

**RETAIN**

S.S. "KENNEBEC" No. 62708 in Register Book.

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This vessel was built at Port Glasgow in 1919 by Messrs. R. Duncan & Co., and is classed ~~100A1~~ "Carrying oils in bulk F.P. above 150°F.", "Fitted for oil fuel, 8-19, above 150°F.

The "Kennebec" is a Standard "Z" vessel, of which type several were built, some for carrying petroleum and the others for high flash oil. She is constructed on the longitudinal system of framing. The machinery is placed amidships. In the fore part of the vessel, an oil fuel bunker 18'0" long adjoins the stokehold; forward of this are placed three cargo oil tanks each 30'9" in length and a cargo hold 49'10" long is interposed between the oil spaces and the collision bulkhead. In the after part, there are two cargo oil tanks each 41'0" long and abaft of these is a cargo hold 49'10" in length.

The erections consist of a topgallant forecastle, a long bridge and a poop; between the erections there is a continuous trunk on the upper deck 7'6" high and 26'0" wide.

When visited by the undersigned on the 23rd February, the vessel was lying in Messrs. Fletcher Son & Fearnall's Drydock, Limehouse, and had been under repairs for several weeks. The damaged parts had generally speaking been cut adrift and were being re-riveted. The damage is alleged to have been caused by heavy weather during a voyage from the Tyne to Port Arthur and return to the United Kingdom, and also to the vessel having been aground.

The principal object of the visit was to make a general examination of the nature of the repairs found necessary, with a view to the experience gained thereby being applied in dealing with plans of oil vessels submitted for consideration.



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The repairs are confined almost entirely to the oil spaces and decrease in extent towards the end tanks. The 41ft. tanks do not appear to have suffered more than the shorter ones.

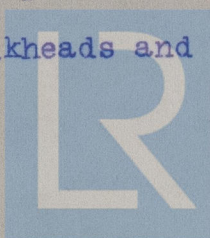
On the upper deck on both sides, the trunk foundation bars are being renewed for a length of 45 to 50 ft. at each end of the bridge, with 6 x 6 x 50 angles, the same size as the original angles. The lower part of the trunk side plate at after end of bridge has been cropped and partly renewed as the holes for the foundation bar were placed too near the heel.

The gunwale bars on both sides at the bridge ends have been renewed with 7 x 7 x .60 angles (the flanges being suitably reduced for caulking) replacing 6 x 6 x .50 bars.

The remaining portions of the gunwale bars have been cut loose, partly renewed, and are being re-riveted.

It was reported that the trunk top forward of the bridge was buckled, but this could not be verified on account of obstructions. The bridge deck was found unfair in places abreast the machinery casings, particularly just forward of the after bunker hatch on the port side; in part this could be attributed to the deck plating not having been drawn by the riveting close to the longitudinals and probably ~~xxxxxxx~~ the unfairness is due to original buckling of the plates.

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Owing to have<sup>ing</sup> been found leaking, or slack, the rivets in the seams, butt overlaps, and strapped butts of the shell plating are being renewed on a large scale from keel to gunwale in the oil spaces. The rivet attachments to shell, of the bulkheads and transverses are





also being extensively renewed but it has not been found necessary to renew on the same scale those connecting the longitudinals to the plating. It might here be observed that the operation of renewing defective rivets has the effect of slackening those in the immediate vicinity and that the presence of a few leaky rivets in a butt frequently necessitates the renewing of the whole number. This is specially noticeable in oil vessels in which much of the binding effect of rust is absent as compared with an ordinary cargo carrier.

Several bottom shell plates had been removed and faired on account of indentations said to be due to grounding - some of these plates were in process of being re-riveted.

A large portion of the shell was found already re-riveted. After the points were formed, the holding up process was reversed and the heads while hot were well laid up, the surfaces being thus effectively closed.

Internally, repairs are being effected to the bulkheads, principally to the boundary bars and to the angles attaching the vertical webs. The boundary angles are double and at the seams of shell plating have been machine joggled. The joggles are placed wide of the seams and wedge shaped pieces of packing, up to 5" in length are fitted being secured by a single rivet.

In places the joggles have been made too deep and slip pieces of packing have been caulked into the intervening space.

In the riveting process the heels of the bulkhead angles and other attachment angles have not everywhere been drawn up to the plating. Double boundary angles are liable to this defect.

The joggling of bulkhead boundary bars in oil ships has been attempted in only a few cases. The practice is



not now approved on account of the difficulty of securing sound workmanship.

The vessel, so far as could be ascertained in the time occupied by the examination appears to have been built in accordance with the approved plans. In the case of two hold beams in No. 4 tank, the large horizontal brackets were found unconnected to the shell longitudinal on the starboard side; the vertical bracket attachments were, however, intact and it does not appear that damage could be attributed to the omitted connection.

The spacing of the seam shell rivets was checked in places and found substantially correct. The countersinking of the holes examined was not quite as full as required and re-countersinking of rimmed holes had not always been properly carried out.

A few defects in the design of details were observed such as the placing of an upper deck bunker hatch against the machinery casing sides without providing suitable stiffening at the deck level; the connection of the transverse bulkhead buttresses to the trunk sides; the position of a "shell longitudinal" butt in relation to the butt of the strake on which it is placed; the position of a seam of longitudinal bulkhead plating so arranged that in order to avoid 3-ply work the lower part of the bracket for attaching the upper deck strong beams to the middle line bulkhead was left unconnected to the latter, and the extension of the bridge side shell plating at the bridge ends not providing sufficient overlap in way of the mooring pipes.

It might be observed that except for some slack riveting in the seam of plating at the bridge ends none of the present repairs is necessitated through these defective details. Suitable compensation is being provided at the "longitudinal" butt referred to.

No fractures of material were observed, but it is learned

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that a fracture has since been discovered in the sheerstrake on the <sup>Starb</sup>port side within the bridge - the fracture having been revealed during the repairing operations.

The general character of the workmanship examined was not found up to the standard for oil vessels. A considerable amount of steel and canvas packing had been used where it should not have been necessary.

It might be observed that the above examination was made after the repairs had been well advanced and is therefore necessarily incomplete.

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