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S P E C I F I C A T I O N .

For Building a
27 Ft. Whaler with Drop keel.

REVISED AND REPRINTED
1952.

I N D E X.

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SPECIFICATION FOR BUILDING A

27 FEET WHALER.

| | |
|--|----------------------|
| Length between Perpendiculars | 27'-0" |
| Breadth, Extreme (Ex Rubbers) | 6'-0" |
| Depth, from top of Hog to top of Gunwale amidships. | 2'-6 $\frac{1}{2}$ " |

(See Sketches I to XII Attached)

GENERAL. The boat is to be built under a substantial shed, and protected from the sun and rain during construction.

It is to be built to the dimensions given, and in general accordance with the sketches. Fixed solid moulds erected one at each square station, are to be used during the construction of the boat, and are not to be removed until the timbers are in place and clenched off. The specified scantlings are to be those after the materials have been trimmed to shape and finished off, and where the section of the material is bevelled, the specified size is to be regarded as the mean size.

The greatest care is to be taken that the scantlings given in the specifications are not exceeded, and that no unnecessary material is worked in. Where slight alterations or additions are made to the structure in the progress of the work, strict attention is to be paid to the strength and utility of the parts affected so that the boat may be built as lightly as possible.

The form of the boat is to be carefully checked before the thwarts are cut to length and fastened to the risings.

All materials used are to be of the best quality, the timber to be clean grown, thoroughly well seasoned, grown to form where required, and free from all defects.

All raying surfaces are to be well laid with thick white lead paint and scarps with oiled brown paper in addition.

The whole of the iron and steel work is to be galvanised by the hot process.

Except where other wise stated, all the fastenings are to be of copper.

Whitworth threads are to be used for all screw bolts.

The fastenings are to be of the gauge and length specified, and where no gauge is specified, are to be of such size and number as may be required by the Overseer.

All clench nails are to be well clenched on circular copper washers of Admiralty pattern and of suitable weight and size. The heads of clenches are to be let into the wood as may be required by the Overseer. Where practicable the heads of spikes are to be punched within the wood and the holes puttied. All bolts are to be made from rolled bars and not cast.

All copper bolts are to have circular gunmetal clench rings of suitable size and weight under their clenches and heads, except where the saucer-shaped heads have been properly forged in a tool, or the bolts are clenched on iron or metal fittings.

All fittings are to be of Admiralty quality and usual Admiralty tests are to be met to the satisfaction of the Overseer. Samples of Standard Admiralty pattern hooks, thimbles, shackles, slips and blocks will be supplied by the Admiralty on demand from the Overseer for guidance.

The workmanship is to be of the highest class and finish and the whole is to be to the entire satisfaction of the Overseer.

Any articles or materials to be fitted, or worked, into the boat for which no Admiralty pattern or specifications are in existence are to conform to the relevant S.A.A. specifications.

METAL FITTINGS, TEST & COMPOSITION OF. Copper used in the manufacture of copper articles is to assay not less than 99.2%. The quality may be tested by the Overseer by the Muntz Metal Test.

TENSILE TEST. Copper bars are, after annealing, to have an ultimate tensile strength of not less than 14 tons per square inch with an elongation of not less than 30% in a length of 2 inches.

BENDING TEST. The bars are to be capable of being bent double without cracking, the internal radius of the bend being not greater than the diameter or thickness of the bar. They are also to be capable of being hammered hot to a fine point.

GUNMETAL. Is to be composed of not less than 86% of copper, 10 to 12% of tin and 2% maximum of zinc. No objection will be raised to the presence of 0.5% of lead as a maximum.

TENSILE TEST. Pieces taken from the gunmetal castings are to have an ultimate tensile strength of not less than 14 tons per square inch, with an elongation of at least 7½% on a length of 4 diameters of test piece.

~~The stem, keel and skeg bands are to be cast of the following composition:-~~ Copper of approved quality, 90%.

Tin 6%.
Zinc 4%.

NAVAL BRASS. To be 62% of best new selected copper 1% minimum of tin and remainder of zinc. In no case will Naval Brass be accepted having less than 61% copper. The impurities shall not exceed ¼ of 1%.

All Naval Brass bars are to be cleaned, straightened, and to stand without annealing the following tests:-

| | | Round and hexagonal Bars. | | Square |
|----------------|---------------|---------------------------|--------------------------------|--------------------------|
| | | $\frac{3}{4}$ " Diameter | Above $\frac{3}{4}$ " Diameter | Flat & Segmental Bars |
| Tensile Stress | Tons | | Tons | Tons |
| Per inch - Not | | | | |
| less than .. | 26 | | 22 | 22 |
| Elongation .. | Not less than | | 20% in 2". | Not less than 20% in 2". |

Breaks within $\frac{1}{2}$ " of the grip, not to count.

Samples from bars or plates are to be capable without annealing of:-

1. Being hammered not to a fine point.
2. Being bent cold without cracking through an angle of 75° over a radius equal to diameter, or thickness of bar.

Samples of the gunmetal and Naval brass used may be taken in the presence of the Overseer and handed to him for chemical analysis, at Admiralty expense, as may be required.

The iron is to be of good welding quality, free from lamination and injurious surface defects. It is to have an ultimate tensile strength of not less than 22 tons per square inch and an elongation of not less than 20%.

All metal articles are to have good, clean and smooth surfaces, free from black oxide, blisters and internal sponginess, and are to be stamped (the sheets in one corner only) with the maker's name or customary mark or brand.

The names and addresses of the firm from whom it is proposed to order the various materials and fittings are to be submitted in duplicate to the Overseer for approval, and the approval obtained before the order is placed.

Copies, in duplicate, of all orders for materials and fittings sub-contracted for, to be forwarded to the Overseer as soon as the orders for such have been placed.

Any necessary detailed sketches are to be supplied by the contractors, and prints of the same forwarded to the Overseer for record purposes.

1. KEEL. The keel is to be of spotted gum, in one piece, moulded 4 inches amidships, and at the fore and after ends by the stem and stern moulds, conforming to the latter inside and out.

The siding is to be 4 inches in way of centre plate, and for one foot on the fore and after sides; from these positions the siding is to decrease gradually to 2 $\frac{1}{4}$ inches at the ends. The keel is to be fastened at each end of slot for centre plate by two clench nails, No. 6 gauge. The slot in keel and hog through which the 3/16 inch centre plate passes is to be $\frac{1}{2}$ inch wide, and protected round the edges by a $\frac{1}{4}$ inch gunmetal plate let in flush on underside of keel, 4 inches longer (each end) than the slot of trunk, and fastened with brass screws, No. 16 gauge, spaced as shown on sketch 1.

2. STEM: The stem is to be of ti-tree, grown to form, in one length, moulded at head 3 $\frac{1}{2}$ inches, and at forefoot 4 $\frac{1}{2}$ inches, and sided 2 $\frac{1}{4}$ inches; it is to be scarphed to keel, and fastened with three 5/16 inch bolts clenched on top of deadwood. It is to be bearded to $\frac{1}{8}$ inch on the front at the head and to suit Admiralty pattern stem band, the beardings to finish at the fore foot to suit the lines of the boat, and at stem head to suit stem head band. A stopwater is to be driven at upper lip of scarph.

3. STERN POST. The stern post is to be of ti-tree, moulded at head 3 $\frac{1}{4}$ inches, at heel 4 $\frac{1}{2}$ inches, and sided 2 $\frac{1}{4}$ inches. It is to be scarphed to the keel and fastened with three 5/16 inch bolts, clenched on top of the deadwood, a stop water being driven at the upper lip of the scarph. The upper part of the stern post is to be bearded at the head to 1 $\frac{1}{4}$ inches, except in wake of eye plate for mizzen sheet, and at the lower part to suit the lines of the boat. Boxen wood is to be left on for heusing the lower pintle, as indicated on the off set sheet.

4. FORE DEADWOOD. The fore deadwood is to be of English Oak, grown to form, moulded 2 $\frac{1}{2}$ inches tapering to 1 $\frac{1}{2}$ inches at the after end, sufficiently sided to ho use the plank on the sides of the boat for the whole depth of the deadwood, and is to extend along the keel 4 feet 10 inches from the fore perpendicular. It is to be well fayed on keel fore end of hog, and stem, and fastened with 5/16 inch bolts (two before the stem scarph bolts and three abaft them), clenched on the deadwood. The deadwood is to be scarphed to apron.

5. AFTER DEADWOOD. The after deadwood is to be of ti-tree, grown to form, moulded 2 $\frac{1}{2}$ inches tapering to 1 $\frac{1}{2}$ inches at fore end, and sufficiently sided to house the plank of the sides of the boat for the whole depth of the deadwood, and is to extend along the keel 4 feet 10 inches from the after perpendicular. It is to be well fayed on keel, after end of hog, and stern post, and fastened with 5/16 inch bolts (two abaft the stern scarph bolts and three before them), clenched on the deadwood. A scarph is to be worked to connect sternson and after deadwood.

6. HOG. The hog is to be of spotted gum in one length, with ends fitted under the deadwoods, as shown on sketch IX, and well fayed on the keel, to which it is to be fastened with clench nails, No. 6 gauge, spaced not more than 9 inches apart, zigzag, driven from the lower part of keel, and punched $\frac{1}{4}$ inch inside the wood and plugged (except in wake of centre plate, where they are to be spaced between the $\frac{2}{8}$ inch copper through bolts which secure the foundation pieces of trunk). It is to be $\frac{1}{4}$ inch thick and sided 6 inches parallel in wake of centre plate trunk, and for one foot on

the fore and after sides, and from these positions to decrease gradually at the ends to suit the form of boat.

7. APRON AND STERNSON. The apron is to be of ti-tree, its head flush with the top of capping, moulded at head 2 inches at keel $2\frac{1}{2}$ inches, and sufficiently sided to house the plank of each side of boat. It is to scarpn to the fore deadwood, and is to be well fayed on stem; the fastenings are to be one $\frac{5}{16}$ inch bolt through the scarpn, clenched on inside, two $\frac{5}{16}$ inch clenched bolts, between scarpn and bow ring plate, and two above. The sternson is to be mouldered $1\frac{1}{8}$ inches at head and $2\frac{1}{2}$ inches at keel, fitted and fastened in other respects similarly to the apron.

8. TIMBERS. The timbers are to be of spotted gum, moulded $\frac{5}{8}$ inch at lower ends, and $\frac{1}{2}$ inch at upper ends, sided $\frac{7}{8}$ inch at lower ends, and $\frac{3}{4}$ inch at upper ends, steamed and worked in one length from top of gunwale to top of gunwale, and where necessary, are to be formed so as to receive the gunmetal knees secured to the trunk. The timbers which receive the gunmetal knees to trunk are to be sided 1 inch in the wake of such knees and the timbers between those that take the gunmetal knees together with one immediately on the fore side of the foremost knee, and the one on the aft side of the after one, are to be moulded at the lower end sufficient to make a fair line with the top of knee on the other timbers, for the purpose of making a fair seating for the bottom boards. The timbers are to be spaced $7\frac{1}{2}$ inches apart from centre to centre and fastened to hog, each with a $3\frac{1}{2}$ inch spike nail, No. 11 gauge, and to the plank, as described in Paragraph 9.

At ends where they cannot be worked across the boat they are to be spaced about 6 inches apart at the heads and $4\frac{1}{2}$ inches at the keels, and shaped into the deadwoods; the heels of the timbers alongside the trunk are to be fitted into mortises in the foundation pieces.

Two intermediate timbers are to be worked in wake of the mid-snip thwart that takes the strongback bolts, and the fastenings to sheer strake increased. This is to apply to all boats, irrespective of strongback being ordered or not.

9. PLANK. The plank is to be of Hoop or Huon pine, 14 strakes each side, no strake being in more than two lengths. All planks are to be well planed on both sides, gauged to $\frac{3}{8}$ inch when finished, and well fitted to the rabbet of keel, stem, sternpost, etc., and to each other. The edges are to show fair lines inside and out; the land or lap is to be $\frac{3}{4}$ inch, and the length of the rabbet into the stem is to be the same as the thickness of the plank.

The fastenings at the lands, and lap of garboard strake at hog, are to be a clenched nail No. 11 gauge, through each timber, and two clenched nails, No. 12 gauge, spaced at equal distances apart between the timbers; $1\frac{1}{2}$ inch spikes, No. 12 gauge, are to be used to secure the planks to the deadwood, gunwales, apron and sternson.

The scarpns are to be $3\frac{1}{2}$ inches long, butted $\frac{1}{8}$ inch on the outside, and are to be disposed at least 4 feet apart, in adjacent strakes, with not less than three passing strakes between any two scarpns in a vertical line.

They are to be fastened with wrought copper tacks, the points being neatly turned on the inside, and one land nail is to pass through each edge of each scarp at the middle of its length.

The Garboard seams and hood ends are to be well caulked with cotton, and the lands made watertight without caulking.

A hoop or huon pine plug tingle, $3/8$ inch thick, is to be fitted on the outside of plank starboard side, between the lower land and keel, and fastened with clenched nails and scarp tacks in tapered ends. The plug is to be of hoop or huon pine, $7/8$ inch diameter, fitted with a lanyard, and secured to a metal screw eye in an adjacent timber.

10. KEELSON. The keelson is to be of beech, 6 inches wide and $5/8$ inch thick, in two lengths, well fitted on the timbers, and each length fastened down with two gunmetal D eyes and wood toggles.

It is to extend as shown on Sketch IX (1) from the after end of mast step to fore end of centre plate trunk and (2) from the after end of the centre plate trunk to the first timber abaft the fore edge of after grating frame. Where the two lengths of keelson meet the centre plate trunk, they are to fit round the latter for a distance of about 4 inches. Along the sides of the trunk the keelson is to be made continuous by fitting a side piece 2 inches deep, and $1\frac{1}{4}$ inches thick, over the timbers down on the hog and secured to the latter with brass screws, No. 12 gauge, and mortises to be cut in the side to allow the cradle battens of bottom boards to step there in $1/2$ inch, tapered at the ends so as to break in fair with the sides of the keelson, and fastened with screws, No. 10 gauge, into each timber.

11. CENTRE-PLATE TRUNK. The centre-plate trunk is to be formed as shown on Sketches I and IX, and is to consist of foundation, side and end pieces, with capping on the top and ends.

The foundation pieces are to be of Teak, Queensland maple or Huon pine in one length each side, $4\frac{1}{2}$ inches deep by $1\frac{1}{2}$ inches thick, well rayed on hog, and bolted through hog and keel with $3/8$ inch copper bolts, spaced 10 inches apart and clenched on the foundation pieces. (See sketch I.)

The side pieces are to be of Teak, Queensland maple or Huon pine, 1 inch thick, the grain running fore and aft, and are to be rabbeted to the foundation pieces, and fastened with $7/8$ inch brass screws, No. 10 gauge, 3 inches apart.

The End pieces are to be of teak, or Queensland maple, 3 inches wide by $1/2$ inch thick, the grain running from top of trunk to bottom keel, into which it is to be through tenoned; the foundation and side pieces which lap on the end pieces as well as keel are to be fastened there to by through clenched nails, No. 10 gauge.

The capping on the top and ends are to be of Hoop or Huon pine, 1 inch and $\frac{3}{8}$ inch thick respectively; the former is to be fastened to the side pieces with brass screws, No. 12 gauge, and the latter to the foundation and side pieces with brass screws, No. 8 gauge.

The trunk is to be supported on each side by three gunmetal knees, 1 inch wide, $\frac{1}{4}$ inch thick at ends and $\frac{3}{8}$ inch at the throat, rounded on the face and fastened to the trunk and timbers with three brass screws in each arm; the length of upper arms is to be $8\frac{1}{2}$ inches and of lower arms $9\frac{1}{2}$ inches. The fore and after ends of trunk are to be secured to thwart with two gunmetal knees $\frac{1}{4}$ inch thick at ends and $\frac{3}{8}$ inch at throat; the arms are to be 6 inches long on the thwarts, 9 inches long on the trunk, secured with brass screws, and are to be let flush into the edges of thwarts.

12. CENTRE-PLATE. A galvanised steel centre-plate is to be fitted, of the shape shown on sketches I & IX and $\frac{3}{16}$ inch thick, pivoted through the keel at its lower fore corner on a $\frac{1}{2}$ inch galvanised steel bolt (Placed 10 feet 1 inch from the fore perpendicular) and fitted as shown on Sketch 1. The plate is to be thickened in wake of the bolt hole by two $\frac{1}{8}$ inch steel washers. Arrangements are to be made for raising the plate, by means of a steel handle about 2 feet long, $1\frac{1}{4}$ inches wide and $\frac{1}{4}$ inch thick, hinged to the plate about 8 inches from its after extremity and folding down on the top of the trunk when the plate is housed. The handle of the drop keel is to be provided with two in number holes to allow the centre plate to be secured at the half or three quarter lowered position in addition. When in the housed position, the plate is to be secured by a $\frac{3}{8}$ inch steel pin, passing through the handle and bearing on a metal plate fitted on the capping. The metal plate is to be shaped to house the pin, slotted for the handle to pass through, and fastened with brass screws, No. 12 gauge. The pin is to be secured to the side of the trunk by a short length of jack chain. A small beech chuck is to be fitted on the capping at the forward end, on each side of the handle, to prevent the latter moving sideways.

13. BREASTHOOKS. T1-tree breasthooks, grown to form are to be fitted against the apron and sternson in wake of gunwales. They are to be moulded as required and sided as depth of gunwale and capping together; to have arms about 12 inches long, and are to be butted into the gunwales $\frac{3}{16}$ inch. The fastenings are to be clenched nails, three in each arm and one through the throat.

14. BOTTOM BOARDS. Hoop or Huon pine bottom boards, $\frac{3}{8}$ inch thick and spaced at equal distances apart, are to be fitted extending (1) from the fore lower to the after sheets, and (2) from the keelson along the bottom of the boat as shown on the Drawings. They are to show fair edges, to be butted on the middle of a timber near the centre of each thwart, and each section is to be cradled together with two Hoop or Huon pine battens 2 inches by $\frac{3}{8}$ inch. The lower ends of the battens are to extend $\frac{1}{2}$ inch under the keelson and into the side pieces referred to in paragraph 2 of clause 10, and the upper ends of the stretcher rail.

The battens are to be fastened with clenched nails, No. 13 gauge, three in each board, through each batten. Each part is to be fitted so as to be portable, and is to be

distinctly marked with Roman figures, to facilitate shipping.

Stop pieces are to be fitted on the lower ends of the battens to keep them to the proper spacing.

The lower edge of the lower bottom board is to be $1\frac{1}{2}$ inches from the keelson, and the boards are to be about 4 inches wide amidships, tapering to about $2\frac{3}{8}$ inches forward and $3\frac{3}{8}$ inches aft.

Each section of the bottom boards is to be secured with two brass buttons fitted on circular plates on the stretcher rail and bearing on brass plates on pieces fitted at the upper ends of the battens.

15. BOW & STERN SHEETS & GRATINGS. The upper and lower bow and stern sheets are to be fitted where shown in Sketch IX. The upper bow sheets are to extend from the apron to the foremost thwart, the lower bow sheet from the casing of fore buoyancy tank to the pillar under mast thwart, and the stern sheets from the pillar under the after thwart to the timber abaft the fore edge of the cross bench.

They are to be laid on hoop or huon pine bearers $2\frac{1}{2}$ inches deep and 1 inch wide, spaced $7\frac{1}{2}$ inches apart, the ends being well fitted to the timbers and fastened with $1\frac{1}{2}$ inch x 8 gauge brass screws. Hoop or Huon pine side pieces $3/4$ inch thick are to be secured to the bearers with $1\frac{1}{2}$ inch screws, of No. 14 gauge, and the edges well fitted to the timbers. Hoop or Huon pine skirting $3/8$ inch by 3 inches is to be worked against the timbers, and fastened with $3/4$ inch brass screws, No. 11 gauge. The lower edge of the skirting is to be well fitted on the side pieces.

Hoop or Huon pine fillets are to be worked under the fore thwart and crosspiece to carry the ends of the upper fore sheet.

Beech gratings, $3/4$ inch mesh throughout, are to be fitted between the side pieces. The width of the gratings at their fore and after ends is in each case to be as indicated on Plate IX.

The gratings are to extend the whole length of the sheets, in one piece.

16. RISINGS. The risings are to be of spotted gum, 1 inch by 1 inch nominal size, rounded on the inside edges, and are to extend in one length from apron to after edge of after thwart, with the upper and lower edges horizontal. They are to be fastened through each timber with a clenched nail, No. 11 gauge. Filling pieces of Hoop or Huon pine are to be fitted between the timbers and plank in wake of risings, and fastened with 2 spike nails driven from outside of plank. The sectional area of the risings amidships is to be maintained throughout the length of the boat.

17. THWARTS. The thwarts are to be of beech, 1 inch thick, with the exception of the midship thwart in wake of strong back, which is to be $1\frac{1}{4}$ inches thick (see clause 21) and 7 inches broad, double kneed at each end, bearded $3/16$ inch on the lower edges, between the risings and rounded on upper edges.

They are to lay on the risings without being notched or filling pieces being fitted between thwarts and risings, and are to be fastened to them with two nails at each end driven from upper side of thwart and clenched on the lower surface rising. The ends are to be well fitted to the plank and timbers.

The positions of the thwarts are to be as follows:-

| | Ft. | Ins. |
|--|-----|-----------------|
| Fore edge of fore thwart from fore perpendicular | 3 | 4 $\frac{1}{4}$ |
| After edge of after thwart from fore perp. | 18 | 1 $\frac{1}{4}$ |
| No. of thwarts. | 6 | |

The intermediate thwarts are to be spaced equal distances apart. Becketts are to be fitted under thwarts and stern benches as necessary, for stowing rifles.

18. STERN BENCHES. The stern benches are to be of beech battens fastened to the bearers with brass screws, the heads being sunk $\frac{1}{2}$ inch and covered with turned end grain plugs. The battens are to be moulded $\frac{7}{8}$ inch and sided $1\frac{1}{8}$ inches, except the innermost one, which is to be sided $1\frac{1}{8}$ inches, and the outmost one, which is to be sided 2 inches and well fitted to the timbers of the boat. The bearers immediately under the innermost batten of the side benches to be 2 inches deep and $1\frac{3}{8}$ inches wide, dovetailed with stop into the forebearers to cross bench, lapped under the after thwart and fastened thereto with clenched nails.

The battens are to be spaced $\frac{1}{2}$ inch apart, and are to be supported under the side benches by Hoop or Huon pine, bearers 2 inches by $1\frac{1}{4}$ inches, worked in the positions shown in the drawing and dovetailed with stop into the fore and aft bearers, and under the cross bench by two bearers of Hoop or Huon pine $2\frac{1}{2}$ inches deep by 2 inches wide, spaced 12 inches apart from centre to centre. Joint pieces fastened to two or three timbers are to be fitted to take the ends of the athwartship bearers. The width of the side benches is to be 12 inches, clear of the timbers, and of the cross bench $12\frac{1}{2}$ inches clear of the backboard. The fore edge of the cross edge is to be 5 feet from the after perpendicular. The side benches are to extend from the backboard to the after thwart, the fore edge being supported by a beech ledger, fastened under the thwart with clenched nails.

All battens to side benches are to conform in curvature to the sides of the boat, and are to be neatly rounded on their upper surfaces, and to have distance pieces of beech between them on all bearers.

19. BACKBOARD. The backboard is to be constructed of beech as shown on Plate IX (Sheet 3) and to have a single panel in one piece with bevelled edges, rabbeted into the stiles and rails from the back. It is to be well fitted on the benches, gunwales and sides of the boat; and is to slide between the backboard knees, the crosspiece to mizzen mast, and neat cleats, which are to be fitted on the inside of gunwales. The upper edge of the backboard is to round up 3 inches in an elliptical form, the round commencing $\frac{1}{2}$ inch above the upper edge of capping. The rails are to be 1 inch thick and 4 inches wide the stiles 1 inch thick and 4 inches wide, and the

panels $1\frac{1}{8}$ inches thick. The backboard is to incline aft 1 in 6.

20. PILLARS TO THWARTS AND BENCHES. Beech turned pillars $1\frac{1}{8}$ inches square at head and heel are to be fitted, one to support each thwart, the lower end being let $1/4$ inch into the keelson, and the upper end held by a cleat secured under the thwart.

Under the beech ledger at forward end of side stern bench, a turned pillar $1\frac{1}{8}$ inches square at head and heel is to be fitted. The heel is to be held by a cleat secured to the side pieces of the stern sheets.

21. KNEES TO THWARTS, BENCHES AND FILLINGS. The knees to thwarts are to be of ti-tree grown to form, sided $7/8$ inch, the heads well with top of capping, neatly fitted, let in on the lands, rounded on the front and head, and fastened to the side with two clench nails, No. 8 gauge. The lower nail should be kept as near the throat as practicable, and the upper nail pass through the gunwale. The horizontal arms are to be 12 inches long, fastened with two clench nails, No. 8 gauge, driven from the top of knees and clenched under thwarts, the tapered ends being fastened with two screws. The spaces between knees to thwarts are to be filled with dry hoop or huon pine, to make a flush surface, and a drain hole bored through the thwarts between the knees.

The knees to midship thwart in wake of strongback are to be sided $1\frac{1}{8}$ inches, and filled in between with hoop or huon pine checks. (See clause 8).

A knee similar to those on thwarts is to be fitted on each side of the boat on the after bearer to crossbench, to support the backboard. The head of the knee is to incline aft 1 in 6. It is to be secured with three clench nails, No. 8 gauge, through the upper arm, and two through the horizontal arm.

22. STRETCHERS. The stretchers are to be of hoop or huon pine, $8\frac{1}{2}$ inches by 1 inch. All stretchers are to be marked with Roman figures to show their positions. (See Plate II, Sheets 1 to 3)

23. STRETCHER PLATES & PINS. Galvanised M.S. stretcher plates as detailed on Plate II sheet 2, are to be fitted and securely fastened to short cant pieces and ledgers in the positions as indicated on Plate II Sheet 1. The cant pieces are to be secured by 2 in number csk. head brass screws 1 inch long, 8 gauge, to each of the 3 in number timbers in way of the positions indicated. The stretcher plates in turn are to be secured to the cant pieces and ledgers by 6 in number $3/4$ inch by 6 gauge round head brass screws in each plate.

The stretchers are to be held in position on the stretcher plates by galvanised mild steel pins, to the form and dimensions shown on Plate II Sheet 1. The pins are to be made fast to the risings by $1/2$ inch cordage lanyards.

24. GUNWALES, SWELL PIECES, SOCKET PLATES & TOE CLEATS.

FOR CRUTCHERS. The gunwales are to be of spotted gum, extending in one length from the apron to the sternson, well fitted to each of the latter and fastened with clench nails, No. 10 gauge, through each timber. The depth of the gunwales amidships is to be $1\frac{1}{2}$ inches, tapering to $1\frac{1}{4}$ inches forward.

and aft; and the thickness 1 inch throughout. The spaces between the gunwales and top strakes are to be filled in solid with hoop or huon pine for the whole length of boat, and fastened with two spike nails, No. 12 gauge, between each two timbers driven from the outside of the plank. Hoop or huon pine swell pieces, 10 inches long by $\frac{3}{4}$ inch thick, tapered 2 inches from the end, are to be fitted on the inside of gunwales in wake of each crutch plate, fastened with two clench nails on each side of the socket and spikes in the tapered ends. A $\frac{1}{4}$ inch bead is to be worked on the inside lower edge of gunwales, swell pieces and breasthook. The gunmetal socket crutch plates (Admiralty pattern) see Plate VII Sheet 1 are to be let in flush with capping and fastened with $\frac{1}{4}$ inch brass screws, No. 12 gauge. The crutchers (Admiralty Pattern) (See Plate VII Sheet 1), are to be fitted double banked throughout the boat and all crutchers are to be interchangeable. The toe cleats that support the lower part of crutchers are to be of ti-tree cuttings $\frac{3}{4}$ inch thick, 6 inches long, circular on the front, fitted to the land below gunwale, and fastened through the double land with a clench nail each side of the hole for crutch, and with spikes at the ends. The centre of crutches are to be 12 inches from after edge of thwarts.

25. CAPPING. Beech capping, $\frac{1}{2}$ inch thick, in one length each side of boat, is to be worked on the top of the gunwales and swell pieces. The upper edge is to be slightly rounded, except abaft the backboard where the top of the round-up grating must conform to the capping. The capping is to be well fastened to the gunwale, with die-head copper spikes spaced about 4 inches apart on each edge.

26. ROUND-UP GRATING. The round-up grating is to be of beech $\frac{3}{4}$ inch mesh, rounding-up similarly to the cross-piece and extending from the after side of the backboard to the after breasthook. The ledges are to lie athwart ships with solid wood in wake of the Ensign Staff and awning stanchion. A neat cant is to be fitted and fastened to the inside of gunwale and after breasthook for the grating to bear on. Holes sufficiently large to allow the grating to slip over the tiller socket are to be cut in the grating, and neat naval brass rims fitted round the holes. The grating is to be well made and fitted, the upper part forming a fair surface with the capping on gunwale. Small brass buttons on circular plates are to be fitted to keep the gratings from lifting.

27. RUBBERS. The rubbers are to be of spotted gum fitted in one length each side, $1\frac{1}{2}$ inches deep, $1\frac{3}{8}$ inch thick. They are to be tapered $\frac{1}{6}$ th of their breadth and thickness at the fore and after ends, the taper commencing at $\frac{1}{6}$ th of the length from the ends. The fastenings are to be clench nails No. 11 gauge, one through each timber, and spikes, No. 12 gauge through the knees. The heads of all fastenings are to be punched $\frac{1}{4}$ inch inside the wood and puttied.

Hoop or huon pine filling pieces are to be fitted between timbers and plank in wake of the rubbers.

28. BILGE RAILS. The bilge rails are to be of spotted gum moulded $1\frac{1}{4}$ inches sided 1 inch and fitted to the 7th land of planking above the keel.

The length of the rails is to be half that of the boat, the ends being tapered and neatly rounded. The fastenings are to be one clenched nail, Gauge 11, in each timber where possible, and brass screws in the tapered ends,

Handholds, 6 inches by $7/8$ inch, spaced 18 inches apart from centre to centre, are to be scored in the faying sides of each rail, the edges of the scores being well founded off.

29. STEM AND STERN-BANDS. Gunmetal stem and stern-bands as indicated on Plate VII, Sheet 1, $5/16$ inch thick, are to be fitted. The stemband is to extend from the breasthook over the stem head to about 2 feet abaft the scarp of stem. It is to be rounded on the front of the stem, flat over the head, and on the breasthook, and is to conform to the siding of keel and bearded size of stem. The angle of the stem-band formed by the front and top of the stem is to be strengthened by well rounding-off the casting on the inside. The stern-band is to extend from lower pintle to 2 feet before the scarp of sternpost. The fore end of stern-band and after end of stem band are to be let in flush with keel; each band is to be fastened with stout brass screws 5 inches apart and to conform to the siding of the keel and bearded size of the sternpost.

30. RUDDER, YOKE, AND SAILING TILLER. The rudder is to be made of hoop or huan pine in one piece, 1 inch thick, bearded to $3/4$ inch on the back, in form and breadth as shown on Sketches IX & XI. The head is to be oval formed by a $5/8$ inch cheek on each side, the cheek extending about 24 inches below the underside of the yoke. The lower parts of the cheeks are to be neatly tapered and rounded, well fastened with clenched nails at the head, and spikes in the tapered ends. The rudder is to be hung on a gunmetal pintle and two gunmetal braces as shown on Sketch X and in accordance with Admiralty patterns. The arms of the pintle and braces are to be well fitted to the rudder and post and fastened with copper rivets clenched on counter sunk holes in the arms. The lower brace arms are to be thickened and extended right across the rudder to stiffen it. A ti-tree sole piece $1\frac{1}{8}$ inches deep is to be fitted to the rudder as shown. A $5/8$ inch hole is to be bored through rudder 1 inch below the cheeks to take the rudder pendant.

The after yoke is to be of 5lbs. mild steel plate, galvanised. It is to be 16 inches long and 7 inches wide, cut to the shape shown in Sketch VIII, and well fitted to the tenon of the rudder head. The extreme rudder angle is not to be less than 45° on each side of the middle line.

The sailing tiller is to be of beech or teak, fitted and fastened to the forward yoke as shown on Sketch VIII.

It is to work by means of a strap and pin on a gunmetal socket fitted to the mizzen mast and secured to the top of the mizzen crosspiece; the internal diameter of socket is to be $1/16$ inch more than the diameter of the mast to allow for its being easily shipped.

Gunmetal lug plates are to be fitted to the two yokes to take Patt. 2050 shackles, ($1/4$ inch dia. material) which in turn will take a $1/2$ inch cordage lashing from the ends of the $3/4$ inch flexible steel wire rope tiller lines.

These tiller lines to be parallel and spaced 16 inches apart.
(See Sketch VIII)

31. EYES FOR FENDER LANYARD. Gunmetal eyes, 1/4 inch dia. by 1 1/4 inches long, are to be screwed into the underside of gunwale at each end of each thwart to take fender lanyards.
(See Plate VII)

32. MASTS, SPARS AND FITTINGS. The masts and spars are to be of the best selected clear oregon pine, winter felled, straight good, sound and well conditioned, all made from spars of suitable size, and not cut from plank or log. They are to be provided and fitted complete in accordance with Sketch III, and with the dimensions in the following table:-

| <u>MASTS.</u> | | | | <u>YARD.</u> | | <u>BOOM.</u> | |
|---------------|-----------------|----------------|-----------------|---------------|-----------------|----------------|--------------|
| <u>Main.</u> | | <u>Mizzen.</u> | | <u>Main.</u> | | <u>Mizzen.</u> | |
| <u>Length</u> | <u>Diameter</u> | <u>Length</u> | <u>Diameter</u> | <u>Length</u> | <u>Diameter</u> | <u>Length</u> | <u>Dia-</u> |
| | | | | | | | <u>meter</u> |
| <u>Ft.</u> | <u>ins.</u> | <u>Ft.</u> | <u>ins.</u> | <u>Ft.</u> | <u>ins.</u> | <u>Ft.</u> | <u>ins.</u> |
| | <u>Ins.</u> | | <u>Ins.</u> | | <u>Ins.</u> | | <u>Ins.</u> |
| 16 | 6 | 13 | 6 | 15 | 3 | 6 | 10 2 |
| | 3 3/8 | | 2 1/2 | | 2 1/2 | | |
| Approx. | | | | | | | |

The rake of masts is to be 1 in 10.

33. MAST STEP AND CLASP. The main and mizzen mast steps are to be of spotted gum shaped at the ends and tie fastened with a clenched nail each side of mortise. The main step is to be the same width as hog, 2 inches thick, by 21 inches long, fitted on the hog, scored over the timbers, and fastened with spikes in hog and keel. The mizzenstep is to be the same width as the deadwood, 1 1/2 inches thick by 12 inches long, fitted on the deadwood and fastened thereto with spike nails.

A galv. M.S. Mast clasp as indicated on Plate VII, Sheet 2 is to be fitted to the after side of the mast thwart; the band is to be 1 inch deep, and 1/8 inch thick; the thwart straps 6 1/2 inches long, and 1.3/16 inch wide, secured with three 11 gauge clenched nails through each, and let in on the top of thwart only.

34. RIGGING. The rigging is to be fitted in accordance with Sketch IX, and rigging warrant shown thereon.

The ends of all ropes are to be pointed; the standing parts of sheets, tack tackles, pendants, and lanyards are to be grafted. Painters are to be pointed and splice grafted, and standing parts fitted with a long eye and two thimbles. The eye when finished is to be of such a length that the outboard thimble shall be about but not more than 12 inches clear of the front of stem-band when painter is shackled to ringplate.

All blocks are to have phosphor bronze sheaves and steel pins.

35. RIG FITTINGS, EYEPLATE FOR MIZZEN SHEET & RUDDER.

PENDANT. A gunmetal eyeplate as indicated on Plate VII Sheet 2 is to be fitted on the head of the sternpost to take the mizzen sheet calliper nook and rudder pendant respectively. The eyes are to be of $7/16$ inch dia. material with $3/4$ inch dia. internal and the eyeplate fastened with 4 in number clenched nails No. 6 gauge.

SHROUD PLATES. Gunmetal shroud plates are to be fitted to hoop or huch pine wood chocks and on the inside of the gunwales; the chocks are to be joggled over the lands of the plank and the plate fastened with four rivets through chocks and plank. The position of the shroud plates to be about 20 inches abaft centre of mast and in size and shape as shown on Sketch VII, Sheet 1.

BELAYING PINS. The belaying pins are to be of gunmetal, $1/2$ inch in diameter, with collar heads and projecting 3 inches below the lower edge of the thwart in each case.

A belaying pin 5 inches long and $1/2$ inch diameter is to be fitted through each forward knee of No. 3 thwart, for the purpose of belaying the jib sheets.

The belaying pins are to be fitted as follows:-

1-No. on the under side of the mast thwart, P. & S. for the mainsail and foresail halyards.

1-No. in either side of the aforementioned for the spinnaker halyards.

1-No. on the thwart next abaft the mast for the tack tackle rope.

MAIN SHEET EYEPLATES. A gunmetal eyeplate, similar to the shroud plates, is to be fitted about 21 inches forward of the after knee to backboard on each side of boat for main sheet.

Main Tack Tackle. A tack tackle is to be provided and fitted, a galvanised iron eye bolt, pattern 78 being clenched through heel of mast for securing lower block. Tack lashing is also to be fitted. (See Plates VII & IX).

Throat brails to be fitted to the mainsail, connected to the yard, in accordance with usual Admiralty practice.

Main Halyard Cheek Sneave and Cleat. A $2\frac{1}{2}$ inch brass cheek sheave is to be fitted on the starboard side of mast just above the thwart for main halyard whip, and a gunmetal tail eyeplate, with eye vertically athwartships and just above the upper sides of thwarts is to be fitted on the port side of mast to take the snackle of standing part of mainsail halyard whip.

Cleats for Main and Mizzen Sheets. A small gunmetal cleat is to be fitted on the fore side of mizzen mast for belaying mizzen sheet, and a gunmetal thumb cleat is to be fitted on top of the after thwart, between the knees, on each side of the boat, for belaying main sheet.

Bearing Out Spars. Two in number oregon bearing out spars of suitable length and scantling, and provided with a forked end fitting for insertion in the clew of the sail,

are to be provided. See Plate III.

36. SAILS. The sails are to be made generally in accordance with Sketch No. IX, Sheet 2. The allowances made for stretching are to be such as will ensure that the sails will be of the given dimensions when fully stretched. The proposed rubbed down sizes are to be forwarded to the Overseer for his consideration. The body seams are to be $\frac{3}{4}$ inch wide, the necessary amount of broad seam and slack cloth being given in each case. The head and foot tablings are to be cut and turned, and the points (crow footed) are to be of the best white line, securely whipped, inserted through the cloth at the seams, and strongly sewn thereto. All cordage is to be of the best quality, the rope is to be fitted to suit the requirements of the several parts of the sails, with all splices and tails neatly tapered. A gunmetal thimble is to be fitted in each cringle and the cringle passed through a pair of worked grommet holes with ends snugly spliced into the body rope and whipped. A gunmetal thimble is also to be fitted to each lap-ring. A stop with two tails is to be fitted on luff at mizzen about 4 feet from tack to stop boom when topped. The tails are to be 18 inches long.

Linings. The clew piece is to extend 12 inches above the upper reef and to be tapered from 7 inches to 3 inches; the tack piece is to be 12 inches by 7 inches by 3 inches, and the peak piece 1 foot 2 inches by 7 inches by 3 inches. The throat is to be 8 inches on the luff and the same on the head.

A cringle is to be fitted at the clew, and on the leech and luff at each reef, an ear-ring at the tack. A hole and thimble at the throat and peak, and brass grommets about 9 inches apart along the head.

Trysails. Brass grommets are to be inserted about 12 inches apart along the luff for lacing to mast.

Foresail. 4 in No. piston spring hanks are to be fitted on the luff.

| Description of sails. | No. of Reefs. | Depth of Reef. | | | Size of bolt Rope. | | |
|-----------------------|---------------|----------------|--------------|-------|--------------------|--------------|--|
| | | Leech | Mast or Luff | Head | Clew | Mast or luff | |
| | | Ft. Ins. | Ft. Ins. | Ins. | Ins. | Ins. | |
| Main sail | 3 | 2 0 | 2 0 | 1.1/8 | 1.1/8 | 1 1/2 | |
| Foresail | 1 | 2 0 | 2 0 | - | 3/4 | 1 1/2 | |
| Mizzen | - | - - | - - | - | 3/4 | 1 | |
| Trysail | - | - - | - - | - | 1 | 1.1/8 | |

External Diameter of Metal Thimble.

| | Tack. | Clew | Throat. | Peak. |
|----------|----------|-------|---------------|-------|
| | Ins. | Ins. | Ins. | Ins. |
| Mainsail | 1½ | 1½ | 1.1/8 | 1.1/8 |
| Foresail | 1½ | 1½ | - | 1.1/4 |
| | and hook | | | |
| Mizzen | 1 | - | Eyelet & Ring | - |
| Trysail | 1.1/4. | 1.1/8 | | 1.1/4 |

The trysail is to be arranged to act as spinnacker also.

The sails are to be made of 10 ounce cotton duck to S.A.A. Specification No. (E) L.503-1941.

All cotton duck gear is to be rot proofed in accordance with Standard Specification S.A.A. Int. 94.

37. COVERS, SAIL. Two covers of painted Royal Navy No. 7 canvas of the dimensions indicated below are to be supplied:-

| | <u>Mainsail Cover.</u> | | <u>Mizzen Cover.</u> | | |
|------------------|------------------------|------|----------------------|------|---|
| | Ft. | Ins. | Ft. | Ins. | |
| Length | 16 | 6 | 13 | 9 | |
| Circumference at | (Mouth | 2 | 4 | 1 | 8 |
| | (Middle | 2 | 0 | 1 | 6 |
| | (Small end | 1 | 4 | 1 | 0 |

The mainsail cover is to be made to take the foresail, mainsail and yard, and the mizzen cover made to take the sail, mast, and boom; each is to have a circular bottom and to be sewn up bag shape to within 12 inches of the top; the remainder to be left open and tabled with line stop. The cover for trysail is to be 2 feet 6 inches long, 12 inches in diameter, bag shape and rounded with a draw-string.

38. ENSIGN & PENDANT STAVES. The ensign staff is to pass through the round up grating 14½ inches before the after perpendicular, and is to step on a spotted gum crosspiece on risings 7 inches wide and ¾ inches thick.

The ensign staff is to rake aft 2 inches to 1 foot, a suitable step being fitted to take the heel.

The pendant staff is to be vertical, fitted 18 inches abaft the fore perpendicular, passing through the forward crosspiece, and stepping on a spotted gum step on deadwood.

The tanks are to be protected by 1/2 inch red pine portable tongued and grooved lining, fastened with round headed screws top and bottom, and are to be secured in the boat in such a manner that working or distortion of the boat will not strain the tanks. The tanks are to be made and secured so that they can be readily removed for testing. The capacities of the tanks are to be as nearly equal as practicable and the combined capacity is not to be less than 6 cu. ft.

47. PAINTING. The whole of the faying surfaces are to be coated with thick white lead paint. The outside of the boat, ex-rubbers, and the inside of the boat, except back-board, thwarts, bottom boards, gratings, sheets, skirtings, keelson, capping, pillars, stretcher rails and stretchers, which are to be left clean and smooth, is to be painted with three coats (one under coat and two finishing coats) of synthetic plastic paint of the latest approved type. The inside, from lower part of capping to lower edge of risings and to the toes of knees on thwarts, is to be white and the outside and remainder of inside is to be grey to match a colour board which will be supplied by the Admiralty on demand from the Overseer.

48. MARKING OF BOAT. The boatbuilder is to cut on the starboard side of stem and on the port side of sternpost the length, number of boat, dockyard and year. This information will be supplied by the dockyard through the Overseer.

49. COMPLETION OF BOAT. The anchor and cable, slings, boats cover, oars, boathooks and staves, crutches, fenders, barricoes and tool bag, are not to be supplied by the boatbuilders, but in all other respects the boat is to be completely ready for service. Any minor fittings not expressly specified herein, but considered by the Overseer to be necessary for the due completion of the boat, are to be provided and fitted by the boatbuilder without extra charge.

50. SWAMP TEST. (To be included separately in the tender price) A swamp test is to be carried out on one completed boat. The test is to be witnessed by an Admiralty representative and is to be conducted to his satisfaction. All labour and material required for the test is to be provided by the boatbuilder.

The information to be supplied to the Admiralty as a result of this test is:-

(a) Weight of boat with full equipment or suitable substitute.

(b) Weight less buoyancy, type and position of ballast required to swamp boat.

51. WEIGHING OF BOAT. Each boat, complete with all fittings and equipment is to be weighed on completion and particulars forwarded to the Admiralty through the Overseer.

52. RIGGING WARRANT. To be as indicated on Plate IX Sheet 2.

All cordage to be of the best manila, except where otherwise stated, and to the requirements of the Admiralty

The size of the mortises in the steps are to be 1 inch by 1 inch by $\frac{3}{8}$ inch deep.

The staves are to be of clear oregon $1\frac{3}{8}$ inches in diameter tapering to 1 inch at the head, 6 feet 6 inches long, and fitted with $2\frac{3}{8}$ inch dia. Hardwood truck and halyards of white line, Naval brass rims fastened with brass screws are to be fitted round the holes in the grating for ensign staff and in the cross piece for pendant staff. Becketts are to be fitted for stowing staves under risings. See Sketch III.

39. LANTERN STANCHION. The stanchion is to be of clear oregon, $2\frac{3}{8}$ inches diameter at the level of the thwarts, tapering to $1\frac{1}{4}$ inches at the top, turned with an acorn head and score. The heel to be square, well fitted to the mortise in the spotted gum step fastened on the deadwood. The height of the stanchion is to be feet 3 ins. from the line of top of thwarts to the score. See Sketch V.

The stanchion is to be perpendicular and pass through a galvanized iron collar $1\frac{1}{8}$ inches deep, $\frac{1}{8}$ inch thick, secured to after edge of forward thwart, by clench bolts, No. 6 gauge.

Gunmetal sockets, 2 in number are to be provided and fitted, as shown on Sketch No. V, to the fore side of stanchion, to take the screen for Pattern 330 hand lantern. The castings are to be filed smooth and the groove machined to the dimensions shown. Becketts are to be fitted for stowing stanchion under rising.

40. CROSSPIECE FOR MIZZEN. The crosspiece is to be of spotted gum, 2 inches thick, $6\frac{1}{2}$ inches wide in the centre and $5\frac{1}{2}$ inches wide at the ends, and to round up $\frac{3}{4}$ inch; the taper in the width is to commence 3 inches each side of middle line. A gunmetal socket to take the forward yoke of tiller is to be fitted to mizzen mast and secured to the top of crosspiece with 4-No. $\frac{1}{4}$ inch copper bolts clenched in counter-sunk holes in socket. The after edge is to be bearded to $1\frac{1}{2}$ inches, and the fore edge bevelled to the angle of rake of the backboard and to lay against it. The ends are to be let up under the gunwale, leaving a distance of $1\frac{1}{8}$ inches from the top of the crosspiece to the top of capping. It is to be fastened with 2 clench nails at each end, a $2\frac{1}{2}$ inch hole bored in the centre and tie fastened with one clench nail each side of the hole. A step is to be fitted on Deadwood to take the mizzen.

41. BADGE CHOCK. Beech chock 8 inches diameter and $\frac{3}{4}$ inch thick is to be fitted on each side of the bow with centre on the landing of the third plank below the rubber and 3 feet from fore perpendicular to take the ship's badge.

42. STRONGBACK & SLING. (Not to be fitted unless so ordered) The strongback is to be of spotted gum; fitted immediately over the midship thwart. For details of construction of strongback and slings, see Sketch VI, and rigging warrant Plate IX Sheet 2. The completed slings are to be tested to $2\frac{3}{4}$ tons, the load to be applied with slings arranged as when in use. Whether the strongback is to be provided or not the middle thwart is to be prepared by boring the holes for bolts marked in Plate VI together with the fitting of the 3" x 3" x $\frac{1}{4}$ " galvanized plates on the under-side of the thwart.

43. COTTON DUCK & CANVAS GEAR GENERALLY. All cotton duck and canvas articles are to be of a good fit, well made, and in accordance with the custom of Her Majesty's Service.

The articles are to be well sewn together with best flax twine coated with a composition of five parts of beeswax, four parts of palm oil, and one of resin. If hand sewn they are to contain not less than 140 stitches to the yard.

All brass grommets are to be of the spur-toothed pattern.

All duck and canvas articles are to be marked in plain letters indicating the purpose for which they are intended and also with the number of the boat. The marking of the sails is to be on the leech cloth near the clew. The painted articles are to have two coats of best paint. (See paragraph 48) All covers and bags are to be marked with the number and description of the boat, and contents of bags.

44. RING PLATES, SLING PLATES & STEADYING BAR PLATES.

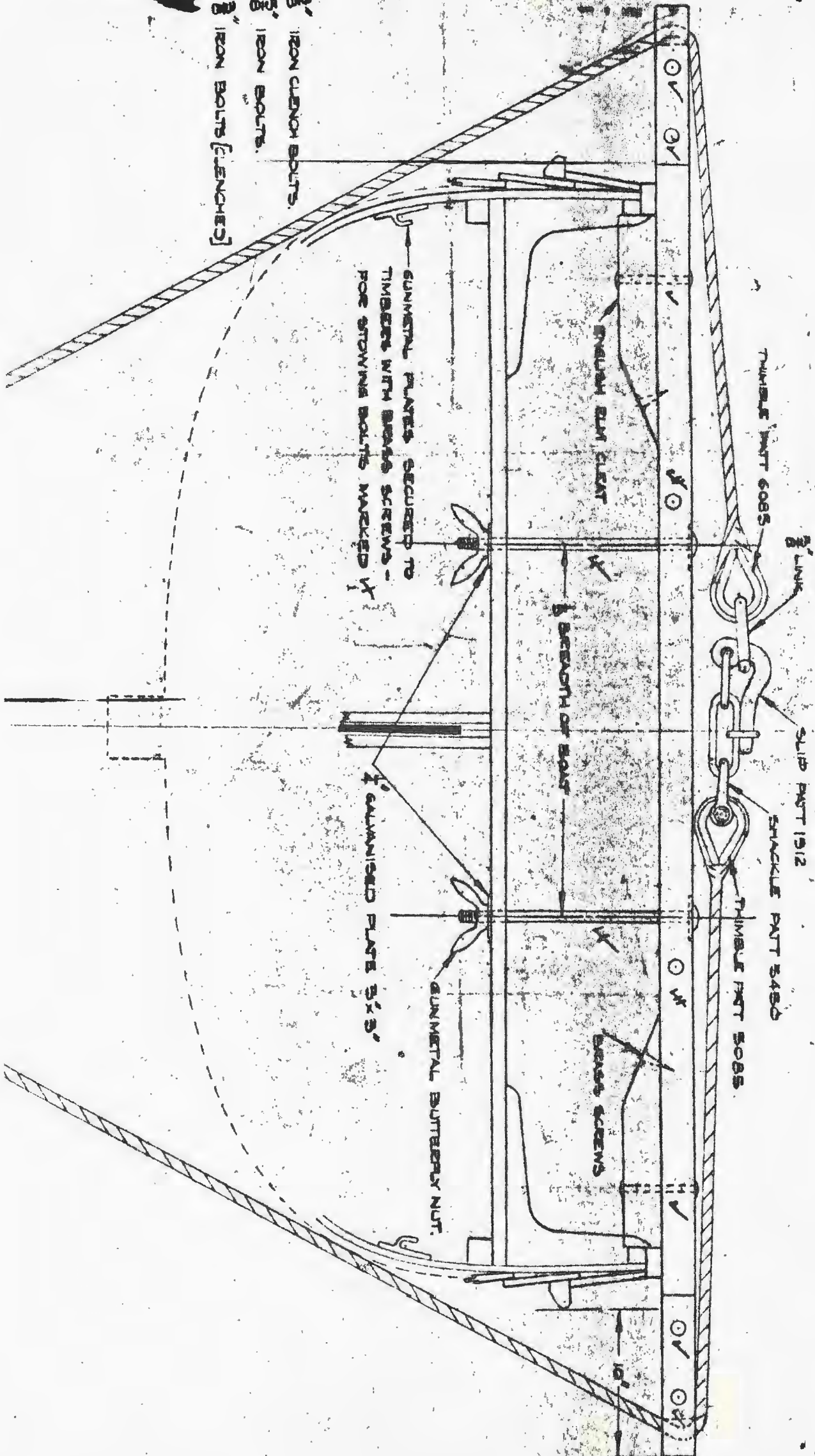
The bow and stern ring plates are to be of forged steel, fitted with copper bolts as shown on Sketches IV & IX. The ring and eye are to be $5/8$ inch diameter. They are to be tested to $1.9/16$ tons.

Gunmetal sling plates with the necessary bolts and $1/4$ inch gunmetal securing plates and four gunmetal steadying plates with bar, $7/16$ inch in diameter are to be supplied by the boat-builder, but not fitted in position by him. (See Sketch IV) The sling plates are to be tested to 3 tons, and steadying bar plates to $1/2$ ton.

45. TOWING BOLLARD. A portable towing bollard of spotted gum, $3\frac{1}{2}$ inches by $3\frac{1}{2}$ inches in section is to be fitted in a position shown on Plates V & IX. It is to snip into the collar on after edge of the foremost thwart, a pin being fitted through it just beneath thwart, to prevent it rising. The upper end is to pass through a galvanised steel clamp piece, $1\frac{1}{4}$ inch by $5/16$ inch secured to a crosspiece of spotted gum. $5\frac{1}{2}$ inches by $2\frac{1}{2}$ inches in section at centre the crosspiece is to be well fitted between the gunwales and is to be kept in position by small angle iron collars, $1\frac{1}{4}$ inch by $1\frac{1}{4}$ inch, fastened to the gunwales. One end is to keep it in position by a steel strip welded across the collar and the other end by a hinged strip, an eyeplate and pin being fitted to secure the latter in place.

46. BUOYANCY TANKS. Buoyancy tanks as shown on Sketch IX & XII are to be constructed of best quality copper or yellow metal of not less than 18 ounces to the superficial foot. They are to be made with hook joints not less than $3/8$ inch in width, hammered well down and soldered. No other joint is to be made unless in accordance with Board of Trade Practice and approved by Overseer. Double hook joints should be made for longitudinal seams but single hook joints may be employed for the ends. The tanks are to be tested for water tightness.

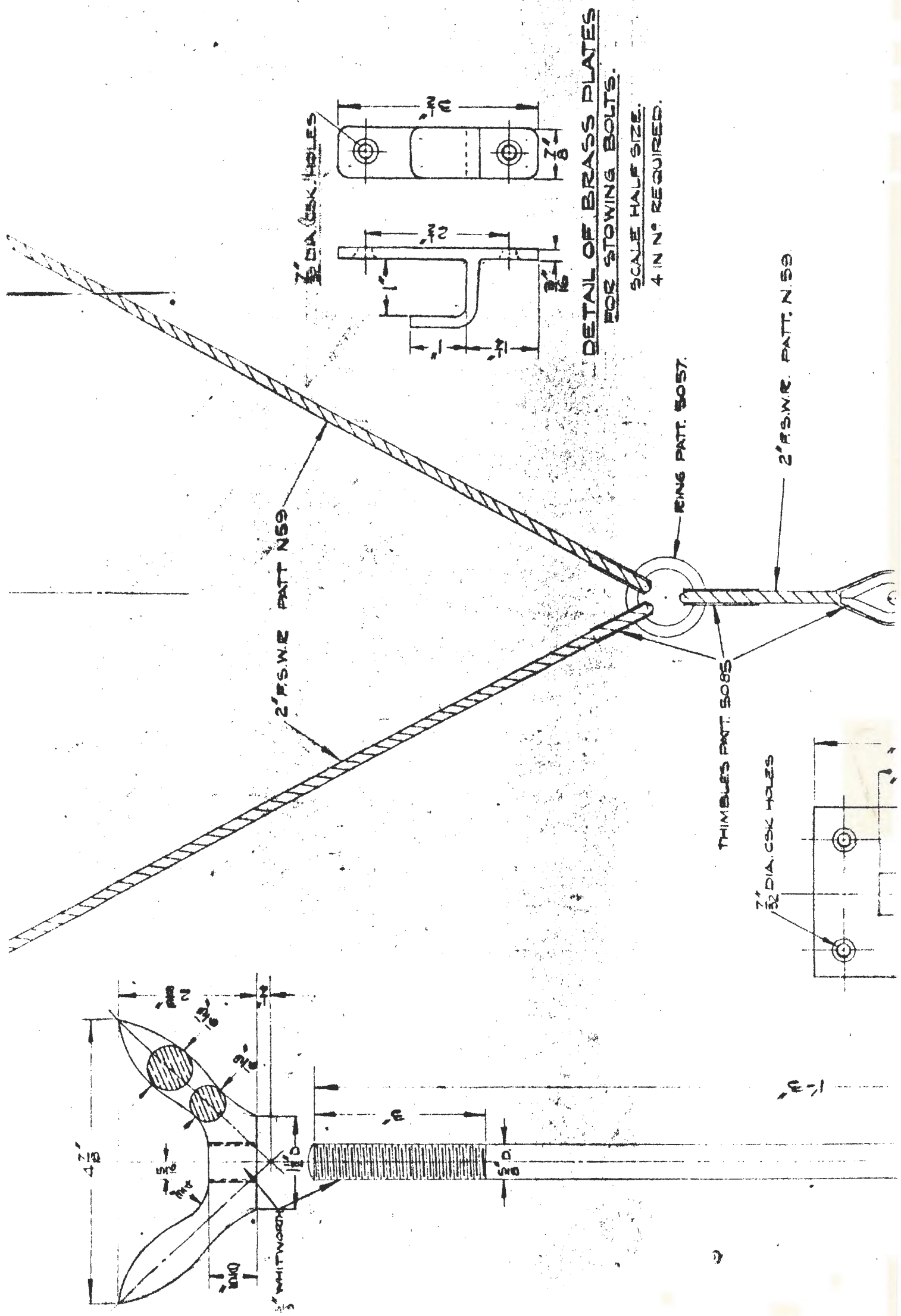
When yellow metal or Muntz metal is used, the Overseer is to satisfy himself that the material is of satisfactory quality, free from cracks and other defects, and bears the manufacturer's trade stamp.



- ✓ 3/8" IRON CLENCH BOLTS.
- ✓ 3/8" IRON BOLTS.
- ✓ 3/8" IRON BOLTS [CLENCHED]

10/10

27'-0" WHALER



DETAIL OF BRASS PLATES FOR STOWING BOLTS.

SCALE HALF SIZE.
4 IN N° REQUIRED.

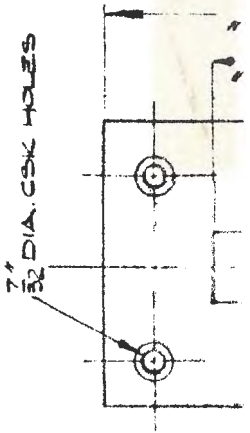
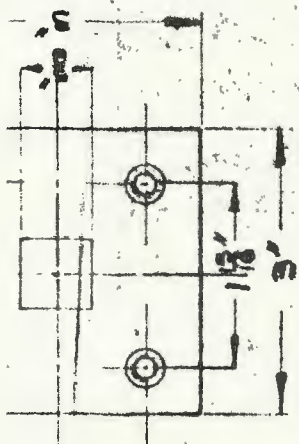
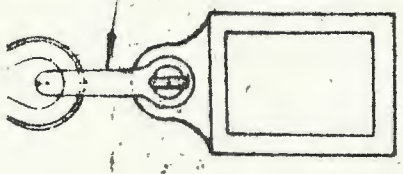


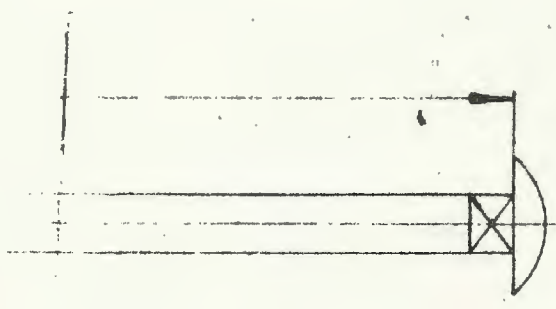
PLATE VI



DETAIL OF $\frac{1}{2}$ " GALV. M.S. PLATES.
SCALE HALF SIZE



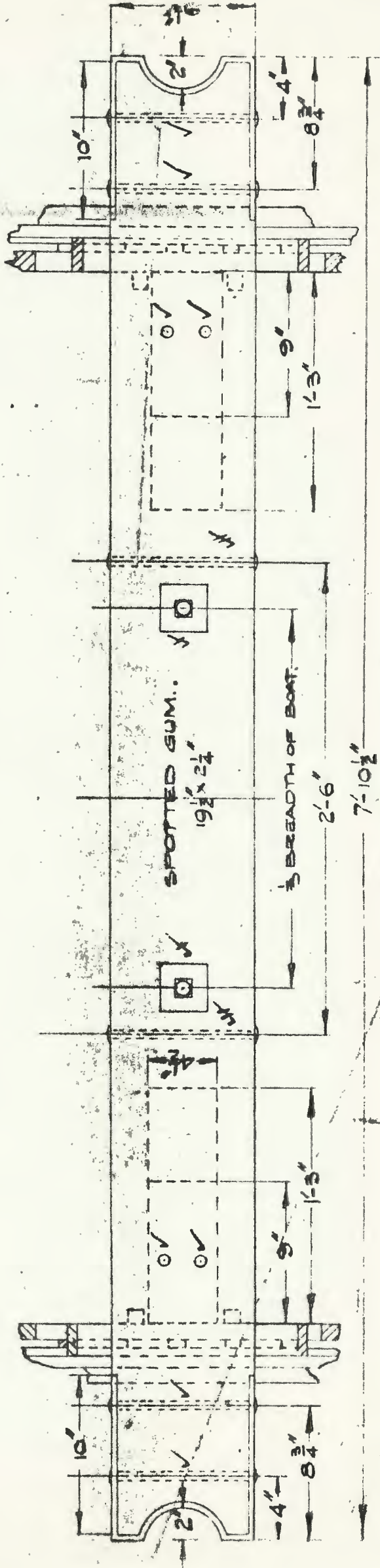
SHACKLE PART 5346



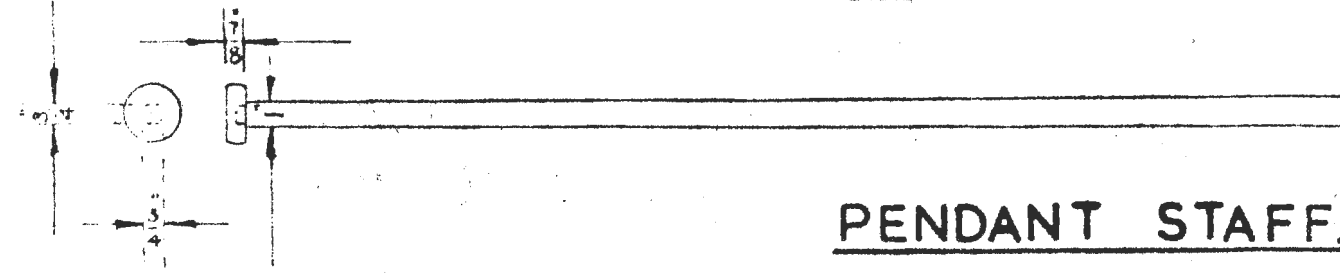
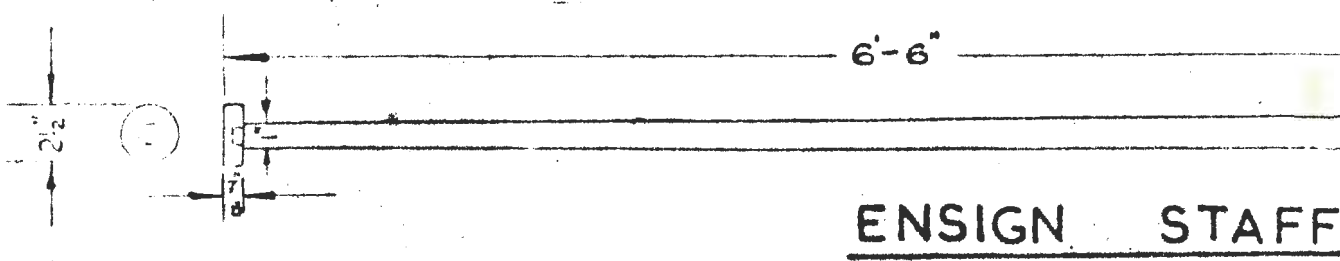
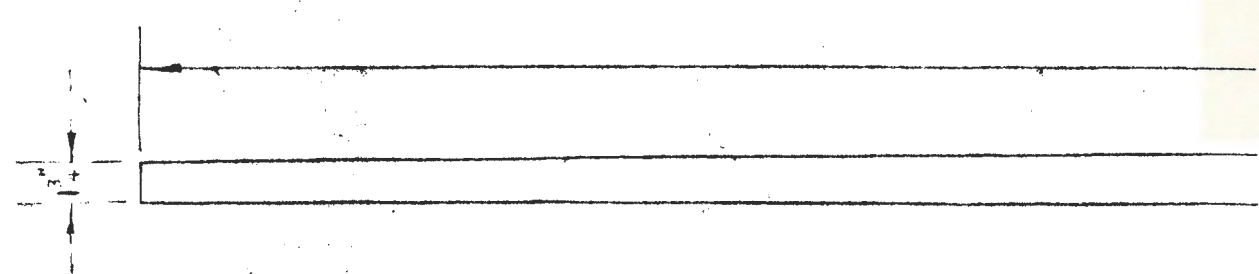
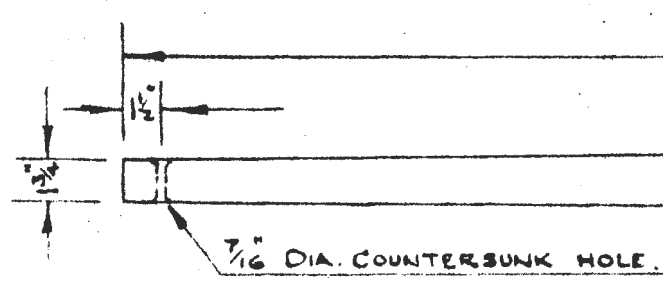
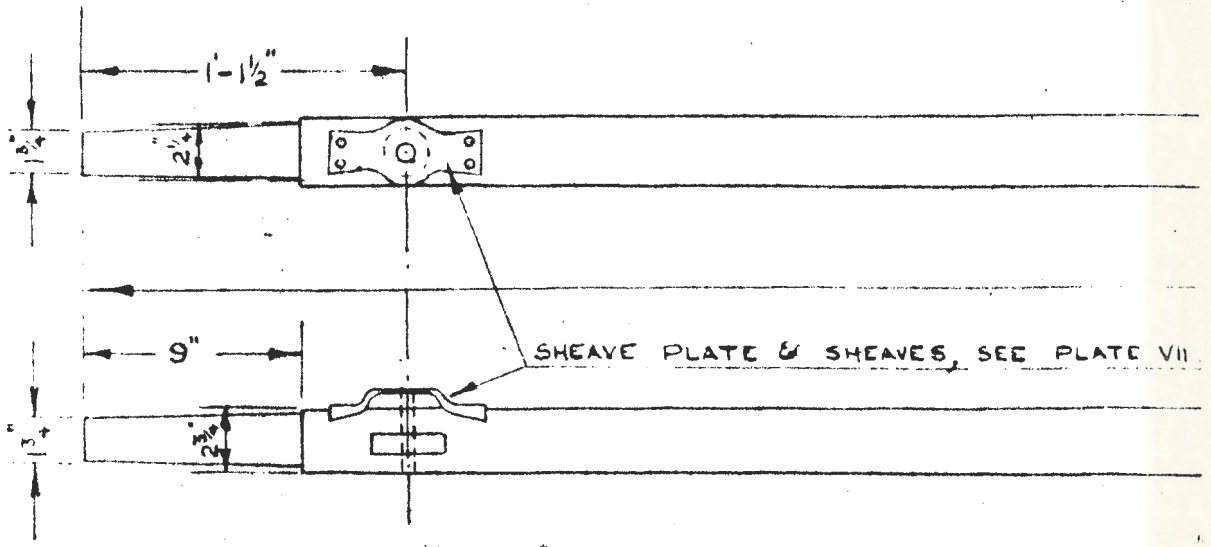
DETAIL OF BOLT & GUNMETAL BUTTERFLY NUT
SCALE HALF SIZE

ARRANGEMENT FOR LAYING OUT 28CWT. ANCHOR.

SCALE 1 1/2" = 1 FOOT.



PLAN OF STRONGBACK
SCALE 1 1/2" = 1 FOOT.



7/16" DIA. C



16'-6"

PLATE VII.

MAIN MAST.

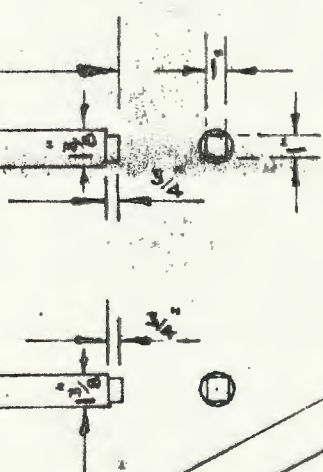
2 1/2"

MAIN YARD.

13'-6"

STAFF.

STAFF.



6'-10"

7/16" DIA. COUNTERSUNK HOLE



SHEAVE PLATE SEE PLATE VII.

TAIL EYEPLATE SEE PLATE VII.

HORN CLEAT, SEE PLATE VII.

3'-4 1/2"

2 1/2"

GOOSENECK SEE PLATE VII.

2 1/2"

6"

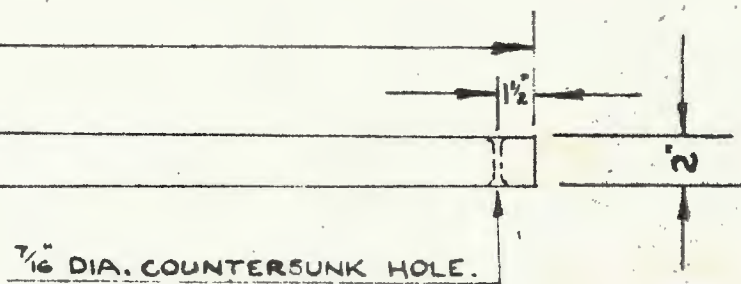
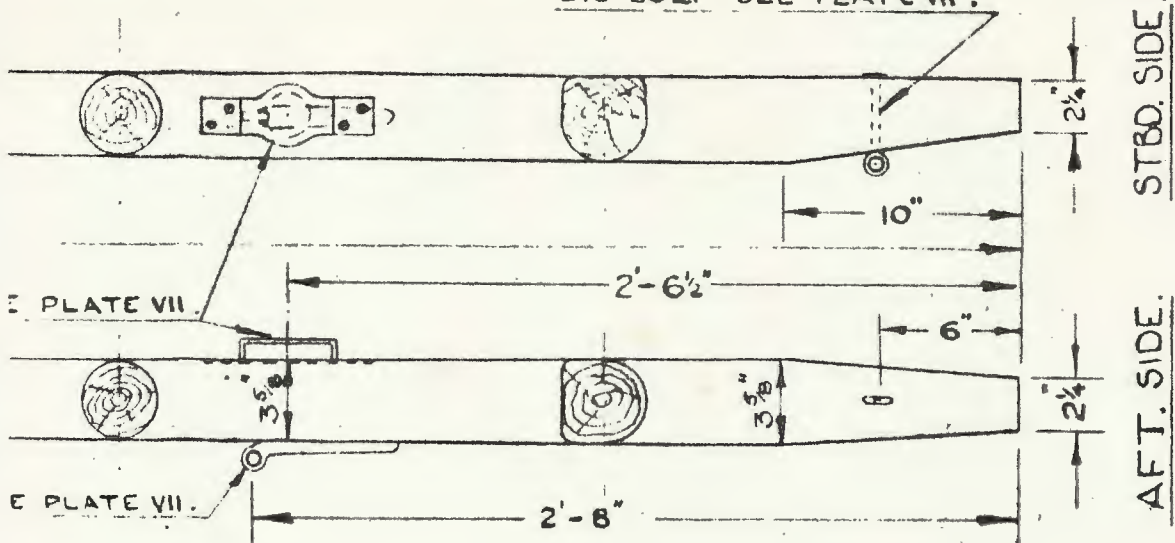
MIZZEN MAST & BOOM.

15'-0"

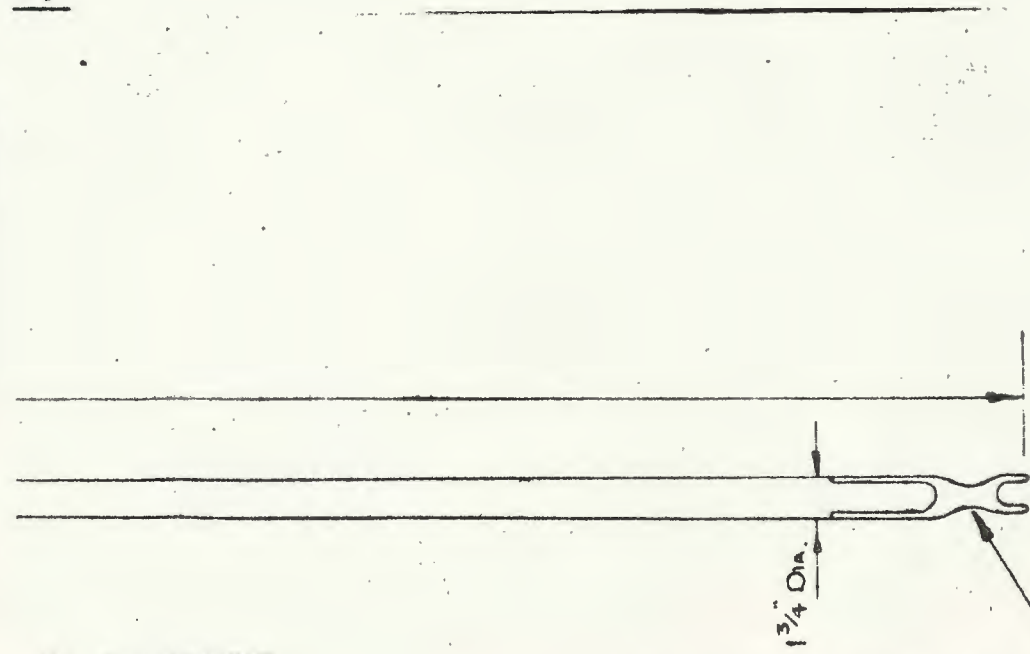
BEARING OUT SPAR. 2 IN NUMBER.

PLATE III

EYE BOLT SEE PLATE VII.



1.



IN NUMBER.

END FITTING SEE PLATE VII