THE MOTOR WHALER

BY

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Following a news release recently made by the Admiralty that a new type of 27-ft motor whaler is being introduced into the Service, it is considered worthwhile to give a brief history of the engine which is to be fitted, and why this particular design was adopted.

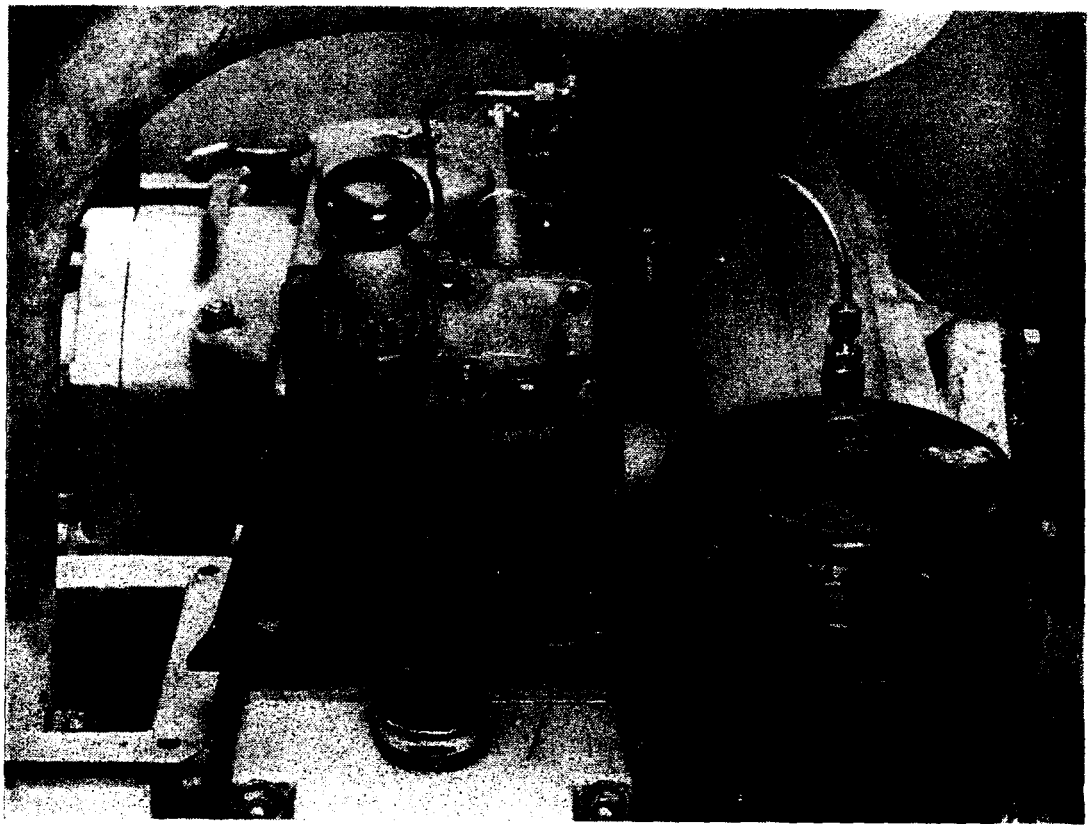
The chief function of the boat is as a light motor sea-boat capable of rescue work. It has also to serve as a pulling and sailing boat and will, for instance, be used in these forms in regattas. In such a craft, with three clearly defined functions, one essential is that the engine should be so constructed and installed, that it can be removed as a complete unit, easily and quickly. It was, therefore, necessary to use an air cooled engine so that the complications of either fresh or salt water cooling systems could be avoided. This automatically restricted the choice of the engine to the Enfield series which contain the only air cooled Diesel in the Admiralty Standard Range. The H.O.2, being the larger, was consequently adopted and the installation was arranged to enable the drive to be taken through two flexible couplings to a C.P. propeller.

The Enfield H.O.2 was type tested at the Admiralty Engineering Laboratory and, with the exception of a weakness in the crankcase, proved most satisfactory. The firm readily agreed to produce a new and stronger crankcase, round which the engine was rebuilt. More tests were carried out and their success resulted in the adoption of the engine by the Admiralty in 1949. It is interesting to note that this was the first engine of its size to complete successfully the 2,000-hour endurance running at A.E.L.

Production and commercial experience subsequently indicated that various modifications were necessary, and the Mark II and Mark III engines were introduced. These modifications did not however affect, to any appreciable extent, the interchangeability of working parts which is so important in a standard engine, and they were therefore accepted into Admiralty service.

A Mark IV version was later introduced by the firm but, as this incorporated changes in design in nearly all the major working components, it was necessary to await type test results before acceptance. There are now therefore four versions of the engine in service but, although it is intended to bring the earlier engines up to the latest standard in due course, it is probable that the Mark I version will be allowed to die out.

The major criticism of the engine, since its introduction, has been the difficulty experienced in starting under cold conditions. This applies however, to nearly all engines where light weight is of major importance because some sacrifice in the weight and diameter of the flywheel has inevitably to be made. It is more pronounced in this case, however, because hand starting is employed. In order to obtain more information on this matter, A.F.O.2195/54 was issued to obtain all possible user experience and the replies indicated that, although the engine is difficult to start at the first attempts by an individual, it becomes increasingly easy to do so, under temperate conditions, once familiarity with the operation is gained. At low temperatures, however, it was obvious that some additional aid to starting was needed. This was in fact catered for by the makers by



START PILOT EQUIPMENT

the inclusion of ether wicks in the air inlet ports. The arrangement was neither particularly satisfactory nor convenient, because it was necessary to store ether in bottles and to apply it to the wicks before each attempt at starting.

To overcome the difficulties, tests were carried out on a Mark I version of the engine at the A.E.L. During these tests, two types of electric-starter motor were tried, both of which were unsatisfactory when used on their own at low temperatures. Tests were then carried out on various ether-type starting devices and of these the ' Start Pilot ' starting aid proved to be far superior in all respects. This equipment consists of a capsule container and a hand-pump coupled by small bore pipes to jets fitted in the air inlets of the engine. The special type capsule contains fuel with a high cetane number and peroxide content, which gives ease of starting with a slower rate of burning than pure ether, thus safe-guarding the operator. Arrangements have been made to provide the ' Start Pilot ' equipment for all Enfield engines in service, a complete set of parts being supplied with fittings suitable for engines with either the Burgess or A.C. type air cleaners. Instructions and drawings will be included with the equipment for guidance.

Electric starting is still being considered for applications where the additional weight, of about 120 lb, is acceptable and, used in conjunction with the ' Start Pilot ' equipment, should be most successful. This involves substituting a conventional battery charging generator in place of the A.C. generator and rectifier at present fitted, because a larger capacity battery is necessary to operate the starter motor. It is this battery which is responsible for the greater part of the additional weight of the installation, being about 90 lb heavier than the small battery at present used for navigation lights etc. The engine in the 27-ft motor whaler in H.M.S. *Cumberland* has in fact been fitted with electric

starting, but this was merely a palliative as the ' Start Pilot' equipment was not available at the time it was supplied.

A contributory factor to this cold starting problem is thought to be that only O.M.D. 110 or O.M.D. 111 lubricating oil has been available for use in these engines. It has now been agreed, however, that O.M.D. 60 will be made available if required.