

METALWORKING

A BOOK OF

Tools, Materials, and Processes
for the Handyman

Edited by

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*WITH 2,206 ILLUSTRATIONS
AND WORKING DRAWINGS*

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PREFACE.



THE scope of this book embraces practically the whole art of working metals with hand-tools and with such simple machine-tools as the small engineering shop usually contains. The tool outfit of the average metalworker does not generally include anything more ambitious than a lathe with or without slide-rest, overhead motion, etc., and it is with this limitation in mind that the whole of the contents of this book have been prepared. Even within such limits, the scope is extensive, and has been made to include a large and pleasing variety of work.

In attempting to present a graded course of instruction, difficulties have been encountered which were absent in the preparation of the companion volume—"The Handyman's Book of Tools, Materials, and Processes Employed in Woodworking." The practice of metalworking has been split up into so many branches, and these have been so sub-divided, that a number of distinct trades has been created; and the tools and processes of one trade often have but slight relation to those of another. In face of this fact, it has been found impossible to arrange the work in a series of exercises gradually and successively increasing in difficulty and in the skill necessary for their performance. The book chiefly conforms to another arrangement—that by which the tools and processes are described in their natural sequence; thus, after a brief introduction giving particulars of all the known metals, the book opens with a section on foundry work, the basis of all modern metalworking. This is followed by a section on the art of the blacksmith, and then come detail descriptions of the tools and processes by which the rough surfaces left by casting and forging are chipped, filed, scraped and polished. Succeeding sections deal with annealing, hardening and tempering, drilling and boring, followed by screw threading with taps, screwplates, and dies. Of the greatest importance is the section on soldering, brazing, and riveting, in which an attempt is made to impart a sound knowledge of the whole of the processes in general use. Three sections on the manufacture and ornamentation of sheet metal ware include instructions on pattern drawing, cutting out and shaping, seaming and jointing, wiring and beading, repoussé and oriental decoration, and it is believed that the section on repoussé work forms the most complete treatise on the subject yet published. The finishing, lacquering, and colouring of brass is a subject that follows in natural sequence.

The second part of the book introduces work of a different kind, and considerably more than a hundred pages is devoted to lathes and lathe-work; all the necessary appliances for and the general processes of chucking, hand turning, slide-rest turning, using revolving

cutters, spinning and knurling are described in plain language and fully illustrated. Engineers' tools for setting out, measuring and testing, are illustrated and described in the next section, and then comes the first of the more important examples—a serviceable 4½-in. centre lathe with slide-rest—in the construction of which much of the information given in previous chapters is applied. Later examples include a skeleton clock, small horizontal and vertical steam engines, boilers, a petrol motor, water motors, a dynamo and electric motor, a microscope and a telescope. These are all the subjects of clear working drawings and minute practical instruction. Among miscellaneous branches of metal-working dealt with at the end of the volume are gold and silver working, electro-plating, wire work, electric bell making, etc., etc.

Actual practice is recorded throughout this book, and the discussion of theory has been allowed only when it is an essential preliminary to understanding the principles underlying a method, a process, or the action of a tool. The examples of work have been adapted from existing articles, and the columns of "Work," one of the journals it is my fortune to edit, have been drawn on freely.

The illustrations have been prepared regardless of trouble and expense, with the full consciousness of their value in showing at a glance what pages of letterpress would fail to convey. Many of the engravings show metalworkers' tools and appliances, and in this connection special acknowledgment must be made to the following firms for their great help in kindly having lent electrotypes illustrating modern tools and appliances of approved design: Messrs. G. Birch & Co., Islington Tool Works, Salford, Manchester; Britannia Engineering Co., Ltd., Britannia Works, Colchester; Messrs. W. Canning & Co., Great Hampton Street, Birmingham; Messrs. Charles Churchill & Co., Ltd., 9, Leonard Street, Finsbury, London, E.C.; Messrs. Fletcher, Russell & Co., Ltd., Warrington; Messrs. J. E. Hartley and Son, 13, St. Paul's Square, Birmingham; Messrs. William Marples & Sons, Ltd., Hibernia Works, Sheffield; Messrs. Richard Melhuish & Sons, 84, Fetter Lane, London, E.C.; Mr. Henry Milnes, Ingleby Works, Bradford; Messrs. T. Morris & Co., 172, Hockley Hill, Birmingham; Messrs. Charles Nurse & Co., 182, Walworth Road, London, S.E.; and Messrs. Henri Picard & Frère, 26 & 27, Bartlett's Buildings, Holborn Circus, London, E.C.

The index, containing upwards of 4,500 entries, is a means of readily finding any item of information contained in the work.

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