

# Combustion Engineering By Borman File Type

Eventually, you will unquestionably discover a additional experience and success by spending more cash. still when? attain you put up with that you require to get those every needs subsequently having significantly cash? Why dont you attempt to acquire something basic in the beginning? Thats something that will lead you to comprehend even more nearly the globe, experience, some places, later history, amusement, and a lot more?

It is your definitely own become old to feat reviewing habit. along with guides you could enjoy now is **Combustion Engineering By Borman File Type** below.

*Moody's Industrial News Reports*  
1986-05

*Evaluation of Design Criteria for Oil Storage Tanks with Frangible Roof Joints* Daniel Swenson 1997-01-01

Describes research that evaluated the ability of the present design criteria (API 650) to ensure the desired frangible joint behavior. Particular questions include: evaluation of the area inequality as a method to predict the buckling response of the compression ring; effect of roof slope, tank diameter, and weld size on the frangible joint; effect of the relative strength of the roof-to-shell joint compared to the shell-to-bottom joint. Charts, tables, graphs and photos. References.

*Diesel Engine Reference Book* Bernard Challen 1999 The Diesel Engine Reference Book, Second Edition, is a comprehensive work covering the design and application of diesel engines of all sizes. The first edition was published in 1984 and since that time the diesel engine has made significant advances in application areas from passenger cars and light trucks through to large marine vessels. The Diesel Engine

Reference Book systematically covers all aspects of diesel engineering, from thermodynamics theory and modelling to condition monitoring of engines in service. It ranges through subjects of long-term use and application to engine designers, developers and users of the most ubiquitous mechanical power source in the world. The latest edition leaves few of the original chapters untouched. The technical changes of the past 20 years have been enormous and this is reflected in the book. The essentials however, remain the same and the clarity of the original remains. Contributors to this well-respected work include some of the most prominent and experienced engineers from the UK, Europe and the USA. Most types of diesel engines from most applications are represented, from the smallest air-cooled engines, through passenger car and trucks, to marine engines. The approach to the subject is essentially practical, and even in the most complex technological language remains straightforward, with mathematics used only where necessary and then in a clear fashion. The approach to the topics varies to suit the needs of different

readers. Some areas are covered in both an overview and also in some detail. Many drawings, graphs and photographs illustrate the 30 chapters and a large easy to use index provides convenient access to any information the readers requires.

**Bioprocess Engineering** Michael L. Shuler 2014 For Senior-level and graduate courses in Biochemical Engineering, and for programs in Agricultural and Biological Engineering or Bioengineering. This concise yet comprehensive text introduces the essential concepts of bioprocessing-internal structure and functions of different types of microorganisms, major metabolic pathways, enzymes, microbial genetics, kinetics and stoichiometry of growth and product information-to traditional chemical engineers and those in related disciplines. It explores the engineering principles necessary for bioprocess synthesis and design, and illustrates the application of these principles to modern biotechnology for production of pharmaceuticals and biologics, solution of environmental problems, production of commodities, and medical applications.

**Advances in Carbon Management Technologies** Subhas Sikdar 2020-03-19 Advances in Carbon Management Technologies comprises 43 chapters contributed by experts from all over the world. Volume 1 of the book, containing 23 chapters, discusses the status of technologies capable of yielding substantial reduction of carbon dioxide emissions from major combustion sources. Such technologies include renewable energy sources that can replace fossil fuels and technologies to capture CO<sub>2</sub> after fossil fuel combustion or directly from the atmosphere, with subsequent permanent long-term storage. The introductory chapter emphasizes the gravity of the issues related to

greenhouse gas emission global temperature correlation, the state of the art of key technologies and the necessary emission reductions needed to meet international warming targets. Section 1 deals with global challenges associated with key fossil fuel mitigation technologies, including removing CO<sub>2</sub> from the atmosphere, and emission measurements. Section 2 presents technological choices for coal, petroleum, and natural gas for the purpose of reducing carbon footprints associated with the utilization of such fuels. Section 3 deals with promising contributions of alternatives to fossil fuels, such as hydropower, nuclear, solar photovoltaics, and wind. Chapters 19 of this book is freely available as a downloadable Open Access PDF under a Creative Commons Attribution-Non Commercial-No Derivatives 4.0 license. The links can be found on the book's Routledge web page at <https://www.routledge.com//9780367198428>

**Comprehensive Dissertation Index 1973 Managing Natural Resources for Development in Africa** Washington Odongo Ochola 2010 The complex and dynamic interlinks between natural resource management (NRM) and development have long been recognized by national and international research and development organizations and have generated voluminous literature. However, much of what is available in the form of university course books, practical learning manuals and reference materials in NRM is based on experiences from outside Africa. Managing Natural Resources for Development in Africa: A Resource Book provides an understanding of the various levels at which NRM issues occur and are being addressed scientifically, economically, socially and politically. The book's

nine chapters present state-of-the-art perspectives within a holistic African context. The book systematically navigates the tricky landscape of integrated NRM, with special reference to Eastern and Southern Africa, against the backdrop of prevailing local, national, regional and global social, economic and environmental challenges. The authors' wide experience, the rich references made to emerging challenges and opportunities, and the presentation of different tools, principles, approaches, case studies and processes make the book a rich and valuable one-stop resource for postgraduate students, researchers, policymakers and NRM practitioners. The book is designed to help the reader grasp in-depth NRM perspectives and presents innovative guidance for research design and problem solving, including review questions, learning activities and recommended further reading. The book was developed through a writeshop process by a multi-disciplinary team of lecturers from the University of Nairobi, Egerton University, Kenyatta University, the University of Zimbabwe, the University of Malawi, Makerere University and the University of Dar es Salam. In addition, selected NRM experts from regional and international research organizations including the World Agroforestry Center (ICRAF), the Africa Forest Forum, RUFORUM, IIRR and the International Development Research Centre (IDRC) participated in the writeshop and contributed material to the book.

**Dissertation Abstracts International**  
1970

Comprehensive Dissertation Index, 1861-1972: Engineering: chemical, mechanical, and metallurgical Xerox University Microfilms 1973

**Encyclopedia of Environmental Science and Engineering, Sixth Edition (Print**

**Version)** Edward N. Ziegler 2012-06-25  
"The authors ... continue the pursuit of new knowledge, calculated to bring new fruits of health, safety, and comfort to man and his environs. The charms, as well as the subtle hazards, of the terms 'conservation, preservation, and ecology' need to be crystallized so that the public and their decision-makers practice this complex art with clearer conception and perception than is apparent in recent bitter confrontations." –From the Foreword to the Fourth Edition by Abel Wolman  
What's New in This Edition: New entries on environmental and occupational toxicology, geoengineering, and lead abatement  
Twenty-five significantly updated entries, including expanded discussion of water supplies and waste water treatment, biomass and renewable energy, and international public health issues  
An expanded list of acronyms and abbreviations  
Encyclopedia of Environmental Science and Engineering, Sixth Edition is still the most comprehensive, authoritative reference available in the field. This monumental two-volume encyclopedia now includes entries on topics ranging from acid rain, air pollution, and community health to environmental law, instrumentation, modeling, alternative energy, radioactive waste, and water treatment. The broad coverage includes highly specialized topics as well as those that transcend traditional disciplinary boundaries, reflecting the interdisciplinary skills and knowledge required by environmental researchers and engineers. Featuring expert contributors representing industry, academia, and government agencies, the encyclopedia presents fundamental concepts and applications in environmental science and engineering. The entries are supported by extensive figures,

photographs, tables, and equations. This sixth edition includes new material on water supplies and wastewater treatment, biomass and renewable energy, and international public health issues. New entries cover environmental and occupational toxicology, geoengineering, and lead abatement. The Encyclopedia of Environmental Science and Engineering provides a view of the field that helps readers understand, manage, and respond to threats to the human environment. Contact us to inquire about subscription options and print/online combination packages. US: (Tel) 1.888.318.2367 / (email) e-reference@taylorandfrancis.com International: (Tel) +44 (0) 20 7017 6062 / (email) online.sales@tandf.co.uk

**Why Knowledge Matters** E. D. Hirsch 2019-01-02 In *Why Knowledge Matters*, influential scholar E. D. Hirsch, Jr., addresses critical issues in contemporary education reform and shows how cherished truisms about education and child development have led to unintended and negative consequences. Hirsch, author of *The Knowledge Deficit*, draws on recent findings in neuroscience and data from France to provide new evidence for the argument that a carefully planned, knowledge-based elementary curriculum is essential to providing the foundations for children's life success and ensuring equal opportunity for students of all backgrounds. In the absence of a clear, common curriculum, Hirsch contends that tests are reduced to measuring skills rather than content, and that students from disadvantaged backgrounds cannot develop the knowledge base to support high achievement. Hirsch advocates for updated policies based on a set of ideas that are consistent with current cognitive science, developmental psychology, and social

science. The book focuses on six persistent problems of recent US education: the over-testing of students; the scapegoating of teachers; the fadeout of preschool gains; the narrowing of the curriculum; the continued achievement gap between demographic groups; and the reliance on standards that are not linked to a rigorous curriculum. Hirsch examines evidence from the United States and other nations that a coherent, knowledge-based approach to schooling has improved both achievement and equity wherever it has been instituted, supporting the argument that the most significant education reform and force for equality of opportunity and greater social cohesion is the reform of fundamental educational ideas. *Why Knowledge Matters* introduces a new generation of American educators to Hirsch's astute and passionate analysis.

**Technical Abstract Bulletin** 1982  
Modelling Diesel Combustion P. A. Lakshminarayanan 2010-03-03  
*Phenomenology of Diesel Combustion and Modeling Diesel* is the most efficient combustion engine today and it plays an important role in transport of goods and passengers on land and on high seas. The emissions must be controlled as stipulated by the society without sacrificing the legendary fuel economy of the diesel engines. These important drivers caused innovations in diesel engineering like re-entrant combustion chambers in the piston, lower swirl support and high pressure injection, in turn reducing the ignition delay and hence the nitric oxides. The limits on emissions are being continually reduced. Therefore, the required accuracy of the models to predict the emissions and efficiency of the engines is high. The phenomenological combustion models based on physical and chemical

description of the processes in the engine are practical to describe diesel engine combustion and to carry out parametric studies. This is because the injection process, which can be relatively well predicted, has the dominant effect on mixture formation and subsequent course of combustion. The need for improving these models by incorporating new developments in engine designs is explained in Chapter 2. With "model based control programs" used in the Electronic Control Units of the engines, phenomenological models are assuming more importance now because the detailed CFD based models are too slow to be handled by the Electronic Control Units. Experimental work is necessary to develop the basic understanding of the processes.

#### Air Pollution and Greenhouse Gases

Zhongchao Tan 2014-11-03 This textbook discusses engineering principles relating to air pollution and greenhouse gases (GHGs); it focuses on engineering principles and designs of related devices and equipment for air emission control for a variety of industries such as energy, chemical, and transportation industries. The book aims primarily at senior undergraduate and graduate students in mechanical, chemical and/or environmental engineering departments; it can also be used as a reference book by technical staff and design engineers who are interested in and need to have technical knowledge in air pollution and GHGs. The book is motivated by recent rapid advances in air pollution and greenhouse gas emissions and their control technologies. In addition to classic topics related to air pollution, this book is also featured with emerging topics related to air pollution and GHGs. It covers recent advances in engineering approaches to the reduction of GHG emissions including, but are not limited to,

green energy technologies and carbon sequestration and storage. It also introduces an emerging topic in air pollution, which is referred to as Nano Air Pollution. It is a growing concern in air pollution, but largely missing in similar books, likely because of recent rapid advances in nanotechnology has outpaced the advances in nano air pollution control.

Dust Explosion Dynamics Russell A. Ogle 2016-09-10 Dust Explosion Dynamics focuses on the combustion science that governs the behavior of the three primary hazards of combustible dust: dust explosions, flash fires, and smoldering. It explores the use of fundamental principles to evaluate the magnitude of combustible dust hazards in a variety of settings. Models are developed to describe dust combustion phenomena using the principles of thermodynamics, transport phenomena, and chemical kinetics. Simple, tractable models are described first and compared with experimental data, followed by more sophisticated models to help with future challenges. Dr. Ogle introduces the reader to just enough combustion science so that they may read, interpret, and use the scientific literature published on combustible dusts. This introductory text is intended to be a practical guide to the application of combustible dust models, suitable for both students and experienced engineers. It will help you to describe the dynamics of explosions and fires involving dust and evaluate their consequences which in turn will help you prevent damage to property, injury and loss of life from combustible dust accidents. Demonstrates how the fundamental principles of combustion science can be applied to understand the ignition, propagation, and extinction of dust explosions Explores

fundamental concepts through model-building and comparisons with empirical data Provides detailed examples to give a thorough insight into the hazards of combustible dust as well as an introduction to relevant scientific literature

**Thomas Register of American Manufacturers and Thomas Register Catalog File** 2002 Vols. for 1970-71 includes manufacturers' catalogs.

Combustion Engineering Gary L. Borman 1998 Combustion Engineering provides detailed coverage of the major combustion technologies and fuels. It introduces fundamental combustion concepts with a strong emphasis on their use in design. Numerous tables and appendixes featuring data and practical formulas further support this design emphasis. Fundamental concepts are discussed within the context of their application. The numerous applications include gasoline and diesel engines, gas and oil-fired furnaces, gas turbines, and fixed and fluidized beds. The text also features numerous problems and worked examples, as well as an accessible mathematical treatment. Qualitative discussion of advanced modeling methods is also included.

Industrial Burners Handbook Jr., Charles E. Baukal 2003-10-29 Rapid development in the field precipitated by the increased demand for clean burner systems has made the Industrial Burners Handbook into the fields go-to resource. With this resource, bestselling author, editor, and combustion expert Charles Baukal, Jr. has put together a comprehensive reference dedicated to the design and applications of indust

**Major Research Topics in Combustion** M.Y. Hussaini 2012-12-06 The Institute for Computer Applications in Science and Engineering (ICASE) and NASA Langley Research Center (LaRC) brought together on October 2-4, 1989 experts in the various

areas of combustion with a view to expose them to some combustion problems of technological interest to LaRC and possibly foster interaction with the academic community in these research areas. The topics chosen for this purpose were flame structure, flame stability, flame holding/extinction, chemical kinetics, turbulence-kinetics interaction, transition to detonation, and reacting free shear layers. The lead paper set the stage by discussing the status and issues of supersonic combustion relevant to scramjet engine. Then the experts were called upon i) to review the current status of knowledge in the aforementioned areas, ii) to focus on how this knowledge can be extended and applied to high-speed combustion, and iii) to suggest future directions of research in these areas. Each topic was then dealt with in a position paper followed by formal discussion papers and a general discussion involving the participants. The position papers discussed the state-of-the-art with an emphasis on key issues that needed to be resolved in the near future. The discussion papers critically examined these issues and filled in any lacunae therein. The edited versions of the general discussions in the form of questions from the audience and answers from the speakers are included whenever possible to give the reader the flavor of the lively interactions that took place.

**Energy Research Abstracts** 1989 *Engineering Fundamentals of the Internal Combustion Engine: Pearson New International Edition* Willard W. Pulkrabek 2013-10-03 For a one-semester, undergraduate-level course in Internal Combustion Engines. This applied thermoscience text explores the basic principles and applications of various types of internal

combustion engines, with a major emphasis on reciprocating engines. It covers both spark ignition and compression ignition engines—as well as those operating on four-stroke cycles and on two stroke cycles—ranging in size from small model airplane engines to the larger stationary engines.

*Liquid Atomization* L.P. Bayvel 2018-10-31 Covering the basics of liquid atomization, this book familiarizes readers with the physical processes of liquid atomization, the main types of atomizers and their design, measurements of spray characteristics, experimental investigations of atomizers, and application of atomizers. It demonstrates how to calculate and design atomizers and how to mea  
Internal Combustion Engines and Powertrain Systems for Future Transport 2019 IMECHE 2020-03-09 With the changing landscape of the transport sector, there are also alternative powertrain systems on offer that can run independently of or in conjunction with the internal combustion (IC) engine. This shift has actually helped the industry gain traction with the IC Engine market projected to grow at 4.67% CAGR during the forecast period 2019-2025. It continues to meet both requirements and challenges through continual technology advancement and innovation from the latest research. With this in mind, the contributions in Internal Combustion Engines and Powertrain Systems for Future Transport 2019 not only cover the particular issues for the IC engine market but also reflect the impact of alternative powertrains on the propulsion industry. The main topics include: • Engines for hybrid powertrains and electrification • IC engines • Fuel cells • E-machines • Air-path and other technologies

achieving performance and fuel economy benefits • Advances and improvements in combustion and ignition systems • Emissions regulation and their control by engine and after-treatment • Developments in real-world driving cycles • Advanced boosting systems • Connected powertrains (AI) • Electrification opportunities • Energy conversion and recovery systems • Modified or novel engine cycles • IC engines for heavy duty and off highway Internal Combustion Engines and Powertrain Systems for Future Transport 2019 provides a forum for IC engine, fuels and powertrain experts, and looks closely at developments in powertrain technology required to meet the demands of the low carbon economy and global competition in all sectors of the transportation, off-highway and stationary power industries.

**Biochar for Environmental Management** Johannes Lehmann 2012-05-16 Biochar is the carbon-rich product when biomass (such as wood, manure or crop residues) is heated in a closed container with little or no available air. It can be used to improve agriculture and the environment in several ways, and its stability in soil and superior nutrient-retention properties make it an ideal soil amendment to increase crop yields. In addition to this, biochar sequestration, in combination with sustainable biomass production, can be carbon-negative and therefore used to actively remove carbon dioxide from the atmosphere, with major implications for mitigation of climate change. Biochar production can also be combined with bioenergy production through the use of the gases that are given off in the pyrolysis process. This book is the first to synthesize the expanding research literature on this topic. The book's interdisciplinary

approach, which covers engineering, environmental sciences, agricultural sciences, economics and policy, is a vital tool at this stage of biochar technology development. This comprehensive overview of current knowledge will be of interest to advanced students, researchers and professionals in a wide range of disciplines.

WRC Bulletin Welding Research Council (U.S.) 1996

**Forthcoming Books** Rose Arny 1998  
**Engine Emission Control Technologies**

G. Amba Prasad Rao 2020-06-29 This new volume covers the important issues related to environmental emissions from SI and CI engines as well as their formation and various pollution mitigation techniques. The book addresses aspects of improvements in engine modification, such as design modifications for enhanced performance, both with conventional fuels as well as with new and alternative fuels. It also explores some new combustion concepts that will help to pave the way for complying with new emission concepts. Alternative fuels are addressed in this volume to help mitigate harmful emissions, and alternative power sources for automobiles are also discussed briefly to cover the switch over from fueled engines to electrics, including battery-powered electric vehicles and fuel cells. The authors explain the different technologies available to date to overcome the limitations of conventional prime movers (fueled by both fossil fuels and alternative fuels). Topics examined include:

- Engine modifications needed to limit harmful emissions
- The use of engine after-treatment devices to contain emissions
- The development of new combustion concepts
- Adoption of alternative fuels in existing engines
- Switching over to electrics—advantages and limitations

- Specifications of highly marketed automobiles
- Emission measurement methods

The John Zink Combustion Handbook Jr., Charles E. Baukal 2001-03-27 Despite the length of time it has been around, its importance, and vast amounts of research, combustion is still far from being completely understood. Industrial applications of combustion add environmental, cost, and fuel consumption issues to its fundamental complexity, and the process and power generation industries in particular present their o

Interactive Aerospace Engineering and Design Dava J. Newman 2002 This text contains an integrated bound-in CD-ROM, and has a strong emphasis on design. Its active visual approach and inclusion of space-orientated engineering make it an interesting examination of the aerospace engineering field.

*Vehicular Engine Design* Kevin Hoag 2007-02-05 The mechanical engineering curriculum in most universities includes at least one elective course on the subject of reciprocating piston engines. The majority of these courses today emphasize the application of thermodynamics to engine efficiency, performance, combustion, and emissions. There are several very good textbooks that support education in these aspects of engine development. However, in most companies engaged in engine development there are far more engineers working in the areas of design and mechanical development. University studies should include opportunities that prepare engineers desiring to work in these aspects of engine development as well. My colleagues and I have undertaken the development of a series of graduate courses in engine design and mechanical development. In doing so it becomes quickly apparent that no

suitable text book exists in support of such courses. This book was written in the hopes of beginning to address the need for an engineering-based introductory text in engine design and mechanical development. It is of necessity an overview. Its focus is limited to reciprocating-piston internal-combustion engines – both diesel and spark-ignition engines. Emphasis is specifically on automobile engines, although much of the discussion applies to larger and smaller engines as well. A further intent of this book is to provide a concise reference volume on engine design and mechanical development processes for engineers serving the engine industry. It is intended to provide basic information and most of the chapters include recent references to guide more in-depth study.

**Handbook of Air Pollution from Internal Combustion Engines** Eran Sher 1998-03-20 This handbook is an important and valuable source for engineers and researchers in the area of internal combustion engines pollution control. It provides an excellent updated review of available knowledge in this field and furnishes essential and useful information on air pollution constituents, mechanisms of formation, control technologies, effects of engine design, effects of operation conditions, and effects of fuel formulation and additives. The text is rich in explanatory diagrams, figures and tables, and includes a considerable number of references. An important resource for engineers and researchers in the area of internal combustion engines and pollution control Presents and excellent updated review of the available knowledge in this area Written by 23 experts Provides over 700 references and more than 500 explanatory diagrams, figures and tables

**The Sun, the Earth, and Near-earth Space** John A. Eddy 2009 "... Concise explanations and descriptions - easily read and readily understood - of what we know of the chain of events and processes that connect the Sun to the Earth, with special emphasis on space weather and Sun-Climate."--Dear Reader.

**Fossil Energy** Ripudaman Malhotra 2012-12-12 The word sustainability shares its root with sustenance. In the context of modern society, sustenance is inextricably linked to the use of energy. Fossil Energy provides an authoritative reference on all aspects of this key resource, which currently represents nearly 85% of global energy consumption. Gathering 16 peer-reviewed entries from the Encyclopedia of Sustainability Science and Technology, the chapters provide comprehensive, yet concise coverage of fundamentals and current areas of research. Written by recognized authorities in the field, this volume represents an essential resource for scientists and engineers working on the development of energy resources, fossil or alternative, and reflects the essential role of energy supplies in supporting a sustainable future. **Internal Combustion Engines** Colin R. Ferguson 2015-07-01 Since the publication of the Second Edition in 2001, there have been considerable advances and developments in the field of internal combustion engines. These include the increased importance of biofuels, new internal combustion processes, more stringent emissions requirements and characterization, and more detailed engine performance modeling, instrumentation, and control. There have also been changes in the instructional methodologies used in the applied thermal sciences that require inclusion in a new edition. These methodologies suggest that an

increased focus on applications, examples, problem-based learning, and computation will have a positive effect on learning of the material, both at the novice student, and practicing engineer level. This Third Edition mirrors its predecessor with additional tables, illustrations, photographs, examples, and problems/solutions. All of the software is 'open source', so that readers can see how the computations are performed. In addition to additional java applets, there is companion Matlab code, which has become a default computational tool in most mechanical engineering programs.

**Energy Research Abstracts 1989**

**Internal Combustion Engine**

**Fundamentals** John Heywood 1988 This text, by a leading authority in the field, presents a fundamental and factual development of the science and engineering underlying the design of combustion engines and turbines. An extensive illustration program supports the concepts and theories discussed.

**On the Shoulders of Titans** Barton C. Hacker 1977

**Atomization and Sprays** Arthur H. Lefebvre 2017-03-27 The second edition of this long-time bestseller provides a framework for designing and understanding sprays for a wide array of engineering applications. The text contains correlations and design tools that can be easily understood and used in relating the design of atomizers to the resulting spray behavior. Written to be accessible to readers with a modest technical background, the emphasis is

on application rather than in-depth theory. Numerous examples are provided to serve as starting points for using the information in the book. Overall, this is a thoroughly updated edition that still retains the practical focus and readability of the original work by Arthur Lefebvre.

*Combustion Engineering Issues for Solid Fuel Systems* Bruce G. Miller

2008-07-02 Design, construct and utilize fuel systems using this comprehensive reference work.

*Combustion Engineering Issues for Solid Fuel Systems* combines modeling, policy/regulation and fuel properties with cutting edge breakthroughs in solid fuel combustion for electricity generation and industrial applications. This book moves beyond theory to provide readers with real-life experiences and tips for addressing the various technical, operational and regulatory issues that are associated with the use of fuels. With the latest information on CFD modeling and emission control technologies, *Combustion Engineering Issues for Solid Fuel Systems* is the book practicing engineers as well as managers and policy makers have been waiting for. Provides the latest information on CFD modeling and emission control technologies Comprehensive coverage of combustion systems and fuel types Addresses policy and regulatory concerns at a technical level Tackles various technical and operational issues  
**Index to Names of Applicants in Connection with Published Complete Specifications** Great Britain. Patent Office 1957