

T. S. S. EMPRESS OF AUSTRALIA"

Ham. 15069

ex "Tirpitz"

Glas. 42026

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This vessel was built in 1914 by Messrs. Vulcan-Werke A.G., Stettin, and classed with the Germanischer Lloyd.

A special survey has recently been held on the machinery by the Hamburg Surveyors with a view to the vessel's classification with this Society, and a satisfactory report forwarded by them.

Both screw shafts have been examined, and one of them has been changed on account of the forward liner being scored, but it is not clear from the report whether this refers to the port or starboard shaft.

The propelling machinery of this vessel consists of two steam turbines each having an estimated shaft horse power of 8600, at 800 revolutions per minute at the Turbines.

These turbines only run in one direction.

The reduction in the speed of revolutions from 800 per minute at the turbines to 160 per minute at the propellers is effected by means of a "Fottinger hydraulic Transformer", which also provides the means of reversing the propellers from ahead to astern and vice versa.

There are 14 Water tube boilers of the Yarrow-Vulkan type whose working pressure is <sup>242</sup>~~227~~ lbs per square inch.

The "Fottinger hydraulic Transformer" consists of two sets, each composed of two water turbines, one set being used for ahead, the other for astern motion.

In each set one turbine is fitted to the Engine shafting, and the other to the propeller line shafting. They are so constructed that each turbine receives water from and returns it to the other, the arrangement of the vanes and water passages being such that whilst dealing with the same quantity of water the water turbine in the Engine shaft rotates about 5 times as fast as the other.



In one set both the water turbines rotate in the same direction, in the other <sup>THEIR</sup> motions are in opposite directions.

The first vessel fitted with a "Fottinger hydraulic Transformer" was the S. S. "FOTTINGER", a tug boat built by the Vulcan Co. of Stettin in 1909, having a steam turbine of about 500 horse power. It is stated that this vessel is still running satisfactorily.

The next vessel fitted with this Transformer was the "Holzapfel 1", 293 tons gross, built in 1911.

She was fitted with a gas Engine, supplied with coal gas from a suction gas plant, the engine shaft being connected to the screw shaft by a Fottinger Transformer.

The vessel and her machinery were built under the survey of the Society's Surveyors and on completion the record of \* LMC 5.11 was assigned, subject to the machinery being surveyed annually and the notation of "Machinery Experimental" was made in the Register Book.

This gas engine, however, did not prove to be satisfactory and in February 1913, the whole of the machinery was removed from the vessel and replaced by a steam reciprocating engine and boiler.

The next vessel to be fitted with "Fottinger Transformers" was the twin screw S. S. "~~Königin~~ Luise" built by the Vulcan Co. of Stettin in 1913 for Cross Channel Service for the Hamburg American Line.

Her Turbine Engines were each of 3000 shaft horse power running at 1500 revolutions per minute, coupled to a "Fottinger Transformer", the revolutions of the propellers being about 370 per minute.

At the commencement of the war the German Government used her as a Minelayer and she was sunk by a British Cruiser in the North Sea in August, 1914.

In a paper read at the Institution of Naval Architects in March last by Sir Eustace T. d'Eyncourt, K.C.B., F.R.S., it was



stated that some of the 1913-14 class of German Torpedo boats were fitted with the "Fottinger Transformers" in place of the usual mechanical reduction gear, but it was understood that this was given up in the latest classes.

The horse power of these engines is not known, but the 8600 horse power of each engine of the twin screw S.S. "Tirpitz" is a very great advance above that of the 3,000 horse power of each engine of the "Koningin Luise".

IT IS SUBMITTED that this vessel is eligible for the record: - LMC - 5.22. F.D. 3480 N.H.P. Fitted for oil fuel 5.22, F.P. above 150°F. 2 steam turbines coupled to 2 screw shafts by hydraulic transformers.

Port HS 5.22.  
Starb. S 5.22

Subject to the Water Tube Boilers and hydraulic transformers being surveyed annually.

*DRH*

*L. J.*

10. 7. 22.

*L. J. 10/7/22*

It is concluded that it is the port screw shaft that has been changed, but this should be confirmed by the Hamburg Surveyors as they state it to be the starboard one in their remarks.

*Yes. See Ham Hto 20/7/22*



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