

**APPLIED MECHANICAL DRAWING FOR  
FIRST AND SECOND YEAR CLASSES IN  
HIGH SCHOOLS: TECHNICAL, TRADE  
AND VOCATIONAL COURSES, AND  
EVENING SCHOOLS**

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Applied Mechanical Drawing for First and Second Year Classes in High Schools: Technical, Trade and Vocational Courses, and Evening Schools by Frank Elliott Mathewson & Judson L. Stewart

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**FRANK ELLIOTT MATHEWSON & JUDSON L. STEWART**

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## P R E F A C E

In planning this course in APPLIED MECHANICAL DRAWING for pupils in the first and second years of high school, the main purpose has been to establish, wherever possible, a close relation between mechanical drawing, mathematics and shopwork, omitting the usual abstract problems which have no direct application to either subject. Almost without exception, each problem demands some mathematical calculation before the pupil can proceed with the drawing.

Our experience leads us to believe that it is the better plan to present a minimum amount of explanatory text in connection with a completed drawing of a typical problem coming under each topic in the course. This enables the pupil to readily comprehend and easily understand the requirements of the ensuing problems which are given in text form. Wherever necessary these problems are accompanied by freehand perspective sketches suggesting the object which is to be represented by the mechanical drawing.

The problems in design for shop drawings of wood-turning and simple pieces of furniture offer an excellent opportunity to relate constructive design in the drawing room to the practical work of the shop courses. In this connection it has been found more practical and productive of better results to present a number of suggestive outlines which aid the pupil to design and draw the particular piece that he plans to construct in the shops.

Facility in design ought not to be considered the chief aim in working out these problems. The important thing lies in the development of fundamental ideas in regard to

the relation between work at the drawing board and work in the shop; the awakening of the sense of proportion; suggesting the fitness of form, size and materials to the requirements of the special problem under consideration. That this relation between drawing room and workshop may be firmly established and the work successfully accomplished, has been practically demonstrated during the past two years in the school with which the authors are connected. We have found that the satisfaction and pride that the pupil has in successfully designing and executing a piece of work that is largely of his own creation, stimulates him to better work all through his course in the school.

To adapt the course to classes in schools which do not offer manual training it is necessary only to leave out that part relating directly to woodworking drawing.

CLEVELAND, FEBRUARY, 1911.





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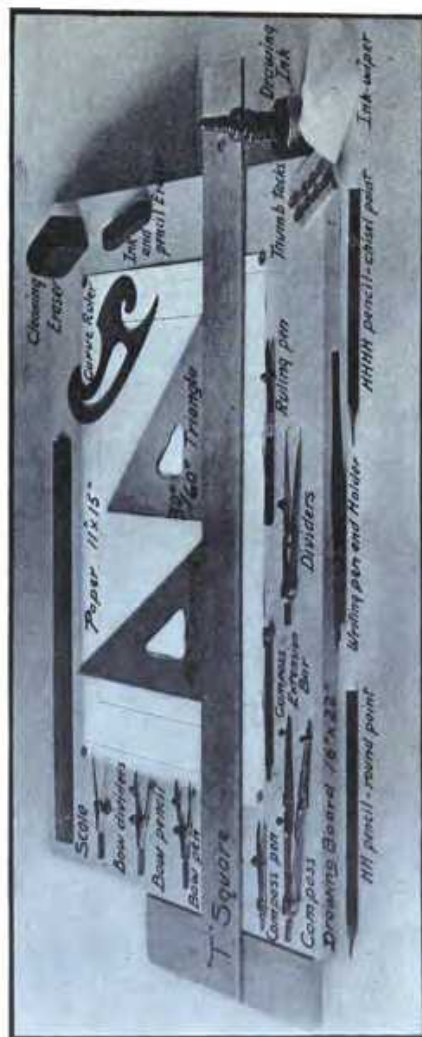


PLATE I. MECHANICAL DRAWING EQUIPMENT

—: A P P L I E D :—

# MECHANICAL DRAWING

BOOK ONE

## INTRODUCTION: THE DRAWING INSTRUMENTS

Mechanical Drawing is used by those familiar with its methods and conventions, as a means of expression through a medium of lines, drawn on paper or other suitable material, so arranged that they will convey a clear, definite conception of any mechanical and architectural construction already existing, or that also which only exists in the mind of the inventor, architect, engineer or designer. To such men, drawing, and especially mechanical drawing, is essential, for through its use they are thus enabled to make graphic representation of their inventive ideas, recording them in a way that makes them of permanent value. From the fact that it is necessary in drawings made for such purposes, to obtain a high degree of accuracy in representation, much, if not all, of this kind of drawing must be executed by the aid of instruments especially designed for the purpose; hence the term "*Mechanical Drawing*" is applied to such drawing. The instruments required, which are commonly used in Mechanical Drawing, are illustrated in Plate I and the following brief description explains their use in the order in which they are employed in making the drawing plates.

**The T Square.** The head of the T square should be held firmly against the left-hand edge of the drawing board and used by running it up or down along this edge. The upper edge of the blade is the working edge, either for drawing all horizontal lines or for the triangles to rest against. Never use the lower edge of the T square.