

S.S. "HAZELWOOD" or "KIRNWOOD".

366'-0" x 52'-3 $\frac{5}{8}$ " x 24'-5"  
21'-4 $\frac{1}{2}$ "

OERTZ RUDDER CONVERSION.

Design No. 345.

*Specification.*

- 1) The outline of the rudder to be drawn out full size as per profile in right hand corner of plan. Moulds to be made of the rudder section, and applied to a mould made of the stern frame and gudgeons of the ship. The section mould to be made for a full angle of 35° port and starboard. The ship mould to be applied to the profile and adjusted so that the requisite clearance between the following edge of the propeller blade and nose is obtained.
- 2) The plate rudder to be uncoupled at coupling, removed, carted to shop or works, converted in accordance with plan and undermentioned specification, returned to ship, erected in position after nose of the rudder has been completed and secured to stern frame; tried hard over to hard over by hand while vessel in drydock, and afterwards coupled up at coupling.

RUDDER.

- 3) The old plate to be cut as indicated on drawing, and the lower portion removed. Section A.A.
- 4) The rudder arms to be cut short as per section D.D. to allow arms to be inside the outline, as per plan.
- 5) Flanged plates to be supplied, made, fitted, and rivetted to arms as shown in Section A.A. to the outline of the rudder.
- 6) Fore and aft framing angles to be supplied, made, fitted and rivetted to flanged plates on arms and side plates, see section A.A. (3 arms).
- 7) The top and bottom end plates to be made up as indicated in sections A.A., B.B. and D.D. The plate to be of .64 and the side angles, or angle ring, of 3 $\frac{1}{2}$ " x 3 $\frac{1}{2}$ " x .48". The flat top plate where cut to house the remaining portion of the plate rudder and the rudder mainpiece, to be welded both inside and outside rudder. The standing flange of the forward end of angle ring at top and bottom



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W51-0139(113)

- ends where connecting to the closing plate to have an extra strip fitted to give additional threads for tap rivets.
- 8) Deep angles and flanged plate to be supplied, made and rivetted to top and bottom end plates as indicated in section A.A.
  - 9) Vertical stiffening angles to be supplied, made and rivetted and fitted between side plates; tie plates of .50 to be supplied and rivetted to the angles as indicated in sections A.A. and D.D. ( $3\frac{1}{2}$ " x  $3\frac{1}{2}$ " x .48).
  - 10) Vertical closing plate .64 fore side of rudder post to be supplied and rivetted, with deep angles of approximately 8" x 4" x .56" bars (for full length) to form side stiffening as shown sections A.A., C.G. and D.D.
  - 10a) Holes to be cut in this plate to allow shipping over pintle end of arms. When in final position the plate to be welded to the arms and made watertight. If necessary slots to be cut in this plate to allow clearance around gudgeon. Plate to be welded to post in way of slots. The top and bottom seam to be secured with tap rivets and an additional strip to be fitted at the back of top and bottom plates for additional thread thickness, the tap rivet heads to be finished under flush and welded over after being driven home.
  - 11) Side plates to be supplied, fitted and rivetted as indicated on plan. The port and starboard side plate to stop short at butts as shown in sections C.G. and D.D., the side plates to be double rivetted at seams on vertical angles. Portable plates to be fitted forward of port side plate for access to pintles and of sufficient length to allow for access to nuts of pintles. When portable plates are finally fitted with countersunk screws, the screw heads to be spot welded, or screws to be left long enough to fit check nuts on inside of rudder (to Owners' Superintendent's requirements). The starboard side short plate forward of butt to be rivetted.
  - 12) The whole of the butts to be caulked.
  - 13) The rudder when complete is to be watertight and tested to a five foot head of water.
  - 14) The whole of the inside structure to be coated with a good bitumen enamel before the vertical closing plate, as shown in sections C.G. and D.D., is fitted. The inside surface of the closing plate is also to be coated in a similar manner.
  - 15) Steppers on rudder arms to be removed (cut away) to allow rudder to swing over without fouling the nose angles.



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W 51-0139(2/3)

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- 16) Moulds to be made from stern frame as mentioned in Item 1: the sizes of angle bars for the vertical fastening to be governed by the space available when the size of stern frame as measured from ship is inserted in the full size plan.
- 17) Angle bars to be supplied, drilled (rivetted to stern frame), or secured to stern frame by tap rivets on both sides, as per section C.C. If tap bolts are used, the head of each bolt to be secured after being driven home by spot welding.
- 18) The stern frame to be drilled in accordance with Lloyd's requirements for Tap Rivets and/or through rivets.
- 19) Nose plate to be supplied, bent to moulds and in accordance with plan, erected and rivetted in position (may be in two pieces with internal buttstraps).
- 20) Filling or top and bottom plates to be fitted and welded as indicated on plan, section B.B. and D.D. Where the nose joins the stern frame it is to be secured by welding.
- 21) The inside of the surface of the nose to be thoroughly coated with a bitumen enamel before erecting in position.
- 22) The existing stern frame which is to be covered by nose and angles to be sealed to bare metal and afterwards coated with a bitumen enamel, and enclosed angles to be also covered, zinc plates if fitted to be removed from the after face of stern frame.
- 23) Rudder post and arms to be scaled to bare metal and afterwards coated with bitumen enamel.
- 24) Stoppers on deck in way of quadrant to be altered to allow rudder to swing to 34 degrees only. Stoppers on steering engine control gear to be also adjusted to 33 degrees.
- 25) Reducing valve to be fitted on steering engines steam supply to allow 40-60 lbs. pressure - this to be definitely arranged when work put in hand.
- 26) Patent plate supplied by Patentee to be secured with tap screws in a suitable position.
- 27) On completion of work and after final inspection by the Owners, Patentees and Lloyd's Representatives; the rudder external surfaces to be coated with Dampneys Apexior Paint where in way of a bronze propeller.
- 28) The whole of the work to be carried out efficiently, the best materials used, to the complete satisfaction of the Owners' Superintendent, Patentees' Representative and Lloyd's Register Surveyor.
- 29) Where tap rivets are necessarily used it must be distinctly understood that an extra strip is to be fitted to allow for additional threads, and moreover the heads of the rivets are to be under flush and spot welded after being driven home.