING.							
BALLOON JIB HALLYARD	1	 63'	1 1/8" Cir 3/8" Dia	Cotton Sennar or Manila.	1 minimum Shock Shackle Fig 391-#1	One minimum Fig 363-#1 Short Shackle	
JIB HALLYARD	1	 22' wire 26' rope	1/8"	6 X 19 Korodless	1 minimum Shock Shackle Fig 391-#1	One minimum Fig 363-#1 Short Shackle	
MAIN HALLYARD	1	 28' wire 32' rope	5/16" Dia	6 X 19 KORODLESS	2 Open Shackle 3/8"	One galv. steel chain Shackle 3/8"	
MIZZEN HALLYARD	1	 21' wire 23' rope	3/8" Dia	6 X 19 Korodless	2 Open Shackle 1/8"	One galv. steel chain Shackle 1/2"	
BALLOON JIB SHEETS.	1	 Each 22'	1 1/8" Cir 3/8" Dia	Cotton Sennar or Manila.	2 Open Shackle 3/8"	One galv. steel chain Shackle 3/8"	
JIB SHEETS.	1	 2' wire 35' rope	3/8"	6 X 19 Korodless	2 Open Shackle 3/8"	2 minimum Shackle Fig 364-#1	
MAIN SHEET.	1	 On boom 60' or more	1/4" Cir 3/8" Dia	Cotton Sennar or Manila.	none	1 minimum 352-#1 port Shackle and block	
MIZZEN SHEET	1	 On boom 35'	1/8" Cir 3/8" Dia	Cotton Sennar or Manila.	none	1 " 440-A-2 1/2" or main boom	
ANCHOR WARE.	1	 About 20 fathoms	3/8" Dia	or Manila	none	1 " 352-#1 port Shackle and block	
TOW ROPE	1	 About 15 fathoms	2" Cir 3/8" Dia	MANILA	none	2 " 440-A-1 1/2" or main boom	
DOCKING LINES	2	 About 10 fathoms	2" Cir 3/8" Dia	MANILA	none	2 " 440-A-1 1/2" or main boom	
CLEW OR HULL TACKLES.	2	 See main and rigging drawings for arrangement	2" Cir 3/8" Dia	MANILA	none	1 minimum Fig 409-B #1 main.	

NOTES—The sizes of rigging given are the minimum that would be practical. For hard use the next larger size could be used if desired, of course with a suitable increase of sizes of blocks, etc. On account of cost Korodless or rustless steel wire is only specified where wear or

strain make it advisable, but rustless steel wire would be best throughout and possibly the cheapest in the end. As for the ground tackle, if two anchors are preferred, then one of twenty-five pounds and one of fifteen pounds would be about right. For the second anchor the docking

lines or tow rope could be used. The weights of anchors specified only apply to the Hershoff type. An increase of ten or fifteen per cent in weight would be necessary for all other types. For cleats see list on boom drawing.

