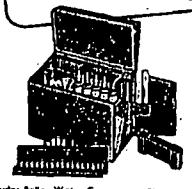
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More TECHNICAL BRIEFS

Begins on page 154

gas turbine plant can find its best field of application in selected central station, industrial and marine fields.

The power plant was originally conceived and designed for electrical power generation where better efficiencies than then existed with steam were demanded and where the power limitations of the open cycle plant precluded its use with a single flow turbine to outputs of the order of 10,000 kw.

Plants for power generation run at constant speed and can therefore be single shaft sets. Reduction gears will be required with plants of small outputs. A separate power turbine will be required with plants of medium output and large output plants can operate with the generator directly coupled to the machinery set.

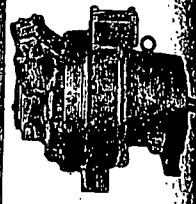
In addition to power generation waste heat from a closed cycle gas turbine plant is available in cooling water which can be released as steam or hot water. The amount of waste heat that is used in processing will not affect the power generation efficiency, contrary to the case with an extraction steam turbine. Such a scheme is being developed by Escher Wyss for district heating in a central European city.

Very often the fact is overlooked that the gas turbine is currently being developed in the lower power range because of its high efficiency compared with the steam plant, as the efficiency of the latter will drop considerably in sizes of less than 10,000 kw. The efficiency of a closed cycle gas turbine plant will drop less than three points from a 10,000 kw design to one of 2,000 kw which makes the smaller size plant extremely attractive for industrial use.

In the chemical and petrochemical industries as well as a great number of manufacturing processes waste heat is available in the form of high temperature exhaust gases. It is normal practice to raise steam in waste heat boilers for steam heating, processing, etc. as the erection of small steam turbine power plants is *not economical*. If exhaust gas temperatures of 1400 F or higher are available it is easy to obtain a circuit air temperature of as much as 1200 F without too great a capital expenditure for transfer surface. It is then possible to install a power plant utilizing at least 25% of the heat contained in the process exhaust gases over a temperature range of 600 F, for power generation, leaving the remainder for raising steam if required. This is the system being installed by Spencer-Boncourt of London in a Coventry gas works.

While but three general fields of application have been discussed here,

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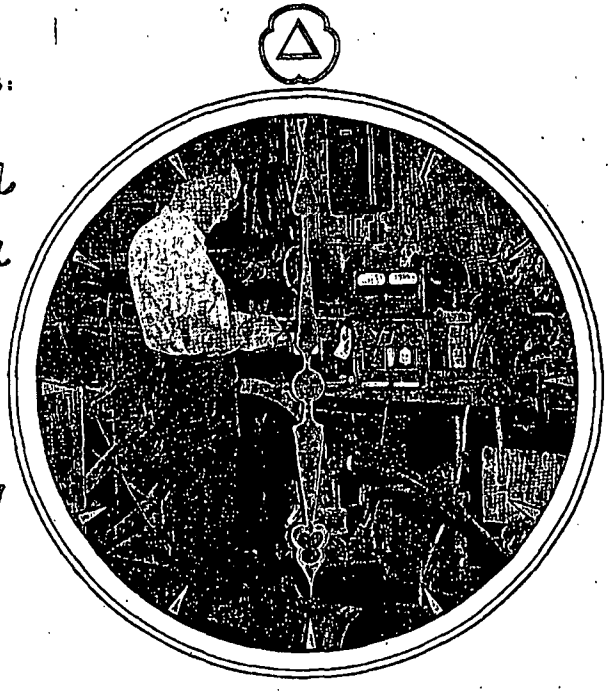
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