

# THE DRUM SPANNER

The device described here was invented by Engineer Lieutenant-Commander R. A. Amey, Royal Navy, while serving as the Engineer Officer of the 5th Minesweeping Squadron, to meet the needs of changing CMS propellers under water. It won for the inventor an award from the Herbert Lott Naval Trust Fund.

The device is known as a Drum Spanner and Strain Piece.

During the time when the Admiralty Experimental Diving Unit were developing a method of changing the propellers of a coastal minesweeper under water, Lieutenant-Commander Amey was approached for advice and assistance with the technical details of the operation.

When these were discussed, it was clear that the part of the operation most difficult to complete satisfactorily under water would be the tightening of the propeller nut to the correct torque, particularly if this had to be done in bad visibility when the 'hard up' marks could not be seen.

There was also a danger of strain and damage to the threads of the aluminium bronze shafts, as previous experience gained by the divers had been by working on the more robust steel shafts of submarines.

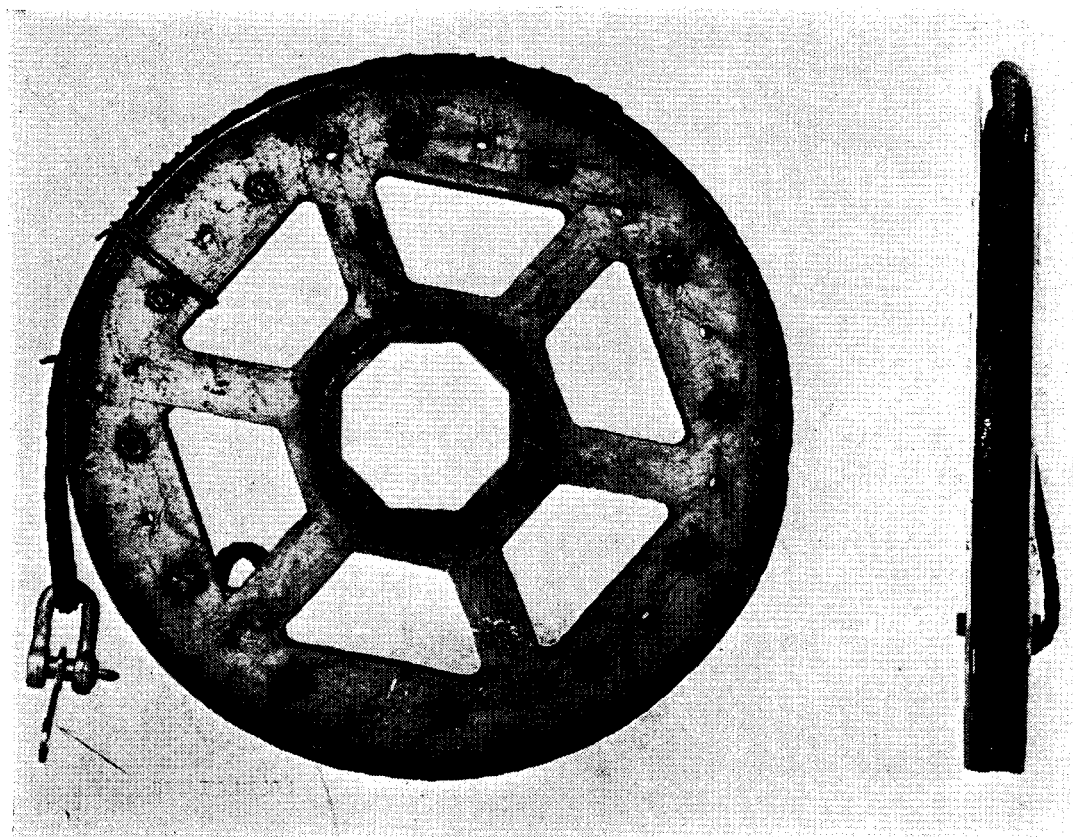


FIG. 1—DRUM SPANNER AND STRAIN PIECE

The problem of tightening the propeller nut correctly was solved by the design of a circular drum spanner fitted with a wire rope pendant which, when pulled, rotated the spanner. Thus for one revolution of the spanner, the wire came off the drum at a constant radius of one foot, and the addition of a strain piece in the wire purchase, designed to break at two tons, ensured that the maximum torque of two tons ft would be applied to the nut.

The purchase could in practice be hauled taut by a suitable chain block rigged over the ship's side, or by the use of the warping drums on the mine-sweeping winch. The latter proved to be simple and convenient.

The spanner and strain piece are shown in FIG. 1. They are also shown in the Admiralty Experimental Diving Unit's Drawings Nos. SK 339 and 340, and the technique associated with it is incorporated in the Diving Manual, BR 155.

Although the principles are simple and well known, it is believed that their application in this case is novel. The use of this spanner means that:

- (a) The propeller nuts are tightened to the standard torque which is not dependent on the skill of the diver
- (b) The torque can easily be adjusted by fitting the appropriate strain piece
- (c) The correct degree of tightness can be achieved where the diver's visibility is too low to use visual checks
- (d) The danger of stripping the threads or of accidental damage by hammering is eliminated
- (e) There is a saving in time over the ordinary methods using an ordinary spanner and hammer.

After several successful tests, this spanner was used to fit the modified propellers to H M S. *Reachampton*