

Works Management and Workshop Practice

By JOHN ASHFORD, M.I. MECH. E., IN THE ENGINEERING REVIEW.

It is becoming increasingly necessary, in the present days of slack trade and keen competition, that manufacturers should know exactly what it costs to make their goods; for, without such knowledge, the conducting of business becomes a matter of speculation instead of certainty.

It is an old saying that "fools manufacture while wise men buy and sell," the underlying argument of which is, no doubt, that when an article is bought to sell again its cost is definitely known, and the simple difference between the cost price and the amount obtained from the sale constitutes profit. When manufacturing, it is a case of buying material, labor, shop accommodation, use of machinery, and a number of other items, all of which need to be taken into account before the cost price is known.

In a factory where a large number of men are employed, it is far from a simple matter to obtain correct particulars of the labor charges, partly because of the ignorance of the men who have to account for their time, and partly through either wilful or careless misrepresentation. The collection of information as to the cost of production is usually placed in the hands of a clerk, who, with his assistants, constitute the cost department. The money spent upon this department being non-productive, it is looked upon as so much loss to be cut down as low as possible, and the importance of the work to be done is much underrated; consequently, to quote the words of Messrs. Sinclair and Frank Pearn, in their recently-published book,* "the work done in this department is usually of a confused and chaotic character, devoid of all finality or practical result."

The successful and accurate costing of work is by no means a simple matter, and it demands that it should be done by men with practical knowledge upon a method that has been carefully adapted to the needs of the factory. The book on workshop costs already referred to contains full particulars of the method or system that has been developed by its authors at the works of Messrs. Frank Pearn & Co., Ltd., pump manufacturers, Manchester, of which firm they are directors. The information contained in the book is of very great value, embodying, as it does, so much that has been developed by practical experience. The key-note that runs through the whole work is struck in the opening words, thus: "Systemization, always an important factor in the economical production of engineering work, has become, in the face of present-day competition, an absolute necessity." Would that more of our engineering firms realized that fact, and reduced the whole of their work, both in the shops and offices, to orderly and economical systemization.

Speaking of cost-keeping in the introduction of their book, Messrs. Pearn make several statements which are of interest; for instance, the following:

* "Workshop Costs for Engineers and Manufacturers." Manchester: The Technical Publishing Co., Limited.

"A correct and up-to-date record of moneys expended, of the return in material and labor for that expenditure, and of the margin of profit attained, is an important adjunct in the upholding of any business on a sound commercial basis." Many directors feel concerned as to upholding their business on a sound commercial basis, but do they realize what an important factor the cost-keeping department may be in effecting so desirable a result, and when the costing method is unsound do those directors realize what a damning effect it has upon the business? The reviewer knows of large factories where, until quite recently, there was no cost-keeping system at all, and where at present it is so faulty as to be actually misleading.

The opinion of Messrs. S. & F. Pearn on this matter is clearly shown in the following extract: "Should this record, either from the want of a cost-keeping system or from the employment of a faulty one, be inaccurate or incomplete, then, far from being of assistance and affording guidance, it is misleading and harmful." "It becomes imperative, therefore, that any manufacturer or engineer desirous of progressing or holding his own with his competitors, should employ some method of ascertaining the true cost, both in detail and in bulk, of all material and of the operations performed thereon. Such a method, to be of practical utility, must be thorough in its character, i.e., it must not confine its working to the offices alone, but must extend them into the workshop, so that the course of material in the shops may be accurately followed step by step by the cost-keeping department in a systematic and progressive manner."

The authors' opinion of many old methods of costing is clearly shown in the following:—"In many establishments the cost office is a time-honored institution, only existing by the apparent importance of its appalling number of books and sheets, and the overwhelming accumulation of figures these contain." "There may have been some system to begin with, but its effects being of an indifferent nature, those subordinates to whom its control has been relegated... have become in process of time mere automatons, going through a daily routine of entering and re-entering from sheet to book and book to sheet, without troubling themselves in the slightest degree as to the ultimate usefulness of their work."

The function of a cost department is usually considered to be to keep a record of money expended, and to account for it in some way. The record is generally compiled from information sent to the department from the works, and the accuracy of the record depends upon the correctness of this information, which they usually have no means of checking.

The cost system advocated in the book under review evidently aims at much more than mere recording, for it is shown to be an important factor in works management. Instead of recording what has taken place, it begins at

the beginning, and says what is to take place. Instead of being a mouldy, fussy department of books, it is a leading department in the works, closely in touch with or controlled by the works manager. The system embraces the ordering of work from the shops in detail, the planning of the procedure of the work through its various operations, the recording of the progress made by the work up to date for the information of the management, the location of disproportionate costs and losses, the safe-guarding against irregularities and hiding of faults, in addition to the recording of costs.

To facilitate the work of booking, stores keeping, etc., the parts to be manufactured are identified by a code of symbols, so that the name of a part may be frequently omitted, the symbol being used instead. The code used by Messrs. Frank Pearn & Co., Ltd., is explained, the general idea being that similar parts of different pumps, alike in general construction, are denoted by similar numbers, and the type of pump is indicated by a prefixed letter, thus: "A1 and Sheet 1 is a pump body, A8 the flywheel, A10 the cylinder-cover of a well pump; while B1, B8, B10 are similar parts of a Manchester pump, as on Sheet 3." Where there are several similar articles of different sizes, the size is indicated by a second number, thus: K1.4 is a circular blank flange pattern 4-in. outside diameter; K1.4½ is a circular blank flange pattern 4½-in. outside diameter—and so on throughout the series.

The symbols used to denote the parts are also used as pattern numbers; the pattern racks bear the marks, and in the stores they appear on the bins; thus the stock of patterns, castings and parts can be recorded and kept in order with the greatest accuracy and facility. As the patterns are clearly marked with these symbols, they appear also upon the castings, and become of valuable assistance to the workmen in both finding the right casting and in correctly booking their work. Extracting from the book: "It can be easily understood how simple, among other things, is the task of the person who has to check the deliveries of castings from the foundry, and for the workman to give particulars of his labor to the time clerk, while the universality of nomenclature which this method leads up to is of inestimable value."

Castings of a special nature are given the job number of the engine or machine of which they form parts. For this purpose a special holder is described to carry brass figures to form the number, which the moulder impresses in the mould that it may appear upon the casting. In addition to this, the progressive number of the engine or machine is boldly marked on all castings specially made for it with the aid of rubber figures and aniline ink. Forged work does not escape the system of marking, a special steel holder for the figures being used to keep the figures in line and enable the marker to impress them all at once.

Undoubtedly a system of marking all castings and forgings, such as described in the book, is of great value in identifying the work and progressing it through the shops. It helps, too, in gathering together the finished parts in stores ready for the assemblers.

In addition to explaining the method