Mechanical Engineering Design: An Introduction

MECHANICAL ENGINEERING DESIGN

An Introduction

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Preface

DURING recent years there has been a growing belief in industrial and educational fields that engineering design, as a highly important aspect of our industrial economy, merits far greater attention than it has hitherto received. This belief has been strengthened by the report of the Feilden Committee on Engineering Design and has already resulted in the addition of Engineering Drawing and Design to the Ordinary National Certificate Courses in Mechanical Engineering and to the inclusion of Mechanical Engineering Design by the Institution of Mechanical Engineers as a Part II subject for exemption from the Institution's Examinations for Associate Membership.

This book has been written partly in anticipation of such changes and partly to meet the requirements of existing syllabuses relating to Engineering Design in Part I of Degree, Higher National Diploma and fifth and sixth year Technician's Courses. In addition it is hoped that it will form a useful work of reference for design office personnel.

The contents have been arranged so that the earlier chapters provide the reader with general background information against which the designs given later can be set. These are graded in complexity to illustrate component design and then the design of simple assemblies. The final chapter carries the work to a logical conclusion in providing a design analysis of a complete machine tool.

My thanks are due to those manufacturers and representatives of various organisations who have so kindly allowed me to interpret their products in a manner suitable for text-book presentation, or have provided me with information of a more general nature. The products used as design examples were chosen for their creative content and interesting industrial features, and as embodying many of the principles of strength of materials, theory of machines and other related subjects. In many instances the manufacturer's own design calculations must have involved more detailed consideration than was possible in a book of this kind. I trust that where this is so my interpretation has not been too unfair. Generally the designs have been worked to slide rule order of accuracy since practical considerations have frequently intruded to necessitate the 'rounding off' of dimensions to standard sizes. Where thought necessary, logarithmic tables have been used.

January 1966

G. D. REDFORD

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