H.M.S. 'TRIUMPH' AND HER CYLINDER LINER

BY

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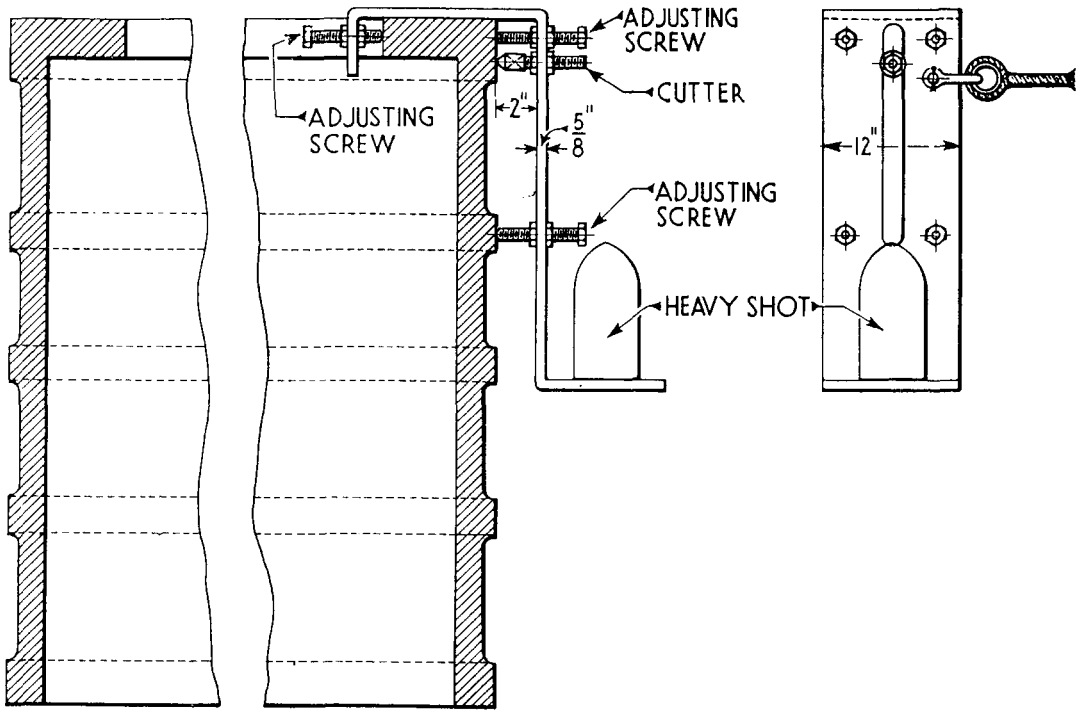
In February 1885, H.M.S. *Triumph* left England for a commission in the Pacific Station. An armoured broadside ship of 6,640 tons displacement and mounting ten 9-in. guns, she was built at Messrs Palmer's works at Jarrow in 1873, and was engined by Maudslay, Sons and Field. She was 280 ft. long, 55 ft. beam, and drew 26 ft. Her original machinery consisted of a simple expansion return connecting-rod, horizontal engine with two cylinders 98 in. in diameter and 4 ft. stroke, developing somewhat under 5,000 horsepower The cylinders were on the port side of the ship and the condensers on the starboard side. In the early eighties she had been thoroughly overhauled at Portsmouth, a new set of boilers made at Keyham had been fitted, and Maudslays had removed her old cylinders and fitted new.



METHOD OF REDUCING DIAMETER OF CYLINDER LINER

On her arrival in the Pacific Station an examination led to the discovery—not an uncommon one in those days—of a long circumferential crack in one of the cylinder liners. The Admiralty was informed, the ship was laid up at Esquimault, and the arrival of a new liner was awaited from England. Meanwhile the work of clearing away was proceeded with, the crank shaft being moved over to the condensers, and the defective cylinder being moved towards the centre line. This done, the cracked liner was disconnected and drawn, and after a part of the lower deck had been cut away was hoisted on deck.

So far all had been plain sailing, but when the new liner arrived it was found to be about $\frac{3}{8}$ in. too large. Esquimault Yard, then in its infancy, contained neither lathe nor boring machine large enough to tackle a job over 8 ft. in diameter, and chipping and filing the five circumferential fitting strips appeared out of the question. Through the ingenuity of the late Engineer-Commander Josiah P. Thomas, the difficulty was, however, surmounted, and if anyone will turn up *The Royal Navy List, or Who's Who in the Navy*, after about 1890, he will find this record against Thomas's name :—

' Thomas, J. P., engineer of the Malabar during the Egyptian War—Egyptian medal, Khedive's Bronze Star—when serving in the *Triumph* on the Pacific Station during her late commission, the liner of one of her cylinders became cracked and useless, and a new one was sent out from England to replace it, which was found on arrival to be so much too large in diameter that it seemed almost impossible to fit it ; chipping was out of the question, and there were no appliances in the dockyard at Esquimault ; Mr. Thomas, however, conceived the idea of utilising the ship's capstan and a slide rest from a large lathe, together with cutting tools devised for this purpose by himself, and succeeded in making as good a job of the liner as if it had been turned down in one of the home factories, the country was saved some thousands of pounds, and the *Triumph* was kept efficient on her station by this display of ingenuity, mechanical ability and readiness of resource.'

Such is the semi-official statement in the *Royal Navy List*, to which reference is made for information regarding meritorious service. Most engineers in the Navy had either read or heard of the capstan being used, and the story had the force of a tradition. When collecting material for some lectures on naval engineering I thought I should like to know more about this interesting piece of work, and Engineer-Commander Thomas having died in 1920, I wrote to three officers who were serving in the ship at the time. These officers were Engineer Rear-Admiral G. C. Bath, Engineer-Captain A. J. Johns, and Commissioned Shipwright J. T. Berry. The outcome of these letters was certainly unexpected, for I then learned for the first time that the cylinder liner was never taken to the capstan, but that the work of reducing the diameter of the fitting strips was all done in the engine-room by hand. Admiral Bath's letter will make this plain :—

' When the new liner arrived it was found in gauging that it was too large for the cylinder. It was lowered into the engine-room on to a platform of 12-in. square baulks of timber and stood on end. To reduce the diameter a stout piece of boiler plate was bent to the shape shown in the accompanying rough sketch, the top being hooked over the end of the liner, and it was weighted by placing a 9-in. shell on the shelf at the bottom, the whole being steadied as far as possible by distance pieces and flat-nosed set screws.

A tool rest was arranged attached to the plate, and the whole was pulled round and round by three or four men on a rope's end. Some little difficulty was experienced, but eventually a steady and even cut was obtained, although, of course, it had to be a very thin one.

The liner was fitted in place and everything replaced and connected up without any mishap, and the ship completed a four years' commission on the station. The whole of the work was done by the ship's staff without any outside assistance.'

This new light on the turning of the liner was corroborated by Mr. Berry, who cut away the lower deck and supplied the timber baulks, and by a stroke of good fortune Engineer-Captain Johns found among his papers the original sketch showing the plate, the projectile, the flat-nosed set screws, the cutter and the rope by means of which the whole was pulled round. It is from this sketch that the accompanying illustration has been prepared.

How the tradition arose and how it got into print that the liner was turned on the capstan will probably remain unknown. Sir James Wright was then Engineer-in-Chief of the Navy, and he and his successors, Inspector of Machinery Richard Sennett and Engineer-Vice-Admiral Durston, have all passed away. But whatever the explanation it will not be denied that the method used displayed ' ingenuity, mechanical ability and readiness of resource.'