

SWAN, HUNTER, & WIGHAM RICHARDSON, LTD

SHIP, ENGINE & FLOATING DOCK

BUILDERS AND REPAIRERS.

WALLSEND & WALKER-ON-TYNE.

LONDON OFFICE: 150, LEADENHALL ST. E.C.

PLEASE ADDRESS YOUR REPLY TO

I.H.

WALLSEND-ON-TYNE.

20th October, 1904.
Thursday.

THE SECRETARY,

Lloyds Registry,

71 Fenchurch Street,

LONDON. E.C.

Dear Sir,

CUNARD EXPRESS STEAMER No. 735.

Referring to your letter of yesterday's date, although I believe our calculations with respect to the bending moment are accurate, we will revise the scantlings of the topside and upper decks so that the estimated stress at the gunwale does not exceed 10 tons per sq. inch, the maximum bending moment being taken at 1.011.400 foot tons under the conditions noted.

We now enclose a plan showing the extent proposed for chain and zig-zag rivetting in the treble rivetted seams. We have worked out the shearing stresses on the rivets and the results of our calculations are shown on the plan. It will be observed that the maximum stress is only 5.3 tons per sq. inch, which is a moderate figure and considerably below the corresponding figures obtained for other ships. In the instance of the "Ivernia" the maximum stress came at 7.3 tons, and in the "Milwaukee" 8 tons. We may state that so far as our calculations show, we think we would have been quite safe in adopting double

Messrs. Lloyds Registry.

chain rivetted seams for the larger portion of the Vessel's length.

In making these calculations we have taken the maximum shearing forces, from the curves of which we enclose a copy. These curves refer to our previous design 760' x 80'. They were worked out for 10 different positions and the Vessel on a wave 760' x 38'. The full line on the diagram gives the maximum shearing forces for any section for any of the 10 different positions. The curves of shearing forces for the ship when on the top and also in the hollow of the wave were shown in dotted lines. We have added our curve for the ship of the present dimensions, viz: 760' x 87'-6" and which shows that there is no material difference as compared with the design on which our figures are based. The stress on the material of the rivets is obtained from the formula $q = F \frac{S_y}{2I}$ quoted in J.A. Ewing's text book on "Strength of Materials".

The values of the different factors being worked out for 7 different sections of the ship as now designed.

We are now calculating the strength of the Vessel at the different sections on the same lines as have been laid down for the shearing forces and we will submit the sections in due course.

We beg to return a copy of the approved Section of 8" channel, the original has been sent to the local Surveyors and to whom we have also sent all the other original plans.

Yours faithfully,

For SWAN, HUNTER, & WIGHAM RICHARDSON, Ltd.

Enclos:

Referred to the Chief Ship Surveyor.

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