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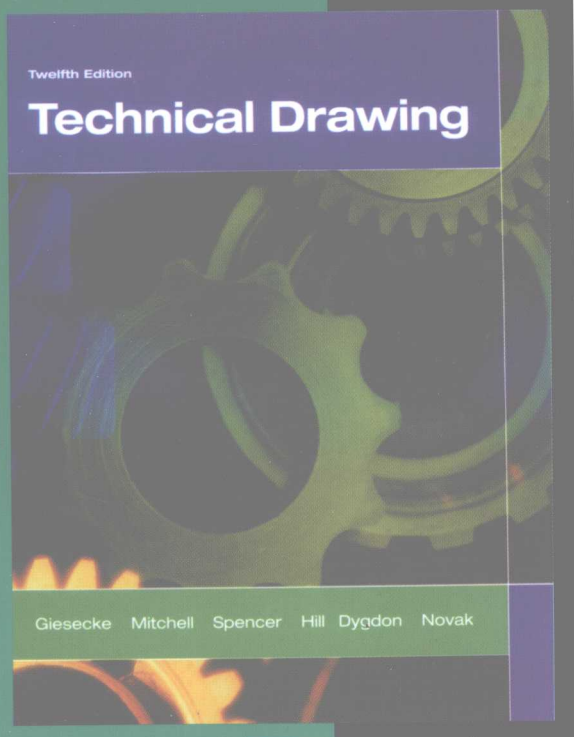
国外大学优秀教材 —— 工程图学系列 (影印版)

Frederick E. Giesecke, Alva Mitchell, Henry Cecil Spencer 著  
Ivan Leroy Hill, John Thomas Dygdon, James E. Novak

焦永和 改编

# 技术制图

(第12版)



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清华大学出版社

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国外大学优秀教材 —— 工程图学系列 (影印版)

# 技术制图

(第12版)

**Technical Drawing**  
(Twelfth Edition)

Frederick E. Giesecke

Alva Mitchell

Henry Cecil Spencer

John Thomas Dygdon

James E. Novak

著

江苏工业学院图书馆  
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焦永和 改编

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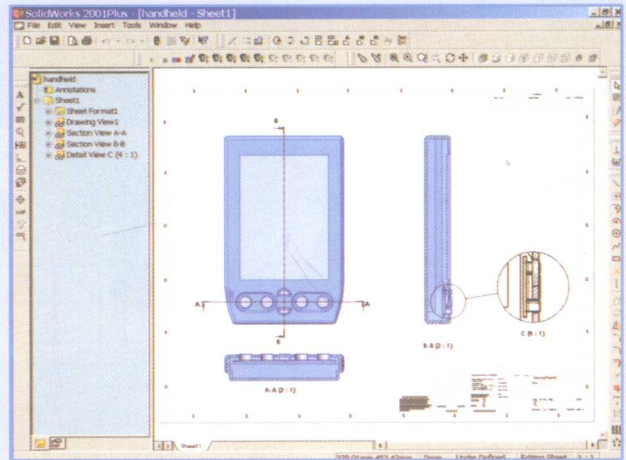
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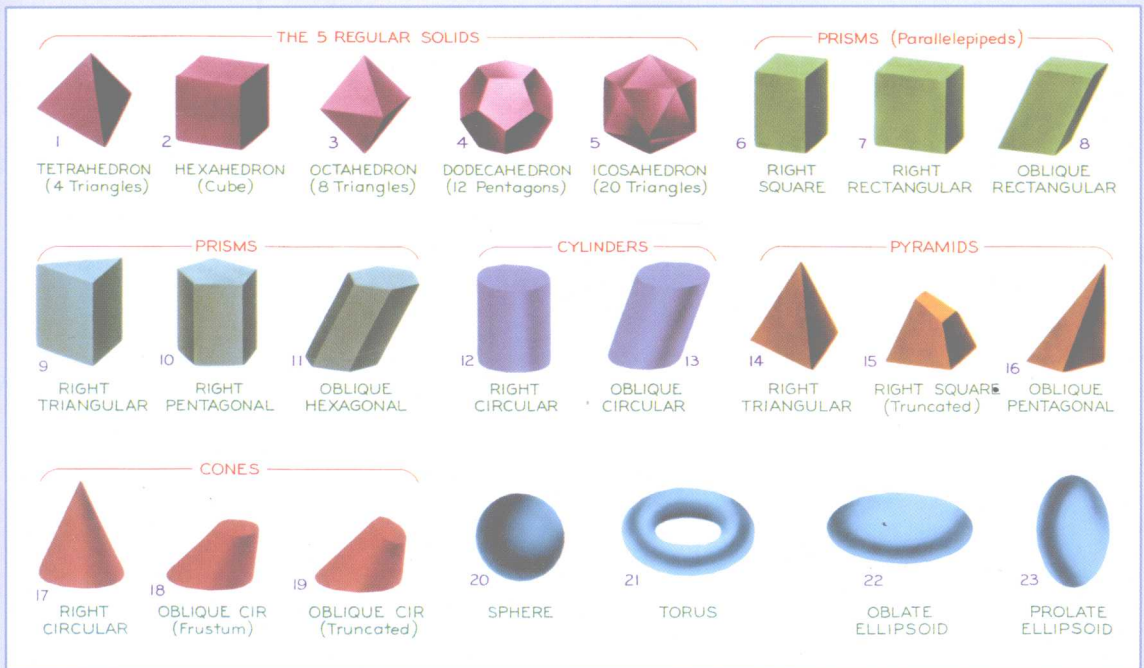
## A

CAD Documents Supply a Multitude of Information that Engineers and Technicians Must Understand and Use. (Courtesy of SolidWorks Corporation.)



## B

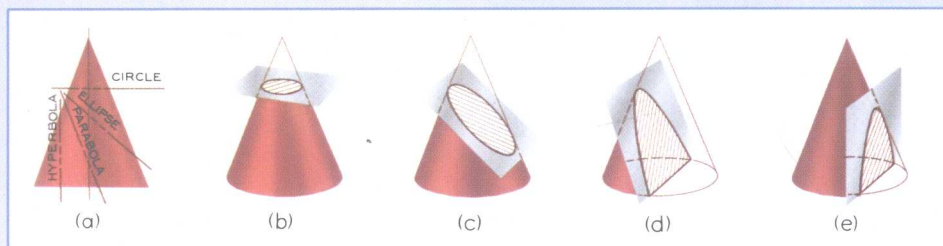
Types of Solids.





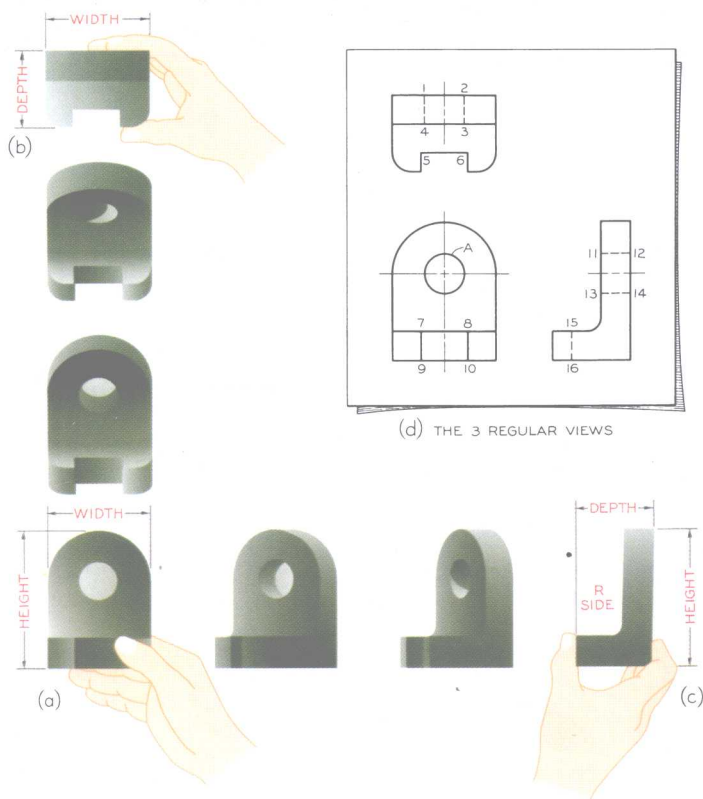
## ■ A ■

### Conic Sections.



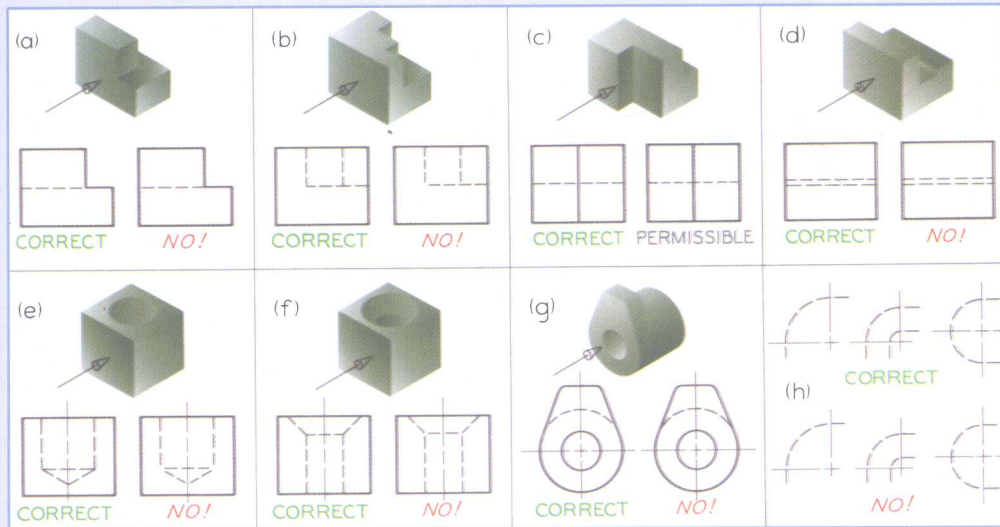
## ■ B ■

### The Three Regular Views.



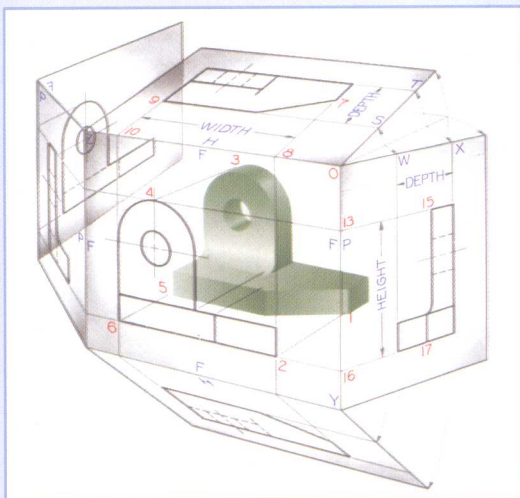
## A

### Hidden-Line Practices.



## B

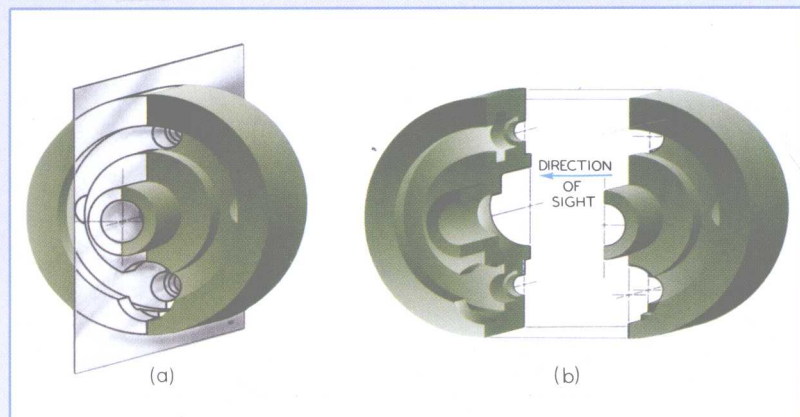
### The Glass Box.





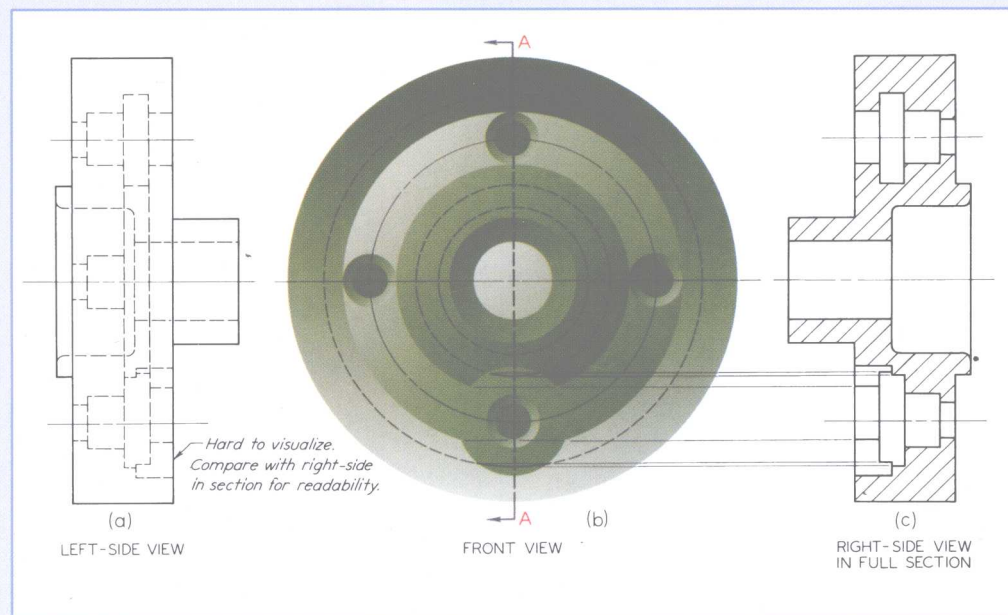
## ■ A ■

### A Section.



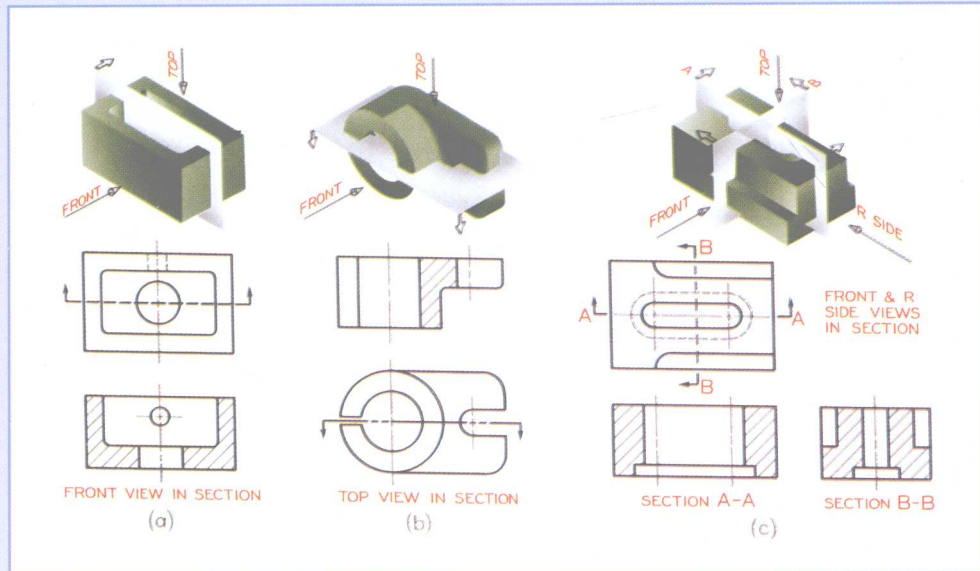
## ■ B ■

### Full Section.



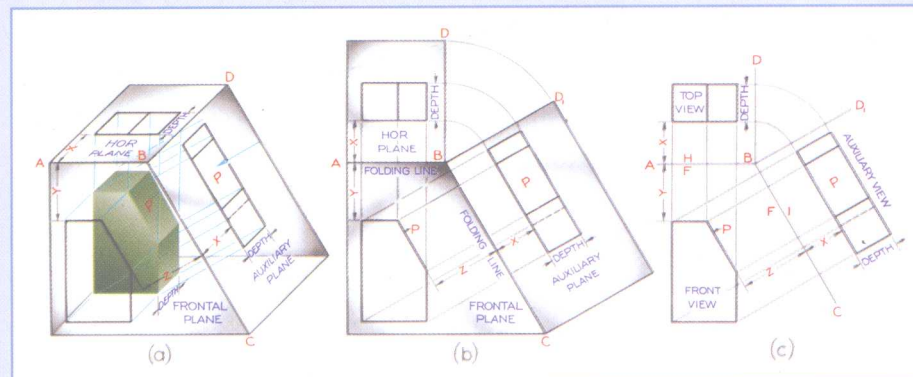
## A

### Cutting Planes and Sections.



## B

### An Auxiliary View.

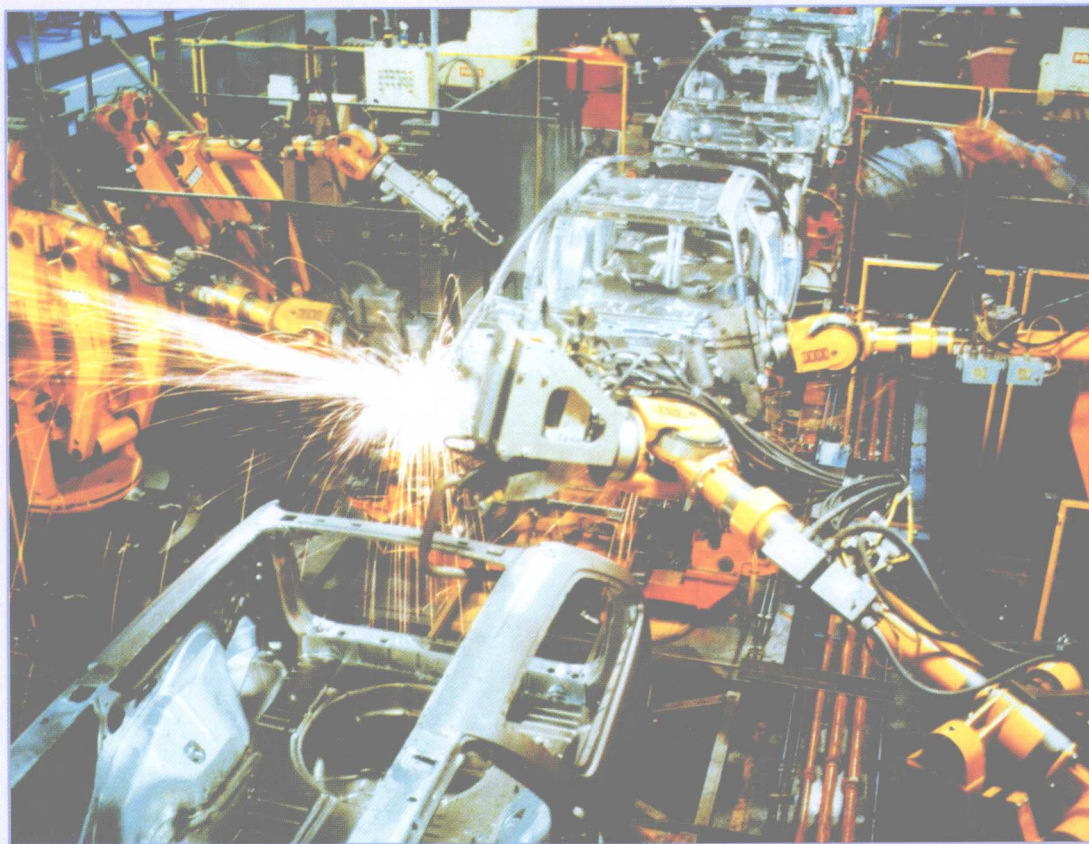




## ■ A ■

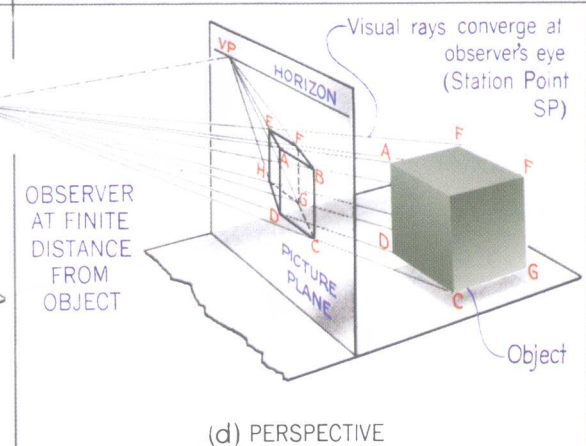
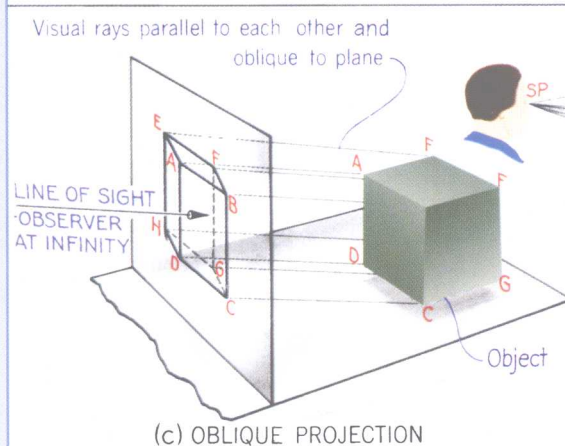
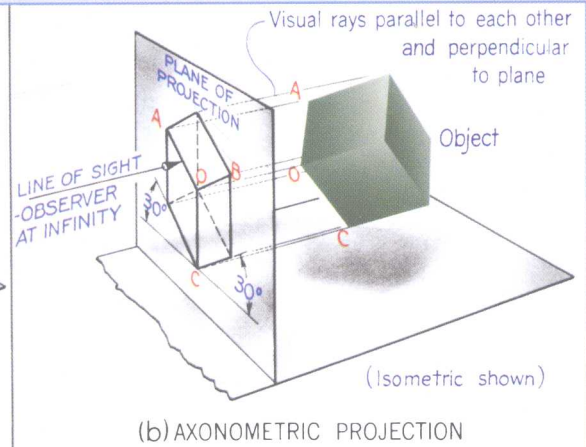
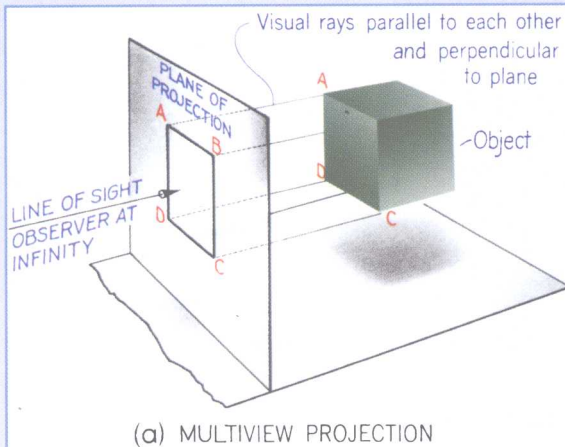
Robotic Welding on Ford Automobile Assembly Line.

*(Courtesy of Ford Motor Co.)*



## ■ A ■

### Four Types of Projection.

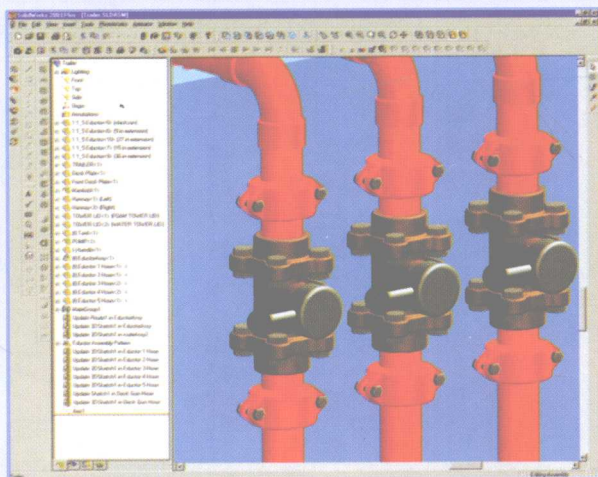




## ■ A ■

### 3D Piping Drawing Produced on a CAD System.

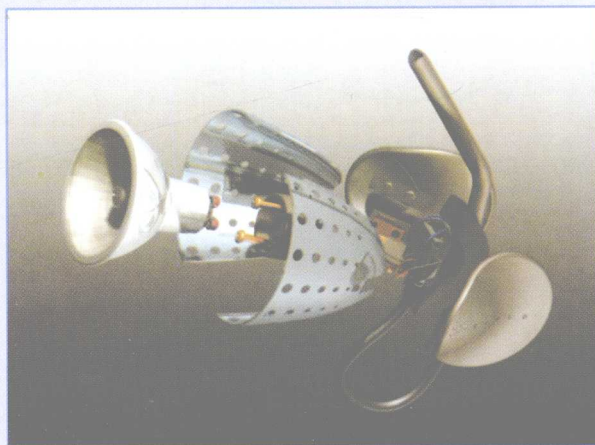
(Courtesy of SolidWorks Corporation.)



## ■ B ■

### Exploded Solid Model. (Exhibition Light Designed for Klem Products GmbH

by Bendis & Kieruff. Courtesy of SolidWorks Corporation.)





## 丛 书 序 言

本套丛书是由清华大学出版社和中国工程图学学会图学教育专业委员会共同策划的。

双语教学是近年来国内高校的教学改革热点之一，目前在数十所高校中已经开展了制图课程的双语教学。

从目前国内开展双语教学的高校使用的教材来看，大体上有以下几种情况：①直接选用欧美原版教材；②中国的制图教师根据我国的教学基本要求改编的原版教材，并以附录的形式讲解投影法和标准方面的差异；③中国的制图教师编写的英文教材；④中国的制图教师编写中英文对照的双语教材等。

为了给我国高校的制图教师开展双语教学提供更多的教材选择，也使我国高校的广大师生对美国制图课程的现状有更多的了解，清华大学出版社和中国工程图学学会图学教育专业委员会决定出版这套丛书。经过编委会一年多的分析与研究，我们从数十本美国原版教材中选择了6本构成了本套丛书，包括机械类的制图教材两本，近机械类与非机械类的制图教材两本，CAD与计算机图形学方面的教材两本。需要说明的是美国的制图教材并未按照上述方式分类，所谓不同的类别是由本套丛书的编委会根据其内容来确定的。

由于美国原版教材的内容远远多于我国同类教材的内容，编委会根据我国的实际情况，以“教学基本要求”为依据，对其内容进行了删减，在这一过程中，未对原版教材作任何改写，以保证其“原汁原味”的风格。我们希望通过这种方法，给开展制图课双语教学的院校提供一套既能保持原版教材风貌，又符合我国实际情况的英语教材。

最后，清华大学出版社及本套丛书的编委会对积极提供样书供编委会选择的美国麦格劳-希尔公司和培生公司表示衷心的感谢，是他们的积极配合使得这套丛书得以顺利出版。

限于改编者的水平，书中不当之处在所难免，欢迎广大读者批评指正。

国外大学优秀教材——工程图学系列编委会

2007年3月

## 影印版序言

本书原版有 25 章,书后还有 46 个附录和索引,共计 802 页,全面覆盖了工程制图与图学技术的主要内容,较好地处理了课程内容的基础性与先进性的关系。

在本书影印时考虑到我国的教学基本要求、授课学时以及现有教材的实际情况,对原书作了必要的删节。本书的适用对象为机械类各专业的教师与学生,因此比较多地保留了原书的内容。具体删节情况如下:

(1) 删去第 15 章,共 14 页。这章内容为工程图的复制等,在我国的教学基本要求中无此内容。

(2) 删去第 18 章,共 24 页。这章内容为透视,在我国的教学基本要求中无此内容。

(3) 删去第 19 章,共 26 页。这章内容为相交与展开,实际主要介绍展开问题,在我国的教学基本要求中无此内容。

(4) 删去第 21~25 章,共 100 页。这几章的内容分别为电气工程图、结构图、等高线与地形图、管路图、焊接图等,在我国的教学基本要求中无此内容。

(5) 删去附录 32~46,共 16 页。这部分内容均为美国标准。

以上共删去 180 页,约占全书 22%。

经过删节处理后,页眉保留原版书的页码,页脚是连续的新书页码。文中提到的页码均为原版书页码。本书目录和索引保留原版书页码,与正文页眉处的页码对应,有的内容或页码可能已被删除从而无法找到,由此给读者带来不便,请读者谅解。

北京理工大学 焦永和

2008 年 12 月

# Preface

## ■ ABOUT THIS BOOK

Over the last sixty years, *Technical Drawing* has taught well over a million students the practices and techniques of graphical communication. Both instructors and their students have come to depend on this text as the authority on the subject, and most students have used this book as a professional reference long after they have finished taking this course. Why has this book been so successful? First, the main goal of the text has always been to explain each principle so clearly that the student is certain to understand it, and to make the text interesting enough to encourage all students to read and study on their own. Second, this book has also had what are unquestionably the best, most detailed, and accurate set of drawings on the market. A student skilled with this book's drawings will have a full repertoire of graphical skills in his or her hands. Lastly, *Technical Drawing* continually has sought to address the new technologies and the skills that constantly change this field. By doing so, this text prepares students to enter the marketplace and face the challenges of a rapidly changing playing field.

## ■ THE TWELFTH EDITION

The Twelfth Edition of *Technical Drawing* continues to offer the best coverage of basic graphics principles available. Edition after edition, this text serves as the authoritative source on the subject. With this new version, we have acted upon the requests of over 10 reviewers and 75 survey respondents to improve certain aspects of the book while preserving its core presentation. In particular, this new volume features:

- Over 75 new screen captures and illustrations reflecting new graphics technologies. All art has also been accuracy checked thoroughly by Professor Gerald Bacza of Fairmont State College.
- New 4-color insert—this insert presents 14 key figures from the text in 4-color format, including key, classic “Giesecke” instructional figures.
- Major revisions and additions to introduction to CAD—Chapter 2, Manufacturing Design and Processes—Chapter 10, Design and Working Drawings—Chapter 14, and Drawing Reproduction, Control, and the Internet—Chapter 15.
- Seven new Graphics Spotlight boxes on topics such as Solid Modeling, Virtual Reality, Factory Modeling, Electric Car Design, and the innovative Segway Human Transporter.
- 50 new end-of-chapter drawing problems featuring parts that come from a variety of industries.
- New and improved text layout and design.
- Updated website <http://www.prenhall.com/giesecke>. Updated to contain
  - Over 35 large format, Flash and Windows Media Player animations of concepts keyed to sections/figures in the text.
  - Self-grading concept questions: T or F, multiple choice, and fill-in-the-blank questions for each chapter.
  - Essay review questions: answer questions from the text on-line and email to an instructor.
  - Reference chapters on graphs, alignment charts, empirical equations, and graphical mathematics, glossary of terms, chapter summaries and objectives.
  - Links: a robust links section on CAD and technical drawing.
  - PowerPoint PDF files of art from the text.
  - eDrawings: a new solid modeling technology that lets you view, rotate, and annotate solid models without any special software.



## ■ SUPPLEMENTS

### INSTRUCTOR'S RESOURCE SYSTEM—INCLUDES INSTRUCTOR'S MANUAL/TESTBANK, INSTRUCTOR'S CD-ROM, WEBSITE RESOURCES

- **Instructor's Manual and Testbank:** This manual by Tom Kane of Pueblo Community College includes answers to end-of-chapter problems, chapter worksheets, teaching outlines, and other tools designed to aid in class preparation. It now also contains a 400-question concept testbank keyed, chapter-by-chapter, to the book.
- **Instructor's CD-ROM:** This CD contains many electronic resources for your class including:
  1. PowerPoint slides of key text figures and PDF files of all art from the text.
  2. 37 animations produced in Flash and Windows Media player for use in your course.
  3. Answers to key drawing problems in dwg format.
  4. Electronic versions of the Instructor's Manual and Testbank. Examples of new eDrawings technology that let's you manipulate solid models on line without having any complicated software on your machine.
- **Website:** <http://www.prenhall.com/giesecke>: This website contains a new and even easier to use syllabus builder technology that lets you create and manage an on-line syllabus for your course. Just follow the simple on-line instructions. It also contains:
  - over 35 large format, Flash and Windows Media Player animations of concepts keyed to sections/figures in the text;
  - self-grading concept questions—T or F, multiple choice, and fill-in-the-blank questions for each chapter;
  - essay preview questions;
  - answer questions from the text on-line and email to an instructor;
  - reference chapters on graphs, alignment charts, empirical equations and graphical mathematics;
  - glossary of terms;
  - chapter summaries and objectives;
  - links—a robust links section on CAD and technical drawing;
  - PowerPoint PDF files of art from the text;
  - eDrawings—a new solid modeling technology that lets you view, rotate, and annotate solid models without any special software.

## WORKBOOKS

Three workbooks with additional problems are available. These workbooks are fully class tested for effectiveness and relevance to the course. They range from having traditional to more modern approaches.

- **Engineering Drawing, Problem Series 1** (ISBN: 0-13-658536-1): Contains traditional, mechanical workbook problems.
- **Engineering Drawing, Problem Series 2** (ISBN: 0-13-658881-6): Contains traditional problems with an emphasis on engineering concepts.
- **NEW 3rd Edition Engineering Drawing, Problem Series 3 with CD** (ISBN: 0-13-111160-4): The new edition of this workbook by Paige Davis and Karen Juneau of the Louisiana State University, contains more modern drawing problems as well as a CD with a disk of starter CAD files. Make sure you preview this supplement for your class.

## PRENTICE HALL NEW YORK TIMES SUPPLEMENT

A free collection of articles excerpted from *The New York Times* covers areas of interest to first year engineers and engineering drafting/design students. Contact your Prentice Hall sales representative for a free supply.

## BUNDLES

To make the cost of purchasing several books for one course more manageable for students, Prentice Hall offers discounts when you purchase this book with several other Prentice Hall textbooks. Discounts range from up to 20% off the price of the two books purchased separately. At press time, you may bundle this text at a discount with titles such as *Discovering AutoCAD 2002* by Dix/Riley; *AutoCAD 2002: One Step at a Time*, and *3D AutoCAD 2002: One Step at a Time* by Timothy Sean Sykes, and *AutoCAD for Architecture* by Tuna Saka. Users of other packages like SolidWorks, Pro/ENGINEER, or I-DEAS may bundle with books by Richard Lueptow, Robert Rizza, or Sheryl Sorby. To request specific bundling information, as well as to get isbns or prices, either contact your local Prentice Hall sales representative, or email: [engineering@prenhall.com](mailto:engineering@prenhall.com). Make sure to visit the CAD/Graphics Section of [www.prenhall.com](http://www.prenhall.com) to learn about all Prentice Hall offerings. For the name and number of your sales rep, please contact Prentice Hall Faculty Services at 1-800-526-0485.

## ■ ACKNOWLEDGMENTS

This edition benefited from the help of 10 reviewers and 75 survey participants. In particular, we'd like to thank the reviewers who spent time with the book and made valuable contributions: Clark Cory, Joyce Wesner, Michael A. Hayden, Douglas G. Grove, Eric C. Loew, Caroline Veith, Kirk Barnes, Michael J. Carey, Gregory M. Conrey, and Cedric E. Beegle.

The publisher wishes to thank all of the members of the "Giesecke" team for their efforts in bringing this Twelfth Edition to fruition, but especially would like to thank Rose Kernan for her hard work, dedication, and professionalism in seeing the project through from manuscript to press.

## 国外大学优秀教材——工程图学系列（影印版）

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英文书名：Engineering Drawing and Graphic Technology, 14E  
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改编者：焦永和  
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改编者：焦永和  
原著出版者：Prentice-Hall, Inc.
3. 中文书名：工程制图基础（第 5 版）  
英文书名：Fundamentals of Engineering Drawing, 5E  
作者：Cecil Jensen, Jay D. Helsel, Dennis Short  
改编者：窦忠强  
原著出版者：The McGraw-Hill Companies, Inc.
4. 中文书名：Autodesk Inventor® 10 工程设计绘图  
英文书名：Engineering Design and Graphics with Autodesk Inventor® 10  
作者：James D. Bethune  
改编者：窦忠强  
原著出版者：Prentice-Hall, Inc.
5. 中文书名：图形信息表达基础教程（第 5 版）  
英文书名：Fundamentals of Graphics Communication, 5E  
作者：Gary R. Bertoline, Eric N. Wiebe  
改编者：童秉枢  
原著出版者：The McGraw-Hill Companies, Inc.
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英文书名：Mastering CAD/CAM  
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