MECHANICAL DRAWING.

For Young Mechanics.

The present condition, and the future, of Engineering and Mechanical Construction, make it necessary that Mechanical Drawing should form a part of elementary education.

There are however, many young mechanics, who have been instructed only in the use and manipulation of the tools and machinery employed in their trade; to them, therefore, the elementary courses we purpose giving in the various branches of mechanical trades, we feel confident, will be particularly acceptable.

Commencing with copies of the simplest forms used in construction, we purpose arranging the lessons so that the finished machines may be arrived at by a gradual progression.

The subjects are selected so as to give the pupil ideas in form and application of machinery, as well as practice in drawing what is most useful. These will, in some measure, represent all branches of Construction where Mechanical Drawing is necessary, by subjects in Land and Marine Engineering, Building and Carpentry, Civil Engineering and Machine Making.

As almost all forms in machinery are geometrical, a series of simple problems in Constructive Geometry will be given in future numbers for the pupils' practice.

In workshop practice, drawings sometimes require to be formed full-size, on floors and places where ordinary drawing implements are inapplicable, and the methods taught by Constructive Geometry are necessary. The ordinary workman, too, in finding centre lines, marking off centres, and raising perpendicular lines, to guide him in constructing and erecting machinery of various descriptions, is regularly called upon to display a knowledge of Practical Geometry. In Mechanical Drawing, its various resources should always be at hand.

Workmen employed on the construction of machinery are guided, mostly, by drawings made to one-eighth of full size—scale, one inch and a half to the foot;—but, from want of training, many of them experience much difficulty in working to the drawings, and cause their foremen much extra labour in directing them.

These instructions and illustrations (from Vere Foster's Drawing Books) will, it is hoped, supply materials for such a knowledge of Mechanical Drawing, and the scales used therein, as will train the young, so that, on entering the large manufactories, working drawings shall be easily understood.

Our space will not admit of copying the drawings of the full size, which, however, is of no consequence to the student, in fact it is rather an advantage to him, as by enlarging the figures he is compelled to study with more care the proportions, curves, and method of construction.

The learner should carefully avoid proceeding with any drawing when he has committed an error, but at once, if possible, correct it or commence entirely anew.

Drawings of the more complicated machines should not be attempted until the detailed copies shall have been thoroughly mastered.

To acquire proficiency in finish, and quickness in forming drawings, it will be necessary to use good drawing instruments, and to acquire the habit of keeping them clean and in order. The drawing pens, when not in use, should always be kept clear of ink by means of a piece of cotton cloth or wash leather. Flat rulers and squares should be well tested, and their edges kept in good order; and compass legs and pencils should be kept well pointed.

In operating with compasses, hold them erect and press on them as lightly as possible, so as to avoid making holes in the paper.

The pencils should be flattened their whole length, parallel to the joint of the wood, which prevents them rolling, and gives a better grip in handling them to aid in forming the points. The points should be formed by cutting away the wood along the flat sides to a moderate distance from the point, and paring down the other two sides, taking care to leave the wood thick enough to support the lead against the side thrust produced when drawing.

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All centre lines should be first drawn in. They are imaginary lines drawn through the object required to be delineated, and form the axis of it and the parts belonging to it.

The centre line of a cylinder is also central to the piston, rod, gland, crosshead, &c.; that of a crank-shaft is also central to the pedestal, fly-wheel, &c.;—and these parts cannot be accurately drawn and adjusted to each other independent of their centre lines.

After drawing the centre lines, draw in the outlines of the *larger portions* of the machine, making all lines the greatest length they may be required.

The drawing should be completed in pencil before inking in any part. When ready for inking, commence with all the circles and curves first; and, when the drawing is complicated, ink in those parts which are foremost or nearest the eye first; and proceed with the remainder in rotation, taking care to finish one part before commencing the next.