

TWIN SCREW S. S. "TIRPITZ".

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 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 their 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 I", 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 Föttinger 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 "Föttinger Transformers" was the Twin Screw S.S. "KONIGIN LUISE" built by the Vulcan Co. of Stettin in 1913 for Cross Channel Service for the Hamburg American Line.

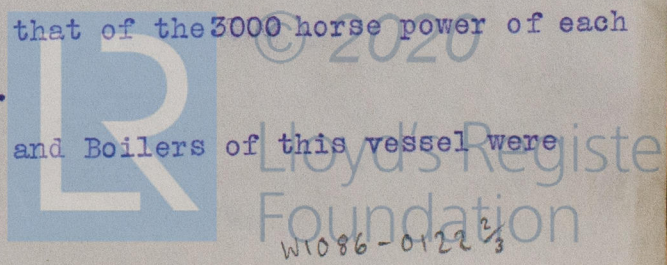
Her Turbine Engines were each of 3000 shaft horse power running at 1500 revolutions per minute, coupled to a "Föttinger Transformer", the revolutions of the propellers being about 370 per minute.

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 "Föttinger 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 3000 horse power of each Engine of the "KONIGIN LUISE".

The plans of the Engines and Boilers of this vessel were



examined by the Surveyors to this Society, who were sent over to Germany at the request of the Government last year and they reported that the scantlings were such that they could be recommended to the Committee for the record of LMC, provided the machinery be found to be entirely satisfactory on trial.

An examination of the Boilers and a partial examination of the Engines were made by the Society's Surveyors at Immingham this year at the request of the Ministry of Shipping, and found to be satisfactory so far as seen, but owing to the Coal Strike, the survey was discontinued.

If the present Owners desire to class this vessel it is submitted that, provided the remaining parts of the machinery be examined and be found to be in good condition and in accordance with the Rules, these Engines and Boilers might be accepted for classification, subject to their being found entirely satisfactory on a full power trial and to the "Fottinger Transformer" being surveyed annually.

Chairman *s/s*

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*W* *A.S.S.*  
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