

# **A MANUAL OF DRAWING**

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A Manual of Drawing by C. E. Coolidge

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**C. E. COOLIDGE**

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OF DRAWING**



# A MANUAL OF DRAWING.

BY

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## PREFACE.

THE officers of instruction in the Department of Machine Design of Sibley College, Cornell University, in addition to a great many other kindred things, are charged with the responsibility of instructing the Sophomore, Junior, and Senior Classes in the art of commercial mechanical drawing.

We recognize the fact that the student is often unnecessarily perplexed, distressed, and even retarded in the advancement of his work because he has no single, definite, or comprehensive system which he can follow in his drawing.

Thus the object of this Manual is to put into permanent form a single and standard drafting-room system which will tend to alleviate unnecessary burdens thrust upon the student.

It is conceded beforehand that the student is not and should not be held in the same *status* as a full-fledged and experienced commercial draftsman. Therefore he should be informed of more than one route which will take him to the same destination.

That information can be imparted by informal talks given in the classroom or lecture-room. But a single and definite system could and should be followed, to facilitate advancement in too short a course in drawing; to give him, as far as possible, the atmosphere and sensation of the commercial drafting-room; and, if nothing else, to teach him one good system well.

The system that has been evolved, and embodied in this book, is intended to be the average of the Drafting-room Systems which are in use in the United States at the present day, and is fully substantiated by the solicited data and information that have been received from about one hundred and thirty of the largest concerns in the United States in various lines of manufacturing.

A cursory glance through the book will disclose blank pages alternating

with the printed ones in the front part of the book and with the illustrated ones in the back part.

The drafting-room system as elaborated in this book is, by virtue of its predesigned scope, by no means complete.

It thus devolves upon the instructor to give and the student to note on the blank pages what is left out in the text.

It was the primary object of the writer to elaborate, as described above, only on what is produced by means of drawing-instruments. He soon realized, however, the fact that that is only the end of things, and the beginning cannot be detached when it is probably the most important part of the technic of mechanical drawing. Therefore the writer has discussed in detail the salient points in the selection, treatment, and adaptation of the drawing instruments and materials that are used in a commercial drafting-room.

The pressing need of this imperfect little book to assist in advancing the interest of the student, was the sole incentive which caused the author to write it. He will be repaid if its mission is partly fulfilled.

He is under obligation to Professor John H. Barr, the head of the Machine Design Department, for reading the manuscript and for rendering substantial assistance which aided in the completion of the book.

He desires especially to thank Mr. Sanford A. Moss, who has collaborated with him in advancing a set of standard drafting-room conventions for the use of the Machine Design Department.

Thanks are also due to all others who have in any manner lent assistance or given encouragement.

C. E. COOLIDGE.

ITHACA, N. Y., September, 1902.

Manual of Drawing.



## PART I.

### MATERIALS AND INSTRUMENTS.

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THE materials used in drawing may be divided into two distinct parts. One part would represent the materials on which drawings are made and reproduced before any substances are applied to make that contrast which pronounces it a drawing for the manufacturer or builder in commercial mechanical lines, to produce, by means of it, that which has utility and a commercial value. The other part would represent such substances as are necessary to apply to the drawing materials, for the purpose just described.

The materials on which drawings are made and reproduced would include drawing-paper, bond-paper, tracing-paper and -cloth, print-paper, etc.

The substances applied for making drawings would include lead, ink, chemicals for prints, etc.

The instruments and other accessories which

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are used in applying the different substances to the surfaces of drawing materials must be selected for their adaptation to the execution of a commercial mechanical drawing.

Commercial mechanical drawing-instruments and other accessories would include the drawing-board, T-square, compass, dividers, etc.

#### **MATERIALS ON WHICH COMMERCIAL MECHANICAL DRAWINGS ARE MADE AND REPRODUCED.**

Commercial mechanical drawings are, at the present time, usually made first in pencil on inexpensive drawing-paper and then traced with ink on tracing-paper or -cloth; and, finally, printed on chemically prepared paper.

Occasionally drawings are penciled and inked on a good quality of white or brown paper, or bond-paper and prints are taken from the inked bond-paper drawing.

#### **Drawing Paper.**

The *ideal* drawing-paper should be of tough fiber, uniform thickness and surface, neither repel nor absorb ink before or after it is rubbed with an ink-eraser, and take the ink without wrinkling the surface.