

GAS TURBINE DEVELOPMENTS.

This term covers power plants in which air or a mixture of air and combustion products is used as the working substance of the thermodynamic cycle. Considerable attention has been given to gas turbine cycles by the technical Press in recent years, especially after the publicity given to engines for aircraft. Experience with jet engines allied with advances being made in the production of materials to withstand high temperatures for long periods has brought very close the possibilities of the gas turbine as a prime mover in marine installations. In fact, a propulsion unit of about 4,000 S.H.P. giving a performance at least equal to that of a steam plant is already a practical proposition. The advantages claimed for gas turbine cycles are:—

- (1) Possibility of efficiency approaching that of the diesel cycle.
- (2) Reduction in the weight and space required by present steam installations by the elimination of the steam generator, high pressure pipe lines, condensing equipment, feed water systems and the allied auxiliary engines.
- (3) Rapid starting.
- (4) Relatively low maintenance.

There is no doubt that some of these claims will be realised although an efficient and reliable gas turbine cycle will introduce complications which offset some of the advantages.

In warships, special design problems arise, the major considerations being:—

- (a) Astern power and manœuvring qualities.
- (b) Durability in service.
- (c) Limiting size of openings in decks for supply of the relatively large quantities of air required.
- (d) Effect of salt laden air on materials at high temperatures.
- (e) Noise.
- (f) Performance at reduced power.
- (g) Loss of output and efficiency as the temperature of the outside air increases.
- (h) Requirements of power for major 'outside auxiliaries.'

Research and development will no doubt overcome all of these problems but it is evident that for several years to come the application of gas turbine cycles will be confined to craft smaller than destroyers.

The Admiralty had been investigating the possibilities of these power plants for many years before the war and an experimental plant was laid down. Another project is now under construction and more are being investigated. It is hoped that within a comparatively short time some experience will be obtained with gas turbines under service conditions afloat.
