FIRST PRINCIPLES OF MECHANICAL AND ENGINEERING DRAWING. A COURSE OF STUDY ADAPTED TO THE SELF-INSTRUCTION OF STUDENTS AND APPRENTICES TO MECHANICAL ENGINEERING IN ALL ITS BRANCHES AND FOR TEACHERS IN TECHNICAL AND MANUAL INSTRUCTION SCHOOLS

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649583911

First Principles of Mechanical and Engineering Drawing. A Course of Study Adapted to the Self-Instruction of Students and Apprentices to Mechanical Engineering in All Its Branches and for Teachers in Technical and Manual Instruction Schools by H. Holt-Butterfill

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H. HOLT-BUTTERFILL

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BY

H. HOLT-BUTTERFILL, M.E.

FORMERLY A MEMBER OF THE INSTITUTION OF MECHANICAL ENGINEERS AND INSTITUTION OF NAVAL ARCHITECTS

WITH UPWARDS OF 350 DIAGRAMS IN ILLUSTRATION OF THE PRINCIPLES OF THE SUBJECT

LONDON: CHAPMAN AND HALL, LIMITED

1897

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PREFACE

THE greater part of the subject matter of this book appeared in a series of articles in the *Mechanical World*. The purpose in writing it is so fully explained in the Introduction that a Preface is hardly required. As the forms given to the various parts of a machine or engine are on analysis invariably found to be combinations of certain geometrical solids, a knowledge of how each of these should be drawn when in any position should be first acquired by the student draughtsman. To this end a series of problems is given in the following pages, commencing with the construction of those simple geometrical figures which form the surfaces of the solids which give shape to mechanical details, and subsequently the method adopted in representing the solids themselves, singly and in combination.

As no amount of *copying* "drawings" of mechanical details will ever give the student a knowledge of the reasons why they are made to take the special forms given to them, so in the earlier stages of the study of mechanical drawing it is impossible for him to acquire the power to draw the simplest solids in different positions correctly without a knowledge of the principles of "Orthographic Projection," which is the basis of the representation of all solid objects. In this part of the subject an extended series of problems is given, the solution of which should enable the student to draw any simple object without further help.

In the method of studying the contents of this work, the student is advised to take the different parts of the subject in the order in which they are arranged, as he will thereby be led to acquire a mastery of it in a way that will impress upon his mind the connection that each part bears to that which follows. The order of study may not be that usually followed, but it is such as an association of many years with draughtsmen and students has proved to the author to be the best for the acquisition of the preliminary knowledge necessary to the successful practice of the draughtsman's art.

This work is not intended as a treatise on either Plane or Solid Geometry, but as much of these subjects is given as will be required by the student to attain to an easy comprehension of the first principles of mechanical drawing as herein exemplified. Their actual application to the delineation of machine elements and engine details may possibly form the subject of a further work.

H. HOLT-BUTTERFILL.

Greenwich, 1897.

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