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MACHINE ACCOUNTING

and Accounts Office Practice

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P. N. WALLIS

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PREFACE

SOME years ago a business magnate, for whom I had (and have) great respect, told me that his son was entering his business and asked me to elucidate, as concisely as may be, the difference between the methods used in the modern office and those described in the textbooks on accountancy I sat down to do so and produced a curiously grotesque jumble of undigested half-truths, far too disjointed to be of use to any student There the matter lay until the war came with its long and often empty hours of firewatching duty Then I took the notes from their pigeon-hole, pondered, re-wrote, and enlarged them, and, I hope, properly digested and organized them to make this book

Although the book is equally addressed to the business man, I have throughout kept the student in mind and have assumed that he will need the information for his answers to examination questions This is not to say that I am expecting machine accounting to be still another subject for a paper in an already overburdened list Far from it, it is not a subject in itself but a part of many subjects The students of the Accountancy, Banking, Insurance, Secretarial, and other professions should know something of the subject, and the only way in which this study can be enforced is by examination question I envisage questions in the papers on accounting, secretarial practice, and general business knowledge rather than a separate paper in itself

I hope the book will be of interest to the expert as well as the enquiring business man and earnest student, and for that reason I have included some quite complicated examples These examples, both simple and erudite, are intended to stimulate the readers' imagination rather than to regulate the precedents In practice it is always necessary to consider a host of outside factors, human and financial, which often turn the scale where there are several good ways of doing a job This is a practical subject and must be approached in a practical way

For similar reasons, it has not been possible to emphasize the question of economy The business man must weigh the costs of one method against those of another The machine involves capital outlay, which means interest on the money How then can we say whether the machine method is a paying proposition until we know whether the business man has the capital or on what terms he can obtain it? We can only judge, from practical experience, that usually and in normal circumstances, such and such a method is best and cheapest

Fortunately economy is not the only factor to be considered Accountancy is one of the ways by which people are persuaded to work together. It may be less inspiring than personal leadership, less driving than firm discipline, less human than industrial welfare, but it is a cog in the same wheel It enables people to trust one another

Now for this purpose the figures must be both accurate and promptly obtained. In Britain, the professional accountant has always loved accuracy, has been ridiculed for it and has withstood the ridicule until it has become a legend Promptness, on the other hand, has been less obvious, in fact "slow but sure" would better describe the position That is one reason for the difference of outlook as between the industrial accountant and his professional colleague It is also the great justification for mechanical methods

P N W

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CHAPTER I

INTRODUCTION

OBJECTS of accounting—Fundamentals of double entry—Book-keeping conventions—Sectional balancing—Effect of the machine on office work—Contact with other offices—Audit—The machine as part of the system—General effect of machine accounting—Description of the machines

WHILE the first accounting machines were invented in the seventeenth century, there was little or no development in their use until the twentieth century The possibilities inherent in the machines lay dormant for so long, yet, when once their value had become recognized, they rapidly found a place in practically every major office in the civilized world

The cause of this rapid and recent development lies, of course, partly in the machines Far more, however, is it to be found in the growth of the office itself, and in the attitude of the commercial world to figures and to office work in general It is only in comparatively recent years that the vast increase in the size and complexity of business organization, with alongside it, partly cause and partly effect, the wide development of the accountancy profession, has brought out the value of accurate, prompt, and detailed financial data as a medium of business control Thus it is only comparatively recently that the office organization in which machine accounting has a place has been evolved

In the modern office, accounts no longer represent a mere historical record of past transactions, to be summarized once a year into a balance sheet, but instead must represent an up-to-date, accurate, living picture of the business of the concern Not only must the accounts be so arranged as to give the maximum of useful figures for the guidance of the management in its future policy, but those figures must be available immediately they are required, be it monthly, weekly, or even daily

It is the purpose of mechanical accountancy to make the production of such figures a practical proposition The economy in office time and expenditure through the more rapid execution of the accountancy already existing is in many cases incidental

The primary and vital function of accounting machinery is to enable to be laid before the management data which could be obtained in no other way.

The Objects of Accounting

Different records have different purposes, and the way in which a record is to be made must depend very much upon the purpose for which it is intended It is therefore advisable to summarize these as follows—

(1) To record every financial transaction in such a way that

reference can be made at any time, somewhat in the nature of an office memory

(2) To find what is owing to suppliers and from customers and to see that these amounts are duly paid and received

(3) To verify the honesty of those who control cash, stock, and other valuables.

(4) To provide statistics from which the executives can guide and control their subordinates

(5) To show what profit has been made and to produce a balance sheet of the concern

(6) To enable the auditors to satisfy themselves that the balance sheet is correct

Whether or not the various records are prepared mechanically, the permanency of the work to be done will have a bearing on the system used. Those classes of work which are intended for immediate use (rather than subsequent reference) allow of a more flexible system which is adapted to the requirements of the one particular concern. Permanent records conform more to the orthodox methods, as it is necessary to use a system which will be understood, without special study, by anyone who refers to it (in particular the auditor) Cash records seldom depart from the orthodox form

Fundamentals of Double Entry

The object of this book will be to show the synthesis of modern ideas (based upon mechanical book-keeping and the use of the adding machine) with the theory of accountancy set out in the textbooks. First the basis of book-keeping must be explained

If book-keeping is to be understood by others besides those who make the entries, there must be an agreed procedure and thus the double-entry system has been evolved It has become customary to look upon double entry as merely a conventional method of recording business figures in an understandable form and to forget that there is a logical basis to the system The fact is that every business transaction really has two sides to it and these are recorded by the book-keeping. Thus if Jones pays Smith £10, then Jones has £10 less and Smith has £10 more. If he sells goods value £20 to Smith, Jones is owed £20 and Smith owes £20, and so on.

Most transactions are between the business whose books are being kept and outsiders. The accounts showing the position of the other parties are known as personal accounts. The transactions relating to the business itself are divided into several accounts, so as to bring similar items together for convenience, some of these accounts will show the property of the business (stock, for instance) and are known as "real" accounts, others will show what the business has gained or expended, and are known as "nominal" accounts. Naturally, as the

same transactions are recorded from the two aspects, if the books are correctly entered each entry will have an equal and opposite entry, and the books will be in balance

The above very short outline gives the fundamental basis of double entry, but because business is complicated and varied, the methods necessary to carry out the book-keeping cannot be simple. It is not the fundamental basis which will be discussed in later chapters, but the method of applying it to varying circumstances

Book-keeping Conventions

In addition to its fundamental basis, orthodox double-entry book-keeping also provides a routine for recording all the detail transactions of any type of concern Every item has first to be shown in a "Book of Prime Entry," from which the ledgers are posted, it is then possible to see with the minimum of effort that every debit has its credit The type and form of the various books of prime entry are prescribed by custom in detail sales and purchase day books, cash book, journals. Definite rules govern each entry and these can be followed automatically without independent thought There are great advantages in this regularization of routine The proprietor can leave the book-keeping to a clerk without himself having to study and control it A book-keeper learned in double entry can install and operate the system with very little study of the particular business to which it is to apply. An auditor or investigator can understand the entries with a minimum of effort or inquiry Above all, a balance sheet showing the position of the concern can be produced with speed and accuracy and in a commonly understood form.

Nowadays, however, the increasing size and complexity of business make it necessary to obtain more and more accounting and statistical data as a guide to management, and this must be produced swiftly and economically It is often found that a modification of the book-keeping system enables these objects to be attained more simply

It is advisable to weigh the general advantages of retaining the standard system against the particular advantages of the proposed modification and it is at once obvious that only where the volume of work is considerable can the saving be such as to justify what may be called short-cut methods This applies not only to machine methods (where the outlay on the machine has to be covered by the saving), but perhaps even more to hand methods where there is no initial outlay to act as a check upon experiment and where the immediate saving might be more apparent than the permanent disadvantages. Taking a hypothetical example, where a clerk works for two or three hours a week upon a particular book or record, the saving may perhaps be one hour of his time each week, with the possibility of lost time by his principal and by the auditor to whom the method may have to be explained anew each year. Whereas, if five or six clerks were engaged

for their full time on a record, then the saving might clearly be material and would justify much thought and perhaps difficulties in other directions.

Each case must be considered on its own merits and at the same time it must be recognized that standard book-keeping is not a static thing. Because it is an art (and not a science) practice continually leads theory, in the last analysis, book-keeping can only be defined as the practice of the best book-keepers

Sectional Balancing

Balancing of the books is an integral part of book-keeping (In some small concerns it is left to the auditors at the year end.) The business man is inclined to look upon balancing as an accountant's fetish, but this is a hasty judgment, as those used to dealing with accounts appreciate that this is by far the quickest way of locating errors and of avoiding the great waste of time which can result from muddled figures It also has the considerable advantage that it enables those taking responsibility to rely upon the work done by those under them.

A large office falls naturally into sections and it is convenient to balance the books in the same sections A merchant house may treat its sales ledgers as a section The cash book and day books will be so designed as to enable the total of the items posted to the sales ledgers to be found and these totals will be posted to a "Sales Ledger Control" or as it is sometimes called "Total Debtors" account

At the end of a month, or other suitable period, the balances on the various accounts in the sales ledgers will be listed and should total to the balance shown on the total account When at a later date a trial balance of the books as a whole is prepared, the detail sales ledger balances can be ignored and the total account balance included instead. Other total accounts can be kept for the bought ledger and such other sections as are applicable to the particular concerns

A further advantage of this sectionalization is that it makes it easier for those clerks who have to operate each section to do so without a detailed knowledge of the methods used by other sections. Thus quite different systems may be employed by different sections without causing confusion.

Sometimes there are sections (particularly in connexion with costing) which do not conveniently balance with any account in the ledger. Nevertheless it is strongly advised that a total account be kept. This will be considered further in the chapter on costing.

As an example, a very usual arrangement for a commercial concern would be a sales ledger section, a purchase ledger section, and a general book-keeping section. The sales ledgers might be mechanically posted and might be divided into alphabetical sections. In that case each ledger would be balanced on machine accountancy principles (as

explained in a later chapter) and the totals would be agreed with a total debtors account probably kept in the impersonal ledger. The purchase ledgers might also be machine posted, or might perhaps be kept in summary forms, or if small might be hand posted. In any case the totals would be balanced with a total creditors account, probably also kept in the impersonal ledger The general book-keeping section would include all the other entries of the concern, such as cash, expense payments, bills of exchange, and impersonal ledger These would be kept by hand in the normal double-entry method, and to obtain a balance the total debtors and total creditors accounts would be included.

Sections of the work which involve only occasional entries (bills of exchange might be such a case in the above example) should be kept on strictly orthodox lines, as otherwise the method of dealing with them would vary from time to time because of changes of staff, and as more time can be lost in explaining the special method to the auditors and others than is saved by simplified entering

In addition there would be records of stores and of costs which would necessarily depend upon the technical peculiarities of the business.

Effect of the Machine on Office Work

The machine has given a certain flexibility to office systems, because figures do not now have to be entered one under the other to be added, and because new ways of handling the papers have been found Examples are given in later chapters Great speed has been attained in making entries, in typing documents, in making calculations. This has thrown into relief that other part of office work which can be summarized in the word "co-ordination"—bringing the records of one office into line with those of another, correspondence, customers, and other queries. The essential part of this work is that each item is different from all others, it is not repetition work, it cannot be mechanized. As the repetition work is mechanized, so this co-ordination takes a greater proportion of the office time For example, a particular office had some fifty clerks, all engaged on book-keeping repetition work and all doing a small proportion of what we are calling co-ordinating work This office was mechanized over a period (extra work taken on) and the number of clerks reduced to thirty, but of them only half were entering the various ledgers (including the juniors collecting the papers for the ledger posting machine) The other fifteen clerks were engaged on such work as writing for overdue accounts, finding the answers to queries, and writing letters—not necessarily difficult work, but of a non-repetition nature The reduction of the time spent on entering and the like had increased the proportion of such other work

When mechanizing a system, it is easy to underestimate the amount

of this non-repetition work and it may be useful to summarize the more usual items—

(*a*) In connexion with customers' accounts—agreeing customers' payments with the ledger, writing for overdue items, answering customers' queries.

(*b*) In connexion with suppliers' accounts—checking statements with ledger and deciding how much is to be paid, signing cheques, scrutinizing invoices, tracing missing invoices.

(*c*) In connexion with wages and petty cash—making payments, checking cashiers' work and the cash.

Contact with Other Offices

Much of the office work involves contact with other offices and it is important to arrange the forms and systems so as to be convenient to these outside offices. This is not only a matter of common politeness, it is also a matter of common sense. Every query makes work for both parties, and smooth running is to the benefit of all.

The statement sent to the customer is an example. It is sent for the customer's use, to check his books and to encourage him to pay his account. The customer's clerk quite naturally will deal first with those statements which are clear and convenient Those which are confused or erroneous will be put at the bottom of the pile. When designing a statement form, or adopting a system which involves a particular design of form, the importance of the customer's convenience must be remembered. Similarly, in considering other forms, the outsider, the man not present to give his own views, must be considered. This particularly applies to the large office, where the temptation to use some internally economical, but externally inconvenient system, is at its greatest. Examples of good and bad forms are given later.

Audit

A chapter is devoted to the effect of machine methods on the audit, but it is necessary to emphasize some points at the outset.

The auditor has found the system of double entry of assistance in two ways. Firstly, it is a standard system which he can understand without special inquiry, and secondly any departure from it is at once brought to his notice. Fraud is more difficult than if the book-keeper could choose any way he should please in which to make his entries. For this reason care should be taken to depart as little as possible from the fundamentals of book-keeping principles when introducing a mechanized system. Further if, as is usual, the form and routine have to differ much in detail from the old book-keeping, then a new routine should be laid down and rigidly adopted. It must in no way be haphazard.

Often there are several ways of doing a particular job, with none

having much advantage over another. In such cases, one way has been adopted by a majority of concerns, has become standard practice. A new orthodoxy is being built up, to apply to machine accounting. See, for example, the form of ledger and statement illustrated in a later chapter.

The Machine as Part of the System

A source of weakness sometimes found in large offices arises from a tendency to treat the machine as an object in itself, rather than as a part of an organization The representatives of the office machine companies are usually genuinely interested in providing the best systems possible, but it is natural that they should have an unconscious bias in favour of the machine, and the accountant or office manager must guard against this if he is to produce a well-balanced office. This book is, therefore, designed from the point of view of the work to be done, bringing together the various methods available, both mechanized and otherwise, and introducing a description of the various machines in connexion with the class of work for which they are designed

General Effect of Machine Accounting

As later chapters are mainly concerned with detail, it is advisable to summarize here some of the changes in the office routine which machines have brought about These can be considered from four angles—

(*a*) The arrangement of the personnel in groups and sections The machines have had two effects here, the division between one group and another has become clearer (e g. calculating section, typists' section, ledger posting section), and the proportion of the non-repetition work has become greater

(*b*) The documents by means of which information is carried from one person to another (inside or outside the office) The use of machines has tended to emphasize the importance of these The forms have become clearer, less verbose, more convenient to handle This is a tendency which will continue, particularly with regard to those forms which pass from one concern to another

(*c*) The books and other permanent records Many redundant records have been eliminated and those which remain are produced much more rapidly On the other hand, certain types of record have been changed very little, particularly those recording receipts and payments.

(*d*) The scope of the office has been extended, as many records which it was impossible to prepare sufficiently early and which were too expensive to keep by old methods are prepared promptly and economically with machines.

Description of the Machines

Many machines are described later, but it must be clear that only the most salient points are given. It is reported that a certain man undertook to teach another to ride a bicycle by correspondence. It was only after the fifth lesson that he discovered his pupil had a wooden leg. Similarly, with accounting machines, a personal explanation is necessary, and the reader is encouraged to take every opportunity to see the machines in his own office, or those of his friends and connexions, or at the exhibitions staged from time to time. Especially does this apply to the student, who must understand that this is a practical subject, of which book learning is only one part.

CHAPTER II

THE HANDLING OF PAPERS

FILING—Office rhythm—Simplicity—Flow of the documents—Design of the stationery—Carbon copies—Paper-holding devices—Duplicate posting—Visible cards—Continuous stationery—Continuous stationery for handwritten records—Card ledgers for machine posting

IN any office there is a vast amount of paper always in use A little investigation would show that more time is spent in sorting and finding documents, in turning over pages and, generally, in handling papers, than in making records This is equally so when mechanical means of entry (typewriters, adding machines, book-keeping machines) are used When these machines are considered in the next chapter, it will be found that much of their efficiency depends upon ideas and small attachments which simplify this handling of papers Similarly, much can be done by the design of forms and use of labour-saving methods to find the routine most suitable to the special circumstances of each particular concern These forms and methods will be considered in this chapter, after some preliminary matters have had attention

Filing

It is usual to treat filing as a thing apart from book-keeping because it is often done in a separate part of the building This is a misleading attitude In fact, both book-keeping and filing are part of the record system and each depends upon the other

The entries in the books are very bare statements of certain aspects of a transaction. The trend of modern practice is to make these entries more and more simplified, so that if further information is needed reference must be made to the original document Such modern systems are therefore sound only if the filing is very good indeed

The system of filing will differ with the circumstances of the concern, but even more important than a sound system is the way it is carried out Good light and adequate space and equipment are essential Given those, it matters less whether the filing is alphabetical or numerical or under one of the mixed systems sometimes advocated A bad system carefully carried out is infinitely better than a good system mismanaged. Filing is an uninspiring and monotonous job, but if well done can be a source of great pride as well as usefulness If the author were asked for an opinion as to the efficiency of some particular office, he would pay first attention to the filing department.

Office Rhythm

It is advisable to stress the fact that other factors besides the accounting systems enter into the efficiency of an office. First there is the obvious question of adequate and competent staff. There is also

the less obvious matter of the regular flow of documents throughout the office.

This is perhaps the most common source of inefficiency in offices. Purchase invoices are held by executives who are "too busy"; information from which sales invoices can be made out is held up, perhaps because the price clerk is waiting to see the purchase invoice, filing is unsatisfactory because papers are not passed regularly to the filing department, clerks tend to keep papers out of the files because there is no certainty of finding them again in an unsatisfactory filing system. Customers complain because statements are sent late and suppliers because accounts are unpaid Everyone is eternally busy sorting out muddled figures, looking for missing documents, doing work twice because the first results have been mislaid

Such a position can only be corrected by patience and persistence. But corrected it must be before any system, no matter how theoretically sound, can be expected to work.

Simplicity

Everyone agrees that the simplest satisfactory system is the best. In practice, this is seldom applied Various departmental heads each wish to have their say, there are changes in office managers, each with his own ideas, with the result that a system becomes a patchwork. The whole should be reviewed from time to time and over-elaboration eliminated.

In particular, the stationery should be kept simple both in design and in the number of copies Printed books should be kept to a reasonable size (say foolscap, 13 in $\times$ 8 in), otherwise they are clumsy to use and difficult to store Large books are often designed for analysis, which is, with some exceptions, better done in other ways (see the chapter on that subject), or to contain reference matter which is available from the general files (if well kept)

It is advisable to limit the number of different forms as far as possible This is a matter of common sense and again simplicity is the key-note. Sometimes it is better to have separate forms for different departments. In other cases it is found more convenient to make the one type of form applicable to both. There is a saving in printing costs in keeping forms to as few types as possible and there is also an advantage to the clerk—the fewer types he handles the more thoroughly he understands them. This will be particularly noticeable by those who have had experience of billing to several Government departments. Each department has its own form which is perfectly clear to those in the department but which is confusing to an outsider who has to deal with many different forms corresponding to different Government departments. In just the same way, a large concern can easily confuse its own clerks by using too many different forms.

The orthodox form of ledger or other book should be used unless

there is some real reason for a change Where a special ruling is designed it should be made self-explanatory, so far as possible, by a suitable printed heading. It is sometimes convenient to insert at the front of a book a short note showing how it is used For example, a concern that used a summary day book had a note typed and inserted in the front of the book as follows—

"On receipt of the invoice copies from the branches, they will be examined to see that the serial numbers are complete. They will then be arranged in batches of fifty and each batch listed on a Burroughs machine The totals (and serial numbers) of each batch will be entered in this summary day book The invoices will then be sorted for analysis and for ledger posting. At the end of the month the total of this book will be agreed with the sales analysis total and also with the sales in the impersonal ledger."

Points in connexion with the rulings to be used for special purposes will arise in later chapters as each class of work is discussed

The Flow of the Documents

It is important that each document should proceed regularly from person to person, that at each step the work to be done should be clear, and that there should be no unnecessary steps To reduce the chances of delay, it is better that one person should do two or more operations on a document, rather than that it should be passed through several hands Transmission through the post should be avoided whenever possible and clerks dealing with the same matter should be placed as near together as practicable Obviously such general rules cannot be rigid as their application must depend upon the staff available and the circumstances of the particular concern The movements of each type of document should be considered in detail and the author recommends "flow" diagrams, as illustrated for a purchase invoice (Fig II—1)

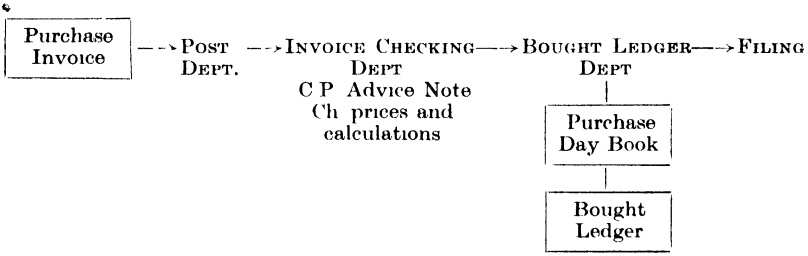


Fig II—1

It is convenient to have a file containing specimens of the forms used, each with its flow diagram, spare sheets being inserted for those forms which originate outside the organization. Related forms can be cross referenced.

It is sometimes advisable to consider where the work is to be done, for example, at head office or the branch. It is often best to do the work where the results are wanted. An example known to the author arose in connexion with the sales analysis. In that case the sales office was in a different part of the country from the accounts department. The analysis was made in the accounts, where the results were recorded on sheets to be copied, on arrival in sales office, on to record cards. It was found that a copy of each invoice was already being sent to sales office and, by the transfer of a clerk and an adding machine, the analysis could be made in the sales office, entered direct on to the customers' cards and the work of copying eliminated

On the other hand, it is sometimes best to do the work where the information is available Branches frequently make returns to head office, which returns can be designed to eliminate recopying as far as possible (subject to suitable staff being available in the branch)

Design of the Stationery

This section refers particularly to those papers which pass from hand to hand, such as invoices, statements, stores issue notes, and the like

Each document should be self-explanatory, which is not the same thing as saying that it should be overloaded with small type Subsidiary matters should be eliminated (or relegated to the back). Where it is to go and what is to be entered on it should be perfectly clear. Sometimes copies are vague, for example the top (original) copy of an invoice must be printed in full so that the customer will understand it, but the duplicate is sometimes left more or less blank, reliance being placed on the clerk who handles the invoices day after day and will be familiar with them. This is a false economy as it can so easily lead to confusion The name and address of the supplier need not be on the office copy of his invoice, but the essential directions and headings certainly should See the form illustrated in the chapter on invoicing.

By the intelligent use of print, much can be done to make the important figures stand out In particular, the total of the invoice (or other document) should be distinct, as it is this total which will be entered from the invoices into the books

The design should help the sorting of the papers. An example of this is found in the usual cheque forms, the bank branch number is printed on the cheque and always in the same corner, so that the cheques can be rapidly sorted by the bank head office when presented through the clearing house It is better not to make different forms too much alike, e.g. a sales invoice should be immediately distinguishable from an advice note or a stores issue note, without close scrutiny of the wording This can be done by using a different colour, size, or layout of the printing. Sometimes different branches or departments are distinguished by a different colour, e.g. Manchester branch documents might all be yellow, and those for Glasgow branch might all be green.

These distinctions must not be carried to extremes. Here, as always, simplicity has its advantages. The size of the forms should be reasonable, not so large as to be cumbersome nor so small as to be easily mislaid. Anything less than, say, three inches square is difficult to handle or to file safely.

Unless there is some clear advantage to be gained, it is advisable to avoid coding or any form of reference to footnotes It is sometimes necessary to abbreviate to save space on the form and in such cases the abbreviation should be made self-explanatory, e.g "Gds" for goods or "rt" for returns. A much less satisfactory way is to have a code. 1 = goods, 2 = returns, 3 = cash, and so on. This code can be explained in a footnote and may be quite clear to its originators, but will be confusing to the person who receives it and who will be receiving documents from many different sources and therefore of different designs. This point will receive further consideration when the design of particular documents (e g invoices and statements) is discussed

Carbon Copies

Carbon paper is much in use for obtaining copies without re-writing Besides correspondence, it can be used for accounting documents. It very often happens that two or more clerks need to use the one document and delay can be avoided by making extra carbon copies As an example, in a particular merchant concern, the invoices are made out at the branches and are sent to the head office for entry. It is found to be worth while to make five copies of the invoices, in addition to the original, which is sent to the customer. One of these copies is held by the branch, and one sent to the central stores so that the branch stock can be replenished The remaining three are sent to the accounts department, where one is used to post the sales ledgers, one as an analysis medium, and one for the cost records. It would be possible to eliminate one or more of these copies by arranging for a copy to pass from one department to another, but the company finds that the comparatively small extra cost of stationery is more than counterbalanced by the elimination of confusion and delay.

It is not necessary that all the copies be printed or shaped alike. Thus many concerns type the invoice and the advice note at the same time. The typing of forms of different shape or size at one operation makes it more difficult to aline them and it is useful to have such forms attached at the top by a stub It is sometimes convenient to have the papers carbon backed, in whole or parts, which saves the handling of carbons, but this should not be done if they are to have much handling, nor if the sheets might be a nuisance to a customer or other outsider.

On the other hand there are certain arguments against the multiplication of copies, mainly because each copy has to be handled and filed. In some cases a copy may serve a purely temporary purpose and be destroyed immediately it has been recorded.

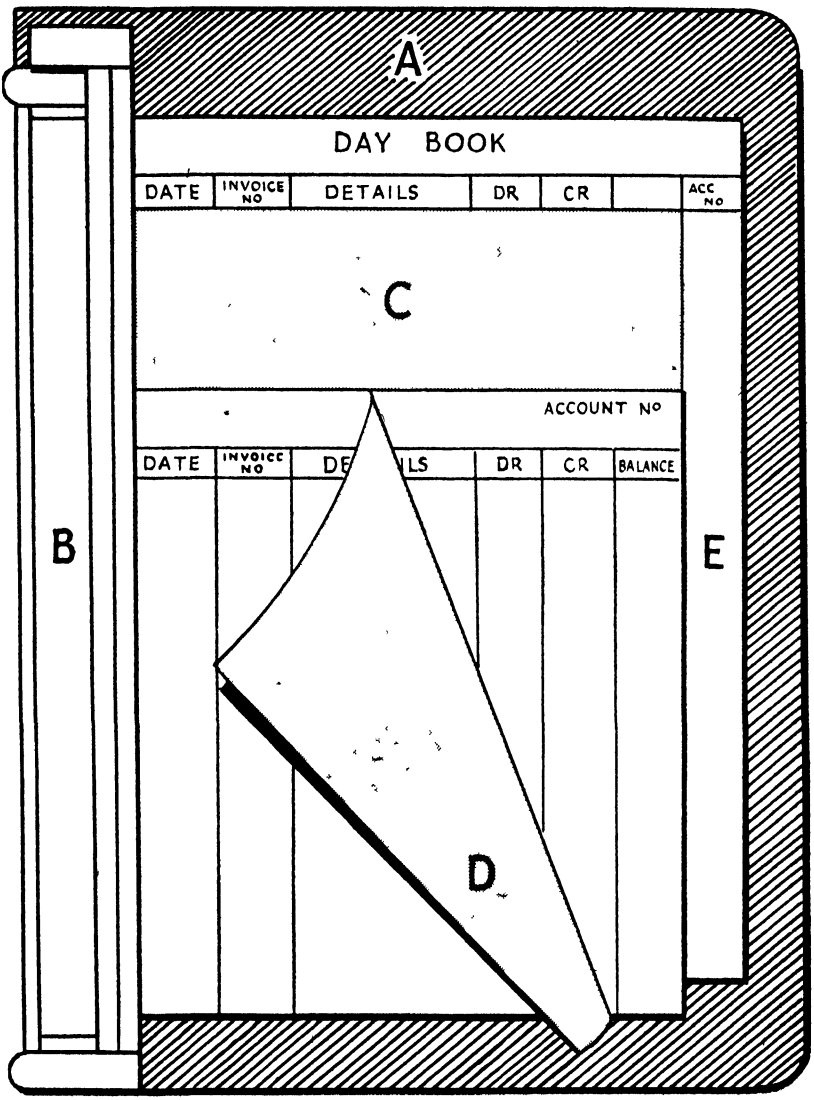

A
DAY BOOK
DATE
INVOICE NO
DETAILS
DR
CR
ACC NO
C
ACCOUNT No
DATE
INVOICE NO
DR
CR
BALANCE
B
D
E

Fig. II—2

Paper-holding Devices

Book-keeping machines will be found to owe much of their efficiency to devices for holding the paper and automatically bringing it into position. There are many other devices for the same purpose, some of which are illustrated here.

Duplicate Posting

A development of the use of carbon paper gives a system whereby the original entry is actually "posted" by this means. It is necessary to have an inexpensive holder to ensure that the carbon "posting" appears on the right line, otherwise the accounts are untidy and confusing (See Fig. II—2)

In essence this consists of a board (A) on which to write, and clamp bars (B) at the left side to hold the papers The day book sheet (E) is placed under the clamp bar, covered by a carbon sheet (C). Each ledger sheet (D) in turn is placed under the upper clamp bar and alined so that the writing comes in the correct position on both sheets.

Orthodox double entry requires two entries (day book and ledger), both made from the same basic document If the books balance it is reasonable to presume that both entries are correct In the duplicate posting method there is one entry only To ensure accuracy it is advisable to list the invoice separately on an adding machine, agreeing the machine list with the day book total

Visible Cards

This is a method of holding record cards so that a portion of the card is visible. The name or short description is written on this visible portion so that any required card can be readily found, without any index.

The cards are held in flat pockets arranged in trays in such a way that about half an inch of each card is exposed below the next pocket This visible portion is covered by a strip of celluloid to keep the card clean. (See Fig II—3)

The advantage of these cards lies in speed of reference and operation Several cards can be placed in the one pocket, so that related records can be kept together Some examples of the use of visible cards are given in later chapters

Continuous Stationery

In the operation of typing, a considerable proportion of the time is occupied by the insertion and alinement of the stationery, particularly where several copies are needed Various types of holders and special stationery have been designed with the object of reducing this handling-time.

In all types the forms are in continuous packs and, as the operator

removes one set of forms from the machine, the next is automatically drawn into position The carbon paper is also handled mechanically.

The illustration shows a typewriter with Parabar attachment (Fig. II—4.)

Continuous Stationery for Handwritten Records

It is often convenient to have a mechanical holder for hand-

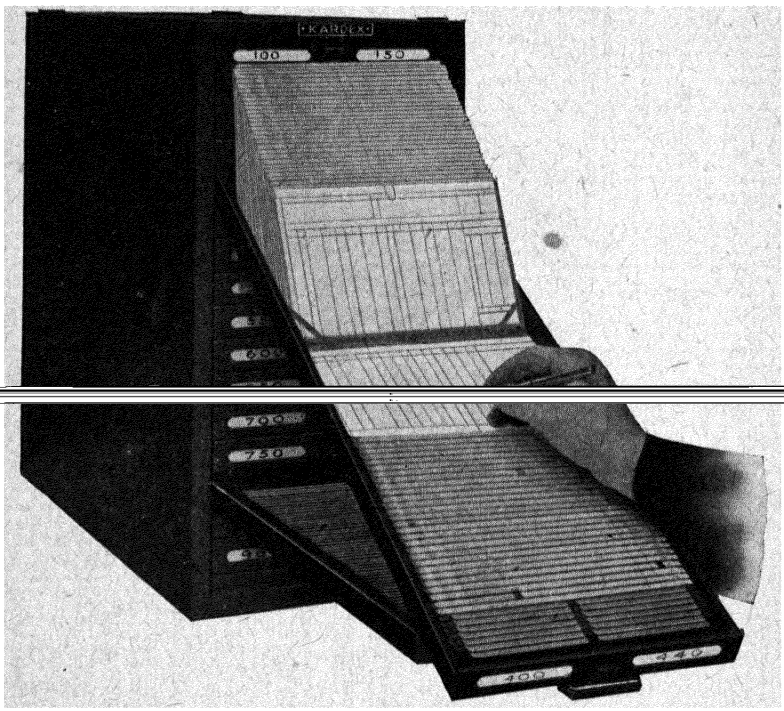


Fig II—3

written forms, such as the Paragon Security Register illustrated on page 17.

The forms are made in a pack, which is placed inside the register When the lever is pulled forward, one set of forms is ejected and the next set is moved into the writing position An audit copy is retained under lock and key in the machine.

Card Ledgers for Machine Posting

The cards have to be inserted in the machine and must therefore be loose. At the same time, no card must be mislaid, even temporarily, or the operator may waste time and temper looking for an artificial



FIG. II—4



FIG. II—5

difference in her balance. There are many kinds of equipment available, of which the most common types are—

(*a*) Loose sheets held in a convenient tray on a trolley, which can be wheeled to the machine for posting and into the strong room overnight.

(*b*) Sheets in a quick-release binder, combined with a posting tray. When in the binder the sheets are convenient for reference; when released on the posting tray they are convenient for machine posting.

(*c*) Trays with a pocket for each sheet This shows the operator when a sheet is missing, as there will then be an empty pocket. It takes more space than the above methods.

(*d*) The "vertical visible" system, in which the pockets are so arranged that a strip of each is shown, on the same principle as the Kardex.

CHAPTER III

ADDING AND BOOK-KEEPING MACHINES

BURROUGHS machines—Carriage—Book-keeping machines—Sundstrand machines—National machines—The 2000 class—Remington machines—Describing systems which use adding boxes—Elliott Fisher writing machines—Elliott Fisher accounting machines—Detailed examination of machines

THIS chapter deals with the machines, leaving systems involving the use of the machines to later chapters

It is not easy to divide these machines into types because, having been developed with the same ends in view, they have tended to have similar features. For purpose of comparison we may class them according to their development—

(*a*) Those which began as adding machines and developed book-keeping features,

(*b*) Those which have developed from the cash register,

(*c*) Those developed from the typewriter by the incorporation of adding mechanism.

Examples of each type are given. Some machines with adding features are described in later chapters—those which add and make calculations but do not print are in the chapter on calculations, punched card machines occupy all Chapter XVI, as they raise special problems, cash registers, although these are really adding machines adapted to a special function, are in the chapter on the cashier's department

This chapter is not intended to be a comprehensive catalogue, typical machines being used to illustrate the whole.

Burroughs Machines

The Desk Adding Machine is the simplest machine of the Burroughs range. The operator depresses the keys corresponding to the amount and pulls the operating handle. The machine prints the amount on the roll and retains the figures in its adding register. The operator repeats this for each item and, when all the items have been printed, depresses the key marked T and pulls the operating handle, when the machine prints the total.

The strip is then torn off the machine and appears as shown on the right.

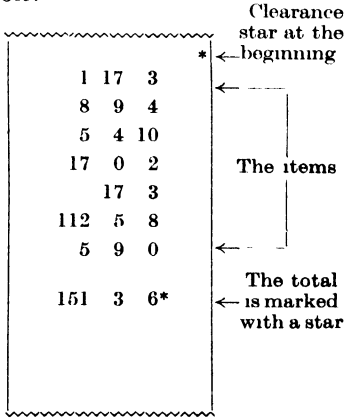


FIG. III—1

Machines can also be obtained—

(*a*) With subtraction mechanism (items are marked with a minus sign on the list),

(*b*) With varying number of columns according to the size of figures to be handled,

(*c*) With two adding registers in place of one,

(*d*) Electrically operated. There is then a motor bar in place of the operating lever.

The illustration (Fig III—2) shows an electric model with subtraction mechanism. On the extreme right are the two motor bars, marked

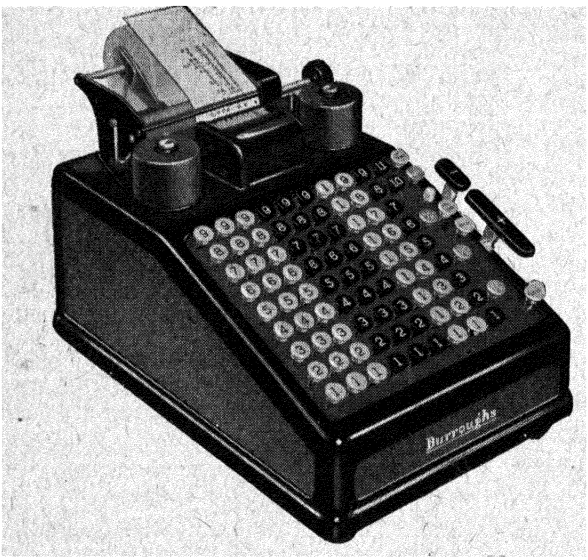


FIG III—2 BURROUGHS DESK ADDING MACHINE

plus (+) and minus (—). The paper, on which the figures are printed, is shown at the top The numerical keys can be seen, each marked with the number which it represents There is an individual key for each digit in the amount which is to be added, and these keys are arranged in columns. On the right are the farthings, then the pence, shillings, and pounds The capacity of the machine (i.e. size of amounts which it can add) will vary with the model That illustrated has a capacity of £999,999 19s. 11¾d.

To print £5 17s. 4d., the operator depresses keys numbered 5 in pounds column, 1 and 7 in the shillings column, and 4 in the pence column, then touches the motor bar marked +. To add £3 4s. 2d. to this, he depresses 3 in the pounds column, 4 in the shillings, and 2 in the pence and again touches the motor bar marked +. He continues this process until all the items are entered, then depresses the key marked T. when the machine prints the total

The keys which have been depressed remain down until the motor bar is touched. If a wrong key has been used, it can be corrected merely by depressing the correct one. Or the whole amount can be cancelled with the error key

Note that before starting to use the machine, the operator should depress the total key to ensure that no figures are in the adding register of the machine

The larger machines have date keys and descriptive keys Each of the descriptive keys prints a complete (or abbreviated) word, not one letter as on a typewriter There are a limited number of these keys, and when the machine is built these are given the lettering most suited to the particular job Once the machine is made, these descriptions cannot readily be altered.

A list printed from such a machine might appear like this—

Date	Description	Folio	£	s.	d	*
JAN 1	GDS	138 9	50	8	2	
JAN 1	GDS	244 8	7	14	9	
JAN 2	NET	948 2	20	8	0	
			78	10	11	*

FIG III—3

Carriage

The machine illustrated in Fig III—2 is designed for printing a list on a roll To print on sheets, whether ruled or not, the machine must have a paper holder, called a carriage This may take various forms, according to the number and shape of sheets on which the printing is to be done One of the advantages of these machines lies in the possibility of printing the figures on two records at once, either by repeat printing or by the use of carbon paper

Book-keeping Machines

A machine with carriage and keys suitable for the entering of ledgers is usually called a book-keeping machine In such cases the entries are made on cards, each card representing an account. It is necessary to have a carriage which permits rapid insertion and withdrawal of these cards.

Apart from the obvious differences of size and carriage, the types of book-keeping machine differ in their automatic operation

As can be seen from the illustrations, various types of figures have to be posted in their proper columns, debit or credit The column on the right of the ledger card is the balance to date. On the fully automatic machine, the carriage moves to the proper place, and this balance is printed without any action on the operator's part.

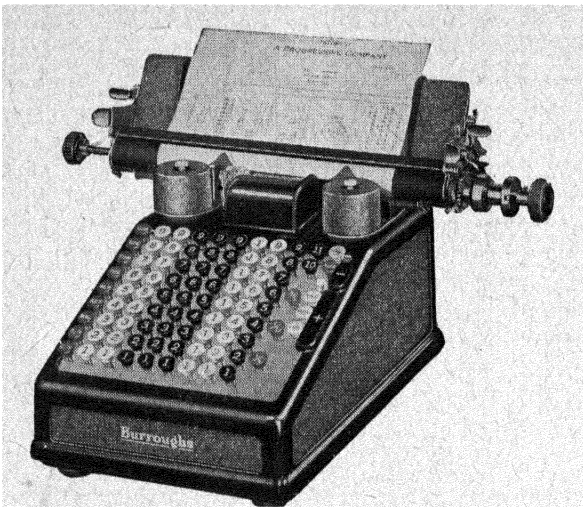


FIG III– 4 BURROUGHS DESK BOOK-KEEPING MACHINE

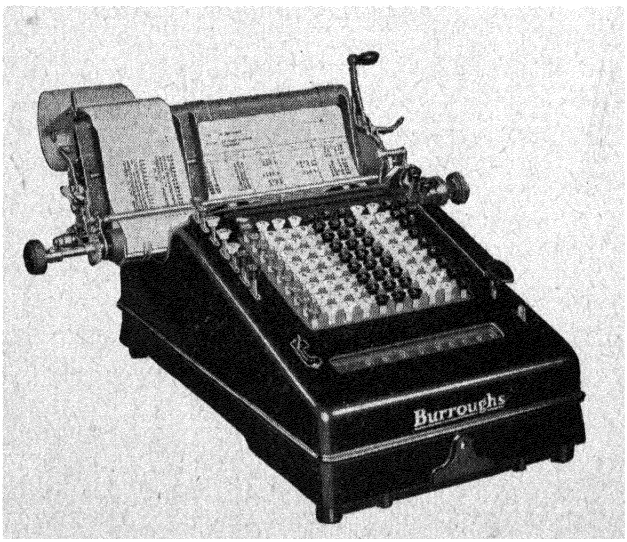


FIG III—5. BURROUGHS DUPLEX-SUBTRACTOR BOOK-KEEPING MACHINE

In some cases a record can be printed either (*a*) by the automatic movement of the carriage, or (*b*) by carbon paper. Which is the better method will depend upon the particular circumstances

The typewriter accounting machine combines the fully automatic

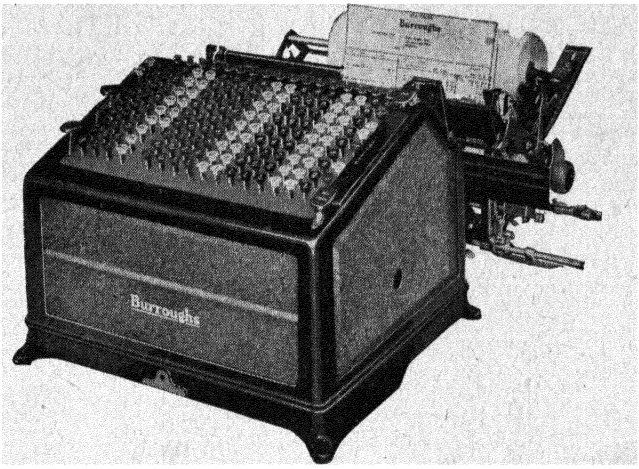


FIG. III—6. BURROUGHS HIGH-SPEED AUTOMATIC BOOK-KEEPING MACHINE

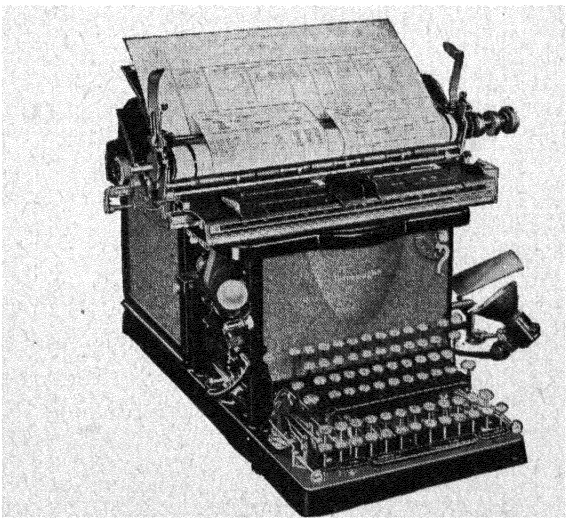


FIG. III—7. BURROUGHS TYPEWRITER ACCOUNTING MACHINE

features of the machines previously illustrated with a full typewriter keyboard.

The Burroughs machine, with both typewriter and multiple registers, retains the full automatic features In the Burroughs range there is

also included the calculator and the combined accounting-calculating machine, described in the chapter on Calculations.

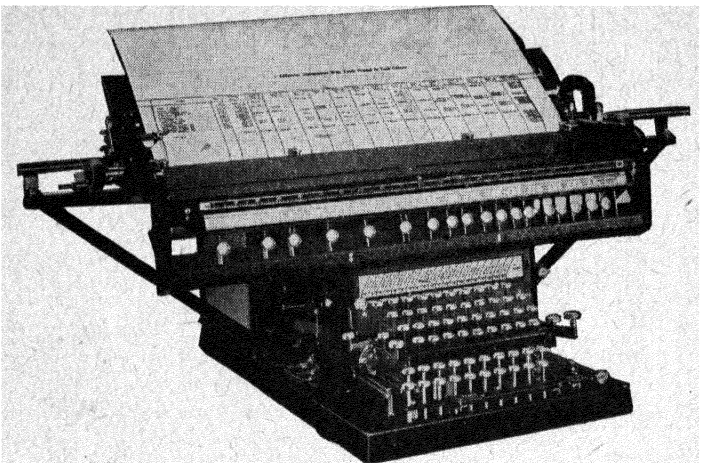


FIG. III—8. BURROUGHS MULTIPLE TOTAL TYPEWRITER ACCOUNTING MACHINE



FIG. III—9. THE SUNDSTRAND PORTABLE

Sundstrand Machines

These also carry the paper in a carriage, which varies according to the work for which the machine is intended. The hand model is illustrated above—electrical models can be had if preferred.

The Sundstrand Class A machine has data keys and keys for abbreviated descriptions The carriage is designed to hold a rear-fed journal sheet in position while the ledger sheets are changed. The work is visible while in the carriage.

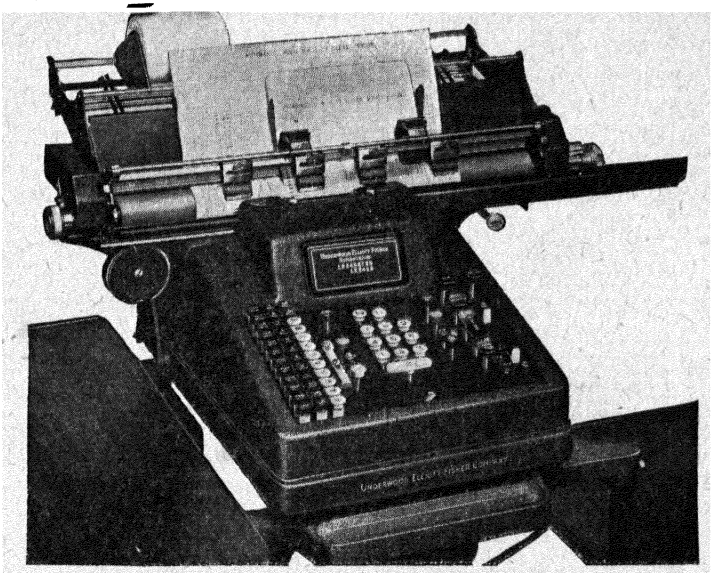


FIG. III—10. THE SUNDSTRAND CLASS A MACHINE

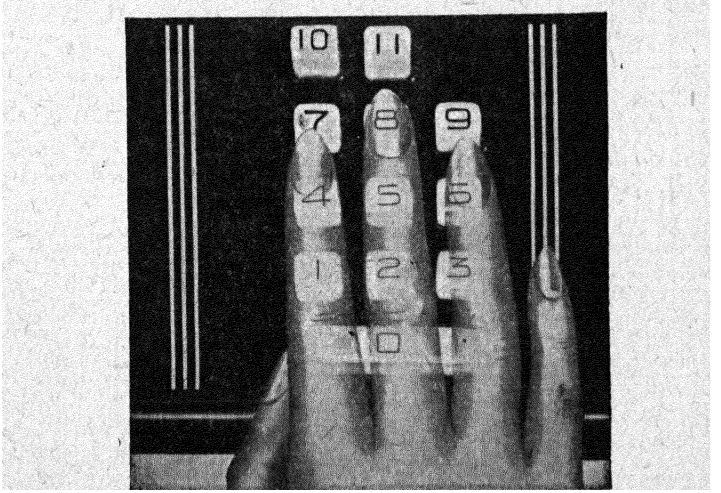


FIG. III—11 THE SUNDSTRAND KEYBOARD

The engagement, sub-totalling, and totalling of the registers, and other features, are controlled by a plate at the back of the machine, which can be changed if several types of work have to be done on one machine. Carriage movements are also controlled automatically.

There are twelve figure keys only. To print £1 11 1 , the same key, 1, would be pressed four times To print £5 18 3., the keys 5, 1, 8, 3 would be printed in succession. It is claimed that the small keyboard helps the operator to work by touch.

The Sundstrand Class D machine has a dual keyboard There are two cross-adding registers and eight accumulating registers All necessary functions, with the exception of the setting of the primary information, are operated and controlled automatically by an interchangeable control plate

Where the nature of the work requires it, four registers can be engaged simultaneously, and items can be automatically transferred

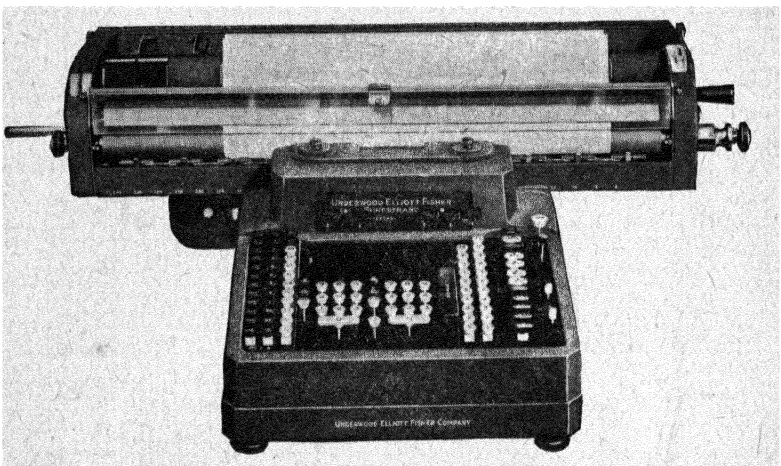


FIG. III—12. THE SUNDSTRAND CLASS D MACHINE

from register to cross-footer and vice versa The ability of the machine to retain and utilize primary information, in order to create new information, without any intervention whatsoever on the part of the operator, provides great scope for its application to complicated costing and statistical requirements.

National Machines

The National accounting machine has a standard typewriter keyboard as well as adding features This is known as the Class 3000 machine (Fig. III—13) to distinguish it from the machine described later.

The sheets used in this machine are fully visible while in place (as shown in Fig. III—14).

The "stops," which control the automatic carriage movement and the addition into the various adding registers, are on a detachable bar. This makes it easy to change from one job to another, the operator merely removing one stop bar and replacing it by another The stop bar is shown in Fig. III—15, immediately above the adding keys.

The 2000 Class

The National machines known as the 2000 Class can conveniently be described as developed from the cash register, just as the Burroughs and Sundstrand machines are developed from the adding machine,

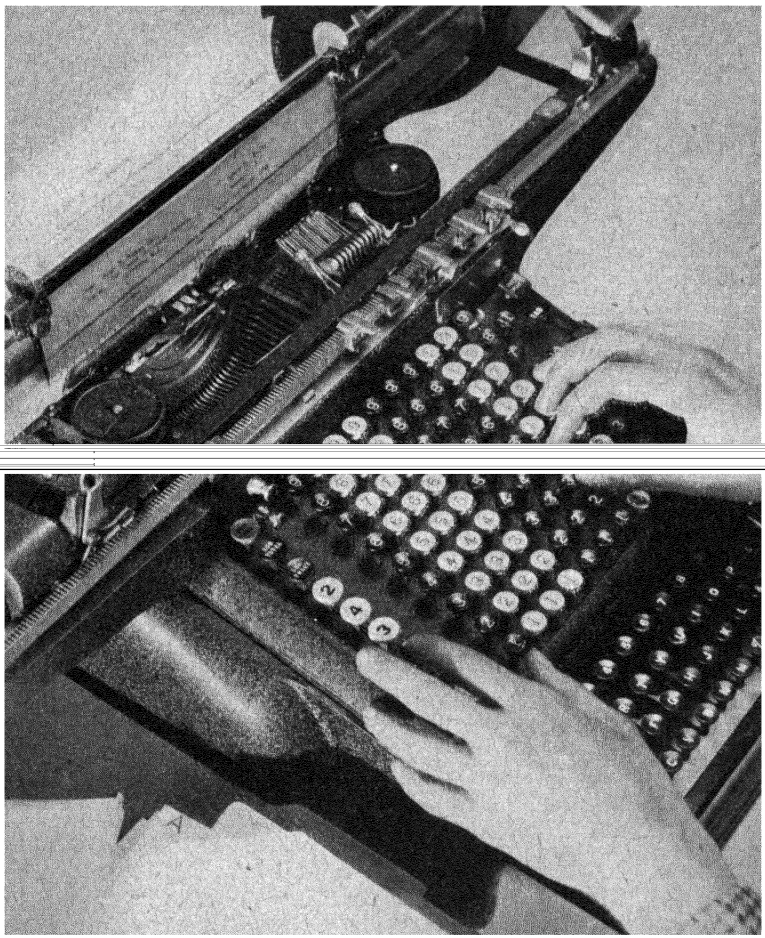


FIG III—13 NATIONAL ACCOUNTING MACHINE—CLASS 3000

and as Remington and Elliott Fisher machines are developed from the typewriter. This is an historical rather than a precise difference as the machines have progressed far from their original sources and as their common uses have produced some common features

This is the ledger and statement machine, Fig III—16. The most

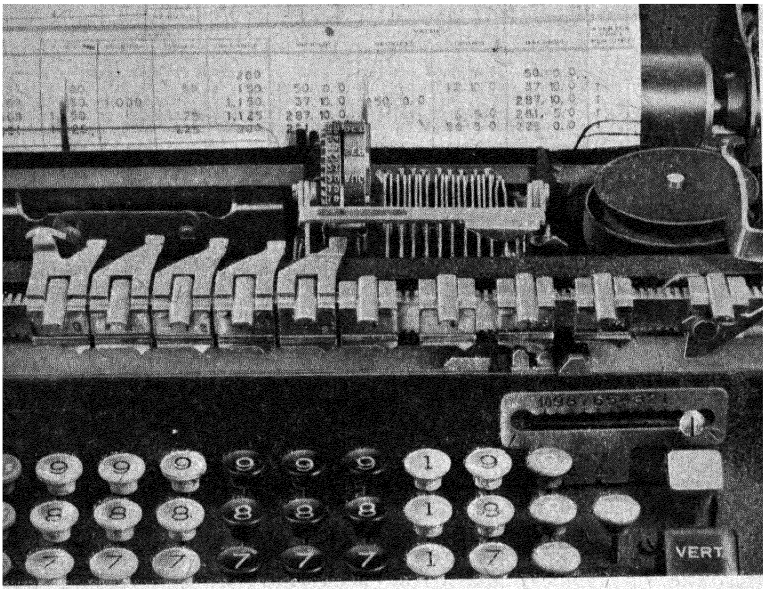


FIG. III—14. NATIONAL ACCOUNTING MACHINE—PRINTING MECHANISM



FIG III—15. NATIONAL ACCOUNTING MACHINE—STOP BAR AND CARRIAGE

fundamental difference between these machines and other classes lies in the absence of a movable carriage to hold the papers

Each form is inserted in its own slot or holder and is provided with a

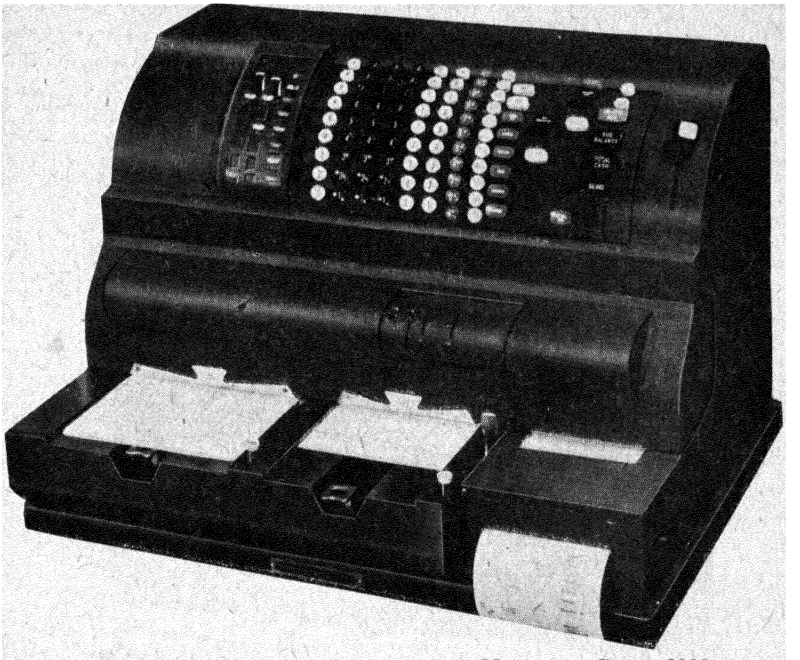


FIG. III—16. NATIONAL ACCOUNTING MACHINE—CLASS 2000



FIG III—17

(Nearer view of keyboard of the Posting and Analysis Machine)

separate printing mechanism. In the above illustration the ledger sheet slides into the left-hand slot, the statement into the central one, and the proof list is held in the machine on the right. (Fig. III—16.)

Because they combine ledger and analysis work, these machines are often called Posting and Analysis Machines The statement and ledger card are at the bottom and the proof sheet immediately above.

All the machines of this class can be provided with a large number of adding registers to facilitate a combination of posting with analysis The printing section is interlocked with the adding registers so that

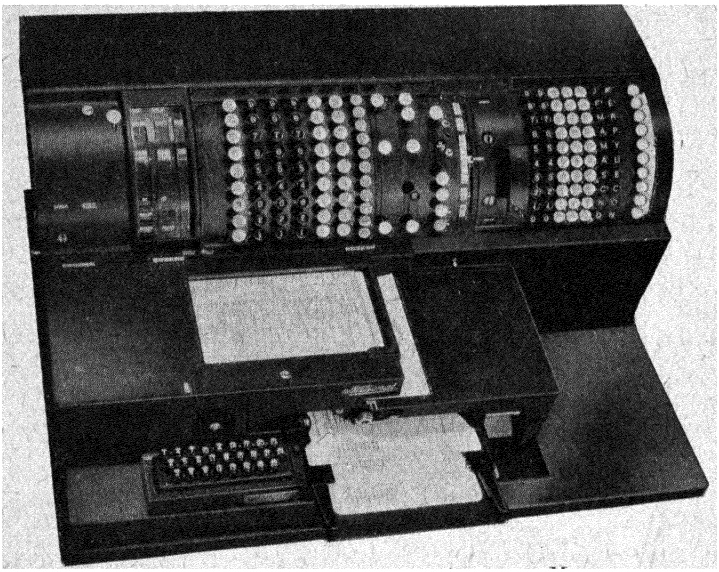


FIG. III—18 THE POSTING AND ANALYSIS MACHINE

when a particular register is used a particular description is printed. E g a register might be used for "returns." Whenever this particular register was used the machine would print RTN This is quite automatic so that the operator and anyone using her results knows that there can be no error on this score—if it says RTN on the sheets, the item is included in the total of the returns register The key which operated this register and printing mechanism would also be marked RTN.

Because of this principle, the machines make no pretence of flexibility, each is designed for great speed on one particular job. Several special machines of this class are illustrated in later chapters.

Remington Machines

These accounting machines may be described as developed from the typewriter by the use of external adding registers. In the billing models the carriage is designed for use with continuous stationery, the accounting models have either continuous or front-feed carriage

At the bottom of the keyboard are the spacing keys, which move the carriage (and paper) into the required typing position. Above these are a row of numerical keys used for the figures which are to be

added, and above these again is the usual typewriter keyboard A larger illustration of the adding register appears in Fig III—20. This is on the front of the carriage of the machine and adds the figures

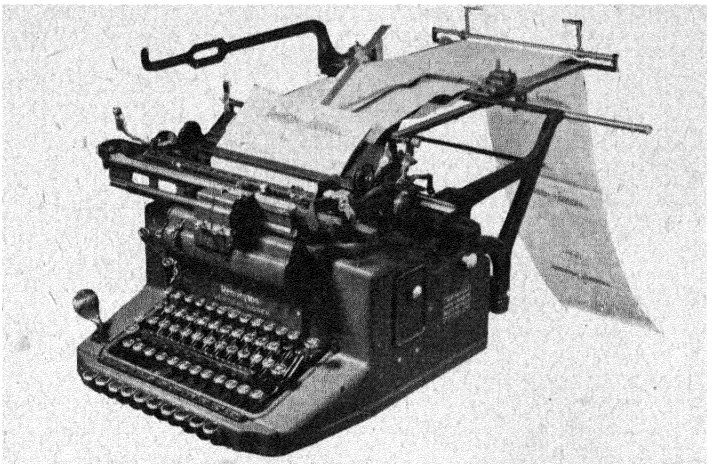


FIG. III—19. VERTICAL MACHINE WITH CONTINUOUS STATIONERY

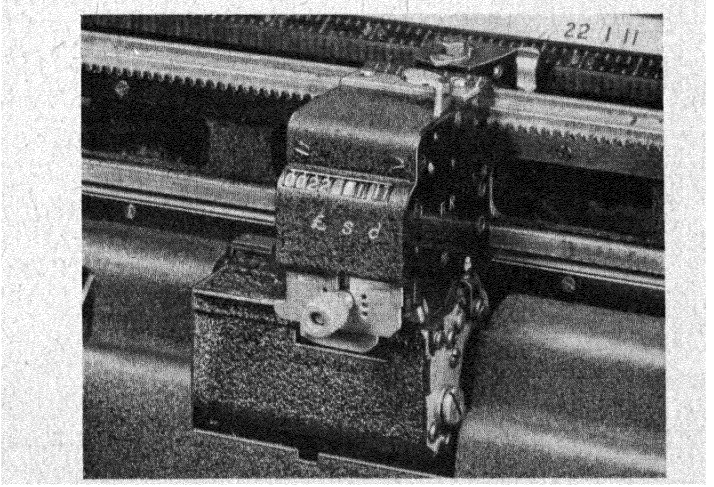


FIG III—20. AN ADDING REGISTER

which are typed in the corresponding column immediately behind it on the paper. The totals appear in the window of the register, and are read and typed by the operator at the end of the posting. The adding registers are separate from the machine, may be attached at any point to suit the ruling of the form, and may easily be moved when it is desired to change from one form to another

The Remington cross accounting model is similar to the vertical

machine, with the addition of a "cross-footer," which is an adding register designed to accumulate or balance the figures on each line.

There is also available a model with cross addition, but no vertical adding registers, suitable for the small concern



FIG. III—21. CROSS ACCOUNTING MODEL

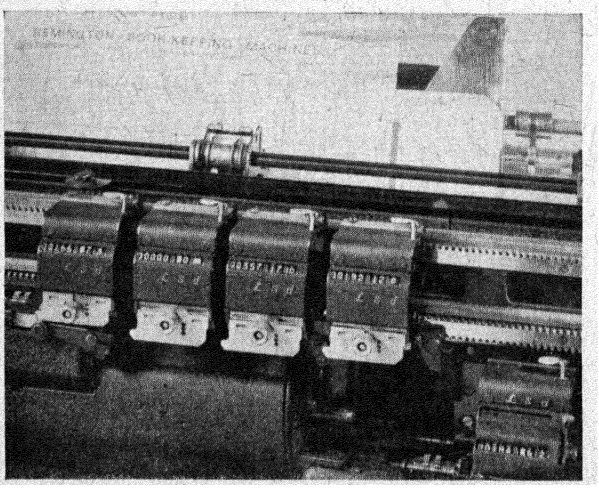


FIG III—22 ADDING REGISTER

The connexion between the adding registers and cross-footer is controlled by an adjustable plate at the bottom of the register. By adjusting the height of this plate, the trip can either be—

(*a*) not depressed and the item not included in the cross cast, or

(*b*) depressed and the item added in the cross-footer, or

(*c*) depressed twice as far and the item subtracted from the cross-footer.

If a particular column is not to be added, but is to be included in the cross-footer, a "dummy" box is used, i e. a holder for the plate without adding mechanism

The Remington all-electric accounting machine has two cross-footers and any required number of boxes for vertical addition. On

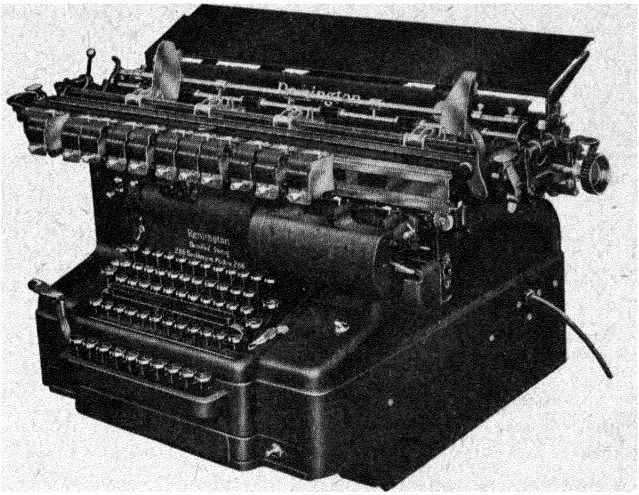


FIG. III- 23 REMINGTON ALL-ELECTRIC ACCOUNTING MACHINE

this machine, the balances are automatically printed from the cross-footers, whereas on the smaller machines the balances are read and typed by the operator.

Describing Systems which use Adding Boxes

As the adding box moves with the carriage, each box is always in the same place relative to the paper; that is to say, it adds a particular column of figures. When describing such a system it is convenient to have a diagram of this type—

A	A	A	A	D		
+ 1	+ 1	+ 1	− 1	− 1 + 2	X A 1	X A 2

Analysis Ledger				Folio	
Date	Stationery	Advertising	Catalogues	Credits	Total

FIG. III—24

Above the ruling of the sheet is shown the arrangement of boxes. | A | represents an adding box and | D | is a dummy Under each box is indicated whether the item is in the cross addition and if so in which cross-footer it is entered. | X A | is a cross-footer and where there are more than one (as here) they are given numbers.

In this example, stationery, advertising, catalogues, and credits are each represented by an adding box, which will accumulate the total

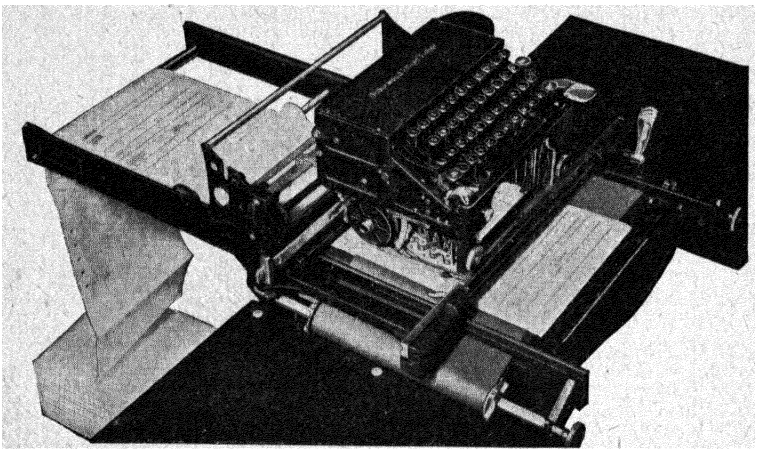


FIG. III—25. ELLIOTT FISHER CONTINUOUS FORM MACHINE

posted to the column on all the cards of one posting. The first three are added and the fourth deducted from the cross-footer. The total column is entered by reading the amount from XA1, the amount typed being deducted from that box and added in XA2. Box XA1 should now be cleared (i.e. = zero) and if not, there is an error and the machine is made to lock until the operator corrects it. On the large all-electric machine the total is entered automatically.

Elliott Fisher Writing Machines

On all other writing machines, the keyboard remains stationary while the carriage, containing the forms, moves. The Elliott Fisher machine reverses this process; it is the keyboard that moves. The forms are held on a flat bed underneath the keyboard. This arrangement simplifies the handling both of cut and continuous forms Carbon paper is fed into the machine in bulk, in the form of rolls, and further handling is practically eliminated

The machine can be fitted to use roll or pad forms, fed from the back or from the side. The maximum advantage is gained where the

machine is continuously engaged on one type of work, as the paper handling arrangement can be specially designed for that one job.

A model is also available for typing into a bound book

Elliott Fisher Accounting Machines

These have been developed from the Elliott Fisher Writing Machine described earlier. The range includes vertical adding machines equipped

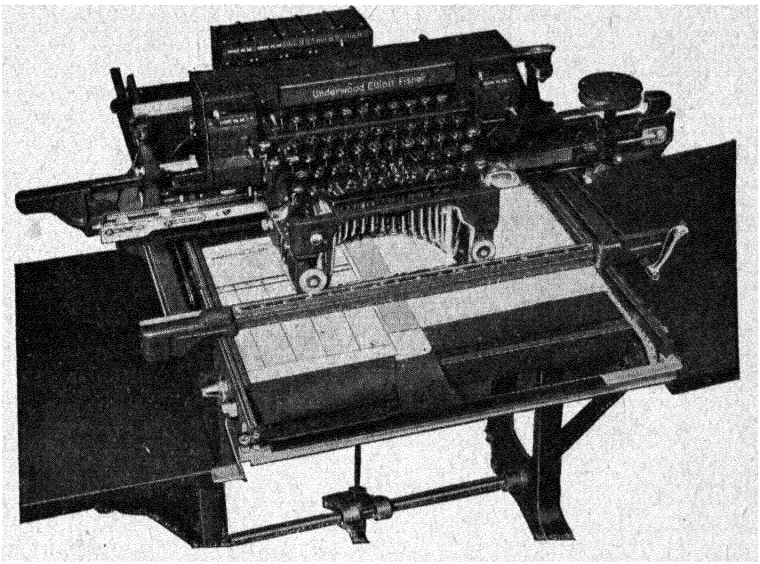


FIG 111–26 ELLIOTT FISHER UNIVERSAL ACCOUNTING MACHINE

with accumulating registers, and accounting machines equipped with two cross-computing registers built into the machine on either side of the head, and which can be equipped with any number of accumulating registers according to their capacities, and the size of the platen. It is claimed that it is considerably quicker to feed and aline forms on a flat bed than in the usual roller platen carriage.

As with the writing machine, so with the accounting machine, the flat surface avoids bending the sheets, enables forms of varying thicknesses, shapes, and sizes to be collated and typed simultaneously and improves manifolding. Carbon papers are handled mechanically.

Detailed Examination of Machines

The business man will not expect to find in this book a record of the strong points of each particular machine, he will study the machines themselves. Nor will the student be expected to differentiate between machines in an examination paper, although he will wish to have the information at the back of his mind for use in practice. In assessing

the most suitable machine for any particular job, these factors should be considered—

1. The carriage, slides, or other gadgets and labour-saving devices for handling the papers and bringing them into printing position. This is put first as more office time is spent in handling papers than in any other operation.
2. The keyboard, its convenience and suitability for particular purposes.
3. The automatic recording of totals.
4. The means by which these automatic movements and totals are controlled. All machines have such mechanisms, some obviously external and flexible, others internal and safe from accidental or mischievous manipulation
5. The number of adding registers; whether this is fixed or variable; the capacity of the registers and whether they subtract as well as add.
6. The ease with which the work can be inspected while it is in the machine.

The practical man will also consider the engineering qualities of the machine, the service (before and after sale), and, naturally, the price.

CHAPTER IV

THE EFFECT OF THE ADDING MACHINE ON OFFICE SYSTEMS

A CHAPTER of examples—File of invoices used as ledger—Batch summaries—Analysis—A tailor's ledger

IN the previous chapter it has been shown that book-keeping machines are adding machines with special facilities for putting the figures in the places where they are needed This is not the only way in which the adding machine has affected and improved modern methods.

Head and hand methods require that items shall be written one under another in order that they may be added together, machine methods do not This may at first sight appear a matter of slight importance, but in actual practice has produced great changes. When the items have to be listed in a column, then the form which the accounts can take is limited, whereas with machine additions these limitations disappear The items may be anywhere on a sheet or on several sheets or in whatever form gives the information with the least number of entries or postings. The accountant or office organizer is free to adopt whatever system is most appropriate to the particular job in hand.

One point where these advantages appear is in balancing the ledgers. To take out a list of balances by hand is no mean job, but this is much helped by the machine, which not only adds the debits and deducts the credits but makes the list of balances at the same time. Regular balancing is thus encouraged, it is less frequently left for the auditors at the year end. Further, many costing and similar systems are now balanced as a matter of course.

Some examples of systems influenced by the adding machine are given in this chapter, and others appear throughout the book

The Adding Machine—Example 1—File of Invoices used as Ledger

The ideal would be to make each entry once and once only. In a particular retail shop the goods sold to customers on credit were invoiced by hand in a counter book, the salesman handing the original invoice to the customer as he left the shop. The copies of these invoices were passed to the office, where they were totalled daily on a listing machine (e g Burroughs portable). These lists were kept for the auditors to see at a later date. These daily totals were entered to the debit of a "customers" account and to the credit of a sales account. The invoices were then filed under customers. When a customer paid his account, his invoice was removed from the file and the cash and discount entered on it. From these paid invoices a list of cash and discount was obtained with the listing machine and agreed with the cash till, these totals being credited to "customers" account. The

invoices remaining in the file were added once a month, again on the listing machine, and the total agreed with the balance on the "customers" account. Thus the file itself became the ledger and the machine list took the place of the day book (which would have had to be cast in any case). All posting was avoided.

These operations can be summarized in diagram form—

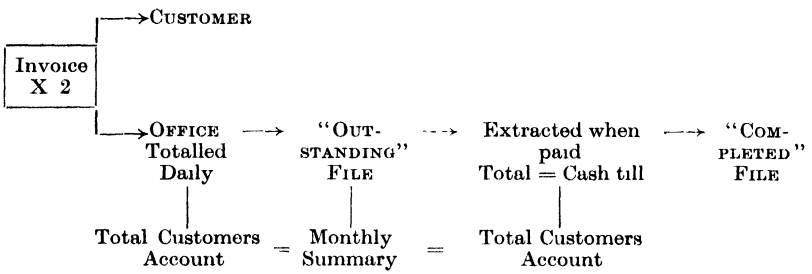


Fig IV—1

This system provides no satisfactory permanent record as a check on the book-keeper's honesty and should therefore only be applied to other cases with caution. In the particular circumstances, with everything under the eye of the proprietor, it worked well and is given to illustrate the possibilities of the adding machine.

Example 2—Batch Summaries

The stores and cost ledgers of a large factory were at one time kept in detail by hand. The goods issued from stores were shown on issue notes which were first listed by hand and a daily total obtained. Then each item was posted to the stores accounts, then posted to the debit of the particular account in the job cost ledger. When the system was re-arranged with the help of an adding machine, three-quarters of this work was saved Under the new arrangement, the issue notes are sorted daily by stores number, all those for a particular item of stores being brought together into one batch and a summary of the batch made with an adding machine (e g. Burroughs or Sundstrand). The total of each batch is posted to the stores ledger. A total of all these batches is the credit to stores control account. The issue notes are then re-sorted according to job number and by a similar procedure the total of each batch is posted to the cost ledger. A total of all these "job" batches is made and after it has been agreed with the total of the "stores" batches, is posted to the debit of cost control account. If any mistake has been made, the totals do not agree and the clerk must find his error. Besides saving time, this system of batch summaries reduces the number of entries in the ledger and makes it easier for an executive to see the state of an account. (See Fig. IV—2.)

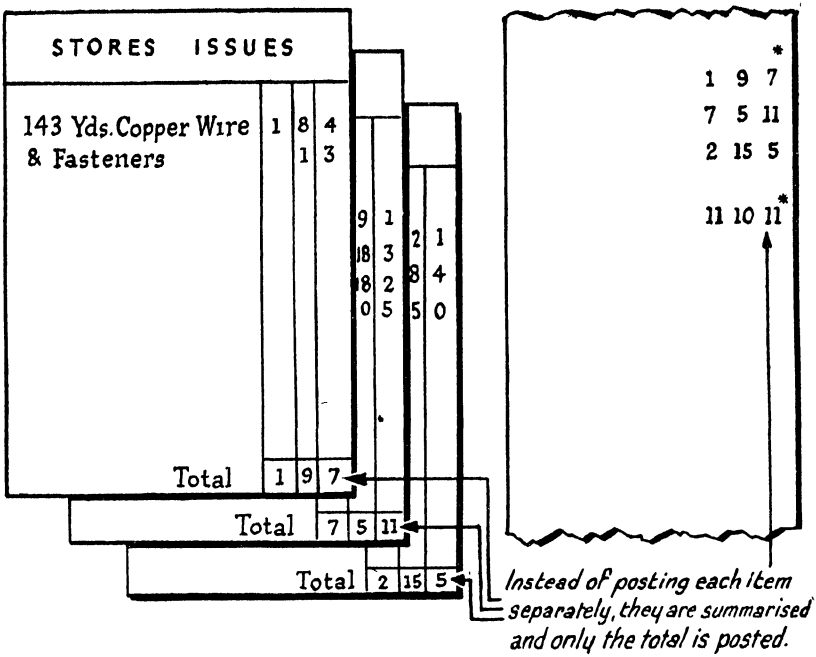


Fig IV—2

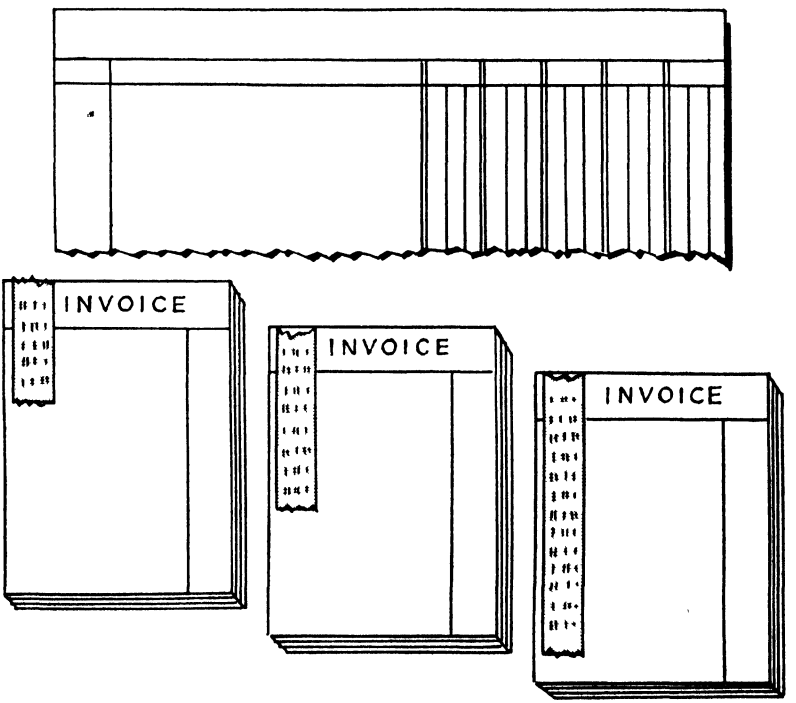


Fig. IV—3

Date	Name	Details	Amount			Cash Received								Bal. to Next Acct.
Sept. 3	J. JONES	Suit 4083	6	2	6	Sept. 4	£1	Oct 3	18/–	Oct. 11	£1			
	W BROWN	Suit 4090	5	5	0	Sept 3	30/–	Oct 10	30/–					
	P. GREEN	Suit 4085	5	10	0	Sept 6	£1	Sept 18	£1	Sept. 30	£1	Oct 29	£1	

FIG. IV—4

Example 3—Analysis

A particular company had sixteen departments and it was necessary to obtain a total of the sales from each. With "head and hand" methods, a day book was provided, with seventeen cash columns, and every invoice was entered therein. With an adding machine, this entering was eliminated. In the new arrangement the invoice was prepared on a billing machine, which gave a daily total The copy invoices were sorted departmentally into batches and each batch added on the listing machine. The total of all the batches agreed with that obtained from the billing machine, if the work was correct

The subject of analysis (the dividing of a number of similar items into groups) will be more fully discussed in a later chapter. It is introduced here as an example of the change which the adding machine has made in office organization.

As illustrated in Fig IV—3, the lists, with invoices attached, take the place of analysis columns

Example 4—A Tailor's Ledger

It is sometimes practicable to arrange a day book and ledger combined Fig. IV—4 shows a ruling sometimes used by tailors The entries are made by hand. In practice it is difficult to balance the ledger as the items (particularly credits) are out of line An adding machine makes such balancing very much easier and thus increases the advantage of this type of ledger.

CHAPTER V

ORIGINAL DOCUMENTS

SALES invoices—Invoicing—Source of the information—Invoicing systems—Sales credit notes—The form of the credit note—Internal documents

THE figures which are the basis of the books are conveyed from place to place and person to person on "original" documents, which are considered in this chapter. These are the vouchers which an auditor wishes to see as evidence of the correctness of the entries. The forms to be considered are of two types. Those concerning persons outside the organization (such as the sales invoice) and those which are internal (such as stores issue notes). Some forms are considered later—the customer's statement, which is best considered along with the sales ledger, the receipt for cash, which is discussed in the chapter on the cashier's office, and the purchase invoice which is included in the chapter on the purchase ledger

Sales Invoices

It is a mistake to look upon the invoice as a humble document, beneath the dignity of the systems expert, it is a mistake, for two reasons. It is the basic document for the accounting system and it occupies the larger portion of office time. So important a document repays detailed study

An invoice is a written notice to a customer of goods supplied and of the amount he is charged for them. In a discussion of its form and systems, these aspects have to be considered—

(1) The interlocking of the system with warehouse or factory procedure, so that information of goods sent is available immediately and accurately,

(2) the information which the customer should have and the best way of presenting it,

(3) the most suitable method of conveying information to the accounts clerks,

(4) the means available for preparing the documents

Invoicing—Source of the Information

It is necessary to collect together the information for the invoice typist, to show the prices and to make the calculation. For this, some working document is needed.

If the customer's order is used, the figures must be squeezed into whatever space happens to be available. Whether this is satisfactory depends upon the type of customer and trade usage. Some firms have a gummed slip to attach to customers' orders, so as to give space for invoicing details.

ORDER

J JONES & CO.
LLANFYLLIN

To P BROWN

8 June

Please Supply—

2 doz	H S S. Drills Size 7 38/3 =	3	16 6
1 doz	ditto Size 8 46/9 —	2	6 9
3 doz	ditto Size 9 52/2 —	7	16 6
1 doz	ditto Size 11 Out of Stock		
		13	19 9

FIG V--1

A transcription of the order is often necessary, because the customer leaves little space, or uses terms which are not clear to the warehouse, or because he orders by telephone

COPY OF CUSTOMER'S ORDER

J JONES & CO
LLANFYLLIN

8 June

Doz	H S S DRILLS				
2	Size 7	38/3	3	16	6
1	,, 8	46/9	2	6	9
3	,, 9	52/2	7	16	6
1	,, (Out of stock)				
(A)			(B)		
			13	19	9

(A) Typed on receipt of order
(B) Figures entered later

FIG. V—2

A manufacturing concern may need a factory order or a merchant an instruction to warehouse. These can be designed to act as the invoicing media as shown in Fig. V—3.

FACTORY ORDER

Customer
J. JONES, LLANFYLLIN

Make the following:

1 set Cutting Tools
Drawing No. 713
Charge at cost + 20%

ADVICE NOTE 547

COPY FOR INVOICING

J JONES & CO
LLANFYLLIN
15 June

Doz	H S S Drills
2	Size 7
1	,, 8
3	,, 9

On the right is a space for prices and calculations

FIG. V—3

Sometimes a copy of the advice note is made the working sheet for preparation of invoices. Note that this is not possible if invoice and advice note are typed together

The copy invoice conveys information to the accounts department.

Each copy should have a heading, showing the dept which will use it

INVOICE 12345

COPY FOR ACCOUNTS

← There should be a serial number, which should be shown in ledger and on customer's statement

The customer's name must be clear and always in the same position →

J JONES & CO
LLANFYLLIN

This information is important to accounts dept, particularly if the customer disputes payment →

Date 17 *June*

This printed information should not be omitted from the copies ←

Order No 74	Order Date 8 June	Dispatch Date 15 June	Advice Note 547	Salesman 15	
2 doz	H S S. Drills	Size 7	38/3	3	16 6
1 doz.	do.	Size 8	46/9	2	6 9
3 doz.	do	Size 9	52/2	7	16 6
				13	19 9

The total must stand out ←

Matter such as this should be kept clear of the total →

→ Nett cash 30 days

FIG. V—4

There may be several copies for use in various sections, each should have its own colour.

The original invoice goes to the customer.

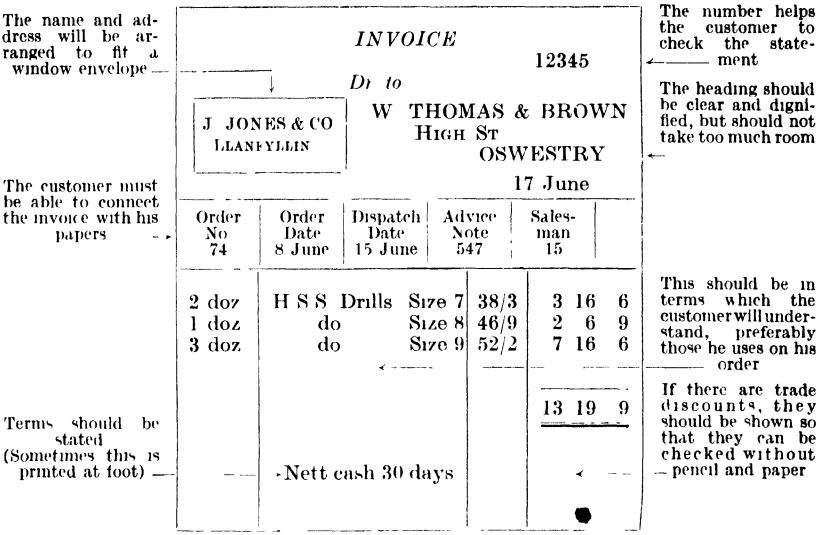
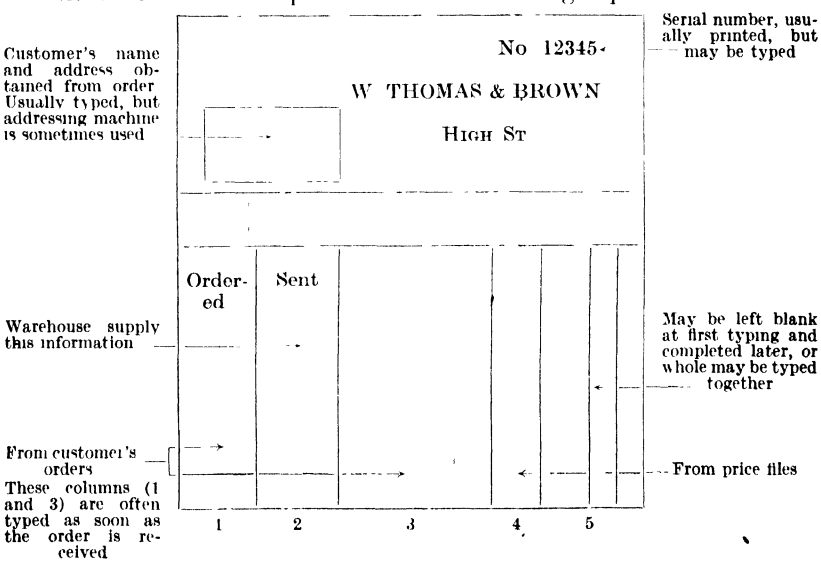


FIG V- 5

From the point of view of the customer, simplicity is the keynote He does not want his work complicated for the benefit of the supplier's internal systems

The invoice from the point of view of invoicing department—



Columns 2, 4, and 5 are usually entered by a pen or pencil on some rough sheet and copied from that on to the invoice.

FIG. V—6

Some examples of invoicing systems follow. These are taken from actual practice and are chosen to illustrate special points, but it must always be understood that simplicity is a virtue in itself.

Invoicing Systems—Example 1 (*Continuous Stationery*)

In this case the orders are received in reasonably tidy form and are made the invoicing media. The goods sent, and prices and calculations are pencilled on the order This gives the typist a clean job Continuous invoice forms are used.

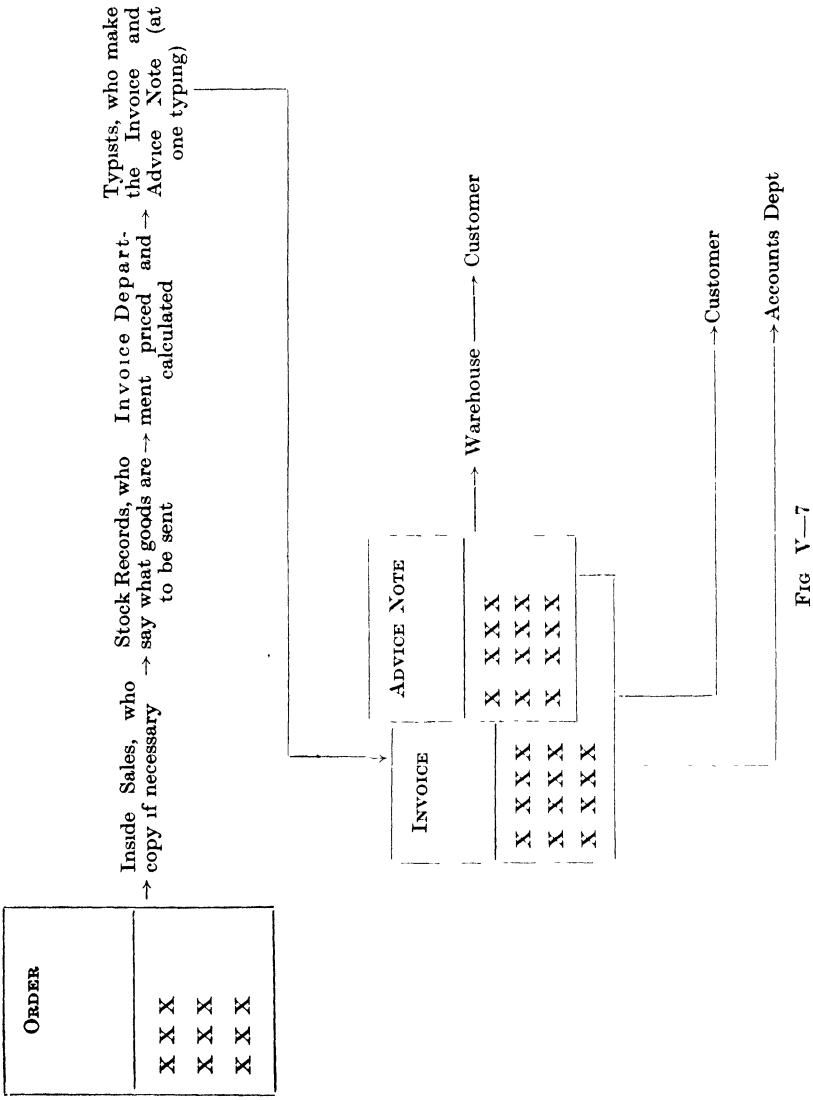


FIG V—7

Example 2 (*Billing Machine*)

In this case, one invoice covers several internal orders which reach the invoice department pinned to the back of the customer's order. The amount of each item is shown, but these have to be added together

Box No 1 | Box No 2

INVOICE 72345

J P BROWN
HIGH ST
GALASHIELS

ANDREW NICHOLSON
SELKIRK ST.
HAWICK

17 June

1	Suit No 8248	9 3 6	
1	Suit No 8807	7 4 6	
1	Trouser No 8808	1 5 0	17 13 0

DAY BOOK

	J P BROWN HIGH ST GALASHIELS 17 June		
1	Suit No 8248	9 3 6	
1	Suit No 8807	7 4 6	
1	Trouser No 8808	1 5 0	
			17 13 0*
	D. CAMPBELL KIRKUDBRIGHT 17 June		
1	Suit No 8719	8 8 0	
1	Suit No 8734 . .	8 8 0	16 16 0*

FIG. V—8

The day book is typed at the same time as the invoices, using carbon paper. The machine has a spacing device so that the day book is moved the correct distance as each invoice is completed.

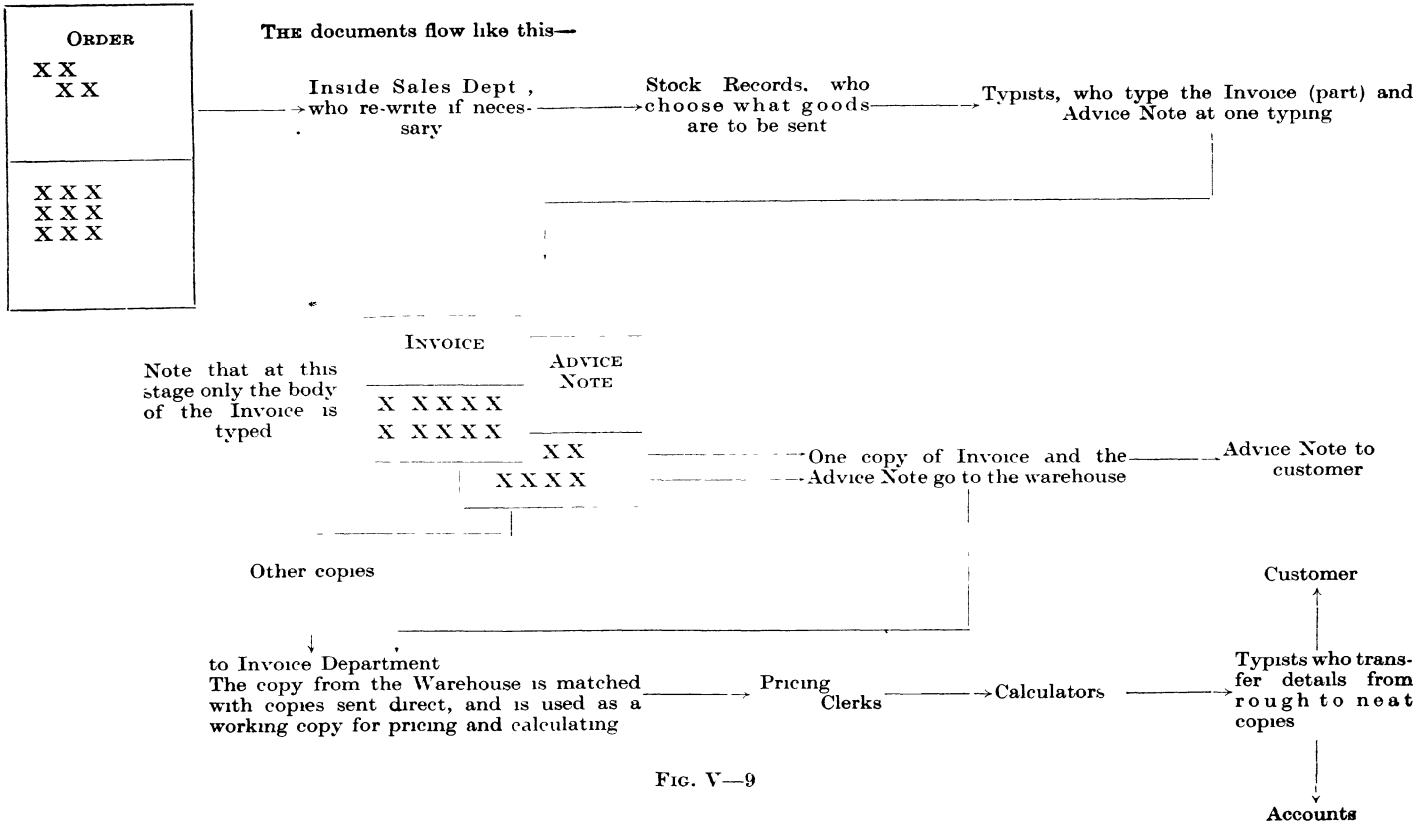

ORDER
X X
X X
X X X
X X X
X X X
THE documents flow like this—
Inside Sales Dept , who re-write if necessary
Stock Records, who choose what goods are to be sent
Typists, who type the Invoice (part) and Advice Note at one typing
Note that at this stage only the body of the Invoice is typed
INVOICE
ADVICE NOTE
X XXXX
X XXXX
XX
XXXX
One copy of Invoice and the Advice Note go to the warehouse
Advice Note to customer
Other copies
Customer
to Invoice Department
The copy from the Warehouse is matched with copies sent direct, and is used as a working copy for pricing and calculating
Pricing Clerks
Calculators
Typists who transfer details from rough to neat copies
Accounts

FIG. V—9

Box No. 1 adds the details. As the total is typed it is added into Box No. 2 and at the same time subtracted from Box No. 1. Box No. 1 should now be clear; if it is not, the machine locks to call attention to the error. At the end of the run Box No. 2 will show the total of the invoices.

The machine used is a Remington of the type described in the chapter on adding machines

Example 3

A merchant concern finds that the orders are not a suitable invoicing medium. It is necessary to prepare a document for internal use, and it is found practical to type part of the invoice at the same time. (See diagram on page 48.)

The set comprises—

(*a*) an advice note to be sent to customer,
(*b*) an invoice for the customer,
(*c*) a working copy of the invoice,
(*d*) other copies for accounts department

(The first two are shown in the diagram)

At the first typing, the customer's name and details of the goods are shown. The working copy goes to the warehouse, where the date of dispatch is entered (in pencil). It then returns to the office, prices and calculations are entered on it, and from it the customer's invoice and accounts copies are completed on a typewriter. Note that this second operation must be carefully done so that the amounts are typed in line with the detail of the goods Also, it is possible to match the returning working copy with the wrong original so that figures are typed opposite to goods of a different nature, to the confusion of the customer

If required, the second operation could have been done with an adding machine of the Burroughs type, as only figures are involved

Example 4

A large merchant concern requires numerous copies of the invoice for internal purposes. A Banda duplicating machine is used The principle of the machine is that a "master" sheet is typed with a special reproducing carbon paper, and from this "master" the information is transferred by the duplicator on to various forms When required, only part of the information is transferred.

The customer's order goes to the chief clerk of the invoicing section, who makes sure that it is clear and marks the number of copies required. A "master" is then made, showing customer's name and goods ordered, and from this a copy is made for each warehousing department concerned, and also a copy, with the packing note and required number of labels, for the packing department. From these copies the goods are taken from the shelves and sent to the packing department, where they

are checked and dispatched. The copies now return to the office, where the values are extended by the calculators, the appropriate master is found, and it is completed by typing the prices, values, and dispatch information. The invoice and copies are then prepared from the master.

If the order has been completed, the master can now be put in a completed file, being kept in case extra copies are needed later. If the

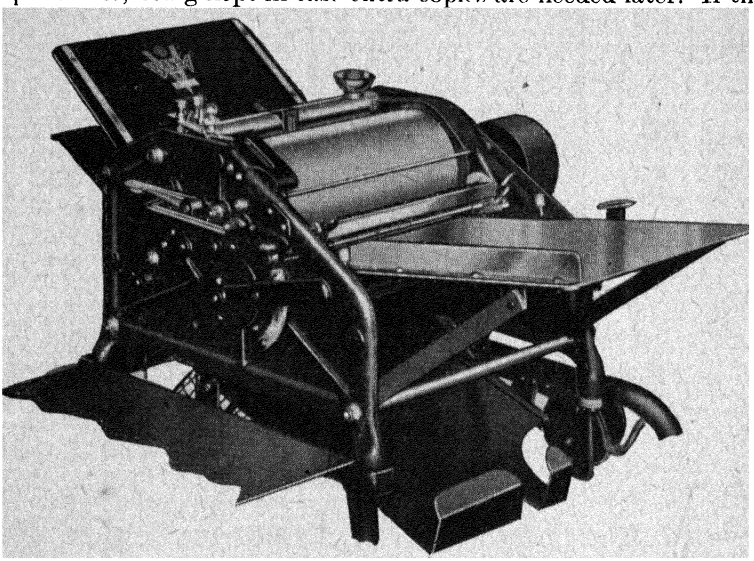


FIG. V—10 BANDA DUPLICATING MACHINE

order is uncompleted, copies are prepared from the master and sent to the various buyers The master is retained in an "uncompleted" file.

The advantage of this system lies in the ease with which many copies can be obtained, including such things as labels and packing notes A similar system can be used by a manufacturer requiring copies of the order for internal use.

Example 5

Another concern finds that the customers' orders are not in a form suitable for use as a working sheet for preparation of the invoices (as in Example 1), and that practical difficulties preclude the method described in Example 3. An advice note and working copies are typed at one operation, and when the working copy is complete an entire invoice is typed as a separate operation The documents flow as shown in Fig V—11.

In comparing Examples 5 and 3, note that it is often quicker to type a whole invoice than a part, because most of the time is taken in

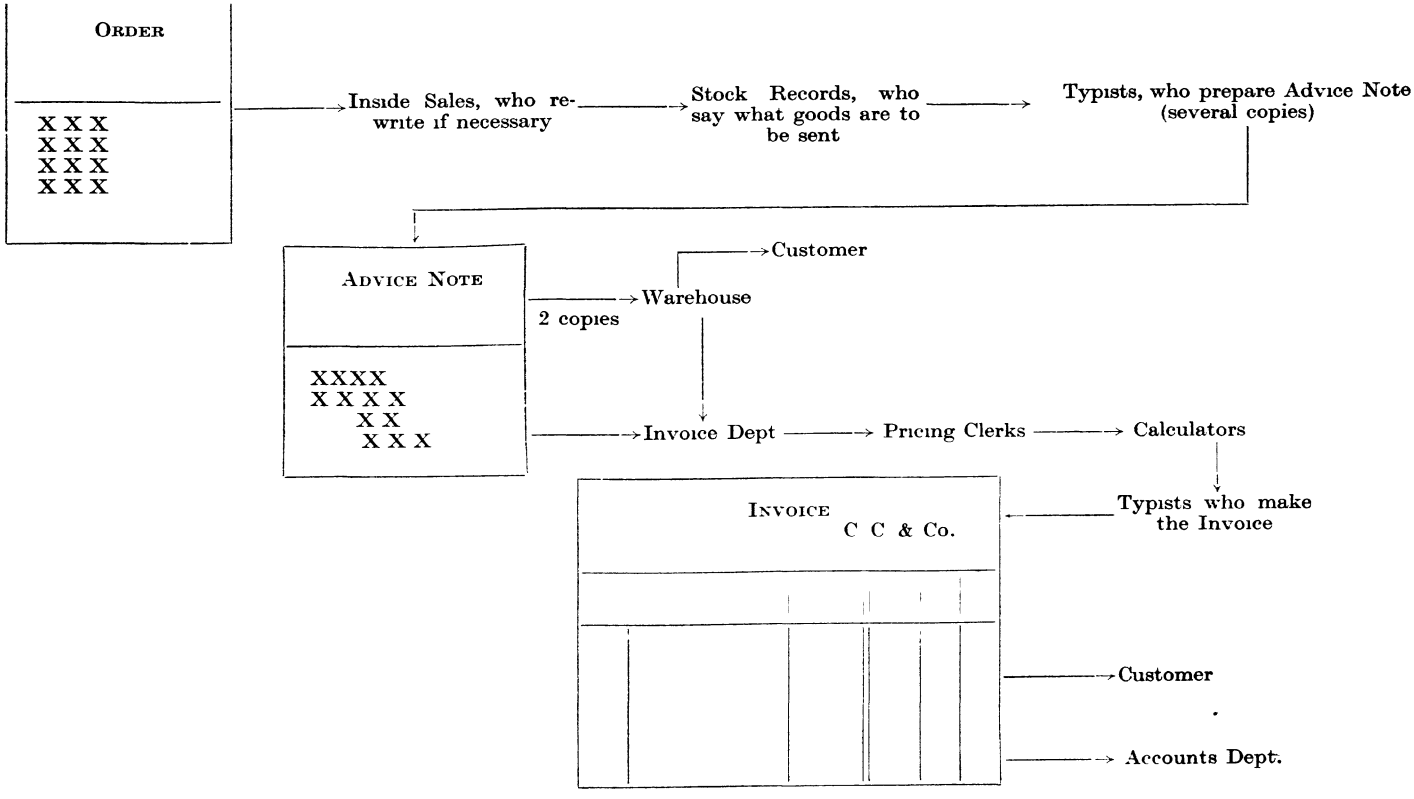

ORDER
X X X
X X X
X X X
X X X
Inside Sales, who re-write if necessary
Stock Records, who say what goods are to be sent
Typists, who prepare Advice Note (several copies)
ADVICE NOTE
XXXX
X X X X
X X
X X X
2 copies
Warehouse
Customer
Invoice Dept
Pricing Clerks
Calculators
INVOICE
C C & Co.
Typists who make the Invoice
Customer
Accounts Dept.

FIG. V—11

handling the paper, and continuous stationery can be used in the former case, also that more copies can be obtained where there are two typings.

Sales Credit Notes

These usually denote cancellation or amendment either because an error has been made or because goods have been returned. The issue of the credit note should be authorized by a senior person, certainly not the ledger clerk, who might use an unauthorized credit to hide some discrepancy in his ledger. The soundest check on this is a voucher (i.e. a document from outside the concern), initialed by the departmental manager, it may be an advice note for goods returned or a letter advising that a correction is required.

The Form of the Credit Note

Many points affecting the form of the credit note have already been mentioned in connexion with invoices.

CREDIT NOTE (C) 299

C BUTTERWORTH & SON
ORMSKIRK

Date

Invoice No	Date	Order No	Date	Salesman		
(A)	(A)	(A)	(A)	(A)		
	(B)				(D)	

(A) These references are needed by customer and by accounts dept
(B) Both the goods and the reason for credit should be stated in full, e g "Allowance as agreed" would be bad
(C) These should be serially numbered.
(D) It is necessary to make sure that the prices entered agree with those on the original invoice.

FIG. V—12

To distinguish them from invoices it is usual to print credit notes in red, or on pink paper.

Internal Documents

If a document is to go outside the organization, the first consideration must always be the convenience of the person to whom it is addressed. It must be in more or less conventional form as there will be no opportunity of instructing him in its use or explaining anything which is not clear. An internal document is different All who handle it are part of the one organization, instructions can be given to them and a routine can be evolved. This allows greater flexibility in the form.

This requisition and issue note is given as an example and should be contrasted with the invoices in the previous examples

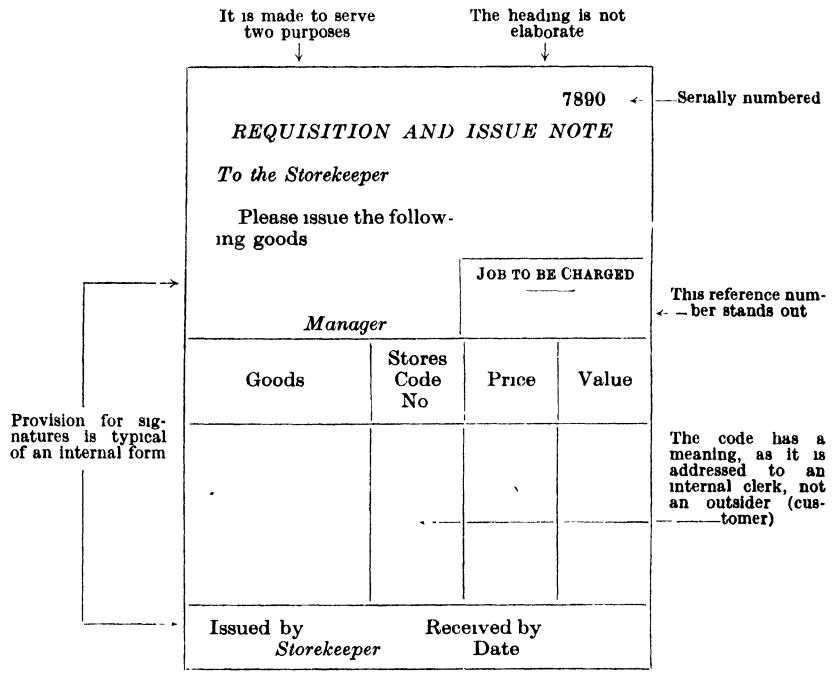


FIG. V—13

CHAPTER VI

BOOKS OF ORIGINAL ENTRY

THEORY—Uses of the day book—Substitutes—Cases where still needed—Day books kept by hand—Day books entered by machine—Machine proof list—Not a day book, but sometimes a substitute

BOOK-KEEPING theory requires that each transaction shall be recorded immediately it takes place, in a journal or day book. No doubt the original purpose was to ensure that the item was recorded before it was forgotten Nowadays, entries are usually made from a written document, e g. an invoice, and it is necessary to consider what purpose the day book or journal fulfils which cannot be equally well satisfied by the (properly filed) original documents, or copies. Cash books are books of original entry which serve obvious purposes, and it is proposed to defer consideration of these to a later chapter There is also a journal which must be kept by every concern to record the transactions of a special or private nature, each entry receiving individual thought. This is best kept by hand in the usual two-column form Apart from these there are the day books used to record the numerous everyday transactions and it is proposed to treat first the sales day book, which is typical

Uses of the Day Book

The most obvious use of the day book is quick reference. A good system of filing makes this unnecessary It is a waste of time to look up an item in the book and follow it from there to the invoice, when a good system would make it possible to refer direct to the invoice. Usually the customer's name is known when reference is made, so that it is convenient to file under customers, in alphabetical order Not infrequently an item is posted to a wrong account, and it is necessary to find the correct customer, then the number or date will be known It is therefore advisable to have a second copy filed in numerical or date order, whichever is most convenient in the particular case Another purpose of the day book is analysis, columns being provided for different classes of goods. A later chapter is devoted to analysis, all that need be said here is that there are other means of attaining that end if need be.

Another purpose is to make falsification of the books more difficult A dishonest clerk will try to delay entries as long as possible so as to find which entry it will best suit him to alter or omit. Further, it is simpler to substitute a false invoice for one in a file than to alter an entry in a book (without leaving a trace). This last can only avail him if he can also alter the ledger and this can be made very difficult by a proper system of balancing as described below. A good system of invoice filing, under which invoices are numbered serially and every

number is accounted for, will give a very good safeguard, and it is usual to separate the ledgers from the filing so that these are handled by different clerks. None the less this point has importance in some cases, and the circumstances of each particular concern should be considered to find whether the day book is necessary. In some countries the day book is made the basis of a sales tax and is then compulsory

Finally, the day book is used for balancing purposes. The items are entered first in the day book and are subsequently entered in the ledger from the same original document (not posted from the day book as is sometimes incorrectly done) If then the day book is cast and the books balance, any error in the figuring can be expected to show, as it is unlikely that the same mistake will have been made in both ledger and day book. The essential of this is that a correct total of the items is obtained If the additions are to be made by eye and head, then the items must be listed under one another as in the day book, but if an adding machine is to be used this ceases to be necessary

Substitutes

Very frequently in modern practice the day book is eliminated and instead the invoices are cast on an adding machine of the Burroughs or Sundstrand type The machine lists are filed, and totals are used to enter a summary day book from which the books are balanced If the ledger is entered by a book-keeping machine (as described in a later chapter) then each batch will be agreed as it is entered If not, then balancing will be done periodically (e g monthly) Provision should be made for the auditors to check the invoices with the lists if they wish to do so, if the items are listed in strict numerical order, it will only be necessary to show first and last numbers on each list Alternatively, if each list represents a day's invoices, then the items can be brought together afterwards (if necessary) by date If neither of these conditions applies strictly, then the reference numbers should be shown on the lists, or perhaps copies of invoices could be fastened to the lists and filed away in batches, which would give the best reference, but more filing work and stationery The method best suited to the particular concern should be used

Cases where still Needed

Nevertheless there are many instances where special circumstances make a day book necessary, and on this assumption it is proposed to describe some of the ways of keeping it

Day Books Kept by Hand

The day book may be in single column, or may have two cash columns, one used for details of the invoices; or may have several columns for

analysis. All these forms are well known and do not need to be described here.

Many special forms of day book are used for special purposes, the difference between these and the normal type being in the provision of columns (memorandum) for the subsequent history of the transaction Each case has to be considered separately and this illustration is given as an example.

A Special Purchase Day Book

Date	Supplier	Folio	Amount	Customer	Sales Invoice Number	Date Paid by Customer	Date Paid to Supplier

Fig. VI—1

This shows a purchase journal for a concern which had an arrangement with its suppliers that each payment should be made to the supplier when payment had in turn been received from the customer. Each item was substantial and was considered separately for this purpose. As will be seen, the columns on the left of the sheet are those usual in a purchase day book, with the value column in the middle. These would be entered day by day in sequence The other columns show the name of the customer, the sales invoice number (for reference), the date payment received from the customer and the date paid to the supplier. In order that errors or omissions could be brought to light, the items not marked off (i.e not paid to supplier) were listed each month on an adding machine and the total agreed with the bought ledger control account.

For any analysis or special day book, an unduly wide form should be avoided as one which is too large is cumbersome and does not make for efficiency.

Another somewhat similar ruling was used for a sales day book where commission had to be paid to the agent as and when payment was received from the customer. Another ruling, used for a purchase journal for goods imported, is shown below. Whenever a day book is kept, the form of it should have special attention, because if it is not possible to use an adding machine list in place of it, the fact alone proves that there is some special condition to be taken into account which would probably justify a specially designed ruling.

Date of Invoice	Supplier	Ship	Date of Report	Invoice Number	Invoice Value	Goods	Freight	Packing	Notes

FIG. VI—2

In the above ruling, £ s. d. columns are given, but these would have to be modified to suit the currency in which invoices were stated

Day Books Entered by Machine

The day book is frequently entered by a typewriter, which can if required have an adding mechanism. If the details are to be entered, the two-box method can be used exactly as for typing the invoices (see chapter on invoicing). Again, if analysis columns are required, a machine with many adding boxes can be used (see the discussion of this point in the chapter on analysis).

There is a particular point in connexion with the machine entering of the purchase day book Where invoices are entered by hand the clerk can look at each invoice to see that it has been duly passed and initialed by the proper person This is not practical with machine entering, as the machine needs full attention if a proper speed is to be attained Provision should therefore be made for a careful scrutiny of the invoices before entering begins.

Machine Proof List

When ledgers are posted by machine it is a common practice to make a carbon copy of all the entries on a proof list. The clerk uses this list to check the entries should any error be found to have arisen. This list is not a day book because—

(1) The items are not entered as they arise, but later, when the ledger is entered.

(2) The items are in ledger order, not in numerical or date order.

(3) As there is only one operation, the agreement of the proof sheet and ledger would have no meaning. A separate list is needed, made independently.

On the other hand, the proof sheet may act as a substitute for the day book for one purpose only—subsequent reference. This will only be necessary in those special circumstances previously explained, where

the record contains further information, as in the following example.

A retail store controls stocks of merchandise at selling price. It is necessary to show selling prices against each purchase invoice. These prices are entered on the invoices and the calculations made, and both cost and selling values cast on a Burroughs portable machine. A bookkeeping machine is then used to enter the invoices in the purchase ledger and at the same time on a record sheet, in this ruling—

RECORD SHEET

Old Balance	Date	Supplier	Invoice No	Debit	Credit	New Balance	Pick up Old Balance	Proof of Items	Sales Values

LEDGER SHEET Account No

Name

Date	Supplier	Invoice No	Debit	Credit	New Balance

FIG VI—3

The ledger card is the original and the record sheet is (in part) a carbon copy of it. The items in the "selling value" column are entered at the same time as the rest of the sheet, but do not show in the purchase ledger. (The method of using the balance columns is explained in the next chapter)

When the entries are complete and agreed, the record sheets are substituted for the original adding machine lists for reference purposes. The lists should be kept until the audit.

CHAPTER VII

LEDGERS—PARTICULARLY THE SALES LEDGER

THE old method—Prompt statements—Mechanical posting—The forms used—The papers inserted in the machine—Proving—A detailed example—A deliberate mistake—The shuttle principle—Double posting—Analysis of overdue accounts—The small man—Adding machine method—Typing machine method—The work which is not mechanized—Marking cash paid—Design of the statement—An example of a bad statement—Form recommended

IN this chapter the general principles of ledger posting are discussed with particular reference to the sales ledger

The Old Method

A sales ledger is a record of money owing from customers It is used as the basis of collection of accounts, and the sending of statements and writing of letters to slow payers. It serves as a check upon the honesty of the cashier and is also one of the books from which the balance sheet is prepared at the year end It is balanced either as part of the whole book-keeping system or else with its own Total Debtors account. In either case it is necessary to obtain totals of sales, cash, returns, and other items posted to the ledger These totals are obtained from books of original entry, or from the adding machine lists, which frequently take their place (see the chapter on books of original entry). The usual forms of hand written ledger and statement are shown below (Figs VII—1 and VII—2)

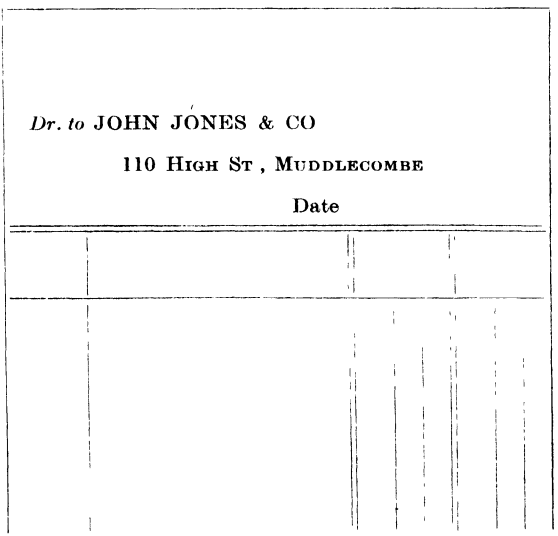


FIG. VII—1

NAME

ADDRESS

Dr.								*Cr.*					
Date		Fo.	£	*s.*	*d.*	Date		Fo.	£	*s.*	*d.*

FIG. VII—2

Prompt Statements

When a ledger and statements are prepared by hand there is a peak load at the end of the month, as, even if the statements have been entered throughout the month, they still have to be cast and the ledger cast and balanced Thus statements are delayed (which delays the collection of accounts) and the work is uneven throughout the month

To avoid this the ledger form may be revised—

Name

Address

		Fo.	*Dr*			*Cr*			Balance		
May 7	Goods		5	1	2						
8	,,			8	3						
8	,,		2	3	0						
8	Returns						11	0	7	1	5

FIG. VII—3

Here the ledger is cast and balance shown after each entry or group of entries. This form is most advantageous where the number of postings to each account is large, so that a group of postings can be made before the balance is calculated.

It is possible to make ledger and statement at one time by carbon paper. It is not easy to ensure that the writing appears on the correct line, and holders are advised for the purpose (see the chapter on the Handling of Papers)

PROOF SHEET

Date

Old Balance	Date	Description	Debit	Credit	New Balance	Old Balance	Control Total

NAME
ADDRESS

Date	Description	Debit	Credit	Balance

STATEMENT

Dr to

H SARJEANT & CO

HIGH WYCOMBE

Date	Description	Debit	Credit	Balance

FIG VII—4

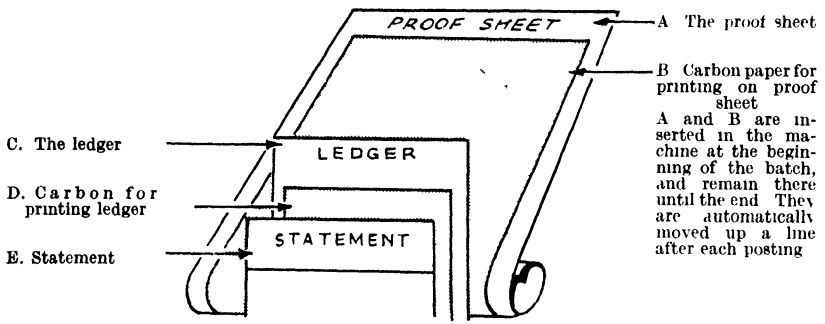
Mechanical Posting

Fig. VII—4 shows forms of proof sheet, ledger, and statement for the orthodox form of ledger posting. This is the system which a business man should consider first, if he wishes to mechanize his accounts. It is also the form which a student should use in his reply to an examination question.

There will in practice be modifications to meet the requirements of a particular machine, the wording may be altered for some minor reason, or there may be further details in the description column, but the general outline has been generally accepted

A diagram showing the paper inserted in the machine is shown below (Fig. VII—5)

The method of making the entries and proving their accuracy will be gathered from the diagram on page 63 (Fig VII—6).



C, D, and E have to be inserted by the operator for each account C and E have each to be inserted the exact distance to ensure that the print appears on the right line
Each type of machine has its own method of ensuring rapid and accurate alinement

FIG VII—5

Note that if the old balance was read wrongly from the card, this method of proof should show the error. For this check to be reliable the operator must always read the old balance figure from the card. It is convenient to have some method of obscuring the first entry of the old balance while the papers are in the machine, so that the operator cannot read it inadvertently and thus repeat any error when she enters the old balance for the second time

The end (right hand) column is sometimes called the proof column.

Detailed Example of Posting Invoices

The method of proving the correctness of the entries is fundamental to machine posting and should be thoroughly understood Figs VII—7 to VII—9 give a detailed example. The operator starts with a batch of invoices, as Fig. VII—7 To enable the reader to follow the three invoices shown the corresponding entries are in heavy type on the pre-list (Fig. VII—8) and on the proof sheet and Ledger (Fig. VII—9).

Only a part of the pre-list is shown in Fig VII—8. It may in practice consist of a hundred or so items This list is made before the posting begins and at the end of posting the total of the pre-list should agree with the total in the register in the machine.

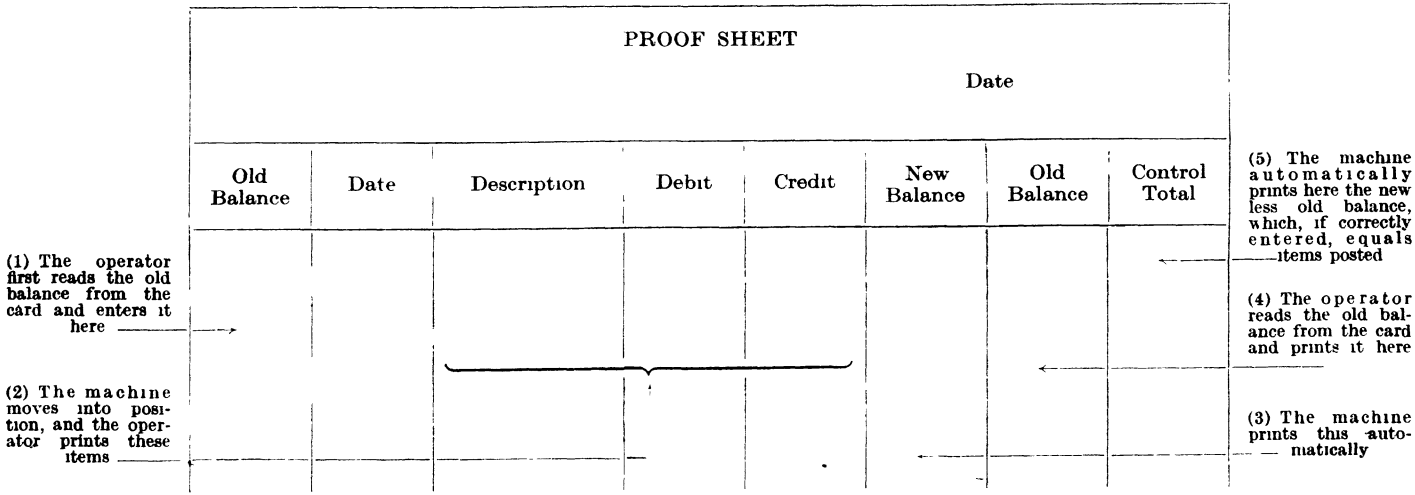

PROOF SHEET
Date
Old Balance
Date
Description
Debit
Credit
New Balance
Old Balance
Control Total
(1) The operator first reads the old balance from the card and enters it here
(2) The machine moves into position, and the operator prints these items
(3) The machine prints this automatically
(4) The operator reads the old balance from the card and prints it here
(5) The machine automatically prints here the new less old balance, which, if correctly entered, equals ——items posted
(6) When all items are posted, the operator presses the total key and the total of the figures in the end column is printed This should agree with the "pre-list" of items

FIG VII—6

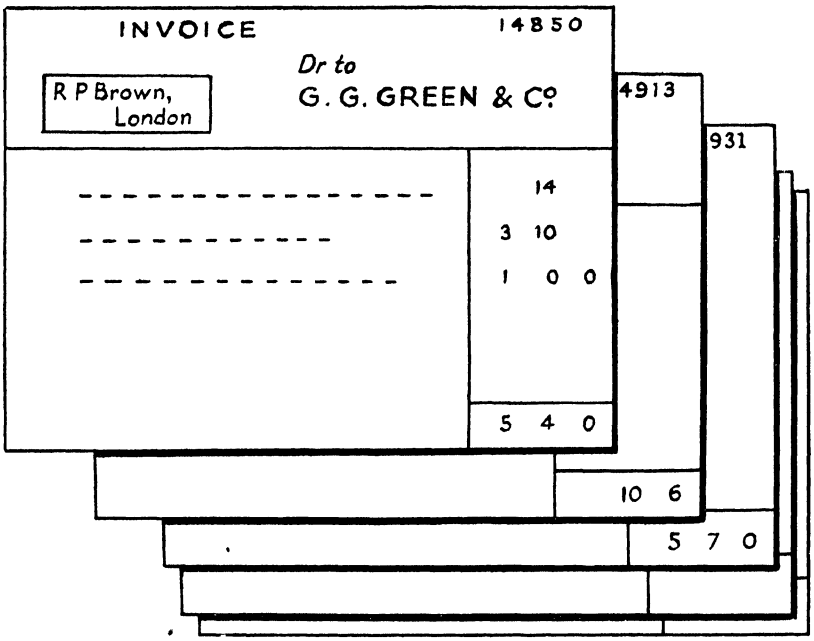


FIG VII—7. THE INVOICES

5	3	0
7	0	4
	5	3
17	10	1
5	4	8
14	7	4
5	**4**	**0**
	10	**6**
5	**7**	**0**
8	9	3
8	9	3
	19	4
5	3	0
	18	0
1	0	7
	5	2
18	18	8
5	4	0
	14	0
7	2	0

FIG. VII—8. THE PRE-LIS

The entries are made in ledger and proof sheet at the same time (see Fig. VII—9), also on the statement (not shown), which is a copy of the ledger

PROOF SHEET

Old Balance	Date	Description	Dr	Cr	New Balance	Old Balance	Control Figures
75 4 9	July 17	14802	5 3 0				
	July 17	14920	7 0 4				
	July 18	14921	5 3		87 13 4	75 4 9	12 8 7
14 14 7	July 17	14827	17 10 1		32 4 8	14 14 7	17 10 1
25 0 0	July 18	14938	5 4 8				
	July 18	14940	14 7 4		44 12 0	25 0 0	19 12 0
41 7 7	July 17	14850	**5 4 0**				
	July 18	14913	**10 6**				
	July 18	14931	**5 7 0**		52 9 1	41 7 7	11 1 6

LEDGER

R P BROWN & CO
CAMDEN TOWN

Date	Description	Dr	Cr	Balance
June 9	BAL			24 3 1
June 15	13804	7 0 1		31 3 2
June 22	13925	15 10 0		46 13 2
June 30	CSH		24 3 1	22 10 1
July 7	RT		10 0	22 0 1
July 9	14301	5 7 0		
July 9	14302	14 0 6		41 7 7
July 17	14850	**5 4 0**		
July 18	14913	**10 6**		
July 18	14921	**5 7 0**		52 9 1

FIG VII—9

A group of items is shown in heavy type. The operator reads the old balance of 41 7 7 from the card and enters it on the proof sheet The machine shuttles into position to print on the ledger The operator reads the information and amounts from the invoices and enters them on ledger and sheet at one operation. The machine moves to the new balance column and prints the new balance (which is a total of the old balance and the items posted). The operator now again reads the old balance from the card, enters it, and the machine automatically deducts this from the new balance and enters the result in the end column. If all the work is correctly done, the figures in this end column should

PROOF SHEET

JULY

Old Balance	Date	Description	Reference No	Dr	Cr	New Balance	Old Balance	Proof
18 3 4	4 July	GDS	7413	5 8 4				
	3 July	GDS	7387	1 17 2		25 8 10	18 3 4	7 5 6
132 4 8	7 July	GDS	7644	8 0 1		140 4 9	132 4 8	8 0 1
72 11 5	4 July	GDS	7459	4 14 3				
	5 July	GDS	7532	7 12 4				
	5 July	GDS	7507	18 0		85 16 0	72 11 5	13 4 7
17 0 2	7 July	GDS	7599	4 12 4				
	4 July	GDS	7414	4 13 4		26 5 10	17 0 2	9 5 8
18 13 2	7 July	GDS	7613	18 8				
	5 July	GDS	7510	1 0 9				
	3 July	GDS	7389	14 0				
	3 July	GDS	7395	14 0		22 0 7	18 3 2	3 17 5
32 9 4	4 July	GDS	7410	14 0				
	5 July	GDS	7511	1 7 0		34 10 4	32 9 4	2 1 0
51 18 0	4 July	GDS	7447	19 6				
	4 July	GDS	7448	8 17 3		61 14 9	51 18 0	9 16 9
								53 11 0

PRE-LIST

5 8 4 *
1 17 2
8 0 1
4 14 3
7 12 4
18 0
4 12 4
4 14 3
18 8
1 0 9
14 0
14 0
14 0
1 7 0
19 6
8 17 3
53 1 11 *

FIG VII—10

The total of the end column of the proof sheet should agree with the pre-list, but does not. Two errors have been made Do you see where they are?

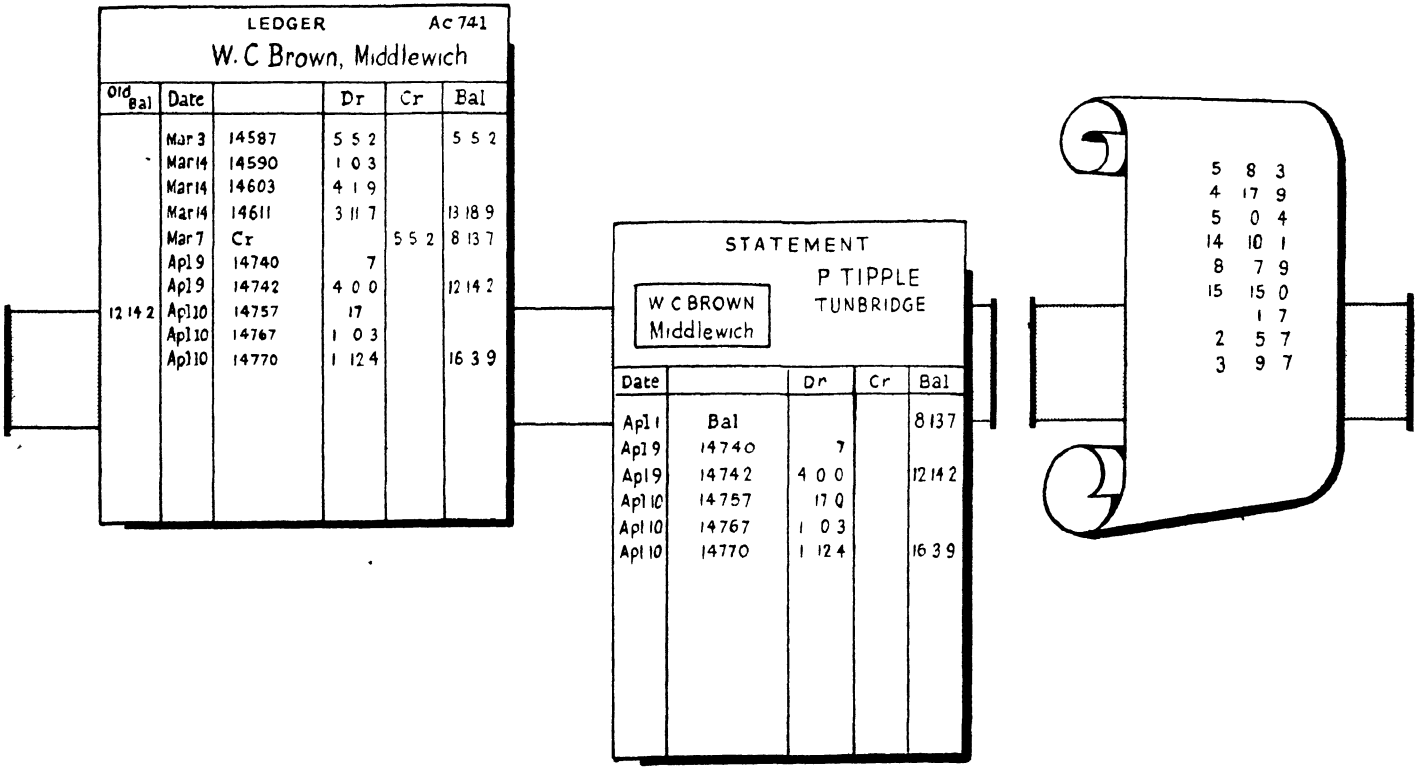

LEDGER
Ac 741
W. C Brown, Middlewich
Old Bal
Date
Dr
Cr
Bal
Mar 3 14587 5 5 2 5 5 2
Mar 14 14590 1 0 3
Mar 14 14603 4 1 9
Mar 14 14611 3 11 7 13 18 9
Mar 7 Cr 5 5 2 8 13 7
Apl 9 14740 7
Apl 9 14742 4 0 0 12 14 2
12 14 2 Apl 10 14757 17
Apl 10 14767 1 0 3
Apl 10 14770 1 12 4 16 3 9
STATEMENT
W C BROWN
Middlewich
P TIPPLE
TUNBRIDGE
Date
Dr
Cr
Bal
Apl 1 Bal 8 13 7
Apl 9 14740 7
Apl 9 14742 4 0 0 12 14 2
Apl 10 14757 17 0
Apl 10 14767 1 0 3
Apl 10 14770 1 12 4 16 3 9
5 8 3
4 17 9
5 0 4
14 10 1
8 7 9
15 15 0
1 7
2 5 7
3 9 7

FIG. VII—11

represent the invoices posted and the total should agree with the pre-list.

Note that this method checks not only the entry of the invoice, but also the reading of the old balance from the card.

A Deliberate Mistake

Fig. VII—10 shows how errors are brought to light. Two deliberate mistakes have been made, resulting in a difference between the total of the end column of the proof sheet and the total of the pre-list

Machine Posting on Shuttle Principle

Instead of using carbon paper the machine can shuttle into position. The carbon method is faster and generally recommended, but the shuttle method is suitable in certain cases (Fig VII—11)

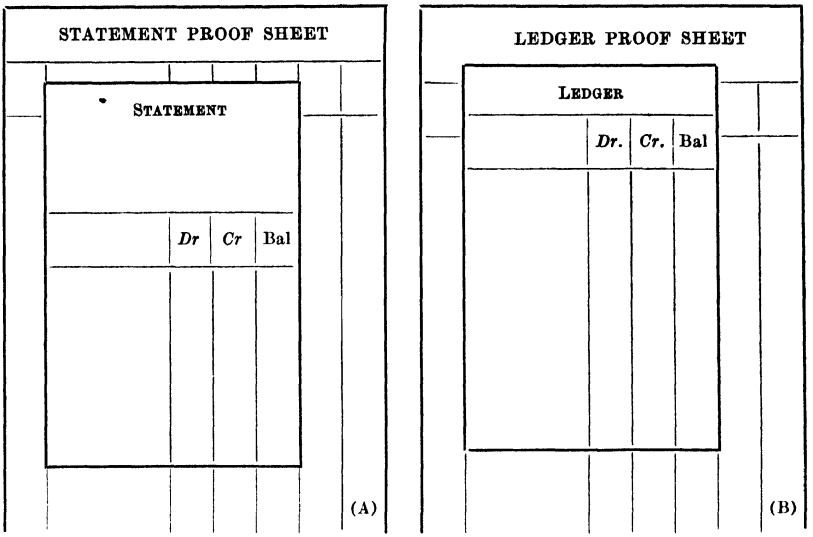
The papers are here shown diagrammatically in the order in which they would appear in the machine.

In this example, three items—17/-, 1. 0. 3 and 1 12. 4.—are posted to an account which already contains a number of other items The proof list on the right is on rollers and remains in the machine. The operator inserts the ledger card and statement for the particular account The first operation is to pick up the old balance, that is to say to press the keys which correspond to it. In the carbon method this old balance (12. 14 2.) was printed on the proof sheet, here it is instead printed on the ledger card. The operator then enters the first item, "Apr. 10, 14757 17. 0 " from the keyboard of the machine. Having printed this on the ledger, the machine shuttles to the statement, prints the same item and returns to the ledger position, ready to print the next item When the operator has entered all the items for this account he presses the balance key, the machine prints the balance (16 3 9.) on the ledger, shuttles to the statement and repeats the balance there. Next the operator presses the keys representing the old balance, but this is not printed. It is deducted by the machine from the new balance and the remainder printed on the proof list. This list corresponds to the last column of the proof sheet in the carbon method, and if correct the total at the end of the batch will agree with the pre-list of all the invoices

Double Posting Method

In this method no pre-list is made Each batch of invoices is machine posted twice, first to the statement and, as a second operation, to the ledger cards. Each operation gives a total of invoices posted and these two totals should agree. Cash is posted to the ledger only. At the end of the month the old items still outstanding are entered on the statement, when the balances on ledger and statement should agree.

The proof sheets will be similar to those used in the orthodox method and the same method of balancing is used (Fig. VII—12).



The two proof columns (A) and (B) each represent the total of invoices in the batch and should agree.

FIG VII—12

The advantages of double posting are—

(1) If an item were to be posted to the wrong account, then the ledger and statement would disagree and the error could be found

(2) The operator is not handling many documents at once and can attain considerable speed

The disadvantages are—

(1) Even though the operator can work faster, the total time taken is more, as each item is posted twice.

(2) There is more work to be done at the month end, which may delay dispatch of the statement

Analysis of Overdue Accounts

There are several methods of producing this result. In each there is some disadvantage as against the orthodox system—either the posting is slightly slower or else there is work to be done at the month end, which delays dispatch of the statements The added information must be weighed against these.

The forms illustrated in Fig VII—13 are designed for use with a Remington or similar machine

The method of operation is similar to those previously described, except as indicated. In posting invoices throughout the month, the operator ignores the opening balance. At the month end, there are two operations—to transfer the monthly total to the balance column on the ledger and to enter the previous month's items on the statement

NAME *J Jones*

ADDRESS

Date	Description	Invoices	Returns	Month's Total	Cash	Balance
Feb. 28	Balance, old card					73 0 0
Mar 31	Balance, old card					17 1 2
Apr 1	Goods	5 0 0		5 0 0		
7	Goods	4 1 8		9 1 8		
8	Returns		7 2	8 14 6		
10	Cash and Dis				71 0 0	17 1 2
17	Goods	23 1 9		31 16 3		
30	Tfr		—	31 16 3		48 17 5
May 2	Goods	9 0 1		9 0 1		
7	Goods	2 10 0		11 10 1		
10	Cash and Dis				10 0 5	38 17 0
17	Goods	17 0 0		28 10 1		
31	Tfr		—	28 10 1		
						67 7 1

STATEMENT

J JONES

Dr to PERCY & PERCY

31 May, 19

Date	Description	Invoices	Returns	Balance
May 2	Goods	9 0 1		9 0 1
7	Goods	2 10 0		11 10 1
17	Goods	17 0 0		28 10 1
	Balance Mar			7 0 9 } Entered
	Apr			31 16 3 } at end of month
	Total			67 7 1

PROOF SHEET

Old Balance	Date	Description	Invoices	Returns	Monthly Total	Cash	Bal	Old Bal	Control	
28 1 3	May 17	Goods	4 1 0							
	May 17	Goods	3 7 6		35 9 9			28 1 3	7 8 6	These would show on other cards
The month's total is used → 15 9 0	May 17	Goods	5 0 0		20 9 0			15 9 0	5 0 0	
11 10 1	May 17	Goods	17 0 0		28 10 1			11 10 1	17 0 0	← See card above

Details of the goods could be shown

This corresponds to "New Balance" in the orthodox system previously described

In posting invoices, these columns are ignored

FIG VII—13

The balances on ledger and statement should be compared to check this work

Machine Posting for the Small Man—Adding Machine Method

This method has weaknesses which make it uneconomic for a large concern and is recommended for those smaller businesses which do not justify the use of an expensive machine

The statement is made in a machine such as a Burroughs Portable, with a wide carriage and date keys

The statement is made in duplicate, one for the customer, the other as a summary of invoices for the ledger

The invoices are entered in batches

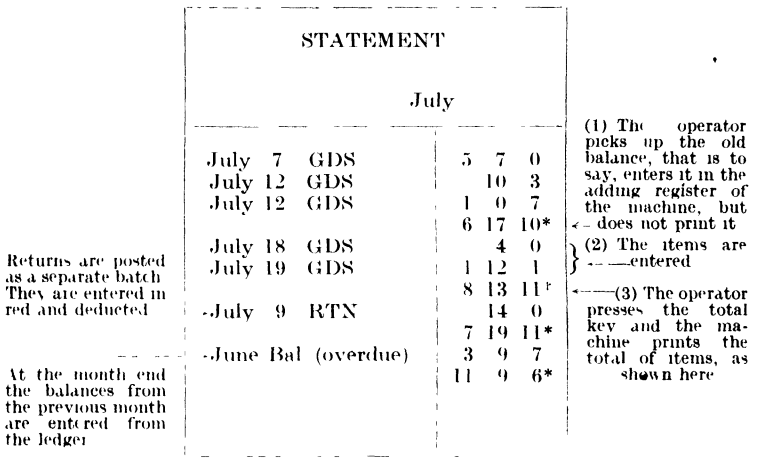


FIG VII 14

As the statements are entered, the operator does not return them to the file, but makes a pile of them At the end of the batch the

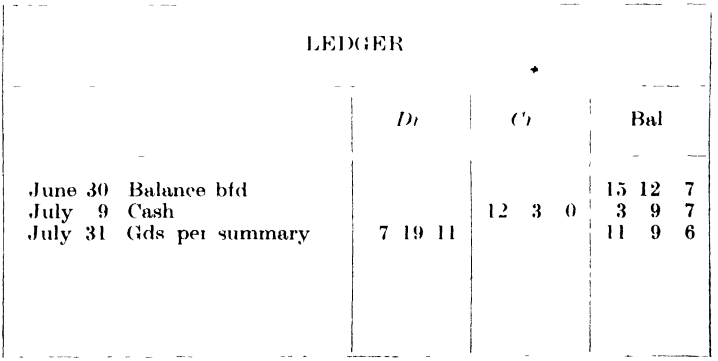


FIG VII—15

operator runs through the pile, first adding the old balances (with the machine), then adding the new balances.

The difference between these should agree with the pre-list of invoices.

The ledger is kept by hand, as there are relatively few entries. The cash is posted as it comes in The invoices are posted in total at the month end The ledger should be balanced before the statements are dispatched

Machine Posting for the Small Man—Typing Machine Method

One of the smaller models of the Remington range is often convenient to the small business as the machine can be used as a typewriter when not being used for posting The machine chosen must be fitted with a front feed carriage for the insertion of the ledger cards The simplest machine is the cross-adding model without vertical adding mechanism This is used to make the entries on statement, ledger, and proof sheet, and the machine computes the new balance, which the operator reads and enters There is no mechanical proof of accuracy At the end of the batch of postings the operator calls over the items and old balances

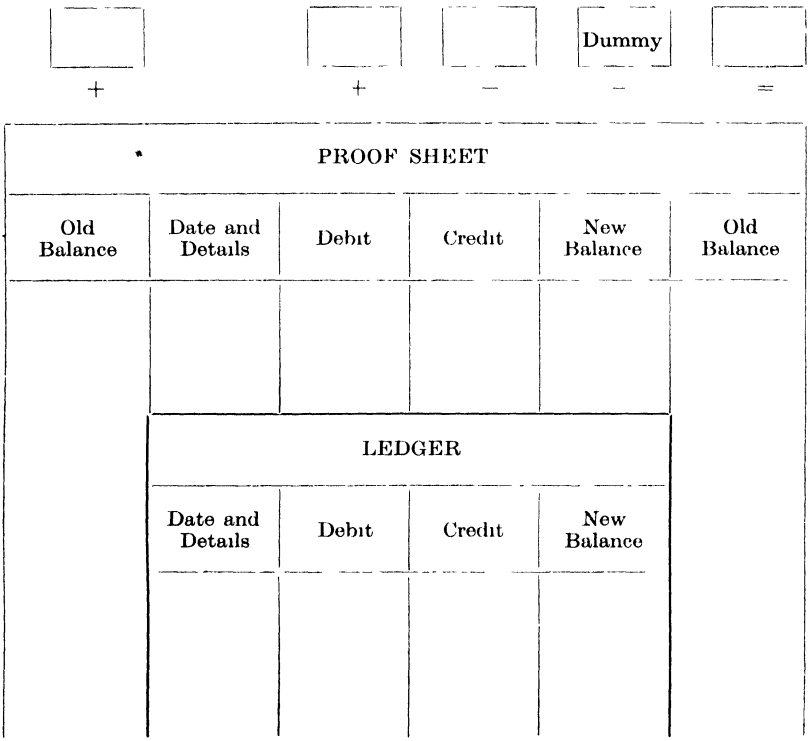


FIG. VII—16

with an assistant. This method is recommended for only a small number of items.

As has been shown, for the orthodox method of machine posting and proving the entries, two cross adding registers are needed. For a medium sized concern a satisfactory method of proof can be arranged with a Remington machine with one cross footer and a number of vertical adding registers. The arrangement of the adding registers is shown on page 72

The old balance is entered in two registers, being read from the card each time. These registers should be in agreement and the operator should glance at them after each entry to ensure that there is no error.

The Work which is Not Mechanized

When adopting a system of mechanical accounts it should not be forgotten that the handling of ledger accounts is not pure routine, but requires individual attention Letters have to be written for those accounts which become overdue, customers' queries have to be answered The volume of such work varies from trade to trade and business to business and it is not uncommon to find that after mechanization this work needing individual attention occupies more time than the (mechanized) entering in the ledgers

SPECIMEN LEDGER CARD AS PRINTED ON THE BOOK-KEEPING MACHINE

LEDGER CARD

A Customer

Date	Details	Debit	Credit	Balance
	BAL			17 18 3
July 3	1482	5 7 0		
July 3	1483	14 1 9		37 7 0
July 9	1532	15 0		38 2 0
July 29	1740	5 7 0		43 9 0
July 31	CSH		14 2 6	29 6 6
Aug 4	1804	5 8 2		34 14 8
Aug 17	1944	5 7 0		
Aug 17	1945	14 0		
Aug 17	1947	12 0 9		
Aug 17	1948	12 1 0		64 17 5
Aug 30	CSH		23 19 6	40 17 11
Sept 4	2001	5 7 0		
Sept. 4	2002	18 0		47 2 11
Sept 9	2117	44 0 9		91 3 8
Sept. 24	2284	1 12 4		
Sept 24	2288	2 17 3		95 13 3
Sept. 30	CSH		23 9 11	72 3 4

FIG. VII—17

A part of the individual attention given to accounts is the marking of details of cash paid Clerks must be trained in a sound method of doing this, particularly where there are many items to each account The usual commercial account is quite different from a bank account in this respect In the latter the balance is the important factor, no attempt is made to relate particular debits to particular credits. In commercial accounts, however, the customer pays particular items The balance outstanding, therefore, represents particular unpaid invoices and details must be kept to show which these are The method recommended will be seen from Fig VII—17 (See page 73)

The card shows that £72 3s 4d is outstanding on September 30th but does not show which items this represents

(This example shows only four or five invoices each month How much more necessary would details have been had there been forty or fifty items per month)

The same card, marked to show which items are paid, is shown in Fig VII—18

LEDGER CARD

A Customer

Date	Details	Debit	Credit	Balance
	BAL		A part 1 B part 1	17 18 3
July 3	1482 B	5 7 0		
July 3	1483 B	14 1 9		37 7 0
July 9	1532 B	15 0		38 2 0
July 29	1740 C	5 7 0		43 9 0
July 31	CSH		A14 2 6	29 6 6
Aug 4	1804 C	5 8 2		34 14 8
Aug 17	1944	5 7 0		
Aug 17	1945 C	14 0		
Aug 17	1947 C	12 0 9		
Aug. 17	1948	12 1 0		64 17 5
Aug 30	CSH		B 23 19 6	40 17 11
Sept 4	2001	5 7 0		
Sept 4	2002	18 0		47 2 11
Sept 9	2117	44 0 9		91 3 8
Sept 24	2284	1 12 4		
Sept 24	2288	2 17 3		95 13 3
Sept 30	CSH		C 23 9 11	72 3 4

FIG VII—18

The customer sends details with the cheque in the form which suits *him*, shown on page 75.

A CUSTOMER

29 SEPT

Enclosed is our cheque in respect of the following items

July 29	1740	5 7 0
Aug 4	1804	5 8 2
Aug 17	1945	14 0
Aug 17	1947	12 0 9
		23 9 11
	(C)	

This should be marked with a letter or other reference to the ledger

A CUSTOMER

30 Sept

Aug 17	1944	5 7	0
Aug 17	1948	12 1	0
Sept 4	2001	5 7	0
Sept 4	2002	18	0
Sept 9	2117	44 0	9
Sept 24	2284	1 12	4
Sept 24	2288	2 17	3
		72 3	4*

If the account is complicated, a machine list of items can be made each month to agree the balance outstanding This list would be clipped to the card for reference

FIG VII—19

The Design of the Statement

The first consideration must be the convenience of the man who is to receive the statement Economy and ease of preparation will naturally receive due consideration, but the "other man" is not present, and his views are not expressed As the object of sending statements is to convey information to this "other man," the best statement is that which is clearest to him

On the other hand, some small shopkeepers find all machine-posted statements difficult to understand because the balance is shown in a third column instead of being carried down at the end, as in the old method. The prejudice against them, however, is rapidly disappearing, and most wholesale houses now use this method

Where there is a running current account between two business concerns the statement is the regular medium by which the books of one concern are checked against those of the other It should show—

(*a*) The balance brought forward from the previous statement either in detail or in one figure,

(*b*) The items (invoices) for the current period, usually a month,

(*c*) Reference numbers to enable the customer to trace the invoices,

(*d*) Cash received and any credits allowed,

(*e*) The balance outstanding,

(*f*) When payment is due and the rate of discount if any.

An Example of a Bad Statement

The following example is based upon an actual statement which came to the notice of the author—

STATEMENT

To

MACK'S EMPORIUM
YARDLEY

From

SMUG & CO.
LONDON

31 Dec.

Account No.	Ref No	Age	Date		Class of Item	Transaction (The last item is the final balance)	Monthly Sub-totals
			Month	Day			
12345		4	8	31	2	20 8 3	20 8 3
12345		3	9	30	2	81 10 4	81 10 4
12345		1	11	30	2	105 19 1	105 19 1
12345	8801		12	4	1	5 12 0	
12345	8843		12	9	1	17 4 8	
12345	8843		12	10	1	7 7 4	
12345	1104		12	10	4	1 5 6—	
			12				
12345	8898			17	1	5 18 1	
12345	8954			24	1	60 9 2	95 5 9
						303 3 5 *	

Class of Item
1 = Invoice; 2 = Old Balance, 3 = Cash, 4 = Credit Note, 5 = Discount

FIG. VII—20

The weak points are—

(1) Debits (invoices) and credits (credit notes, cash, etc.) are all in one column, without even a distinction of colour. True, the credits are marked with a minus sign, but that would be very confusing to a clerk not accustomed to the system.

(2) The method of describing items by numbers is also confusing.

(3) The monthly sub-totals are intended to draw the customer's attention to the overdue portion, but he will not understand them without some study of the statement. They fail in their purpose.

(4) One invoice (8843) is split into two entries. This might help the internal analysis in the sender's office, but only adds to the confusion in that of the customer.

(5) If the statement were for many items, it would present a great mass of figures without the relief of wording.

Statement Form Recommended

On previous pages statements have been simplified to bring out particular points. A form recommended is illustrated below, in more detail.

STATEMENT

To MESSRS. JONES & CO. CARDIFF

From GENERAL MERCHANT CO. LONDON

Date 31 *March*

LONDON

Date	Description	Reference Number	Invoices	Cash and Credits	Balance
Mar. 1	BAL	—			124 9 1
4	CSH	519		80 6 6	44 2 7
6	GDS	7019	1 8 7		
7	GDS	7073	120 9 10		
8	GDS	7110	20 3 3		
14	GDS	7398	21 4 6		
23	GDS	7571	28 2 0		235 10 9
27	CR	1418		21 4 6	214 6 3
29	GDS	7701	5 3 0		219 9 3

BANKERS EASTERN BANK, HOLBORN

Cash received since the end of the month is not shown

Accounts are due on the last day of the month following delivery. If paid before that date, 2½% discount will be allowed

The last item in this column is the balance at the end of the month

FIG VII—21

The descriptions, although abbreviated, are clear without footnotes (particularly so to a bought-ledger clerk).

The terms should be stated clearly, as they are necessary in order to fulfil the purpose of the statement to collect the money.

The banker's name is a convenience to those customers who pay by the bank transfer method

CHAPTER VIII

THE PURCHASE LEDGER

DOCUMENTS connected with the purchase ledger—Passing of purchase invoices—Machine-posted purchase ledger—Suppliers' statements—Agreement of statement with purchase ledger—Slip system—American system—Advantages of the American system

THE documents connected with the purchase ledger come from outside sources and must be accepted in the form in which the supplier chooses to send them. The routine for handling them varies considerably, the following may be taken as typical—

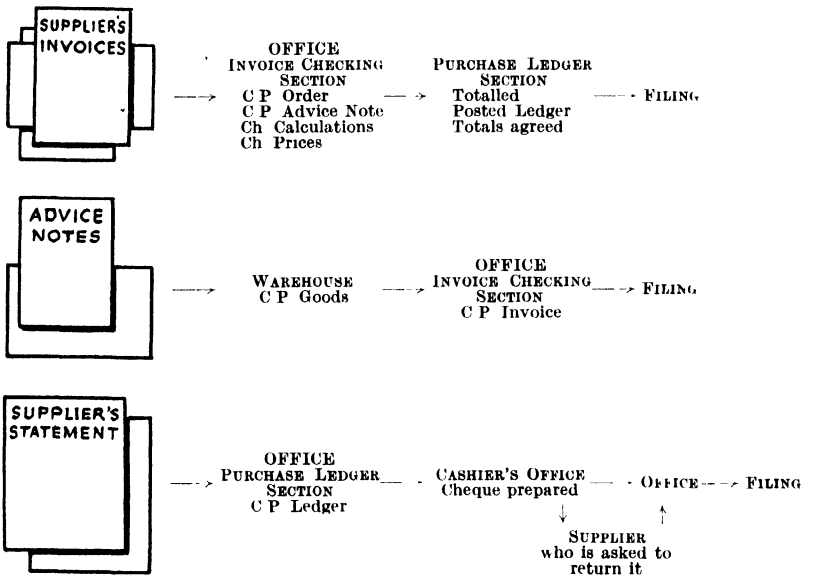


FIG. VIII—1

The Passing of Purchase Invoices

A diagram showing the routine checking of invoices is given in Fig VIII—2.

To ensure that the work is completed, it is usual to have a rubber stamp, impressed on the front of the invoice if there is room, otherwise on the back. The stamp will be similar to Fig VIII—3. (See page 79.)

The clerks who do the work initial in the spaces shown.

The ledger clerks are instructed not to enter any invoice unless the stamp has been completed.

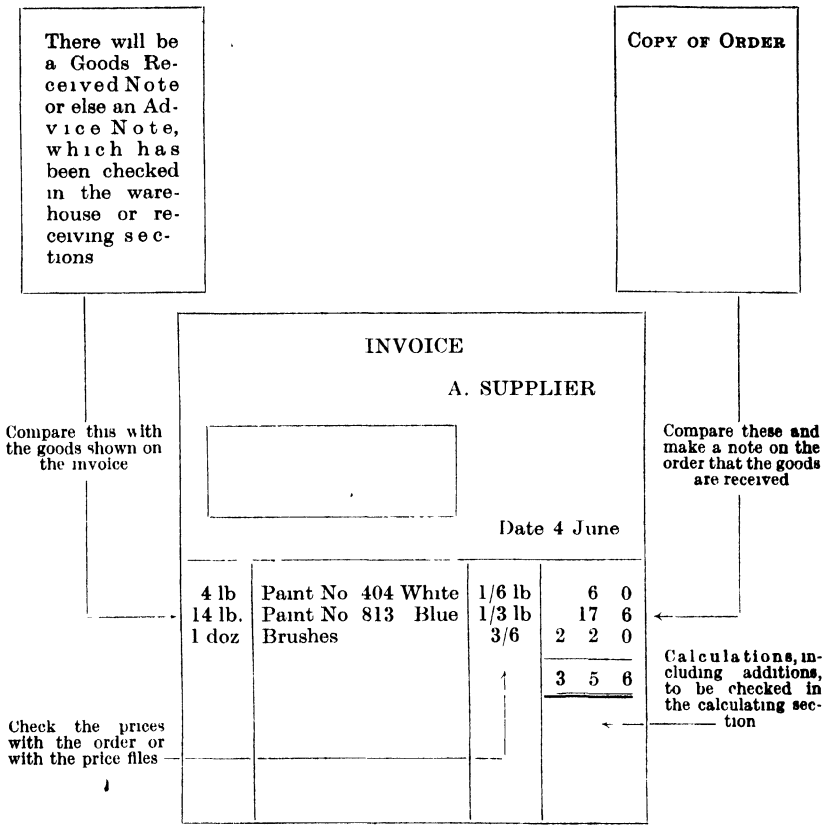


FIG VIII—2

INVOICE CHECKING SECTION	
Date received in section	
Checked with Advice Note by	
Checked with order by	
Calculations checked by	
Prices checked by	
To be charged to Job Number	

FIG. VIII—3

Machine-posted Purchase Ledger

The invoices, which are of varying sizes and shapes, are made into convenient batches (Fig. VIII—4)

The items are pre-listed as shown in Fig VIII—5

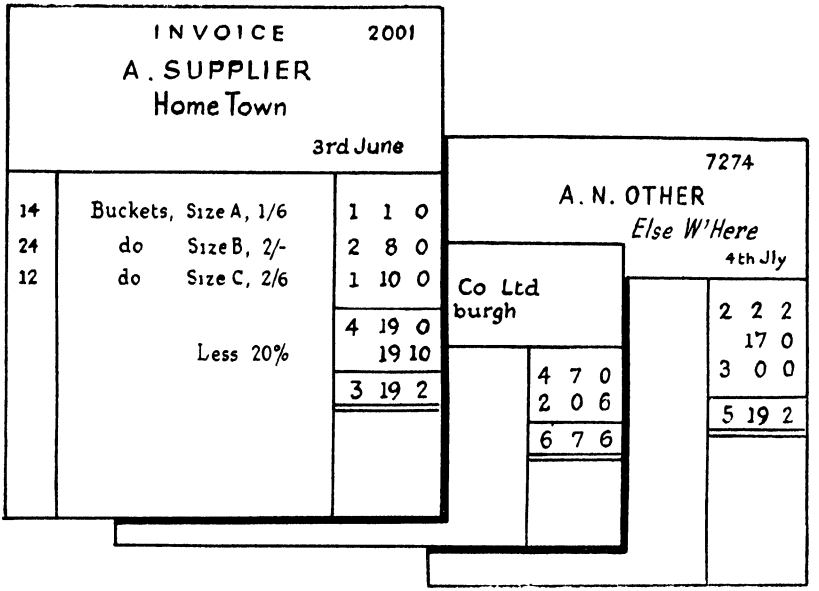


FIG VIII—4

		*
7	4	9
8	8	8
	15	0
14	1	0
3	19	2
6	7	6
5	19	2
	14	0
2	0	1
5	18	0
	2	6
	15	4
	18	0
1	7	0
1	9	0
18	0	0
	14	3
2	4	0
2	5	3

FIG. VIII—5

The operation of posting is similar to that in the case of the sales ledger, but invoices are in the credit column

The details in the second column vary with different machines.

LEDGER CARD

A. SUPPLIER

Date	Description	Reference Numbers	Cash and Credits	Invoices	Balance
May 4	GDS	1174		18 0	
May 4	GDS	1288		1 4 0	2 2 0
May 19	GDS	1704		5 0 0	7 2 0
May 24	GDS	1922		2 0 6	9 2 6
May 20	CR	121	18 0		8 4 6
June 1	CSH	44	7 2 0		1 2 6
June 3	GDS	2001		3 19 2	5 1 8

FIG VIII—6

PROOF SHEET

Batch 14 JUNE

Old Balance	Date	Description	Reference Numbers	Cash and Credits	Invoices	Balance	Old Balance	Proof
14 3 0	June 3	GDS	17812		7 4 9			
	June 3	GDS	17900		8 8 8			
	June 4	GDS	17824		15 0	30 11 5	14 3 0	16 8 5
90 7 4	June 3	GDS	4444		14 1 0	104 8 4	90 7 4	14 1 0
1 2 6	June 3	GDS	2001		3 19 2	5 1 8	1 2 6	3 19 2
7 2 3	June 4	GDS	740		6 7 6	13 9 9	7 2 3	6 7 6
46 0 2	June 4	GDS	7274		5 19 2			
	June 4	GDS	7275		14 0	50 13 4	46 0 2	6 13 2

FIG VIII—7

To post the item for "A. Supplier," £3 19s 2d , the operator picks up the old balance (£1 2s 6d.), enters the item, and the machine calculates the new balance (£5 1s 8d.). The operator again reads and enters the old balance, £1 2s 6d , which the machine deducts from the new balance, giving the figure in the "proof" column At the end of the run, the proof column should agree with the pre-list

Agreement of Statement with Purchase Ledger

The purchase ledger clerk checks the statement against the ledger marking it as shown in Fig. VIII—8.

STATEMENT

From

A. SUPPLIER

CUSTOMER AND CO
LONDON

June

Date			Invoices	Cash and Credits	Balance
June 1	Balance bfd			√	74 8 3
June 9	GDS 7421	√	5 18 3		
June 10	GDS 7449	√	4 4 6		84 11 0
June 14	GDS 7742	√	10 12 0		95 3 0
June 27	GDS 7912	Not cleared	4 19 2		
June 27	GDS 7913	Not cleared	15 0		
June 27	GDS 7914	Not cleared	14 0 0		114 17 2
June 7	RTN 448		√	2 10 0	112 7 2
June 8	CSH		√	32 7 11	79 19 3
				Less cheque 4 July	39 10 4
					40 8 11
			Less items not yet cleared		19 13 2
				Cheque 1 Aug	£20 15 9

FIG VIII—8

Agreement of A Supplier account for June

Balance per Ledger	23 5 9
Less credit 448 to be posted	2 10 0
Cheque 1 Aug	20 15 9
Add items not yet cleared	
June 27 7912	4 18 2
June 27 7913	15 0
June 27 7914	14 0 0
	40 8 11
Add Cheque not on statement	39 10 4
Total per statement	79 19 3

FIG. VIII—9

The person signing the cheque should insist upon seeing this statement, not only to know what account is paid, but also to check that the invoices are reaching the ledger clerk promptly. Numerous deductions will damage the firm's credit.

The supplier will be asked to return the statement, but may not do so. The clerk should keep notes such as those shown in Fig. VIII—9

The agreement (between the statement and his note) checks his calculations.

Slip System of Purchase Records

A ledgerless system is sometimes used for purchases, as shown below

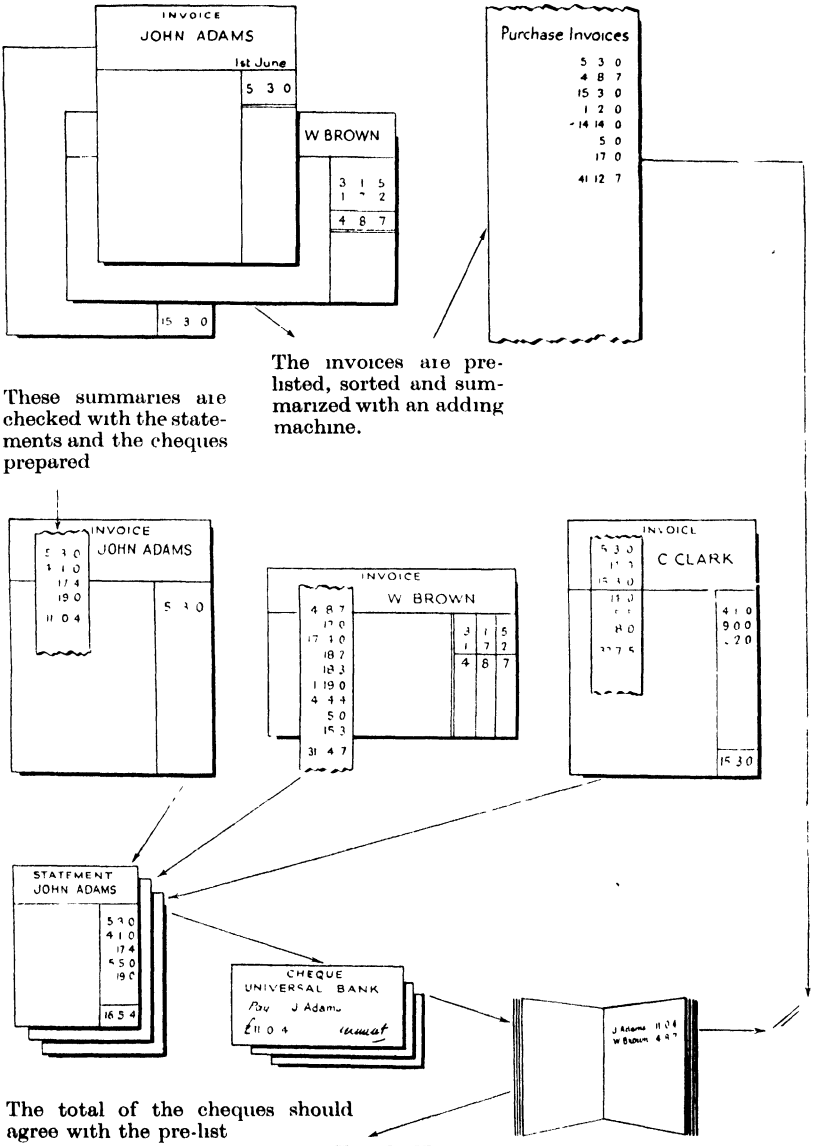


FIG VIII—10

As compared with the usual purchase ledger, there is less clerical work in using the above-mentioned system.

The disadvantages are these—

(1) The work is uneven. There is a slack period during the month, while the invoices accumulate, and a rush period at the end of the month, when they are summarized.

(2) The system depends upon rigid adherence to a routine. If the invoices do not flow regularly to hand, or if the records are untidy, or filing poor or balancing perfunctory, then the results will not be even reasonably satisfactory Like all slip systems, this is either very good or very bad, there is no middle course

(3) There is no provision for abnormal entries, e.g. contra accounts

(4) The records are not in permanent form, but depend upon the filing. After a number of years it will be necessary to destroy the invoices, as they are bulky.

The American System

This is a machine-posting system, in which those invoices which come to hand are paid, without any reference to the supplier's state ment. This makes it necessary to keep a register of invoices to ensure that they reach the ledger section in a regular flow, not being held in the works, nor in the invoice checking section

REGISTER OF INVOICES RECEIVED

Date

No	Supplier	Date of Invoice	Amount	Department to which Sent	Date Returned
(A)			(B)		(C)

(A) Each invoice is given a send number, which is marked on the invoice by a numbering stamp

(B) Note that this column cannot be added to agree with the ledger, as there will always be some items which are not returned promptly. The register is, therefore, not a day book in the book-keeping sense.

(C) As the invoices come back, they are entered here. Any which are not cleared within a reasonable time are the subject of an inquiry.

FIG. VIII—11

Any type of book-keeping machine can be used The routine is indicated by the diagram in Fig. VIII—12

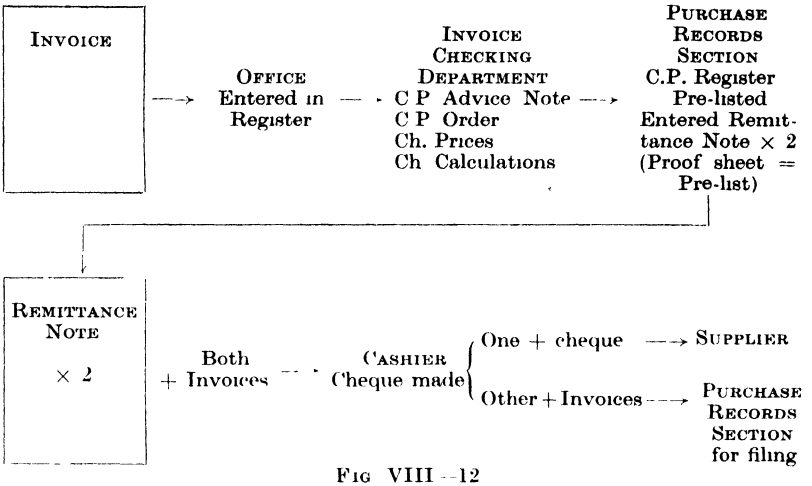


FIG VIII—12

The remittance advice is made on the book-keeping machine at the same time as the ledger, using carbon paper

The following form is typical—

REMITTANCE ADVICE

No

PERCY ROBINSON & CO

LEAMINGTON SPA

To

Date 31 *July*

Date	Description	Your Ref	Our Ref.	Debit	Credit	Balance
4 June	GDS	5817	443		58 7 2	58 7 2
2 June	GDS	5702	447		4 0 3	62 7 5
9 June	GDS	5992	453		44 14 5	107 1 10
17 June	GDS	6162	524		33 9 0	140 10 10
15 June	RTN	482	513	·7 2 0		133 8 10
	(A)	(B)				

Dear Sir,

We have pleasure in enclosing cheque in settlement of the items above

Yours faithfully,

PERCY ROBINSON & Co.

R R. Robinson

It is convenient to give each advice a number.

(A) The description should be readable (without reference to a code).

(B) The supplier's reference is most important.

FIG VIII—13

The object of the form is to convey information to the supplier His convenience should therefore be studied

The ledger would be ruled exactly as the remittance advice. The proof sheet would be wider, with old balance and proof columns. The method of operation is similar to the machine-posted ledger previously described

Advantages of the American System

The chief advantage of the American system in the case of the purchase ledger is that the "head and hand" work is reduced because the statement is not checked with the ledger The disadvantages are—

(1) A register of invoices is needed, to enforce steady flow of the papers, as the statement is not used for the purpose.

(2) A queries department will be necessary to do some of the work which is associated with checking statements

(3) The executive who signs the cheque or authorizes payment has no outside evidence upon which he can rely

NOTE —The American system of purchase records is often used in conjunction with the trader's credit method of payment because the same machine can conveniently be used for both. There is, however, no fundamental connexion, and either system can be used without the other.

CHAPTER IX

SOME SPECIAL LEDGERS AND STATEMENTS

CUSTOMERS' ledger of a bank—Machine-posted—Hotel ledger—Machine system—Hire-purchase ledger—Visible cards—Machine-posted—Public utility concerns—Bills entered by hand—Bookless method—Examples of machine billing—Consumers' ledger—The addressing machine—Billing—Insurance company's renewal notices

THIS chapter is intended to give examples of ledgers which differ in some point of principle from those given in the previous chapters The reader should appreciate that examples are chosen to emphasize the differences, and that many alternative examples might have been chosen to which more orthodox systems would have been appropriate Nor should the systems in this chapter be taken as applicable without independent thought to any particular concern the object is to illustrate ideas, not to create rigid precedents

The Customers' Ledger of a Bank

The bank's ledger must always be up to date Therefore it is not practicable to wait until there are enough of one kind of item to make a batch, as is commercial practice. Items must be posted as they arise, debit or credit. This means slightly more care on the part of the operator. The balancing figure will not be obtained from a single pre-list, but from an account made from various pre-lists, or waste books as the banker calls them Otherwise the principle is identical

Banks use a comprehensive slip system Each transaction is recorded on a slip, which may be a cheque, a paying-in slip, or some form of transfer instruction The essentials are the date, the amount, the persons or accounts to be debited and credited, and the signature of the person giving authority The routine is—

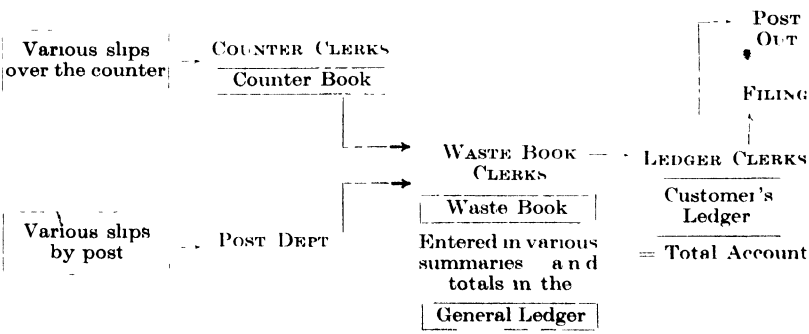


FIG. IX—1

Customers' Ledger—Machine Posted

The statement (to be handed to the customer) will be similar to the ledger card and is not illustrated.

The proof sheet method is given here, as being easier for the reader to follow, but in some actual cases only the last column is printed on a proof list (Compare that with the "shuttle" method of posting a sales ledger)

PROOF SHEET

AUG 30

Old Balance	Debit	Credit	Balance	Old Balance	Proof
14 7 1	Aug 30 243 5 3 0				
	Aug 30 244 7 1 1		2 3 0*	14 7 1	12 4 1–
103 7 4	Aug 30 711 18 3	Cqs 17 2 0	119 11 1*	103 7 4	16 3 9
8 15 1–	Aug 30 176 1 2 6				
	Aug 30 177 5 0 0	Cqs 24 5 8	9 8 1*	8 15 1–	18 3 2

LEDGER

Debit	Credit	Balance
July 29		29 14 6*
July 31 171 5 0 0		
July 31 169 2 6 8		22 7 10*
Aug 3 S/O 20 0 0		2 7 10*
Aug 7 168 3 10 0		1 2 2 O/D
Aug 17 172 5 0 0		6 2 2 O/D
Aug 19 173 3 7 2	CQS 5 11 8	3 17 8 O/D
Aug 23 174 8 5		4 6 1 O/D
Aug 27 S/O 4 4 0		8 10 1 O/D
Aug 28 CBK 5 0		8 15 1 O/D
Aug 30 176 1 2 6		
Aug 30 177 5 0 0	CQS 24 5 8	9 8 1*

ABBREVIATIONS

CQS = Cheques
S/O = Standing Order
CBK = Cheque book
Div = Dividend
* = Credit balance
O/D = Overdrawn

(There will be other abbreviations besides those shown here)

Note that the proof total may be debit or credit (marked with a minus sign)

FIG IX—2

There will be *occasional* items needing more than an abbreviated description This difficulty can be met either by using a machine with typing keys, or by typing such descriptions afterwards as a separate job. In the latter case, sufficient room must be left on the form, but a machine with small type can be used.

Hotel Ledgers

The special point of the hotel ledger is that it must always be up to date, so that the customer can have his bill immediately, whenever he asks for it. A special type of hand-written book has been evolved for

this purpose and may be classified as a tabular ledger. (It is usually called a summary book, but does the work of a ledger.)

The information reaches the office in the form of slips, usually from the waiters. The items are entered at once in the summary book and on the customer's bill (suggested rulings for these are given). The headings into which the items are divided must be the same on each, and for easy reference these headings are numbered Note that the summary shows accounts for all customers for one day on one page, whereas the bill shows several days' charges for one customer If each is entered from the original slips, the bill can serve the purpose of checking the summary, and vice versa This is not a double entry check in the orthodox sense, as the slips are not entered in any day book, nor independently added day by day however, the check is satisfactory The summary book is cast daily and totals carried forward to the next day until the end of the month, when they are posted to the impersonal ledger

In a small hotel this system may be unnecessarily cumbersome In such cases the summary is not used, but is replaced by a carbon copy of the customer's bill When the bill is paid (usually weekly) the item is treated as a cash sale and entered in an analysis cash book This method gives no check upon the accuracy of the bill, in this respect the bill is comparable to an invoice for goods rather than to a statement of an account

GRAND HOTEL

MR KENILMINSTER

Week ending

Room No

		Sun.	Mon.	Tues	Wed	Thur	Fri	Sat.
1	B. forward							
2	Rooms							
3	Breakfast							
4	Lunch							
5	Dinner							
6	Garage							
7	Bath							
8	Drinks							
9	Sundries							
10	C. forward							
							Total	

FIG. IX—3

GRAND HOTEL

DAILY SUMMARY

Date

Room No	Name	1 B. Fwd	2 Rooms	3 Break-fast	4 Lunch	5 Dinner	6 Garage	7 Bath	8 Drinks	9 Sun-dries	Deduc-tions	Cash	10 C. Fwd.
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													
16													
17													
18													
19													
20													
Extra													
	Daily Total												
	Bfd												
	Total for Month to date												

(If more convenient, the arrangement may be inverted, with a column for each customer and a line for each class of goods)

FIG. IX—4

Hotel Ledger—Machine System

A National machine of the 2000 (cash register) class is often used for hotel billing and ledgers The machine is similar to the posting and analysis machine described in Chapter III, and has 27 registers, some of which are used for the posting operations, others for analysis

TELEPHONE COURT 1122 TELEGRAMS NACARECO, Wesdo London

ROOM No. 456

NAME Mr W J SMITH

HOTEL NACARECO
LONDON, W.1.

REMARKS	ITEM NO	DATE	DETAILS	CHARGES	CREDITS	BALANCE DUE
	1	1-JAN 46	APART	x -14-6		
	2	1-JAN 46	PHONE	x --1-0		x -15-6
	3	1-JAN 46	GRILL	x --7 0		
	4	1-JAN 46	WINES	x -14-0		x 1-16-6
	5	2-JAN 46	PD OUT	x --5 0		
	6	2-JAN 46	MEALS	x -13 9		
	7	2 JAN 46	PHONE	x --0-6		x 2-15-9
	8	2 JAN 46	APART	x -14-6		x 3-10-3
	9	3 JAN 46	MISC	x -15 0		x 4-5-3
	10	3 JAN 46	CIGS	x --2-0		
	11	3 JAN 46	MEALS	x -17-0		x 5-4-3
	12	3 JAN 46	APART	x -14 6		x 5-18-9
	13	4 JAN 46	CASH		x 5-18-9	--0-0
	14					
	15					

FIG IX—5. CUSTOMER'S BILL

There are four sets of print mechanism, used for

(*a*) Bill for the customer (Fig IX—5)
(*b*) Ledger sheet, similar to the bill (not illustrated)
(*c*) Confirmation on the voucher (Fig IX—7)
(*d*) An audit list (Fig IX—6)

There is no time to agree the postings with any pre-list as the customer may call for his bill. Therefore, another check is used The machine prints the same information on the voucher as it prints on the bill, and the voucher immediately passes to another clerk sitting beside the machine, who checks that the information now on the bill is correct This is not quite so sound a check as the balancing method described in Chapter VII, but on the other hand the account number is checked as well as the value.

	OB					*	3-16-3	
CASH				*	3-16-3			E.345
	BL					*	--0-0	
	OB					*	6--4-8	
MEALS		*	—8-9					E.543
	BL					*	6-13-5	
	OB					*	7-16-9	
CASH				*	2--4-0			E.657
	BL					*	5-12-9	
	OB					*	6--7-9	
NEWS		*	—0-8					E.617
	BL					*	6--8-5	
	OB					*	5--4-7	
WINES		*	—3-7					A.800
	BL					*	5--8-2	
	OB					*	-15-6	
GRILL		*	—7-0					A.456
WINES		*	-14-0					A.456
	BL					*	1-16-6	
	OB					*	12--4-6	
CASH				*	12--4-6			A.123
	BL					*	--0-0	
	OB					*	6--6-9	
LNDRY		*	—2-4					A.547
	BL					*	6--9-1	
	OB					*	6--5-8	
MISC.	THEA	*	-10-6					A.568
	BL					*	6-16-2	

FIG. IX—6. AUDIT LIST

STOCK

GOODS *Burgundy etc* AMOUNT *14/-*

NAME *J Smith* ROOM No *456*

DATE	AMOUNT	ROOM No
1-JAN-46 WINES	-14-0	A 456

FIG. IX—7 VOUCHER

Hire Purchase Ledger

If there are few accounts a loose-leaf ledger in standard form is best The same is true in those cases where interest has to be calculated separately on each payment In the following examples it is assumed that interest is added in one sum at the commencement

If the instalments are not very numerous, a ledger in summary form is often convenient, as, for example, this ruling—

HIRE-PURCHASE ACCOUNTS

Agreement No	Name	Goods	Charges	Total	Payments Received							Transfers
					Deposit	1	2	3	4	5	6	

FIG IX—8

As with other summary ledgers, this can be balanced monthly with the aid of an adding machine.

Where the accounts are numerous, and reference has to be made to them while the customer is in the shop, a visible card system (e.g. Kardex) is convenient (See Fig. IX—9.)

Hire Purchase Ledger Machine Posted

If remittances come by post they may be posted in batches as described in Chapter VII, it is an ordinary posting operation and any of the recognized types of machine can be used

If the customer pays at the counter another factor is introduced, as the item must be entered at once, because the customer must not be

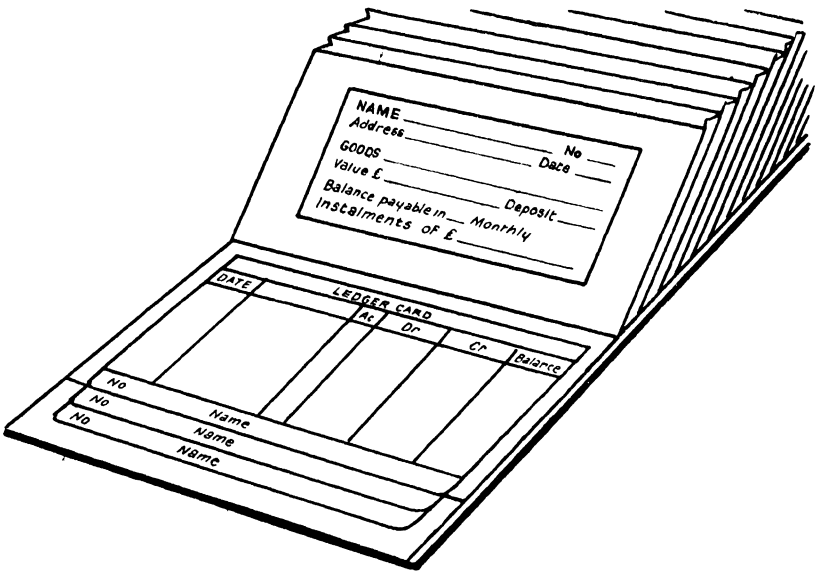


FIG. IX—9

kept waiting for an unreasonable time A National machine of the "cash register" type is advisable

The forms used are illustrated in Fig IX—10

The customer hands the "customer's card" to the cashier with the cash, when entered, this is handed back to the customer as his receipt The entries are not "proved" by means of an arithmetical check, but an independent clerk reads and checks the entries on the customer's card before handing it back to the customer Compare this with the check method used for machine-posted hotel ledgers

Public Utility Concerns

Gas, electricity, and similar concerns send out their bills at regular intervals, usually quarterly Unlike a commercial invoice, each bill is kept separate from other bills for purpose of record, as payment is received against the bill individually, not against a group of items in account form There is therefore no need for a statement in the commercial sense, although a copy of the bill may be sent as a reminder.

Name Mr P. N. Wallis,
Address 66 Highfield Road, Hall Green

	Date	Goods	Cash	Balance	Reference
1	16 AUG'46	17 10 0			1212
2	16 AUG'46		2 10 0	15 0 0	1212
3	15 SEP'46		1 5 0	13 15 0	1212
4	15 OCT'46		1 5.0	12 10 0	1212
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					

Name Mr P N Wallis,
Address 66 Highfield Rd, Hall Green

Account No 1212

	Date	Goods	Cash	Balance	Reference
1	16 AUG'46	17 10 0			1212
2	16 AUG'46		2 10 0	15 0 0	1212
3	15 SEP'46		1 5 0	13 15 0	1212
4	15 OCT'46		1 5 0	12 10 0	1212
5					
6					
7					
8					
9					
10					
11					
12					

This Card should accompany all remittances

13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					

15 OCT'46

3	1-0-0	754
5	10-0	2201
3	18-0	790
8	1-10-0	1804
3	5-0	783
5	14-0	2213
4	18-0	1290
3	15-6	792
4	1-5-0	1212

FIG. IX—10

From the point of view of the system there are these special factors—

(*a*) The peak load at quarter day,

(*b*) the absence of balances brought forward (the few items unpaid from the previous quarter are much overdue and kept entirely separate), and

(*c*) the rush of cash at certain periods

Because of this pressure in the cashier's department it is often found convenient to provide an extra portion of the bill, to be detached by

BUNGAY & Co
Paradise Lane
A/c 1113

Total £9 10 1

Cashier detaches this part

Receipt entered here

LEICHESTER CORPORATION
ELECTRICITY DEPARTMENT

BUNGAY & Co
Paradise Lane
A/c 1113

Method of payment and other details in this space

	Meter Reading	At	£	s	d
Lighting					
Present	7232				
Previous	6952				
	280	5	5	16	8
Heat					
Present	11503				
Previous	10742				
	761	1	3	3	5
Meter Rent				10	0
Other Charges					
	Total		£	9	10	1

FIG. IX—11

the cashier and to act as his posting slip This is particularly so where payment can be made at a bank.

Bills Entered by Hand

Many of the smaller authorities still enter their bills by hand, except that the names and addresses are entered by an addressing machine The bill might be as shown in Fig IX—11

An advantage of hand billing, as compared with machine methods, is that the meter rent and other items can be entered in advance. The machine must enter all the items at one time so that it can add them Where there are many items the speed and other advantages of the machine outweigh this disadvantage

The Bookless Method

In Chapter IV, example 1, a system was outlined in which a file of copy invoices was used in place of the ledger Because of the periodic nature of the billing, this method is particularly suited to public utility concerns Copies of the bills are prepared and these are cast on an adding machine, the total being entered in a control account The copy bills are then placed in special files When payments are received the copies are removed from the file, cast on an adding machine (to agree with the cash) and the total credited to the control account The copy bills remaining in the file should be added at frequent intervals (e g weekly) to agree with the control account The file will be continually reducing in volume and when the time comes for the preparation of the next quarter's bills, the old items still outstanding can be transferred to an overdue file and given special attention

The papers move in the manner indicated in Fig IX—12

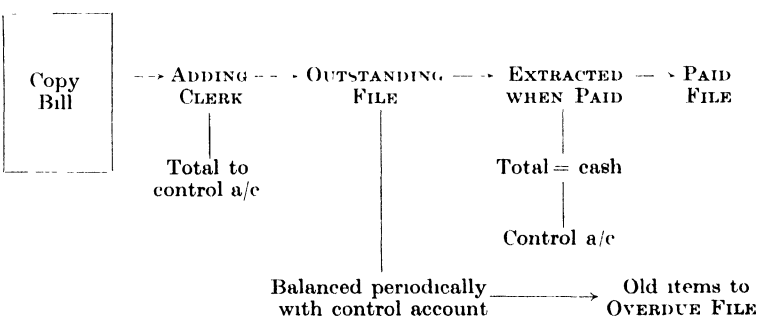


Fig IX—12

It must be remembered that in this system there are no permanent records in book form and that therefore the paid bills must be kept in a file in a suitable order for the auditors to check them with the cash. As always, the persons handling the cash should be quite distinct from

Perforated here

S OSBORNE, ESQ
Marine Parade
Scarborough

Dr to NORTHERN ELECTRIC CO

Meter Reading	Units	Items	£	s.	d
2913 1490	1423	Domestic ½d. Standing Charge Meter Rent	2 1	19 10 2	3 0 6
			4	11	9

BILL

S OSBORNE, ESQ
Marine Parade
Scarborough

Ref	Total
117	4 11 9

CASHIER'S SLIP

OFFICE RECORD

S OSBORNE, ESQ
Marine Parade
Scarborough

Dr to NORTHERN ELECTRIC CO.

Meter Reading	Units	Items	£	s.	d
2913 1490	1423	Domestic ½d Standing Charge Meter Rent	2 1	19 10 2	3 0 6
			4	11	9

OFFICE RECORD

FIG IX—13

those keeping the records (i e removing bills from the outstanding file and marking them as paid)

An Example of Machine Billing

This concern uses the bookless plan with a National 2000 class posting machine The reader will recall that the 2000 class is the type of machine developed from the cash register, as illustrated in Chapter III. No carbon copies are made as there are several sets of type for printing the various documents There is a wide slot at the left into which the bills are inserted These bills are automatically fed, ejected, and stacked—the operator has to handle no papers, except to ensure that sufficient bills are placed in the container before posting begins The operation is thus almost as rapid as pure listing

The forms used are shown in Fig IX—13

SUMMARY

Ref	Meter		Units	Rate	Consumption Charge	Mixed Charge	Meter	H P	Other Items	Total
	Pres	Prev								
117	2913	1490	1423	1	2 19 3	1 10 0	2 6			4 11 9

Fig IX 14

The summary takes the place of the audit roll or tally roll provided in other applications of this machine Note that the summary and bill do not have to be in the same form, as is necessary with machines using carbon instead of separate sets of type (Fig IX—14)

Another Example of Machine Billing

Many concerns use the bookless plan with a book-keeping machine of the typewriter class

The office record takes the form of a copy of the bill, made with carbon paper. These bills and copies can conveniently be in continuous form, as has been illustrated in Chapter V, so as to reduce handling to a minimum For speed of typing and so as to obtain maximum benefit from the adding boxes, the typing is usually arranged in one line as in the examples (Figs IX—15 and IX—16)

GEO. HAPPY, ESQ.
French Horn
Lambeth Walk
118 S E 11

Dr to
SOUTHERN GAS CO
WANDSWORTH

GEO. HAPPY, ESQ.
French Horn
Lambeth Walk
118 S E.11

A/c	Meter Reading		Cu Ft	Therms	Charge for Gas	Meter Rents	Other Items		Total	A/c	Total
	Present	Previous					Details	Charge			
118	631	600	31	13 9	17 1	1 0			18 1	118	18 1

STATEMENT CASHIER'S SLIP

FIG IX—15

CHARGES SUMMARY

Qr ending

A/c	Meter Reading		Cu Ft	Therms	Charge for Gas	Meter Rents	Other Items		Total	Cashier's Slip	
	Present	Previous					Details	Charge		A/c	Total
118	631	600	31	13 9	17 1	1 0			18 1	118	118

FIG IX—16

It should be noted that this produces a very wide statement If the information to be shown is considerable, the width might become unreasonable and either the meter readings should be omitted ("refer to meter card") or else some other method should be used

Machines of this sort are of particular advantage where descriptions of the items have to be typed in some detail

A Third Example of Machine Billing

Other concerns use the bookless plan with a Burroughs machine The forms and procedure are similar to that last described in that the office record is a copy of the statement, made by carbon paper, but differ in that the information does not necessarily have to appear on a single line (this reduces the width of the statement). As with the National machine, the descriptions are abbreviated. Each statement is inserted separately, while the summary remains in the machine throughout the posting

A form of statement is given—the summary would be ruled with the same columns

MISS MAISY DATES
THE BURROWS
MAIDSTONE

M414

Dr to

SOUTHERN GAS CO

MISS MAISY DATES
THE BURROWS
MAIDSTONE

M414

	Therms or Details	Charge for Gas	Rents and Other Charges	Total	Total
Meter readings Present 631 Previous 600	13 9	17 1			
	Mtr rent		1 0		
Cu ft used 31	H P		12 0	1 10 1	1 10 1

FIG. IX—17. STATEMENT

When choosing the method most suitable to a particular case, consideration must be given to the number of analysis headings necessary, e g units consumed, charges for gas, meter rents. The more adding registers are needed, the higher will be the price of the machine.

The Consumers' Ledger

The bookless plan is so suited to the special circumstances of public utilities that consumers' ledgers are not recommended unless there are special and unusual reasons for their use. The purpose of a ledger is to bring together items which will be paid or offset not individually but in groups, as an account. If each bill is normally kept distinct

from others, both by the concern which sends it and by the user who receives it, then there is no purpose in a ledger.

Should bills be sent at less widely spaced intervals, there may be a point in ledger keeping, as balances will be carried over from period to period. Similarly, if payments are frequently made by instalments, a ledger may give a better record than a file of copies In these cases,

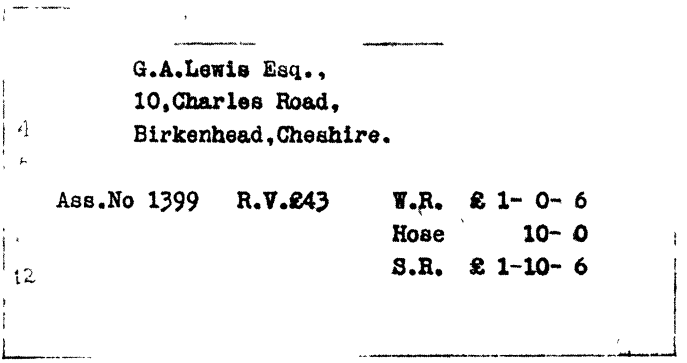


Fig IX—18

the system used will correspond to other ledger-posting operations, there will be an old balance to be picked up and proved as previously described This needs a number of adding registers and reduces those remaining for analysis and also results in a slower billing operation

The student will from time to time see bills which have been sent out by public utility concerns and should be encouraged to think about them and to try and discover, from the lay-out and appearance of the bill, what system has been used to produce them

The Addressing Machine

Originally designed for addressing envelopes, the addressing machine can be used to reproduce any standard information within the scope of the plate Before systems are discussed it is necessary to describe such a machine, it being understood that machines of other makes work on the same general principles, although differing considerably in detail

The Adrema machine (Fig. IX—19) uses metal plates as shown above A ribbon is brought between the plate and the paper, which is struck by a rubber pad, causing the raised letters on the plate to be printed on the paper.

The plates are put in the raised hopper seen on the right and each in turn moves towards the left, firstly, into a visual position, so that the operator can see it and decide whether he wishes to use it, secondly, under the ribbon, in the printing position, and thirdly, through a hole in the table, into a container Above the table is the printing arm to which the rubber pad is fixed The operator learns to bring down this

handle with the right pressure to make a clear print. At the back can be seen the listing attachment, used to hold papers on which it is desired to make a list from the plates and automatically to move the paper the correct space after each printing.

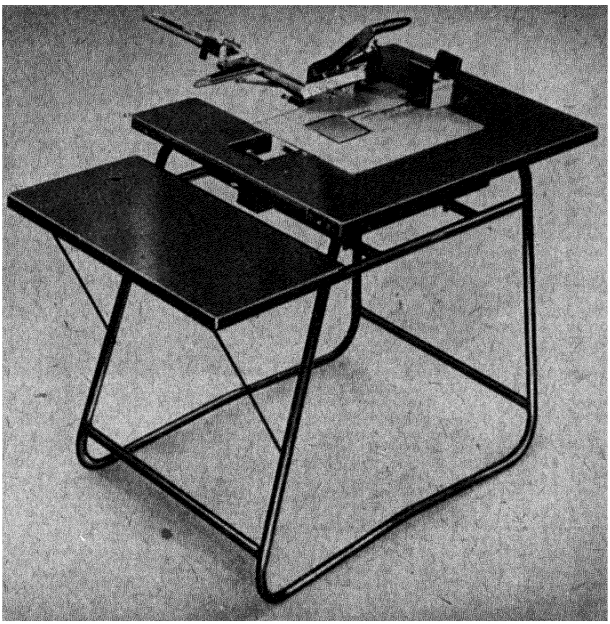


FIG. IX—19. THE ADREMA WEBER FLOOR MODEL

Other features and attachments available on some or all models, are—

(*a*) A means of printing part only of the plate The printing is by means of the rubber pad and if part of the pad is cut away then only those parts of the plate which are actually struck will print. This device is known as a cut-out pad

(*b*) A skipping arrangement, that is to say, a means of passing a plate under the ribbon without printing it When the skipping button is pressed, a brake is put upon the handle, so that the pad does not press upon the plate.

(*c*) A signalling method, i e a means of marking the plate so that the operator can immediately recognize the group to which that plate belongs and decide whether or not to print it This is done by means of a coloured metal tag, inserted at the top of the plate

(*d*) Provision for printing standard information This is done by the use of a rubber pad larger than the plate and by the insertion of printing type above and below the plate

(*e*) An automatic dating device

(*f*) Repeat mechanism, for use where the information is to be printed more than once, on the same or other documents

(*g*) A number-printing device

(*h*) Paper handling devices, such as a throw-off device which packs the forms into a tray.

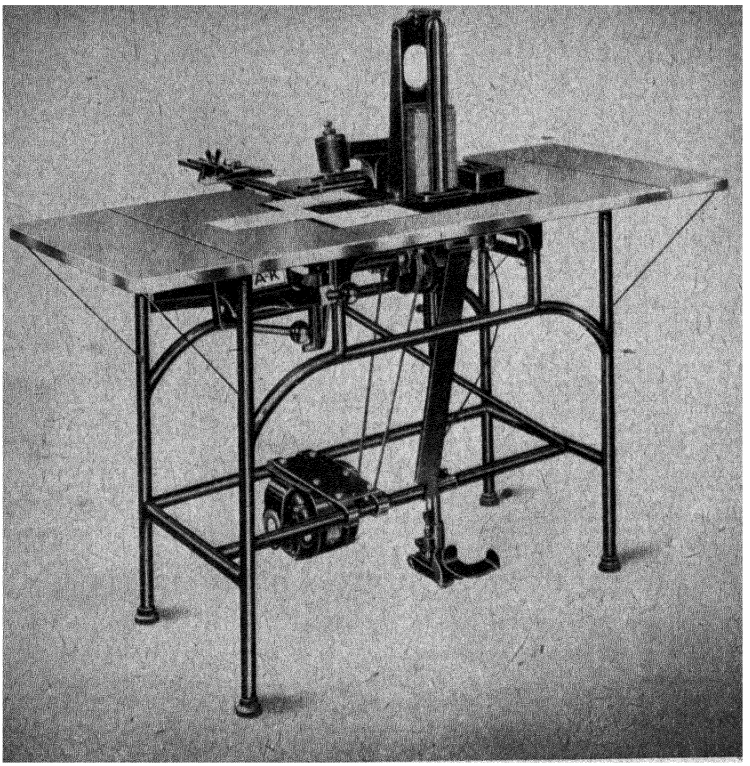


FIG. IX-20.—THE ADDIMA ELECTRIC MACHINE

There are two sizes of plate, the small (2R) size, used largely for addressing envelopes, statement headings, and the like, and the large (3R) size used for many listing and form jobs. The embossing of the plates can be done either by the makers, who maintain a service for this purpose, or else at the user's offices by means of a convenient type of embossing machine.

The listing device is very precise in its movement, as it has to be for use with ruled sheets. There are various useful modifications of this lister, e.g. an arrangement for stopping the operation when a sheet is finished, or when a particular group of plates is completed. A very interesting (though comparatively expensive) attachment permits part of the information to be printed in one column and another part in the

next column. To do this the paper has to be moved from side to side, automatically and precisely, and the rubber pad must automatically be moved and returned from one printing position to the other

There is a special model designed for factory form production. It has an extended numbering device for job and similar reference numbers, a quick typesetting device for the permanent or semi-permanent information, paper guiding and handling arrangements

A particularly interesting machine is the automatic selector This operates by means of embossings on the metal plates, and the operation is entirely automatic, it is only necessary to set the machine and to keep it fed with plates and paper The machine chooses and prints the required plates

Addressing Machine for Billing

Reference has already been made to the use of the addressing machine for heading statement forms Where the charge normally remains the same from period to period, the amount can be put on the plate and the whole statement or bill produced at one operation A series of slips can be prepared, to take the place of the ledger on the bookless plan, either by carbon paper at the same time as the bill, or by a separate printing from the plates A register of charges must also be kept This can be prepared from the same plates by means of the listing attachment

INVOICE

CITY OF LEAMINGHAM
WATER DEPARTMENT
COUNCIL HOUSE

Payment is requested of water rate shown hereon, for two quarters ended

(Payment instructions, etc)	B 1197 MESSRS WM TOMPSON Corporation St L U Shop £9 5 0 *(This information is all entered at one operation by the addressing machine)*	*(Space for receipt)*

(Payment instructions, etc)

FIG IX—21

The example shown above has been simplified for the sake of clarity. In practice it might be advisable to provide, among other things, (*a*) cut-out pads for use where the bill is sent to an address other than the

WATER RATE REGISTER

Qr ending 25 *Mar*

Binding

Charges		Notes
B 1195 MESSRS J JONES, New St L U Shop £5 1 3		
B 1196 MR B BROWN New St Flat £1 4 8		
B 1197 MESSRS WM TOMPSON Corporation St L U Shop £9 5 0		

The information in the first column is entered by the addressing machine Each account is a separate plate

FIG IX—22

premises to which it refers, e g the head office of a company. (*b*) a dating device for printing the period, and (*c*) set up type for printing more or less standard information, e g the rate in the £

Between such a case where the whole bill can be entered by the addressing machine, and others where only the addresses are sufficiently standard, there are many where much of the information can be entered in this way leaving only an amount to be entered by some other method, such as a book-keeping machine

Insurance Company's Renewal Notices

Insurance companies often use a somewhat similar system for their renewal notices The charge remains the same from period to period and can be entered in full from the addressing machine plate, the renewal notice, agents' notification, lists and slips for record purposes can all be prepared in the same way.

CHAPTER X

THE CASHIER'S OFFICE

SEPARATION of the cashier's office—Permanence of cash records—Cash received over the counter—Docket systems—For a store—For a restaurant—Cash registers—Municipal receipting machine—Cheques received—Paying-in slip—Cheques received book—Receipts—Continuous form—Payments in cash—Cheque payments—Cheque-writing by machine—Signatures—Traders' credits

IT is a fundamental principle of office organization that the cashier shall not also be the book-keeper In very small firms it may be impossible to adopt this principle. In all other cases, no special circumstances should be allowed to interfere with it

A medium-sized firm usually has a cashier, with or without assistants, who is responsible for wages, petty cash, cheques paid, and cheques received In large firms there may be separate persons responsible for certain parts of this work. Thus there may be a wages office, under a chief wages clerk. It is not necessary (although often advisable) that all work connected with cash and cheques should be under one person or in one room Sometimes there is a section dealing with cheques received, working in the same room as the sales ledger department, this is satisfactory provided that the clerks handling cheques are separate and are responsible to the accountant or other senior executive and not to the chief clerk of the sales ledger department. The book-keepers and the cashiers should be a check one upon the other and should therefore be entirely independent When considering mechanical accounting or other aspects of book-keeping organization, this principle must be kept in mind

The Permanence of Cash Records

Whereas some records are designed primarily for immediate use, cash records must be permanent This limits not only the style of book used, but also the system, which should be as orthodox as practicable to enable auditors to understand it without special study This does not mean that mechanical aids must be eschewed, but that mechanical systems must be of a standard type or must produce records similar to those in ordinary book-keeping

Cash records must be entered at once, not held to make a convenient batch as is done, for example, with sales invoices to be entered in the ledger Nor is it satisfactory to replace the chronological list by a summary Compare the cash book with the sales day book. In an earlier chapter it has been suggested that the day book can often be replaced by an adding machine list supported by the file of invoices, such a procedure would be dangerous in the case of a cash book unless special precautions were taken Cash registers produce what is equivalent to an adding machine list to act as cash book, and this list is kept in a locked drawer until the supervisor or chief cashier brings the

key and takes the list—the person handling the cash has no access to the list.

The cash book (including, for this purpose, cheque records) is not only a part of the double entry, it is also an immediate record, which reduces the temptation to juggle with the cash

Cash Received over the Counter

No system of checking cash received can be perfect, in all cases it is necessary to place some reliance on a personal knowledge of the cashier's honesty. Where a large retail concern has many branches or many departments, in all of which cash may be handled by assistants, it becomes essential to find some way to minimize the temptation to misappropriation of cash and at the same time to simplify the process of supervision.

The circumstances vary very much between different firms In some concerns all trade is for cash, in others a system has to cover club and credit transactions. The nature of the goods may enable a good stock check to be used; or they may be perishable or wasting, when no stock records can be very accurate If a given quantity of durable stock can be put in a definite person's care, any discrepancy will appear at the next stocktaking. This gives a good check on cash receipts, but does not operate quickly—much cash might be misappropriated between stocktaking periods. It is only really effective where stock can be put under one assistant's absolute control and where stock can be taken weekly. These conditions are exceptional But in other cases it does ultimately bring shortages to light.

Examples of methods of keeping stock records are discussed in Chapter XV.

Docket Systems

Counter sales dockets are commonly used as a method of checking cash. These dockets are serially numbered and a record is kept of the numbers of those dockets sent to each branch or department. The salesman makes a docket for each sale, hands the original to the customer and sends the duplicate back to the office These duplicates are cast (on a comptometer or similar machine) and the total agreed with the cash receipts. This system guarantees that the money is available against every docket made, but the weakness lies in the possibility of taking cash without making a docket. Cash customers are notoriously slack in asking for a receipt (docket). In a large departmental store this difficulty can be overcome by supervision, and by floorwalkers, and stores detectives if necessary, but this is less easy in a multiple shop concern. Special circumstances sometimes avoid the difficulty, e.g. a co-operative store's customers will insist on their checks to obtain their dividend.

If the store is large enough the cash office can be centralized and the

cash docket either sent by pneumatic tube or taken by the customer. In such cases the system is very good indeed, as the salesmen act as a check on the cashiers and, as there are only a few of the latter, blame for any shortage can be allocated.

A Docket Designed for a Store with a Central Cashier

THE GENERAL STORES
HIGH ST, OSWESTRY

Date

(Part A, the customer's receipt, shows full details)

G S 12121 Assistant No

Assistant	Class	£ s d
		(Part B, for the salesman and checking office.)

G S 12121

Assistant	Class	£ s. d.
		(Part C, for the cashier.)

G S 12121

It is necessary to show the serial number on each part

FIG. X—1

The salesman makes out the docket and hands it to the customer, retaining the goods for packing. The customer takes the docket to the cash desk and hands it with cash to the cashier. The cashier tears off part C, receipts part A, and returns parts A and B to the customer,

who then returns to the salesman and hands him parts A and B. The salesman tears off part B and hands part A to the customer with the goods. Part B is held by the salesman until the end of the day, when it is sent, with others, to the office to check against the cashier's record

Simple Form of Docket for Restaurant

The forms are in book form, bound on the left The waiter makes out the bill (right-hand portion) and also enters the total on the stub (left-hand portion). The customer hands the bill to the cashier with the money The stubs are retained by the waiter until the book is full, when they are sent to the office

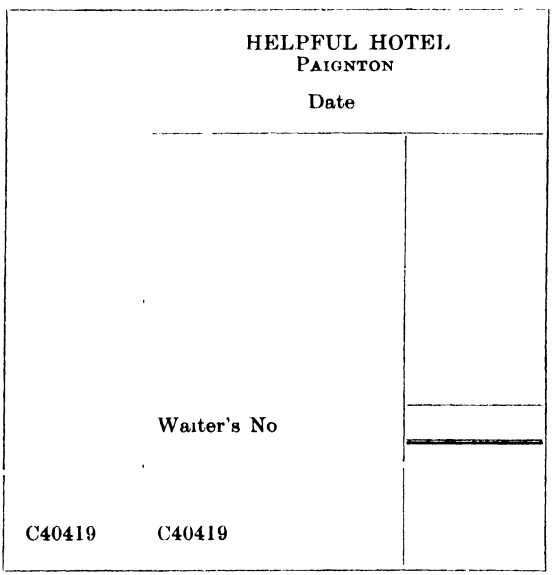


FIG. X —2

The student will often receive dockets from shopkeepers and others and should compare them with those shown here in order to understand the systems of which they form part

Cash Registers

No machine can give perfect control of cash It is always necessary to have adequate supervision and staff control and to rely on personal honesty. Subject to that, cash registers go a long way towards removing the temptation to play fast and loose with the cash and, at the same time, speed up the work of the counter assistants and enable them to attend to a greater number of customers.

This saving of time is important Shops tend to have rush periods, with many customers requiring attention at once. The number of assistants is limited, not only by the cost, but also by the space available. If a docket has to be written by hand or an entry made in a day book, several minutes may be spent in clerical work for each customer To depress the keys of the cash register takes as many seconds. This

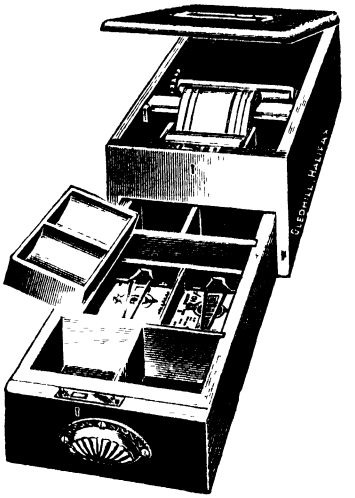


FIG X—3. THE GLEDHILL "IMPERIAL" CASH TILL

enables the assistants to handle a bigger turnover and pleases the customer (who may be a busy housewife, rushing to prepare her children's dinner) The advantages are greater when the items are numerous and each is quickly sold (e g greengrocer) than when the items are fewer and larger and when the customer needs more personal attention (e.g furniture or shoes).

The reader will have seen cash registers in use and will be familiar with the principles on which they work. The machines have some or all of these features—

(*a*) Type for printing the items and mechanical devices for handling the paper

(*b*) An adding register for totaling the cash taken

(*c*) Further adding registers for analysis, e.g. salesmen's figures

(*d*) Some visible means of telling the customer (and anyone else in the shop) how much has been entered in the register

(*e*) A means of producing a receipt or ticket for the customer.

(*f*) A lock which prevents the till from being opened until an item has been registered

(*g*) A bell which rings when the till is opened This discourages the assistants from opening the till while the manager's back is turned.

One make of machine is illustrated, it being understood that other makes, being designed for the same purpose, are superficially similar, although differing in detail

In essence, this is a drawer to contain the cash, and a roll of paper upon which to write details of the transaction, designed to give the

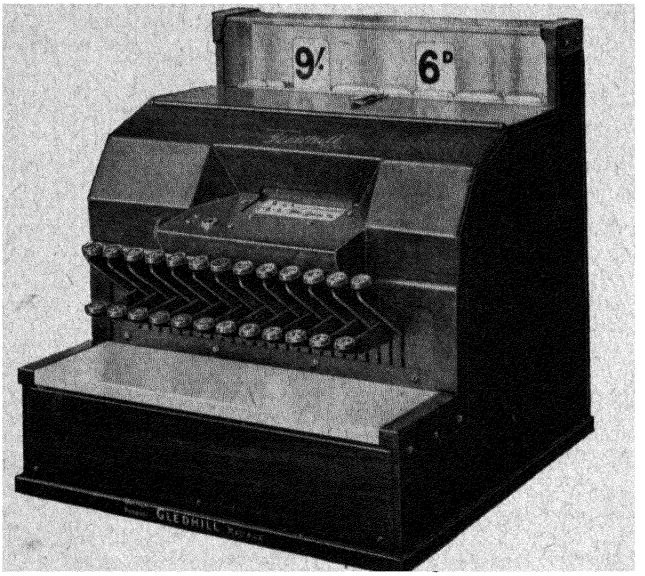


FIG X—4 GLEDHILL CASH REGISTER

utmost speed of handling and at the same time having locking mechanism to prevent abuse (Fig. X—3).

The machine illustrated in Fig X—4 prints a record of each transaction, shows the amount recorded to the customer, and adds the totals

Municipal Receipting Machine (National)

The reader will compare the machine shown in Fig. X—5 with the National posting machine (Class 2000) illustrated in Chapter III, and will appreciate that this machine is very similar to the posting machine in construction.

The records are—

1. The bill on which the receipt is to be printed is inserted in the slide at the bottom.

2. Immediately above this slide is a continuous sheet (on rollers) on which the summary is printed. This takes the place of the cash book

3. Locked inside the machine, another summary is made for audit purposes.

4. The machine has a number of adding registers and also item counters These can be used for analysis and statistical purposes.

5. Usually, there is a portion of the bill, known as the cashier's slip, which is cut from the bill by the machine and retained in a special

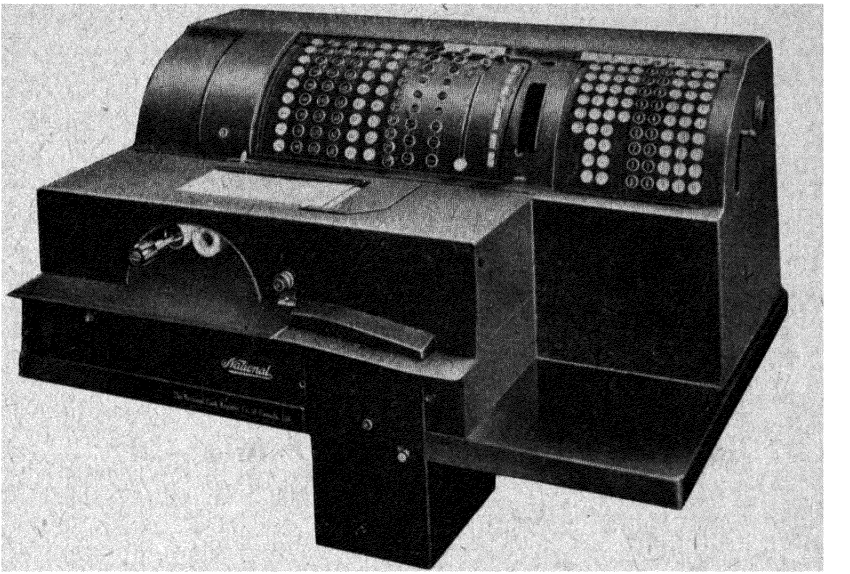


FIG. X—5. NATIONAL MUNICIPAL RECEIPTING MACHINE

drawer until needed. These slips are a more convenient medium for posting to customers' accounts than the cash summary.

For illustration of forms, see Chapter IX.

Cheques Received

In the following paragraphs it is assumed the cheques are numerous If not, a simpler method would be convenient

The cheques will usually come by post. The first job is to make sure there is a working slip which shows the details of the cheque. This may be a statement or a payment form, as given on page 114.

The cashier's clerk marks the amount of the cheque (£22 15s. 8d) either by drawing a ring round it in red pencil, or by some other convenient method, and initials the slip

This prevents subsequent disputes.

Sometimes the details are in a letter, not suitable as a working slip. Sometimes, also, Government departments send payable orders which include the details on the order (not on a separate slip) In these cases a slip should be made, such as the one shown in Fig X—7

GENERAL ENGINEERS
WOOLWICH

To MESSRS JONES
Twickenham

Herewith we send cheque for the following items				
Dec 4	1182		5	3 0
Dec 9	1744		15	4 4
Dec 10	1792		3	0 0
			23	7 4
$2\frac{1}{2}\%$ Disc				11 8
			£22	15 8

FIG X—6

DETAILS OF CHEQUE RECEIVED

From

Date

Initials	£	

FIG X—7

Note that this is not intended to be more than a working slip and can be entered in pencil (but must naturally be accurate)

Note that the paying-in slip is checked by the cash book, and vice versa Sometimes a carbon copy of the paying-in slip makes up the cash book, in such cases a list of the cheques should be made on an adding machine for confirmation.

The bank will usually arrange to accept paying-in slips designed to be prepared on an adding machine.

The cheque and its working slip (showing details) move as follows—

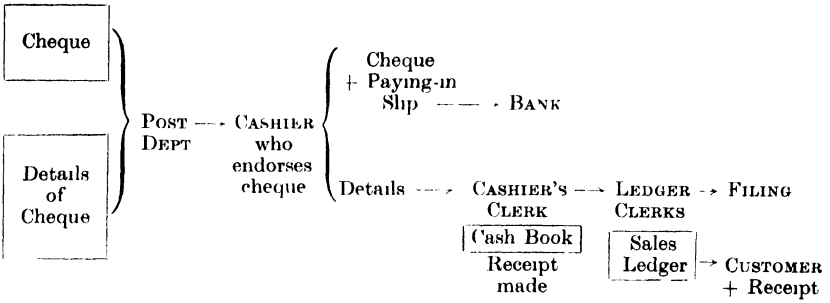


Fig X—8

Paying-in Slip

The cash book and paying-in slip can be typed at one operation, if a billing machine with an adding box is used, the total will be obtained automatically.

The paying-in slip is a carbon copy of the right-hand column of the cash book.

CASH BOOK

Date 17 *Sept*

Name	Details	Amount
Percy Parish & Co	Sales Ledger A/c	5 8 4
William Wallace	Rent	44 10 0
Carey & Cook	Sales Ledger A/c	17 6
Winkleman Bros	Sales Ledger A/c	14 0 0
		64 15 10

GENERAL BANK

Paying-in Slip
Date 17 *Sept*

	5 8 4
	44 10 0
	17 6
	14 0 0
Paid in by	£64 15 10

The form of the paying-in slip must, of course, be agreed with the bank.

Fig X—9

It is not always possible to prepare these documents together, for purely practical reasons. Some concerns receive numerous cheques on the first few days of the month, and in those cases it may be necessary to have the simplest possible system for paying in the cheques, so that they may be banked early on the day of receipt In such cases the cash book is left until later in the day.

Cheques Received Book

In a big concern it is usual to split the cash book into several books, of which the cheques received book will be one If the ledgers are balanced in section it will be necessary to analyse the cheques in the same sections, and a columnar book may be used

Name	Cheque	Disct	Total	Ledger				
				A–G	H–K	L–R	S–Z	Nominal

Fig. X—10 Cheques Received Book

A very wide book tends to be cumbersome and if there are more than, say, six sections of the ledger, some other method should be used (e g. a slip method, see the chapter on analysis)

Receipts and Cheques Received Lists

The receipt and list can be prepared at the same time, using a billing machine such as a Remington, or a National typing-model book-keeping machine. The essentials of the machine are: (*a*) typing, (*b*) adding the figures, (*c*) moving the paper separately.

The receipts will be in continuous form, and will be moved up the whole width of the receipt, while the list moves one line only.

When typed the receipts are separated, checked, and signed

Sometimes it is found convenient also to prepare a posting slip, similarly shaped to the receipt but showing discount as well as cash. These slips would be sorted into sections to correspond with the ledger, added and passed to the posting clerk who makes the ledger entries from the slips.

THE XYZ COMPANY

Date	Received from	The sum of
25 Sept.	J Jones & Co.	£8 2 3

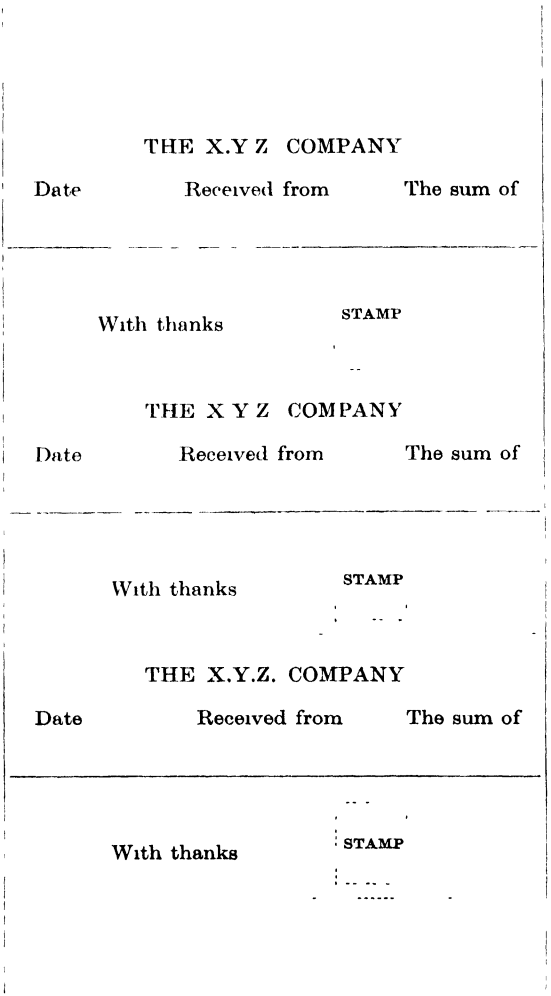
With thanks STAMP

To this point the list is a carbon copy of the receipt

CHEQUES RECEIVED

Date	Name	Cheque	Discount	Department
25 Sept	J Jones & Co	8 2 3	4 5	Hose

FIG. X—11



The typing is on one line for speed.

FIG X—12. RECEIPTS IN CONTINUOUS FORM

Payments in Cash

The organization of wage payments to workpeople raises special problems and is considered in another chapter. Other payments to personnel (such as travelling expenses) should, if considerable, be handled by a similar system to wages. Apart from such items, payments in cash should be reduced to a minimum, as cheques give a better record and do not subject the cashier to the same temptations. If the post outwards is considerable a Neopost machine should be used to simplify the control of stamps. For receipts, forms with embossed stamps are

frequently used. If there are numerous items of carriage, the railways or other carriers will arrange for a monthly account. Bulk travel vouchers can be used by salesmen. In these and other ways cheque payments may be substituted for cash.

As a principle, cash received should be rigidly separated from cash payments, and it is preferable that each be handled by a different person Petty cash payments are usually and best controlled by the imprest system. The petty cashier is allowed a deposit, sufficient for the requirements of a week (say £10) At the end of the week, receipts for all payments made are handed to the senior cashier, who draws a cheque for an equivalent amount, to restore the balance to the original deposit (£10). The petty cash book might appear as follows—

PETTY CASH BOOK

Apr 2	Balance	10	0	0	Apr 4	Brown—Carrier	2	10	4
					4	Percival—Nails			6
					5	Wilson—Rail fare		1	3
					5	Peters & Co —Soap		2	0
					7	Wilson—Bus			4
					9	Balance carried down	7	5	7
		£10	0	0			£10	0	0
Apr. 9	Balance	7	5	7					
	Cheque	2	14	5					

FIG. X—13

The credit side is sometimes analysed by columns

Owing to the small number of items and the necessity of immediate entry, a machine system is not usually applicable to petty cash

Cheque Payments

The writing of cheques and the making of entries in the cash book is a responsible part of office work and an efficient routine is essential Either a statement or remittance note should come from the bought ledger clerk showing clearly how much is to be paid and the initials of the person taking responsibility. The cheques must be made out with care and (unless the office is small) checked by another clerk. It is usual to write the amount in words by means of a Protectograph machine or else by a typewriter with pin-point type (i e type which breaks the surface of the paper)

Cheque-writing by Machine

A machine similar to a billing machine is used (e g Remington) or else a book-keeping machine with typewriter keys. Note that pin-point type should be used. The cheques are made in continuous or pad form and the carriage of the machine is so arranged as to move the

cheques and list separately and just the correct distance between one entry and the next These are the forms—

No 1234

MERCANTILE BANK, LTD
LONDON

Pay *P. R White & Co*
the sum of
Date
17 Sep W8 *Seven pounds and nine pence*
£7 0 9

For J JONES & Co.

FIG. X—14

CHEQUES PAID

Date	Fo	Cheque	Amount	Discount	Total
17 Sep	W8	P R White & Co. Seven pounds and nine pence	7 0 9	3 6	7 4 3

FIG X—15

The cheque is designed to have all the typed matter on two lines

To this point the list is a carbon copy of the cheque

The machine checks the cross addition, thus proving the accuracy of the typing, and accumulates the total of each column

The operation is very similar to that of typing receipts and the one machine is frequently used for both jobs.

Signature to Cheques

In a large concern it is not possible for the director or executive who signs the cheques to study the details supporting each one. His time is too valuable. On the other hand, it is asking for trouble to sign cheques blindly without any inspection. It is therefore recommended that to each cheque be attached the supplier's statement or whatever evidence is available, provided that wherever possible the evidence

comes from outside the business. Before these are passed to the cashier they should be initialed by the senior ledger clerk or whoever is given authority for this purpose Thus when the director sees the cheque, it has with it papers which are apparently in order and which bear the initials of someone personally known to him, so that he can rapidly decide which items he can sign and which, if any, need further evidence

If there are too many cheques for individual signature by a responsible executive the system of trader's credit described later in this chapter is recommended

Payment by Trader's Credit

Many large concerns make their payments by means of a bank transfer known as a trader's credit. Instead of drawing many cheques for suppliers, only one is drawn, made payable to the bankers and they are given instructions to pay the various amounts to the credit of the suppliers' bank accounts This is only possible where the supplier agrees and where the bank agrees It is necessary to follow the routine which is convenient to the bank

The bank requires a separate slip for each account to be credited and a list of all the accounts making up the total cheque It will also be necessary to send the supplier details of the payment, unless these can be on the reverse of the slip (if space is sufficient) Where there is no separate advice to the supplier, reliance must be placed on the promptness of the bank in advising its customer, otherwise a supplier will be pressing for a payment which the books show has been made already These slips can be made on an adding typewriter of one form or another (National, Remington, etc.) very much in the way suggested for

[redacted]

advantages The slips do not require individual signature by directors, nor is it necessary to take the same precautions against alteration, as the slips do not pass out of the banker's hands until the transaction is complete Dangers arise from this same lack of formality, which may lead to lack of care or supervision The cashier or some other responsible official should scrutinize every one of the accounts paid, exactly as if he were signing cheques, and to ensure this it is recommended that each credit slip be initialed by the cashier

It is sometimes found that the trader's credit system of payments is combined with the American system of recording purchases (described in Chapter VIII) because both are suited to the same machines The danger is that the separation of the cashier's department may be lost

TRADER'S CREDIT

WESTERN BANK
Please credit Date

BANK	ACCOUNT	£

X Y Z COMPANY
Wolverhampton

WESTERN BANK

Please credit the undermentioned accounts
Our cheque £ is enclosed

X Y Z Co
Date *Director*

Bank	Account	£

PAYMENTS LIST

Date

Bank	Account	Cheque	Discount	Total

Dates are inserted with a stamp.

FIG. X—16

and the summaries of invoices (which in that system take the place of the ledger) prepared by the same person who prepares the credit slips If this is unavoidable, for practical reasons it is recommended that before they are dispatched the credit slips are checked by an entirely separate department, such as an internal audit department

The trader's credit system saves much time in checking the bank pass book. The forms used are shown in Fig X—16

The bank's list and the payments list are prepared at the same time as the slips by carbon paper The lists move up one line for each slip.

DETAILS OF AMOUNT SHOWN OVERLEAF		
Your June statement		74 1 3
Less 14172	5 0 0	
14203	12 6	
14164	4 4 4	
		9 16 10
		£64 4 5

FIG. X—17. REVERSE OF TRADER'S CREDIT SLIP

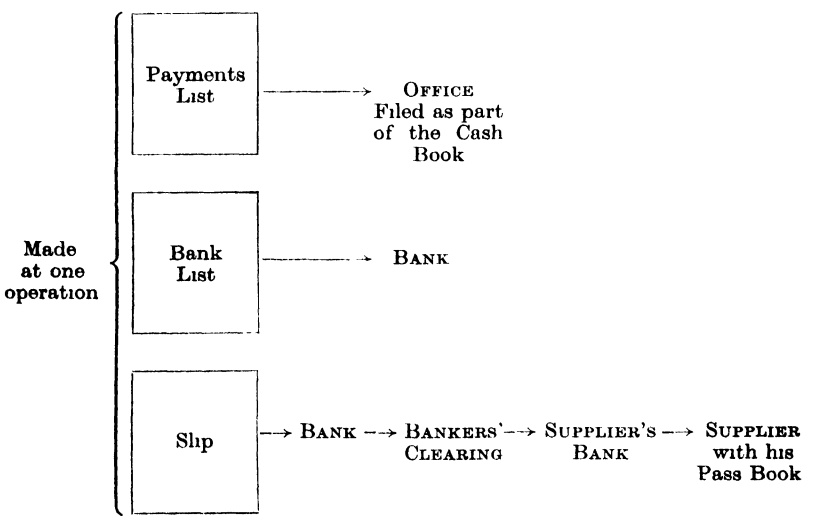


FIG. X—18. FLOW OF TRADER'S CREDIT SLIPS

Details of the payment must be sent to the supplier. These may take one of these forms—

(*a*) Return of the supplier's statement with suitable notes.

(*b*) A list of the items paid, as in the American system of payments

(*c*) Details, if simple, may be entered by hand on the back of the trader's credit slip, as illustrated (Fig X—17).

CHAPTER XI

DIVIDEND PAYMENTS

Use of addressing machine—Form of warrant—Plates—Signals—The dividend list—Book-keeping machine used for dividends

The clerical work in connexion with the payment of a dividend by a large company may be considerable and has usually to be done within a limited period. This involves interference with the normal running of the office to enable the maximum staff to be available for the dividend work. A good system is necessary in order to reduce the upset to a minimum.

The work consists in making a list of shareholders, showing the number of shares, calculating the dividend due to each, and preparing warrants, tax statements, and envelopes. As always with office routine, the actual system must vary with each individual concern, but that following is one which is in use and which gives a good illustration of the principles involved.

Much of the information remains constant from one half-year to the next, so that an addressing machine can conveniently be used to enter the names and addresses of the shareholders on the warrant, tax statement, envelope, and list (also, subsequently, on the return of members, which has to be sent to the Registrar of Companies). The machine is similar to that illustrated in Chapter IX. During the year the plates for the addressing machine are kept up to date by preparing new plates for those shareholders who change their address and for new members and by removing the plates for persons ceasing to be shareholders. Additional plates will be needed for those shareholders who give instructions for the dividend to be paid to a bank account (these plates are illustrated on a later page). When instructions are received to commence the dividend preparation, the plates should be ready for use.

The working routine is—

(1) The names of payees are entered on the dividend list by the addressing machine.

(2) The number of shares is entered by hand on the list from the share ledger, and the payees' names checked at the same time.

(3) The amount of gross dividend, tax, and net dividend is calculated, added, and agreed.

(4) The names of shareholders and banks are entered on the warrants and tax statements with the addressing machine.

(5) The amounts are typed on warrants and tax statements.

(6) The envelopes are prepared with the addressing machine.

DIVIDEND WARRANT PREFERENCE SHARES

No. 1234

THE X Y Z. CO LTD
LONDON

STAMP

19

To MERCHANT BANK LTD

Pay A

Words	Figures
	£

For and on behalf of X Y Z Ltd.

Director

THE X.Y Z. CO. LTD.

No 1234 LONDON

19

STATEMENT OF DIVIDEND WITH CERTIFICATE OF TAX DEDUCTION

B

DIVIDEND IS PAYABLE AT 6% per annum on the Preference shares

Half-year	Shares	Gross	Tax	Net

I certify, etc , etc

Secretary.

The typing is on one line, for speed.

A and B. The name and address are inserted by the addressing machine If the cheque is to be paid to the shareholder's bank, A will be different from B, two plates being used

The date can be entered with a date stamp or, if there are a large number of warrants, can be printed on the form in advance.

The rate of dividend is usually printed on the form

(In order to make the form clear in the space available here some information has been omitted.)

FIG. XI—1

No. 1234 THE
X. Y. Z. CO., LTD
LONDON
19

STATEMENT OF DIVIDEND AND CERTIFICATE OF DEDUCTION OF TAX

Mr.

Gross Dividend at % on shares
Less tax at in the £

Net amount of warrant : :

I certify that, etc., etc

Secretary

DIVIDEND WARRANT

No. 1234
THE X Y. Z CO LTD
LONDON
19

To MERCHANT BANK

Pay
the sum of
For and on behalf of X.Y.Z. Ltd
£
Director

FIG XI—2

The above is the old form of dividend warrant, designed to be completed by hand Companies with a medium number of shareholders will continue to use this form. (Between thirty and three hundred is considered a medium number of shareholders.)

Small companies use their ordinary cheques with typed statements. A modern form is given on page 126.

Addressing-machine Plates used for Dividend Payments

a detachable signal of varying colour (see below).

JOHN SMITH, ESQ
77 BROWNHILL ROAD
MOSELEY
* S44 BIRMINGHAM

FIG. XI—3. SHAREHOLDER'S PLATE

* It is convenient to show the folio of the share ledger.

Note that if the plates are to be used for the annual return of members, the first Christian name should be in full.

MIDLAND BANK LTD
EDGBASTON ROAD
MOSELEY
S44 BIRMINGHAM
A/c John Smith, Esq

FIG. XI—4 BANK PLATE

The name of the account must be shown on the warrant, but not on the envelope The machine has a cut-out device to enable this to be done

Signals

These vary in form between different machines, but, in essence, are detachable, coloured indicators for marking different classes of plate These signals are particularly used in connexion with skipping, or passing over a plate, e g if a warrant is to be sent to a bank then an envelope will not be needed for that shareholder, and when envelopes are being prepared that shareholder's plate must be skipped, the bank being printed instead

The signals can be any colour, e g.—

(*a*) Yellow for shareholders without bank instructions

(*b*) Blue for shareholders with bank instructions

(*c*) White for banks

(*d*) Red for any shareholders to which special conditions apply, e g executors

The Dividend List

Fig XI—5 shows a typical form The first column is entered with

DIVIDEND LIST

Sheet No. 7

Ordinary Shares 10%

Date of Payment 30 *Sept*

Payee	Number of Shares	Gross Dividend	Tax at 9/- in the £	Amount of Warrant
PERCY K BROWN, ESQ The Chesils Coventry B42	100	10 0 0	4 10 0	5 10 0
MIDLAND BANK LTD High St Abergavenny B43	250	25 0 0	11 5 0	13 15 0
M S W BROWNHILL, ESQ.				

FIG. XI—5

ZYX CO LTD

DIVIDEND ADVICE

No 4321

19

PREFERENCE SHARES

Quarterly Dividend due 19

A

Herewith please find cheque in payment of Dividend on the Shares of which you were registered proprietor on the 1st June, 19

Account No	Class of Shares	No of Shares	Dividend	Less Income Tax @ 9/-	Net Dividend
1240 B	6%	100	1 10 0		
	7%	200	3 10 0		
	Total	300	5 0 0	2 5 0	2 15 0

I hereby certify, etc

Secretary

ZYX COMPANY LTD

DIVIDEND WARRANT

No 4321

19

MERCHANT BANK LTD

Pay

STAMP

A or order

The sum of Two Pounds Fifteen Shillings

£2 15 0

For ZYX. CO LTD

Director

In this form the name and address are filled in by an addressing machine in spaces marked A The rest of the particulars (B) are entered by a book-keeping machine Several classes of shares are shown on the same warrant, and only one tax calculation is made

FIG XI—6

DIVIDEND LIST

	Account No	Class of Shares	No of Shares	Dividend	Less Income Tax @ 9/-	Net Dividend
Binding	1239	5½%	200	2 15 0		
		7%	100	1 15 0		
		Total	300	4 10 0	2 0 6	4 9 6
	1240	6%	100	1 10 0		
		7%	200	3 10 0		
		Total	300	5 0 0	2 5 0	2 15 0

The entries on the dividend list are carbon copies of those on the warrants shown in Fig. XI—6.

FIG XI—7

the addressing machine, and shows either the shareholder or his bank account The addresses could be cut out, but it is usually convenient to show them, despite the extra space taken The other columns are totalled and agreed before the warrants are typed

Book-keeping Machine used for Dividends

The practical difficulty is that the machine lies idle between dividend dates, or, on the other hand, other work is disorganized while the dividends are prepared This system is only recommended where this difficulty can be overcome

Most of the standard types of book-keeping machine can be adapted for this purpose The warrant and list are prepared at one operation (as previously described for cheques)

The name and address are entered by the addressing machine (A), and the figures are entered by the book-keeping machine The amount may also be entered in words by the machine, if it has typewriter keys with pin-point type, or may be entered later with a Protectograph cheque writer

A sheet of carbon paper should be placed between the Advice and the Dividend List As the information is printed on the list, the columns must be spaced to correspond with the Advice The advices and warrants are changed for each shareholder, the Dividend List remaining in the machine until the end of the operation.

CHAPTER XII

ANALYSIS

A CHAPTER of examples—The book or card ledger—Columnar day book—Columnar ledger—Machine posting—Pegboard—National analysis machine-unit slip method—Re-sorting - Unit slip methods—Dangers of unit slips—Machine sorting—Exhaust method—Creating unit media—Paramount sorting—Combined methods

IN a sense all book-keeping is in the nature of analysis, the breaking down of a mass of figures into an orderly set of totals In this chapter the word "analysis" will be used in the more restricted sense, where the items to be analysed are all of one type (e g sales) and are to be divided so as to obtain a total of each of numerous sub-divisions This work has three parts—

(*a*) sorting out the items.
(*b*) adding them
(*c*) putting the results into a useful form.

Note that whereas much office work is conditioned by circumstances outside the office, analysis is much less so In the design of sales ledgers and statements, the customer's point of view must be kept in mind Stock records are designed for use by or in conjunction with the warehouse Analysis work, on the other hand, is strictly an interior office matter Even where documents from other parts of the organization (e.g. cash vouchers) are used, the form of the document can usually be dictated to suit the analysis

This chapter takes the form of examples, not intended to be copied literally but applied to the particular circumstances In doing so, the following practical factors should be considered—

(1) How far it may be necessary to check the figures at a later date
(2) Whether, and to what extent, accuracy can be sacrificed for speed
(3) How the figures will be used, what will be their convenient final form, and how can the system produce them in that form without re-copying

Much analysis is done by means of loose slips, which are sorted and added. If a record is required, an adding machine such as the Burroughs portable is used If no record is needed, a key-driven machine such as the Comptometer can often be used, and is much more rapid This particularly applies to those forms of sales analysis which are for immediate use, i e to guide the sales manager and salesman Key-driven machines are described in Chapter XVII

Example 1.—The Book or Card Ledger

This is the longhand method Each heading is given a card or a

page in a book, and the items are posted to these cards. It has advantages—

(*a*) Where the clerk has to think about each item as it is entered

(*b*) Where much narrative is needed for reference

(*c*) Where the number of headings is great, in proportion to the number of items

Analysis records of this type can sometimes be posted by machine (see the chapter on ledgers for description of method)

As an example, a company wished to analyse its expenses so as to show each item in the permanent record with explanatory narrative A National book-keeping machine (Class 3000, with typewriter keyboard) was used, the expense invoices were first pre-listed, then posted to the expense bought ledger, then passed to the analysis machine, and posted to cards of this type—

ACCOUNT: REPAIRS AND RENEWALS

Date	Supplier	Details	Invoice No	Item	Balance	Old Balance
Jan 3	Jones	Drains at Old St	14	15 3 7	15 3 7	—
17	Wickerman	Brickwork Wall at rear of warehouse	79	70 0 0	85 3 7	15 3 7
23	Jones	Plumbing Lennard St	113	15 3	85 18 10	85 3 7

FIG. XII—1

This analysis ledger would be accompanied by a proof sheet and balanced, as explained in the chapter on mechanical ledgers

Note that there is no credit column here, any occasional items being entered as deduction, in the item column

Example 2.—Columnar Day Book

Where items are to be added by head and eye it is necessary to enter them in columns For this purpose the columnar form of day book is very convenient The form is well known and does not need detailed explanation, but for completeness, an expenses day book is illustrated as example

The introduction of the adding machine makes it advisable to inquire whether the day book is necessary This has been discussed in the chapter on books of original entry, and it is only necessary to say that in many cases the day book is superfluous and can be replaced by a file of invoices and adding machine lists. In that case the analysis would be in slip form. On the other hand, if subsequent detailed

checking (e.g. by auditors) may be necessary, then the book form must be retained. Each case must be judged on its merits. In some cases it may be advisable to have a part of the items recorded in book form, e.g. expense invoices may be in a day book, while those for purchases of materials are in slip form.

It may be advisable to repeat the warning that where the number of items is small, the most orthodox system should be used A small concern would normally use an analysis day book, in preference to a slip system Similarly, a separate and small section of a big concern should have an orthodox form of records, e g a substantial concern had a small department dealing with hire purchase transactions For this small department a day book was kept by hand in standard form, as an alternative system would not have saved enough time to balance that lost in explaining it to auditors and new staff

The petty cash book is another example of a columnar record kept by hand, even in the largest concerns

EXPENSES DAY BOOK (FOR HAND ENTRY)

Date	Supplier	Fol	Total	Carriage	Packing	Printing	Miscellaneous		
							Account	Fol	£

FIG XII—2

The number of columns could be extended as required

EXPENSES DAY BOOK (FOR MACHINE ENTRY)

Date	Supplier	Carriage	Packing	Printing	Miscellaneous		Total
					Account	£	

FIG. XII—3

A machine such as the Remington would be used for this with an adding box to each column. Note that in the hand-posted form the total is on the left, while in the machine form it must be on the right

Example 3.—Columnar Ledger

Where books are kept by hand, a columnar ledger is a useful device to obtain a double analysis in one record. For example, a multiple shop concern had fifty shops and wished to keep a record book showing petty cash of each branch with analysis under various headings. An analysis ledger was introduced with a page for each branch and ruled as under—

BRANCH PETTY CASH RECORD BOOK

Branch No

Week Ending	RECEIPTS					PAYMENTS						
	Total	Sales	Tax Deducted	Sundries	From H Q	Total	Wages	Insurance	Trav.	Carriage	Sundries	Bank

Fig XII—4

To simplify the ruling, £ s d columns are omitted The number of columns could be extended *ad lib* , but a very wide book is not recommended It might be necessary to confine the book to payments

Such a ledger (or record book) can be transferred to a book-keeping machine, but it is not easy to retain the full advantages of the machine If the reader refers to the chapter on machine posted ledgers, he will note that the advantages include—

(*a*) each entry is verified as it is made

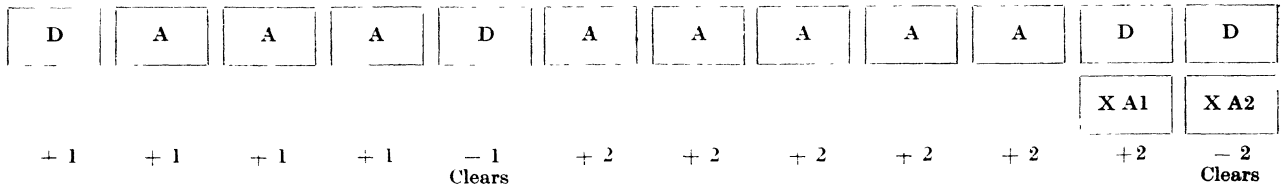
(*b*) a running balance is shown

The following examples should be examined with these points in mind

Example 3a

A ruling for a branch petty cash analysis ledger for use on a book-keeping machine of the Remington type is given in Fig XII—5

There will also be a proof sheet ruled with similar columns and on which all the entries for the one week will be shown.



PETTY CASH ANALYSIS LEDGER

BRANCH NO

Date	Balance B. Forward	Tax Deductions	From Bank	Sundry Receipts	Total Receipts	Wages	Insurance	Travelling	Carriage	Postages	Balance C Forward	Total Payments

Each square | A | represents an adding box, related to the column above which it is drawn See Chapter III for method of drawing these diagrams

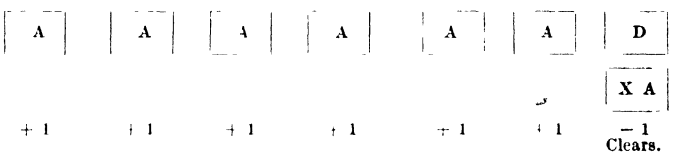
FIG XII—5

Each branch sends to head office a weekly petty cash sheet, which shows the items in convenient form for posting to the above ledger, it is already added As the debits (receipt) items are entered they are accumulated in the adding boxes and also cross cast in the first cross-footer The operator reads and enters the total receipts from the petty cash sheet and, if the entries are correct, this clears the first cross-footer. If there should be an error, this cross-footer does not clear, the machine locks, and the operator must find the error before proceeding In the same way the credit (payment) items are checked by the second cross-footer.

This method gives no running totals on the ledger sheets, which must be added periodically by some other method (e.g. Comptometer)

Example 3b

The circumstances of the example may be varied a little Suppose the multiple shop company each week paid various branch expenses from head office and wished to collect the figures of these in one record book This ruling might be apposite—



BRANCH EXPENSES LEDGER

Branch No

Week Ending	Carriage	Packing	Stationery	Travelling	Cleaning	Petty Cash	Total Weekly Expenses

There would also be a proof sheet with similar columns

FIG XII —6

The various types of expense are recorded in different types of document Each type is pre-listed The cross-total for each branch is not known until the book is entered (in that way it differs from the previous example)

The documents are sorted so that those for each branch are together and in the right order for posting As the items are entered they are

accumulated in the boxes and the total for each branch is cast in the cross-footer. The "total weekly expenses" is entered from the cross-footer, which is then clear ready for the next branch.

At the end of the run of postings the total of the carriage column is read from the box and should agree with the pre-list. The other columns are checked in the same way.

Here again there is no current balance shown on the cards.

Example 3c

Reverting to the example of the multiple shop petty cash analysis from petty cash sheets already added by the branch managers, suppose that payments only are to be analysed.

This ruling might be convenient—

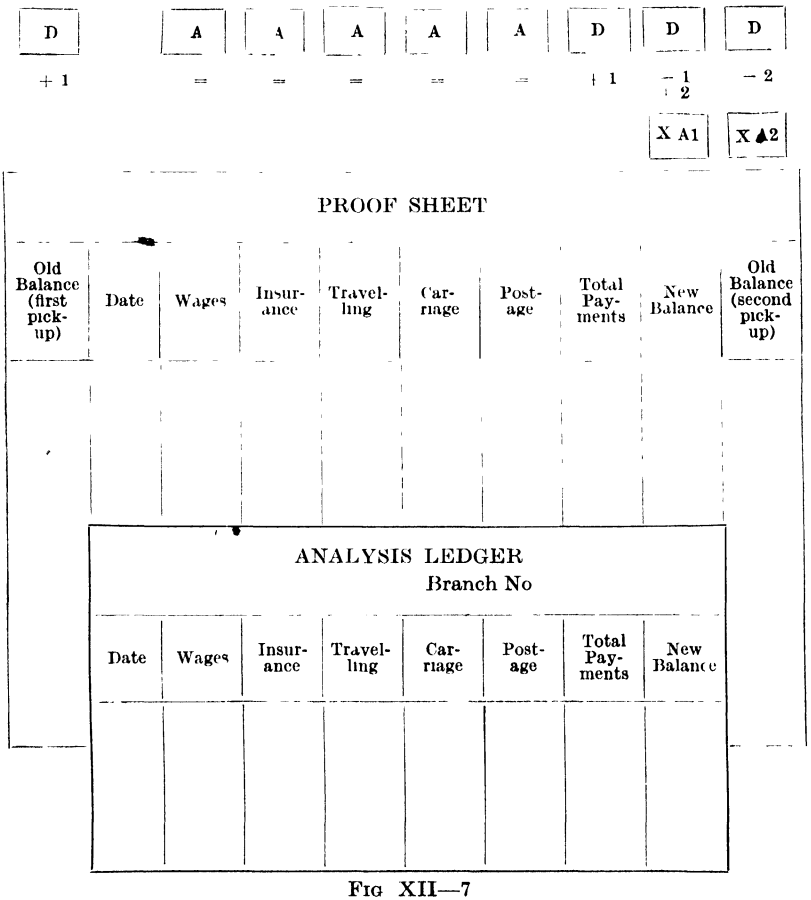


FIG XII—7

The items in the analysis columns are accumulated in the adding boxes, but are not in the cross-cast. The method of proof is exactly as

described in the chapter on ledgers, the proof total being accumulated in the second cross-footer to agree with the pre-list.

A thoughtful comparison of examples 3A, 3B, and 3C will make clear that all the advantages of both analysis, machine proof, and accumulated totals could only be obtained by an impossible number of cross-footers and an exceptionally wide carriage. That method should be chosen which gives the greatest practical advantage in the particular case.

Example 4.—Peg-board Analysis

This method gives the advantage of the entry of figures in columns without the necessity of re-entering them in a cumbersome book.

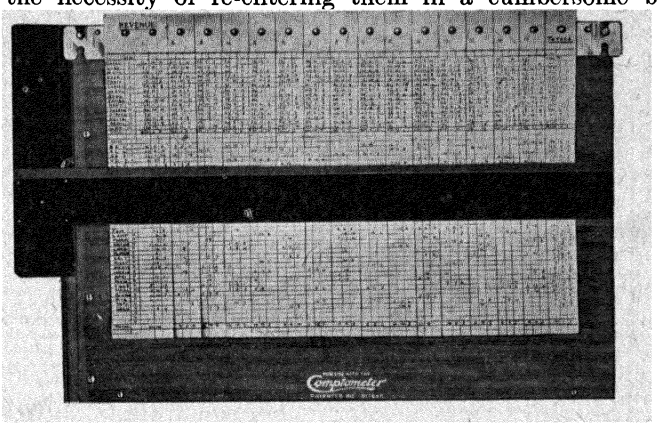


FIG. XII—8. PEG BOARD

The details are entered on printed forms, each of which has the heads of analysis on the left and a cash column on the right. These forms are arranged on a board as shown in the illustration and are cross-cast by means of an adding machine.

As an example, a company received reports of sales from its branches these reports being on forms designed for the peg board. These are arranged on the board, and the total for each class obtained by cross-adding At the end of the year, the reports for each particular branch are arranged on the board, and an analysis of sales for that branch obtained in a similar way

The advantages of the method are greatest where the figures have in any case to be put in report form; if the slips had to be specially entered for the peg board, much of the advantage would be lost.

Example 5.—National Analysis Machine

The analysis machine is similar to the National book-keeping machine (Class 2000), but is simplified to suit this particular job. There are 26

adding registers available for analysis If sales invoices were to be analysed by salesmen, 26 or less in number, each salesman would be indicated by a particular number As each item is put on the keyboard for entry, the particular salesman's number is selected and the item will then be added in that particular register

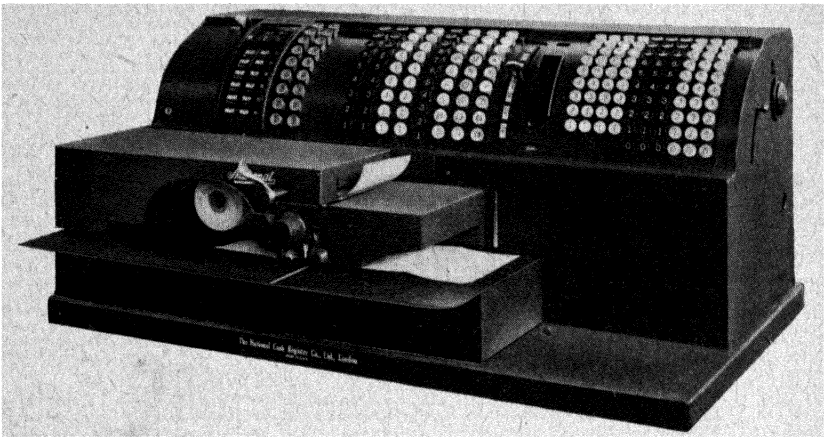


FIG. XII—9 NATIONAL ANALYSIS MACHINE

This is a rapid operation The makers claim that the machine will handle 3000 items a day

The machine makes a list like this—

4 Sept

21	4	0	9
7	3	10	5
13	1	7	4
1	5	2	9
2		7	1
15	1	4	8
21			7
23	5	15	6
23	1	0	2
5	2	14	4
	584	13	9*

FIG. XII—10

The number against each item shows the register selected, that is, the salesman given credit

Note that the items are entered exactly as they come to hand, without sorting

Invoice numbers could also be shown on the list, but are omitted here for simplicity.

If there were to be more than 26 salesmen, those occurring most frequently would be given numbers as explained above, and the others would be treated as sundries and numbered 27 For each of the sundries the machine would produce a slip like this—

Salesman's Number	Amount
41	2 4 1

Fig XII—11

These salesmen's numbers (over 26) would be printed with the reference number keys on the right of the machine

The slips would be sorted and added on the machine and posted to salesmen's cards

The total of each register is posted by the machine to a card like this—

Salesman No 7

Date			Amount		
Sept	1	7	21	4	3
	2	7	7	18	2
	4	7	14	14	5
	5	7	13	9	8
	6	7	12	19	1

Fig. XII—12

The register number is shown after the date to confirm that the amount is posted to the correct card The total sales would be posted to a total card and at the end of the month the cards would be added and agreed

Example 6.—Unit Slip Method

Where documents (e g invoices) are available and where the items on each document are all in the same analysis group, a very convenient slip system can be used

Invoices are sorted into piles, corresponding to the analysis heads Each pile is added on a listing machine and the list is clipped to the pile of invoices. These, with list, are filed for reference

The totals are carried to a summary, which may be a columnar book (if the headings are few) or may be in card form. Above is shown a card for use on a book-keeping machine of simple type There would

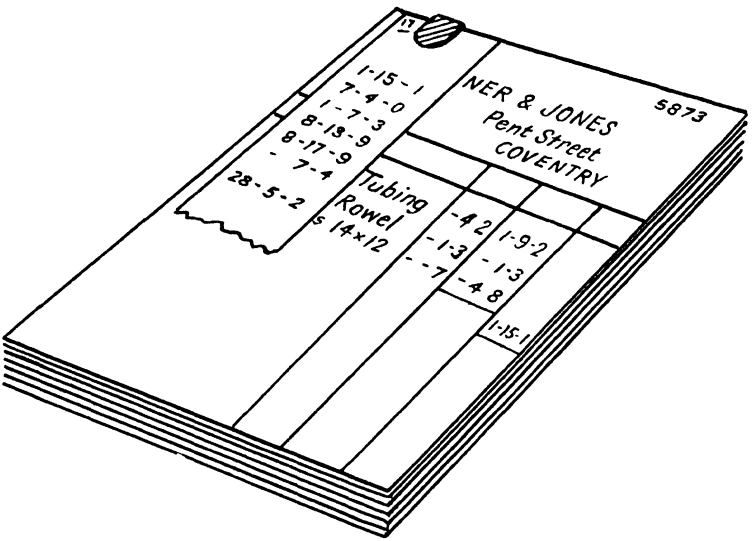


FIG XII—13

								GROUP NO 17			
Week Ending	Total for Week			Brought Forward			Total to Date				
3 Jan.	17	9	4		—		17	9	4		
10 Jan	30	0	5	17	9	4	47	9	9		
17 Jan	28	5	2	47	9	9	75	14	11		

FIG. XII—14

be a control card and the total of all heads for the week would be agreed with the total invoices.

Note that a separate copy of the invoice is needed for this method. It would not be convenient to use the same copy subsequently for (say) a second analysis.

Similar systems could be used, e.g. for purchase invoices, or for stores issue notes The great advantage is that the original documents relating to any heading can at once be found

This method is known as a system in which the filing follows the analysis.

Example 6a.—Unit Slips: Re-sorting

A company wished to analyse its sales in three ways (*a*) by area, geographically; (*b*) by class of goods, (*c*) by type of customer, i.e. factors, shopkeepers, engineering works, gas works, and so on. These were to be three independent groupings It was found that each invoice showed one class of goods only.

One copy of the sales invoice passed to the analysis department. These invoices were made into daily batches and the total obtained. The daily batch was first sorted into areas, the invoices for each area being clipped together as an area batch Each area batch was added on a Burroughs listing machine, the lists being marked with the area and a total of all these area batches obtained to agree with the daily total The lists were handed to another clerk, who entered them in the summary book, while the analysis clerk re-sorted the invoices by class of goods and proceeded to add exactly in the same way as before Finally the invoices were sorted by type of customer and again added. If more types of analysis had been needed, the procedure could have been extended

For this type of work it is convenient to use a machine with two registers In one register the batch is added while the total of all the batches is accumulated in the other register.

Note that this procedure can be used for any analysis in which the basic document is a unit, i e does not need splitting between two headings. In our example, if an invoice had represented more than one class of goods it would have had to be put into two batches and the method would have been impracticable

For reference, this method is called analysis by re-sorting.

Example 6b.—Unit Slip Methods

A co-operative society wished to analyse its sales so as to find the figure on which each member should have dividend A slip of some sort was available for each transaction—in some cases an invoice, in others a cash sale receipt. The form of these documents varied much between different departments, but in all cases showed the essential information, customer's number, and amount of sale These slips passed to the analysis department, where they were first added to agree with the sales. (This ensured that no slips were missed.) They were then hand sorted by numbers, those for each number added, the totals accumulated, and again agreed with the sales total. The slips were filed with the lists in case any customer should raise a query.

The totals from the lists were posted to ledger cards with a book-keeping machine

Dangers of Slip System

A slip system should be carried out well or not at all If the sorting is careless or the subsequent filing is untidy, the system will only produce concealed errors which it will be very difficult to trace To appreciate this, comparison should be made with a columnar book, where the eye can see at a glance what has become of every item, and a casual check will call attention to any error If the analysis depends on loose slips, which have been put away, then this easy verification is not available. Therefore the work must be well done in the first place

There is also a danger that a slip might go astray while the analysis was in progress, making it impossible to balance the totals. This possibility can in practice be almost eliminated by good organization and supervision The clerks should have plenty of room. where necessary trays should be provided for stacks of slips in use Slips on which work has been completed should be at once filed so as to prevent any mixing with the new slips The time saved by a slip system can be considerable and justifies attention to details

Example 6c.—Unit Slip Methods

The convenience of the unit slip method gives the suggestion of a mechanical means of handling the slips, of sorting them, and adding them That is just what the Powers and the Hollerith machines will do Because this extension of machine accounting leads to new uses and new problems, a separate chapter is allotted to it

Example 7.—Exhaust Method

In the previous example, each invoice related to one analysis head only. If invoices have to be split over several heads, another method must be used The items could be entered in columns or in separate sheets (which would mean much clerical work) or the "exhaust" method could be used In this the items are first added (this has probably been already done) Then the clerk goes through them and picks out the items for group one, which are listed and added on a Burroughs portable (or similar machine) When all the items in group one have been listed, the clerk picks out those for group two, and so on, until all the items have been taken Finally, the totals of all these lists are added, and should agree with the first total as shown in Fig. XII—15.

This method looks easier than it is The clerk has to pick out the items by eye, must not overlook any, must show them on the correct list. If an error is made, much time may be lost in looking for it

These difficulties may be much reduced by well-designed documents.

The figures to be read should be clear and not too close to other matter. Totals should stand out. The clerk should be able to read the heading to which each item refers, without delay or inquiry Two examples are shown on page 146.

In Fig. XII—16 the number of gallons is shown inside the square against the required pump The analysis is thus made easy because

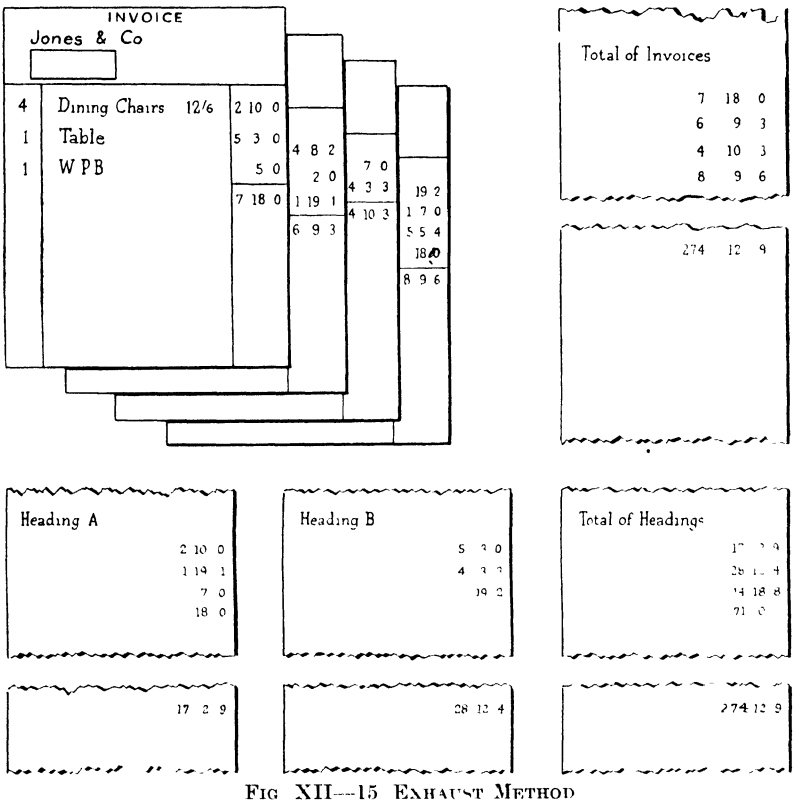


FIG XII—15 EXHAUST METHOD

there cannot possibly be any items on the wrong line, or ambiguously written

The number of gallons from each pump is important, as a stock record must be kept for this class of goods

Each line is for a particular class of goods and is labelled with the initials of the class so as to prevent any doubt

There is a detachable portion at the bottom, which the cashier retains as a check on the cash

Example 8.—Creating Unit Media

An adding machine list (e.g. Burroughs) can be divided so as to produce unit media

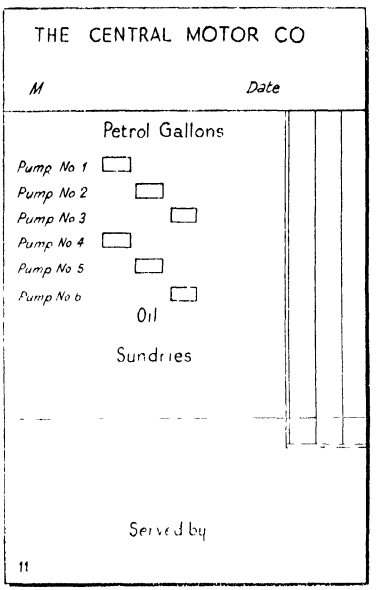


FIG. XII—16. A DOCKET FOR USE AT A PETROL STATION

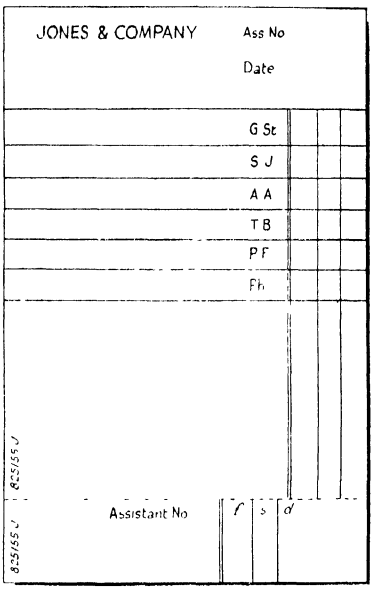


FIG. XII—17. A CASH SALE DOCKET DESIGNED TO ASSIST ANALYSIS

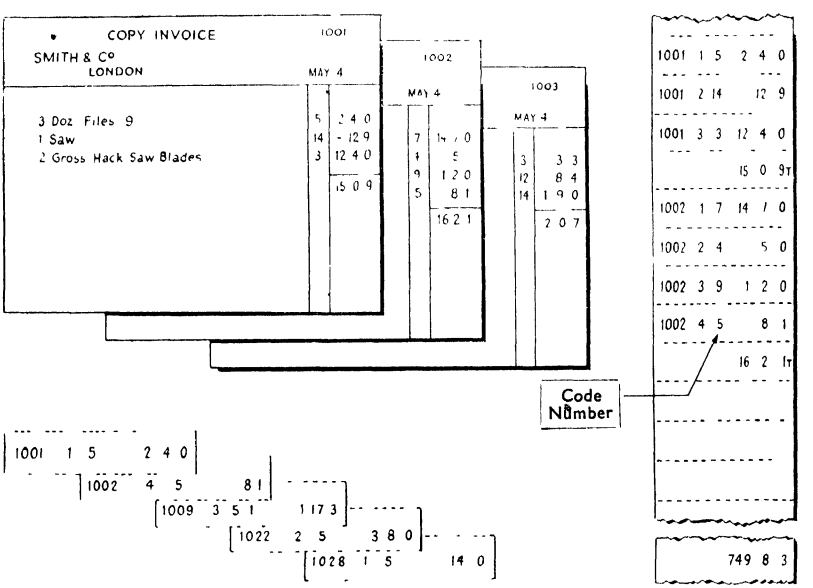


FIG. XII—18

In the first place, the document on which the information comes (here a copy invoice) must show clearly the analysis heading into which each item is to be added. In the illustration (Fig. XII—18), each item has a code number against the amount. These code numbers are repeated against the amount on the machine list (shown on the right). This list is cut into strips, with one item on each strip The strips are sorted to bring together all those for one code number

These slips are then listed on the machine (Fig. XII—19, left), the total of each heading being posted to a summary card (right). For this operation, the machine must have a front-feed carriage, as a different card must be used for each heading.

Example 9.—Paramount Sorting System

Sorting can take a great deal of time, and although clerks sorting by hand can gain considerable speed, it is natural to look for methods to improve it The Paramount system is designed for this purpose

The system uses specially designed cards with holes punched along the sides' Each hole represents a particular number or letter The

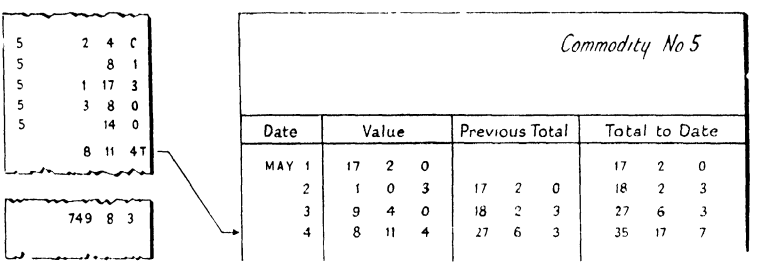


Fig. XII—19

cards are slotted by a punch rather like that used by a railway guard to punch tickets.

When the cards are received in the office, they are sorted by means of a needle, inserted through the holes. The needle is put in each hole in turn and the cards which have been slotted in that place fall out. It is claimed that this method is quicker than hand sorting, but against this must be set the time spent in slotting the cards A key punch is available for rapid slotting in those cases where the work can be centralized.

Example 9a.—Sales Analysis with Paramount Cards

A multiple retailing company uses a small card as illustrated. For each item sold a card is punched in the shops These are sent to the office, where they are added to agree with the cash returns and are sorted with the needles. When sorted, the cards are cast on an adding machine to obtain the total of each group (this is similar to other slip systems).

Where space is available, it is preferable to use ten holes to represent the numbers 0 to 9 Frequently, where large numbers are involved, the condensed method is used, as in the example below. Four holes represent nine numbers, using two holes for one number where necessary, e g. in the top right-hand corner of the card illustrated, the

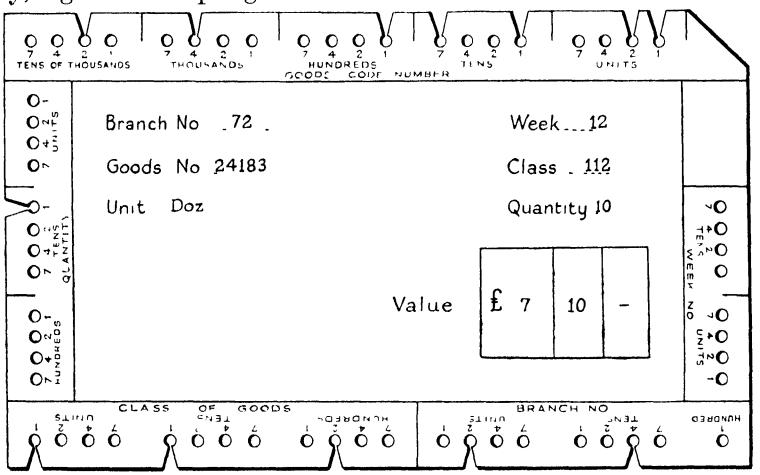


FIG XII—20

number 3 is shown by punching both the two and the one and also in the section to the left of that, the number 8 is represented by seven and one

There is a piece cut away at one corner of the card so that the clerk can see that all the cards are the right way up

Example 9b.—Wages Analysis with Paramount Cards

In some cases the cards are designed for use with a time clock In other cases it is a small card such as illustrated in Fig XII—21

When an order is received, a card is made for each operation involved, the office punching the department, job number, and operation These cards are sent to the foreman in the factory The foreman in turn passes each card to a workman as his instruction to do the work, and when the operation is complete the workman punches his own number and enters the times, returning the card to the foreman The cards are collected at the end of the day and the office calculates the labour charge.

Each week the cards are sorted by means of the holes, and added firstly to give the wages due to each man, and secondly to find the charge to each job This system ensures that no wages are paid unless definitely allocated to a particular job

Example 9c.—Stores Issues on Paramount Cards

A card such as shown in Fig. XII—22 is used

Each foreman has a supply of cards, on which he enters the goods required from stores. The cards are handed to the storekeeper in exchange for the goods. The storekeeper enters the values The

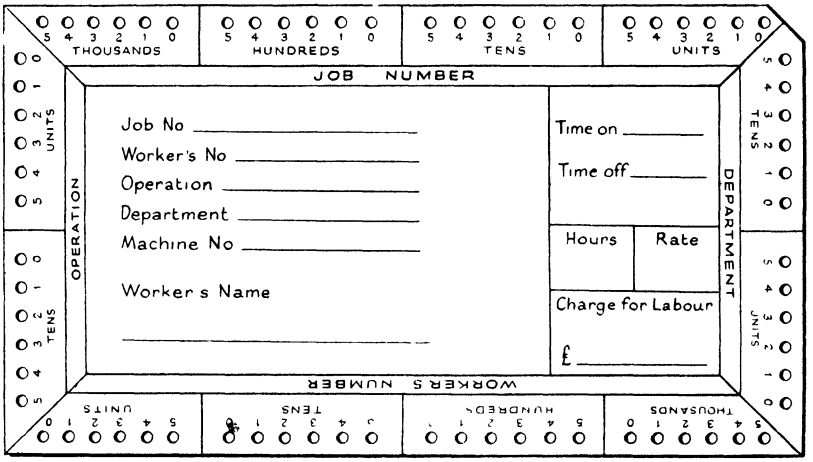


FIG XII—21

cards pass to the office, where they are punched and sorted by stores number, summarized with an adding machine, and the totals posted to the stores ledger The cards then pass to the cost clerk, who re-sorts

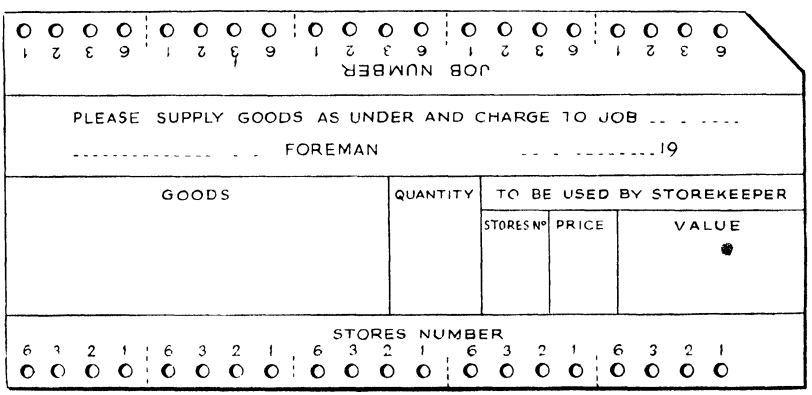


FIG XII—22

them by job number, summarizes them, and enters the totals in the cost ledger

The reader will note that the Paramount system is flexible and needs no expensive machines. If desired, it may be started on an experimental scale and expanded and modified as opportunity offers.

CHAPTER XIII

WAGES

PECULIARITIES of the work—Time records—Time sheets—Unit slips—Piece-work—Examples—Continuous belt—Tax deductions—Another method—Preparation of pay-roll—Hand preparation—Branches—Addressing machine—Standard deductions—Machine entering

WAGE-PAYING differs from other office work in three practical ways—

(1) The payment has to be made on a particular day. If the number of employees is large, great speed is necessary. This means that certain parts of the work may have to be spread over many clerks; that the office may have to be organized so that clerks engaged on other work have to be transferred to this for certain days, or, possibly, that the office may have to carry a surplus of personnel available for this purpose When considering systems or mechanical aids, the criterion will be speed and not only a comparison of costs

(2) The large amount of cash handled calls for a particularly sound system of internal check. Theoretically, the more persons who are concerned in the wage payment the better, as they act as a check on one another, but this is limited by practical considerations It is usually best to have the calculations of the gross amounts (piece or time rates) made by persons other than those who put the money into the wage packets and to have two persons working together on the

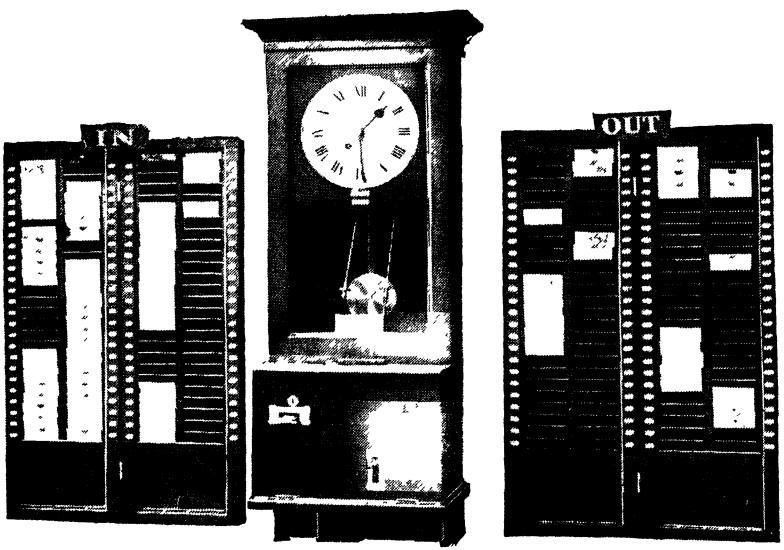


FIG. XIII—1 GLEDHILL TIME RECORDER

No.	Name	Dept.
1234	Brown	T.R

[1] 7 55 Sa.	
12.00 Sa	
	7 55 M
	12 30 M
	1 30 M
	5 30 M
7 55 Tu	
12 30 Tu	
1 30 Tu	
5 30 Tu	
	7 55 W
	12 30 W
	1 30 W
	5 30 W
7 55 Th	
12 30 Th	
1 30 Th	
5 30 Th	
	7 55 F
	12 30 F
	1 30 F
	5 30 F

	Hours	Rate	£	s	d
[2] Standard					
Overtime					
Lost Time					
Total Adjustments	47	1/5	3	6	7
Gross Wages			£3	6	7

[1] These are the clock records marked with the day The letters printed sideways indicate the afternoon

[2] This can be arranged as necessary The gross wages can be carried on to the back and completed by the deductions (tax and other items), and the net amount shown

This card is given only as an example Provided it is of suitable shape, any card can be used. If required, it may be designed for use for Paramount sorting, or for punched card machines

FIG. XIII—2

latter job. In many businesses the costing records provide a check on wage payments. Periodical independent checks of insurance cards and clock cards should be made to ensure that no "dummy" names are shown on the wage sheets

(3) Secrecy, or at least tact, is necessary The arrangement differs very much between one concern and another It usually implies that the information reaches as few people as possible, which is in direct contrast to methods of internal check Thus many (perhaps most) concerns have to adopt some compromise Certain parts of the work can be done from clock numbers without reference to any names. Certain parts of the staff may be entered on a separate section of the payroll, to which only one clerk has access

The work in connexion with wages is—

(*a*) Collecting the information and calculating the gross amounts (time, piece, or bonus)

(*b*) Income tax calculations and records

(*c*) Summarizing the gross wages and deductions to make a payroll

(*d*) Putting the money in the wage packets and making payments

(*e*) Analysis and cost records.

Time Records

There are many forms of time clock of which one is shown on page 150 The record produced by this clock is shown in Fig XIII–2

Time Sheets for Costing Purposes

There are two main classes of time sheet—those which cover a period (e g a whole week) and those which cover one job or one operation only

Fig. XIII—3 shows a specimen time sheet for a week

The advantage of this method is its simplicity It is easy to ensure that the amounts posted to cost accounts do actually agree with the wages paid

The disadvantage is that each item has to be posted separately to the cost ledger They cannot be so readily summarized as the unit slips used in the next example. If the workmen spend considerable time on each job, then this time sheet method is best. If they are continually changing jobs, then the unit method is usually better.

Time Analysis by Unit Slips

Either the worker makes out unit slips, or (usually preferable) the slips are issued from the office The latter is illustrated in Fig. XIII—4.

These slips can be punched for paramount sorting, or can be designed for punch-card machines, or can be hand sorted. In any case they are sorted and summarized, as with other slip systems described in the chapter on analysis. The total for each job is posted to the cost ledger

TIME SHEET

No. *74* Name *H W Brown*

Dept. *T R* W/c *29 June*

Job	Operation	Hours	£ s d	Posted by
1704	Milling	14	1 8 1	R J
1914	,,	9	18 1	R.J.
1913	,,	10	1 0 1	R.J.
1748	,,	7	14 0	R.J.
1812	,,	8	16 0	R J
		48	4 16 3	

Workman to sign here *H W Brown*

Foreman to sign here *B Berridge*

It is useful to have initials in the last column to show that all the items have been posted

The figures are entered in the office first, the total is entered, and then it is divided in proportion to the hours

FIG XIII—3

(1) JOB TICKET

Workman's Number Job No

Workman's Name

(1)
Work to be done

Date	Hours	Rate	£ s d	Posted by
(2)	(2)	(3)	(3)	

Workman's initials

Foreman's initials

1 These are entered before the work is given out.

2 Workman enters date and hours

3 The office enter these. It is necessary to have a table showing the hourly rate for each man (including insurance and bonus, if any)

FIG. XIII—4

and the total of all cards for the week is agreed (as nearly as may be considered necessary) with a total obtained from the pay sheets

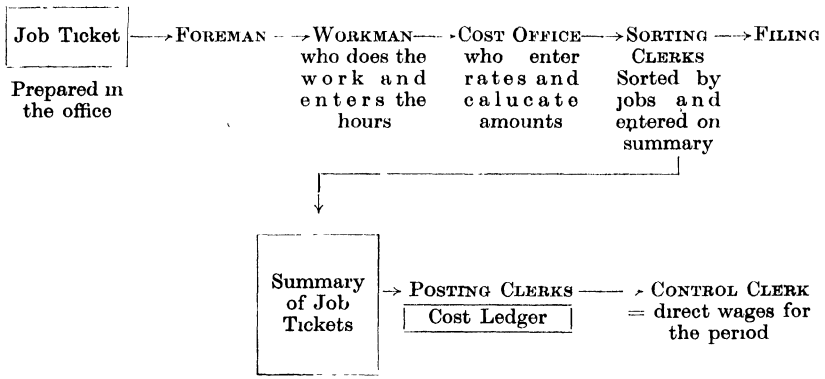


FIG. XIII—5

Piece Work

There are two methods of recording piece work. In one case the workman makes a summary of the work which he does In the other case, the office issue cards bearing instructions to do the work, and these cards return in due course to the office bearing the information from which the wages are calculated

First Method —The worker makes a summary of work done on a form given to him for the purpose. The size and ruling of the form will differ in each case and may be something like this—

PIECE WORK

Clock No 172 Name *J Williams* W/c 17 *June*

Job	Operation	Number of Parts	Rate	£	s	d	Foreman's Initials
1518	Grinding 19432	8	4/3	1	14	0	R.O C.
1743	Grinding 9482	1	15/–		15	0	R O.C
1518	Grinding 19823	8	3/–	1	4	0	R O C.
1519	Grinding 19432	8	4/3	1	14	0	R.O.C
1520	Grinding 19432	1	4/3		4	3	R O.C
				5	11	3	

The operation may be given a number, or may have to be shown in full Sometimes the operator adds the cash items; more often it is done in the office.

FIG XIII—6

If desired, these forms can be bound into books, which pass between the worker and the office each week (or, for practical reasons, two books, which are used in alternate weeks)

Second Method.—The fact of piecework presupposes that there is a regular manufacturing programme In this method the instructions to proceed with the work bear a record of the piecework rates allowed

WORKS ORDER CARD

Post No *12407* Quantity required *24*

Operation No.	Rate Each	Total Allowed	Workman	No	Foreman
1	1 3	1 10 0	J. Harris	7	
2	4 0	4 16 0	K Brown	44	
3	8	16 0	W P. Smith	13	
4	1 0	1 4 0	W P Smith	13	
5	9	18 0	W. P Smith	13	
	7 8	9 4 0			*R O C*

The first three columns will be entered in the office before the card is issued
The workman who does the work signs in the column indicated

FIG XIII—7

This method necessitates a subsequent analysis to obtain the total amount due to the workman for the week It is only satisfactory where the number of workmen likely to work on one works order are few, otherwise the analysis and summaries are too elaborate

The advantage of this method lies in the simplicity of the costing. The materials cost and overheads can be shown on the back of the card (see the chapter on costing)

Another Example of the Second Method —To avoid the analysis and summarizing, detachable sections are sometimes used

Fig. XIII—8 shows a card for use in this way In practice it would show more detail of the work to be done as it carries instructions to the workman as well as providing a record.

This system is particularly suited to those cases where variety in the work makes mass production methods impracticable, but there is sufficient repetition for detailed planning from the office, for example, it could be adapted to the needs of a manufacturing clothier or a medium-sized machine shop.

The form is completed in the office, before issue

WORKS ORDER CARD 12121

Date

Part No *70703*

Quantity *12*

Operation	Rate Pence	Allowed		1 12121
1	15	15	0	15 0
				2 12121
2	9	9	0	9 0
				3 12121
3	7	7	0	7 0
				4 12121
4	13	13	0	13 0
				5 12121
5	2	2	0	2 0
	Total	2	6 0	

The workman tears off the section for the work he has done. He keeps small strips in an envelope until the end of the week, when he writes his name on the envelope and sends the strips in it to the office, where they are added on a Burroughs or similar machine

FIG. XIII -8

Continuous-belt Production

Mass production requires and facilitates some modification of method The operator is doing the same job over and over again He is provided with a supply of cards such as this—

PIECEWORK CARD

OPERATION NO *74128*

Worker's No	Rate in Pence
	19

Every time the worker completes his operation, he takes one of these cards and signs in the space shown. The office enter the other items

FIG. XIII—9

The cards are returned to the office, sorted, and added for the pay roll and perhaps re-sorted for statistical purposes Punched cards designed for hand or machine sorting are usual

A card for Paramount (hand) sorting might be designed—

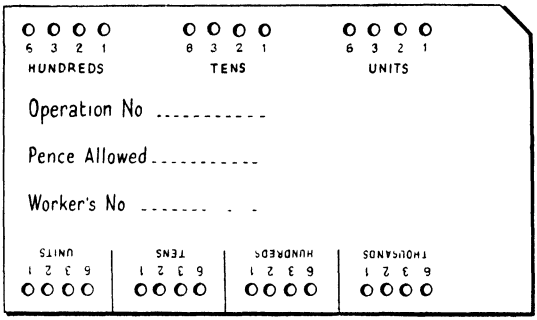


FIG XIII—10

Tax Deductions

It is not proposed to repeat here the explanations which are contained in the official publications and which are now well known to cashiers If the number of workers is small, it is convenient to enter the wages on the tax cards, work out the tax to be deducted, and when these figures are complete to copy the figures on to the wages sheet In a larger concern it is advisable to study labour-saving methods

There are two methods Either the calculations are all made first

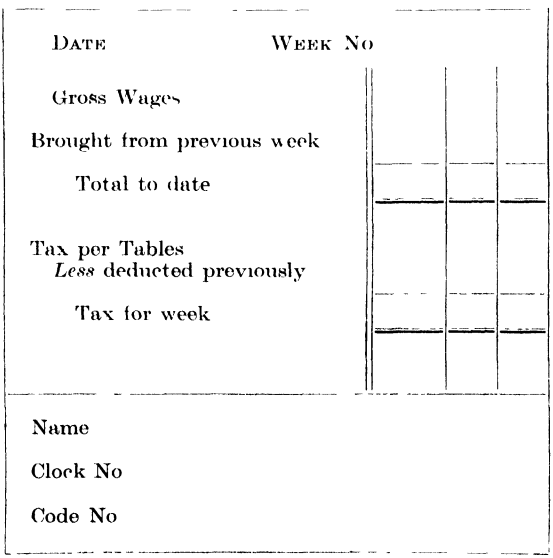


FIG. XIII—11

and later transcribed on the pay roll, or else these calculations are made as the pay roll is prepared. An example of each is given

The calculations are made on the back of the clock cards, ruled as shown in Fig. XIII–11 This is convenient to handle and the record can be rough, as a neat summary is made later The official tables may be used or special tables in conjunction with a calculating machine

From the clock cards the information is entered on pay roll and earnings record (in duplicate). This is done on a book-keeping machine, the method being described more fully later in this chapter

The forms are simplified to make the method clear.

PAY ROLL

Week No	Clock No	Name	Wages			Tax			Net Pay-able
			For Week	B/fwd	To Date	To Date	B/fwd.	For Week	

Fig XIII—12

EARNINGS RECORD

Name Clock No

Week No	Clock No	Name	Wages			Tax			Net Pay-able
			For Week	B/fwd	To Date	To Date	B/fwd	For Week	

Fig. XIII—13

Tax Deductions (Second Example)

The pay roll and earnings record are made in one operation on a

book-keeping machine Alongside the machine operator sits a clerk with a special form of ready reckoner The ruling is—

PAY ROLL

Date Week No

Name	Code No	Wages for Week	Wages B/fd	Wages to Date	Code Equivalent	Taxable	Tax to Date	Tax previously Deducted	Tax for Week	Net Payable

FIG. XIII—14

The machine operator enters the wages for the week, and wages brought forward, these the machine adds and enters in the column headed "Wages to date." While these are being entered, the other clerk finds from the tables the value of allowances which are equal to that particular code number and week This figure she calls out and the machine operator enters it in the column headed "code equivalent" The machine deducts this from the wages to date and enters the balance in the column headed "Taxable." The clerk finds this figure in her tables and calls out the tax corresponding to it, which the operator enters in the "Tax to date" column The operator enters the tax previously deducted and the machine automatically computes and enters the tax for the week and the net amount payable

The point of this special operating method lies in the use of much simplified tables If the clerk had to look up the figures in the official tables the pay roll would take too long to prepare by this method

The earnings record has the same ruling as the pay roll and is prepared at the same time.

Preparation of the Pay Roll

Systems which abolish the pay roll have been suggested but should be discouraged. It would be quite possible to make calculations on the clock cards, pay from the clock cards, and add them on a Burroughs listing machine, but the records would be difficult to reconstruct for audit and would put temptation in the way of the cashier. Similarly, a system has been suggested based upon visible card equipment, with the amounts payable showing at the visible edge of the card. This would suffer from the same defect, as there would be no convenient record for audit.

Where there are only a small number of employees, the standard and well-known type of wages book with short and long sheets is most convenient In those cases there is neither scope nor need for further labour saving. Its ruling might be—

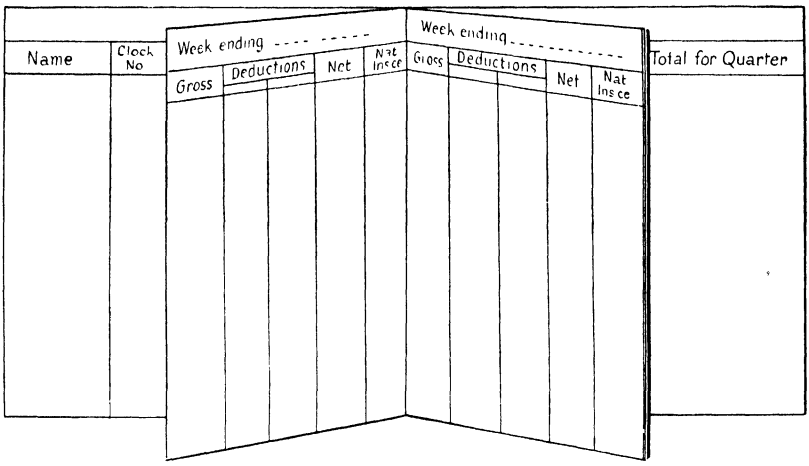


FIG XIII—15

There are usually sufficient short sheets to enable a quarter's figures to be entered before the names are re-written

Where there are many employees other systems may be applicable and some examples follow.

Pay Roll.—Example 1—Hand Preparation

If it is desired to give the employee a record of the amount paid, and where the numbers do not justify a machine, the following method is used—

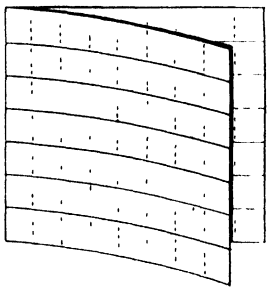


FIG. XIII—16

The front sheet is made up of perforated strips, as many as convenient. The back sheet is the pay roll, a carbon being inserted between Both sheets are ruled the same, but the column headings must be repeated on each strip. The figures for one man are written

on each strip and when complete these strips are removed and inserted in the wage packets.

The ruling might be—

Date	Name	No	Gross	Deductions				Net	Co 's Insce
				Tax	Insce	Hospital	Total		

Fig XIII -17

Pay Roll.—Example 2—Branches

Sometimes the wages are paid at one place but recorded in permanent form at another. In such a case the records may be in an abbreviated form, as in this example from a multiple shop concern—

The branch makes a return of its weekly cash takings and expenses, one side of the return showing details of wages as in the form below—

Branch 17 W/ending *7 Jan*

	Gross	Deductions		Net
		Tax	Insurance	
W Brown	5 0 0	7 0	1 6	4 11 6
C Jones	3 0 0	9 0	1 6	2 9 6
W Bromley	15 0		10	14 2
K Coker	2 0 0		1 0	1 19 0
D Davies	1 10 0		1 0	1 9 0
	12 5 0	16 0	5 10	11 3 2

Fig XIII—18

Head office keep a record book, with a page for each branch, as shown in Fig. XIII—19.

BRANCH *17*

Name	Date Commenced	Invoice		Gross Wages	7 Jan	14 Jan	21 Jan.	28 Jan	4 Feb	11 Feb.	Total for Half-year
		Co	Emp'ee								
W Brown		1 7	1 6	5 0 0	√	√	√	√	√	√	
C. Jones		1 7	1 6	3 0 0	√	√	√	√	√	√	
W.Bromley		10	10	15 0	√	√	Left 14 Jan				
K. Coker		1 1	1 0	2 0 0	√	√	√	√	√	√	
D Davies		1 1	1 0	1 10 0	√	√	√	√	√	√	
S Vincen	23 Jan	10	10	15 0				√	√	√	
					12 5 0	12 5 0	11 10 0	12 5 0	12 5 0	12 5 0	

NOTES

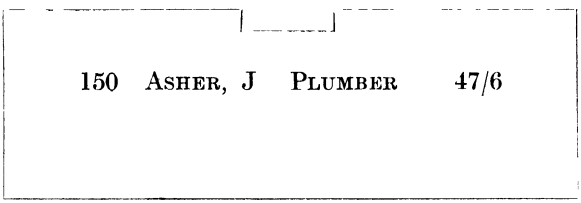
The use of ticks saves both space and clerical work
The total is written sideways to save space.
The number of columns is here reduced for illustration There would be 26

FIG XIII—19

At the end of the period the total wages for each man can be calculated easily with a ready reckoner or Comptometer.

Pay Roll.—Example 3—Addressing Machine

It is often convenient to use an addressing machine for a large pay roll, as in this example. The machine has been described and illustrated in connexion with ledger work in Chapter IX The plate used would be designed like this—



In some cases the plate can also show standard deductions, e g insurance

FIG XIII—20

The pay roll would appear like this—

WEEK ENDING

No.	Name	Occupation	Basic Rate	Hours	O T Bonus	Total Hours	Gross Wages	Deductions			Net Wages	Employrs Insurance
150	*Asher, J*	*Plumber*	*47/6*									
151	*Adams, L*	*Painter*	*47/6*									
153	*Arnold, E*	*Carpt*	*56/–*									
154	*Boyd, B*	*Elect*	*56/–*									
155	*Barratt, J*	*Turner*	*58/–*									
156	*Benson, O*	*Turner*	*58/–*									
157	*Benson, W*	*Plumber*	*50/–*									

These details entered by the addressing machine

FIG XIII—21

In the case from which this example is taken, the other details were entered by hand, because the time sheets reached the office spasmodically, and sometimes late. If these time sheets could have been collected together to form a convenient batch, then a book-keeping machine could have been used.

Pay Roll.—Example 4—Standard Deductions

This example refers to a part only of the pay roll—the standard deductions.

In many concerns there are, apart from income tax, numerous standard deductions from pay, the amounts remain the same for long periods. These can be shown in columns on the pay roll, but that makes a wide sheet and if there are many types of deduction, may be cumbersome It is better to consolidate these The following system is suggested—

STANDARD DEDUCTIONS

Name	*W. Brown*
Dept	*Clicking*
Clock No	*713*
Date	*14 June*

Hospital	3
Savings	*2 6*
Superannuation	*3 0*
Sports Club	*1 0*
Health Insce	*1 3*
Unemp Insce	*1 5*
Total	£ *9 5*

These will be shown in one figure on your pay slip

FIG XIII —22

The worker is given a summary in the above form From the duplicate, cards in this form are made—

NAME *W Brown* *Clicking*
NOTES

Clock No	Hospital	Savings	Superann	Sports Club	Health Insurance	Unemp Insurance		Total Deductions
713	*3*	*2 6*	*3 0*	*1 0*	*1 3*	*1 5*		*9 5*

FIG XIII -23

These cards are inserted in visible trays

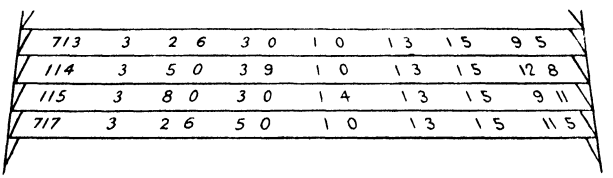


FIG XIII—24

The figures then appear as though in columns

The weekly procedure is—

(1) Make new cards where there are any changes.

(2) Remove cards for persons left or absent (not paid)

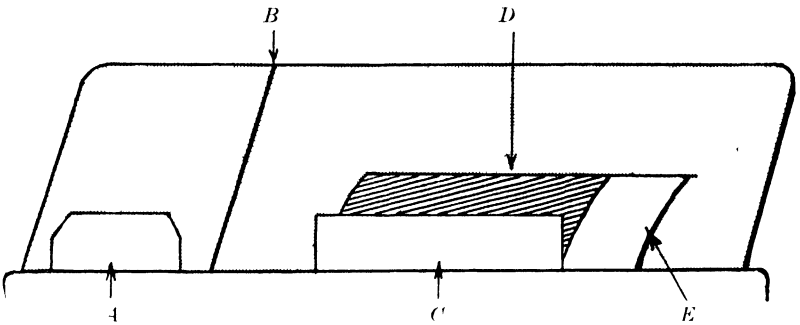
(3) Add the columns as they appear in the trays, either by Comptometer or lister

(4) Only the total deduction for each man is shown on the pay roll.

It is advisable to complete this work early in the week, to reduce the rush on pay day.

Pay Roll.—Example 5—Machine Entering

A book-keeping machine of any of the makes described in Chapter III can be used. The method and forms will differ somewhat with different



A The pay envelope
B The carriage is divided here
C The employee's card is fed in separately for each line (similar to a ledger card)
D The pay roll is held in the carriage covered by a carbon
E The extreme right (not covered) shows the name

FIG XIII–25

machines Whatever machine is chosen, however, there are two main systems, depending on the method of tax calculation which is preferred (described earlier in this chapter). In one method tax calculations are made before the pay roll is commenced, using clock cards or other working sheets, and Examples 5 and 6 illustrate this Example 7 shows the other system, with calculations made at the same time as the pay roll

Let us take the case of a company which uses a Burroughs machine (of the non-typing model) designed for pay roll work. The machine has several adding registers and a carriage designed for the rapid handling of the papers The addressing machine is used to enter names and clock numbers on the pay roll and pay packets. These pay packets are made an integral part of the system and the amounts payable entered on them (instead of using separate slips). The papers are held in the carriage of the Burroughs machine as shown in Fig. XIII–25.

PAY ROLL

WEEK ENDING *21 Apr.*

Date	Gross Wages		Tax Deductions		Regular Deductions	Nett Paid	Clock No.	Name	
	For Week	To Date	To Date	For Week					
21 Apr	*9 0 4*	*26 15 0*	*5 3 0*	*1 15 0*	*6 3*	*6 19 1*	*1904*	*C Higgs*	*1904*
21 Apr	*4 18 3*	*15 1 0*	*2 18 0*	*1 0 0*	*5 0*	*3 13 3*	*1093*	*P Harrison*	*1093*
21 Apr	*5 4 3*	*16 4 10*	*2 2 0*	*13 0*	*5 0*	*4 6 3*	*1212*	*J. Lauder*	*1212*

EARNINGS RECORD

Name *Lauder, J* Code *27* Clock No *1212*

Date	Gross Wages		Tax Deductions		Regular Deductions	Nett Paid	Clock No
	Per Week	To Date	To Date	For Week			
7 Apr	*5 1 0*	*5 1 0*	*12 0*	*12 0*	*5 0*	*4 4 0*	*1212*
14 Apr	*5 19 7*	*11 0 7*	*1 9 0*	*17 0*	*5 0*	*4 17 7*	*1212*
21 Apr	*5 4 3*	*16 4 10*	*2 2 0*	*13 0*	*5 0*	*4 6 3*	*1212*

FIG XIII—26

The split carriage allows items to be printed one under another on the envelope, while the pay roll remains stationary.

The operator has only to copy the information which reaches her on the clock card or other working sheet. The operation is—

(1) Enter gross wages.

(2) Register cumulative gross wages to previous week, that is to say, the keys are depressed so that the adding register may retain the figures, but the item is not printed.

(3) Enter gross wages to date. The machine adds 1 and 2 and if these do not agree with 3, the machine locks and so calls the operator's attention to the error.

(4) Enter tax to date.

(5) Register the cumulative tax to previous week—not printed.

(6) Enter tax for week—the machine checks that 4 — 5 = 6.

(7) Enter regular deductions

(8) Enter net amount. The machine checks the cross addition.

The rulings are shown in Fig XIII—26

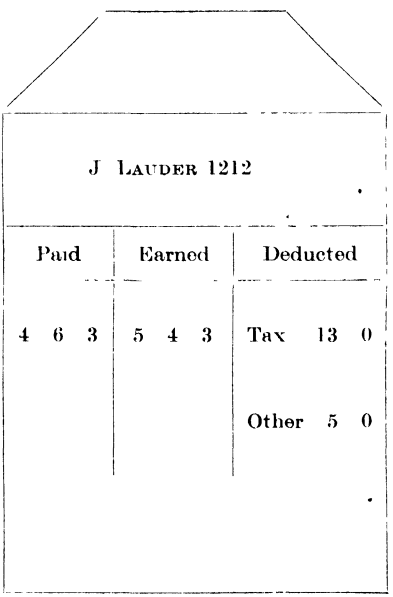


FIG XIII—27. PAY ENVELOPE

The items are entered on the earnings record (and pay roll) and the machine shuttles into position and repeats the required information on the pay envelope.

PAY ROLL

WEEK ENDING *21 Apr*

Date	Clock No	Name	Gross Earnings		Tax		Regular Deductions	Nett Paid
			For Week	To Date	To Date	For Week		
21 Apr.	*1904*	*C Higgs*	*9 0 4*	*26 15 0*	*5 3 0*	*1 15 0*	*6 3*	*6 19 1*
21 Apr.	*1093*	*P. Harrison*	*4 18 3*	*15 1 0*	*2 18 0*	*1 0 0*	*5 0*	*3 13 3*
21 Apr	*1212*	*J Lauder*	*5 4 3*	*16 4 10*	*2 2 0*	*13 0*	*5 0*	*4 6 3*

TAX AND EARNINGS RECORD

Name *J Lauder* Clock No *1212* Code *27*

Date	Clock No.	Name	Gross Earnings		Tax		Regular Deductions	Nett Paid
			For Week	To Date	To Date	For Week		
7 Apr.	*1212*	*J Lauder*	*5 1 0*	*5 1 0*	*12 0*	*12 0*	*5 0*	*4 4 0*
14 Apr	*1212*	*J Lauder*	*5 19 7*	*11 0 7*	*1 9 0*	*17 0*	*5 0*	*4 17 7*
21 Apr.	*1212*	*J Lauder*	*5 4 3*	*16 4 10*	*2 2 0*	*13 0*	*5 0*	*4 6 3*

PAY SLIP

Date	Clock No	Name	Gross Earnings		Tax		Regular Deductions	Nett Paid
			For Week	To Date	To Date	For Week		
21 Apr	*1212*	*J Lauder*	*5 4 3*	*16 4 10*	*2 2 0*	*13 0*	*5 0*	*4 6 3*

FIG XIII—28

Pay Roll.—Example 6

In this case a National book-keeping machine 3000 (typing) model, is used The rulings are as shown in Fig. XIII—28

The pay roll remains in the machine throughout the operation and is covered by a carbon sheet. The tax and earnings record and the pay slip are fed in for each line, either the pay slip is carbon backed or else a carbon is inserted behind it Compare this method of handling the papers with that described in Chapert VII for a sales ledger posting (statement, ledger, and proof sheet).

Pay Roll.—Example 7

In the case upon which this example is based a Sundstrand book-keeping machine was used There are two clerks engaged at the machine, described as the operator and the assistant These are the forms used—

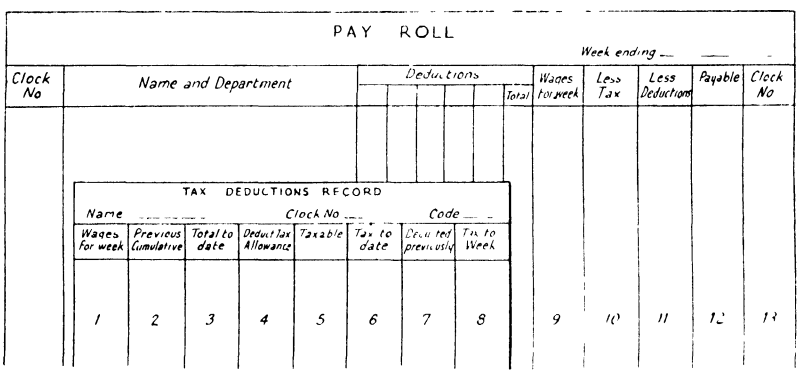


FIG XIII—29

A different tax deduction record card is inserted for each line In comparing this with a ledger posting operation, note that although this card is inserted just in the same way as a ledger card, there is no carbon paper behind it, so that the figures do not show on the pay roll In fact the two sheets are only overlapped to save space

The tear-off slips shown in Fig XIII–30 are for insertion in the wage packets They are carbon backed and fit over the columns numbered 9 to 13 in Fig XIII–29

Earlier in the week the names and standard deductions have been entered on the pay roll with an addressing machine The pay roll is inserted in the back feed of the carriage and the front feed is used to insert a different tax card for each workman. The operator sits at the machine and the assistant sits alongside with the tax tables (the method of calculating tax deductions has been described earlier in this chapter). The procedure is—

(1) The assistant calls the wages for the week from the time sheet or piece-work record, and the operator enters this.

(2) The operator reads the previous total wages to date from the card and enters it.

(3) The machine adds these and enters the total wages to date

(4) The assistant, who has meanwhile read the tax code from the card, looks up the corresponding tax allowance and calls it The operator enters it

Wages	Tax	Deduction	Payable	No
Wages	Tax	Deduction	Payable	No
Wages	Tax	Deduction	Payable	No
Wages	Tax	Deduction	Payable	No
Wages	Tax	Deduction	Payable	No
Wages	Tax	Deduction	Payable	No

FIG XIII—30

(5) The machine deducts the tax allowance from the cumulative gross wages and enters the taxable amount

(6) The assistant, having turned to the other tables, finds and calls the tax corresponding to the taxable amount The operator enters it.

(7) The operator reads from the card the amount previously deducted from pay and enters it

(8) The machine deducts item 7 from item 6 and enters the tax for the week

(9) The assistant again calls the wages for the week, which the operator enters.

(10) From the card the operator reads the tax for the week and enters it.

(11) The total of other deductions is already shown on the sheet, having been entered by the addressing machine This the operator reads and enters.

(12) The machine calculates and enters the net amount payable.

(13) The operator enters the clock number.

The machine has a number of adding registers which accumulate the column totals. The totals of the two wages columns should agree and each should agree with a pre-list. The two tax deductions columns should agree The column for cumulative wages to previous week should be reconciled with that obtained from the previous pay roll, and so should the column for tax deductions to date.

Note that accuracy depends upon the correct hearing of the figures called, the machine and operators should therefore be isolated from outside noise. The assistant should have every possible help in handling the papers and tables Often these tables are in the form of charts or cards, with figures printed in large type, placed on stands around the operator. She has then no pages to turn

Looked at from above, the arrangement may be shown thus—

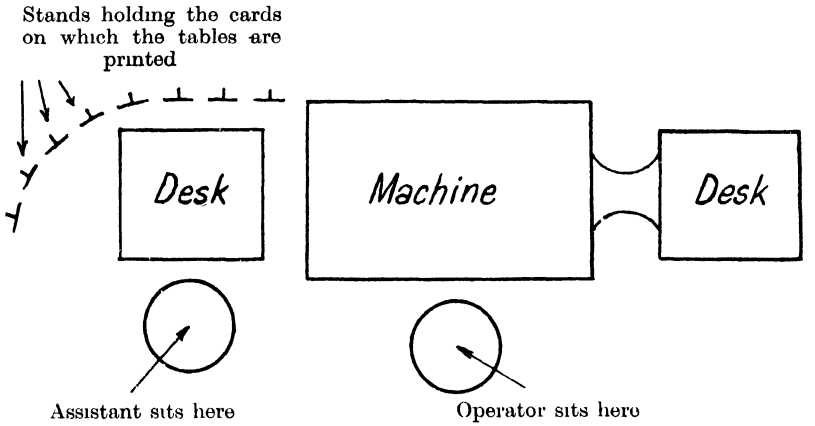


FIG. XIII—31

CHAPTER XIV

COSTING

ACCURACY—Cost control account—Controlled estimates—Diagram of cost system—Labour—Materials—Expenses—Finished work—Oncosts and overheads—Oncost on time sheets—The cost ledger—Book-keeping machine—Examples—Works order cards—Assembly schedule—Production control

THE problems of costing lie not in the book-keeping theory, but in the application of the theory to the multitude of varying technical methods relating to different industries. Such problems are outside the scope of this book. From the point of view of office organization, costing falls into three parts—

(1) The collecting of the information on suitably designed forms, such as stores issue notes, piece-work records, expense invoices.

(2) The analysis of the information.

(3) The recording of the results of the analysis in cost ledgers or some other suitable form.

It is obvious that this work overlaps with other office work. The forms on which the information is collected have been discussed in the chapters on wages, on stores, and elsewhere. A whole chapter has been given to analysis. It remains to show how the adding machine has simplified the control of accuracy in cost accounts, to examine the form of the cost ledger, and to touch upon the very technical subject of production control.

Accuracy

Some sets of cost books are kept with less accuracy than others and this apparent carelessness may be the result of deliberate policy. This often puzzles the trained book-keeper. If it is necessary and profitable to keep sales ledgers and the like on strict double-entry lines, why should it be any less profitable to keep cost books with equal accuracy? The answer is that many cost records contain items which are estimates, and it is absurd to spend time and money to obtain a degree of arithmetical accuracy much greater than the accuracy of the basic estimates. Besides, the cost information is often of immediate use only and if insistence on complete accuracy delays the result, then much of the benefit is lost. The essential point is to know how accurate the figures are, and whether the error which may arise results in any loss in hard cash or in reputation. If the figures are used as the basis of a Government cost investigation, then arithmetical accuracy is quite necessary, otherwise the management must make its decision.

Lest this view of accuracy may sound heretical to some accountants, [illegible] be said at once that some form of control account is quite essential [illegible]t with modern methods there is no difficulty in making the [illegible]ccount. Also that the greater the number of items, the more [illegible]ould be laid on accuracy. In the small concern the manager

relies upon his own knowledge to check the detail shown in the cost records, but in the large concern the executive cannot have a detailed knowledge of the same sort and must be able to rely entirely on the information given to him

Cost Control Account

Sectional balancing has been explained in an earlier chapter and numerous examples have been given as they arose throughout the book In those cases it was assumed that the balance of the control account took the place of all the detail balances and was carried to the trial balance A cost control account is sometimes exactly similar in that it is part of a balanced group of accounts On the other hand, there are numerous cases where it is entirely independent of any trial balance, and is an entity in itself This is particularly so in those concerns which have a mixed business, part of which is recorded in cost records and part of which is not

Each detailed job account covers all the transactions relating to a particular job, irrespective of the time when the transaction takes place The control account shows all the charges to all jobs for a given period. Once this distinction is made clear it is an easy matter to see how the control account is put together The total of each item has to be obtained for the given period (say a week) An example is given later The first item is the balance brought forward If the account is being newly started then this item is obtained by adding all the job account balances on a listing machine (e g Burroughs portable). The next item is direct wages, obtained either from the pay roll or from the wages analysis, and which will have been agreed with the piece-work records or time sheets (which items have been charged to the individual jobs) Materials ex store are obtained by adding the issue notes for the week on the listing machine Expenses charged direct to jobs are found from the analysis of expenses Oncost is found by a calculation on wages (and should therefore agree with the items charged to the individual jobs, which are based on similar calculations on the detail items of wages) On the other side of the account, the cost of completed jobs is also obtained by adding the items with the listing machine

Note the great importance of the listing machine, such as Burroughs In some systems the cost records are posted by a book-keeping machine, when there are the usual pre-lists from which the control account can be prepared. If there were no such listing machine available, it would be necessary to have day books or some other cumbersome arrangement to obtain totals With Burroughs and similar machines available, no cost accountant has any excuse to neglect control accounts on the ground of clerical expense

As the items making up the control account are totals of those entered in the job accounts, the balance on the control account should

agree with the total of the job accounts There may be a small difference due to estimating, e g oncost. If there are very many small items in the job accounts, it may be decided to ignore small arithmetical differences, but the possibility of a compensating error should not be overlooked.

A Specimen Cost Control Account

		£			£
Apr 23	Balance, brought fd.	21,462	Apr 30	Cost of completed Jobs	1,789
Apr 30	Charged to cost during the week				
	Direct Wages	666			
	Material ex store	541			
	Expenses directly chargeable	180			
	Oncost, 50% on Wages	333		Balance carried fwd	21,393
		£23,182			£23,182

FIG XIV—1

To complete the story shown by the above account it is necessary to—

(*a*) Agree the detail balances with the control account.

(*b*) Have further accounts to compare completed jobs with sales (or finished stock), to control materials stock, to compare oncost with overheads.

(*c*) Reconcile direct wages and expenses with the nominal ledger in the same way as the bank account is reconciled with the bank pass book

Cost Control Account in Column Form

The same cost control account, re-designed and with cumulative figures added, can give a picture of the activities of the concern for the week. (See page 175)

This is, of course, simplified to show principles. In practice there would probably be other items and there might be more than one department

Controlled Estimates

Figures may be—

(*a*) Known and accurately charged to an account, or

(*b*) Known, but split between two or more accounts (jobs) on an arbitrary basis; or

(*c*) Estimated; or

(*d*) Oncost, which is both estimated and divided on some conventional basis.

		Week ending 30 April	Total 17 Weeks to Date
		£	£
Part 1			
Work in progress, brought forward	Jan. 1		17,581
	From last week	21,462	
Charged to the cost cards			
Direct Wages		666	11,062
Materials		541	9,341
Expenses directly chargeable to Jobs		180	3,020
Oncost, 50% on Wages		333	5,531
		23,182	46,535
Cost of completed Jobs, carried to Part 2		1,789	25,142
Work in Progress on 30 April	£	£21,393	21,393
Part 2			
Sales invoiced to customers		2,016	30,981
Less cost of completed Jobs, as Part 1		1,789	25,142
		227	5,839
Less unabsorbed Overheads per Part 3		15	385
Estimated Profit for the period	£	212	5,454
Part 3			
Overhead Charges, estimated (£348 per week)		348	5,916
Oncost charged at 50% on Wages (*see* Part 1)		333	5,531
Unabsorbed Overheads to Part 2	£	15	385

The Cost Control Account in columnar form This would also provide a summary of the activities of the concern for the week.

FIG. XIV—2

In general book-keeping estimates are excluded, but in costing that can seldom be done without either delaying the production of the figures or making the clerical work too cumbersome and expensive. The vital point is to check that in total, the estimates are reasonably in accordance with the figures in the general book-keeping, that is to say with the actual facts This check is made through the control account. See the example on page 176

All such orders which are completed in the week are brought together, and the total wages, total materials, and total oncost are found by analysis with a Burroughs listing machine. From these totals a control account is prepared, which shows the operation of the factory for the week.

The cumulative figures in the control account should be periodically compared with the nominal ledger. Whenever such a comparison is effected, due allowance must be made for work in progress

An Example of Controlled Estimates

This example has (as usual) been over simplified to show principles In practice it might be found advisable to keep separate control headings for each class of wages and each type of material, with comparable accounts in the nominal ledger The greater the detail of

WORKS ORDER

Date *7 Apl*

Quantity	*12 doz.*	No	*1214*
Description	*Men's Brown Oxford*	Size	*7*

COST ESTIMATE

	Each[1]	Total[2]
Wages. Clicking	*1 9*	
Closing	*2 0*	
Finishing	*1 3*	*39 12 0*
Sundry	*6*	
Leather Upper	*3 6*	
Sole	*2 0*	*46 16 0*
Sundry Materials	*1 0*	
Oncost	*5 6*	*39 12 0*
Total estimated Cost	*17 6*	*126 0 0*
Add 20%	*3 6*	*21 0 0*
Factory Selling Price	*21 0*	*147 0 0*[3]

Date completed

Foreman's initials Storekeeper's initials

[1] The figures in the 'Each' column are entered by the cost estimator

[2] The calculations are made by the Comptometer section.

[3] The output for the week is found by accumulating these totals

FIG XIV – 3

the control account, the better guide it will be, particularly to the cost estimator.

Job Cost Systems

Practically all job cost systems are similar to the one illustrated in Fig. XIV—4. The names of the accounts differ, the forms used are modified for particular trades, the reconciliation is more or less complete in different cases, but the outline is reasonably consistent.

Diagram of a Job Cost System

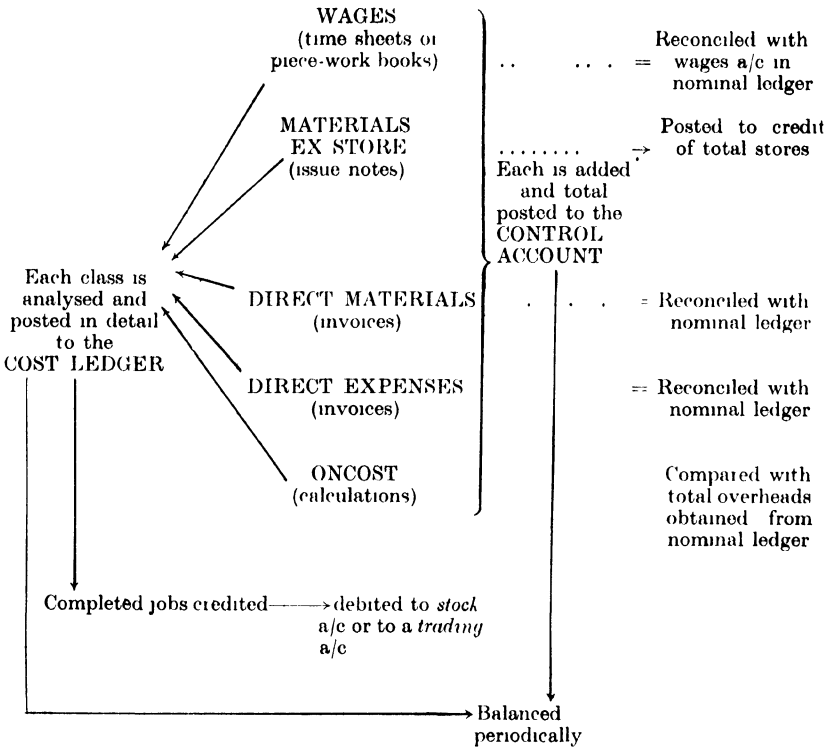


FIG XIV—4

Direct Labour Cost

This is obtained from an analysis of the wages paid The method of making the analysis has been fully discussed in the chapter on wages. The total of the pay roll is divided as this—

	£ s d
Direct wages chargeable to jobs	1210 0 5
Indirect wages	109 12 8
Total gross wages for the week	£1319 13 1

(Every effort should be made to charge to jobs as large a proportion of the wages as is practicable)

The indirect wages are posted to a separate account and are a part of overheads The direct wages are the subject of the analysis, and each item is posted to the cost ledger, either in detail or through a summary. The total of direct wages (£1210 0s. 5d above) is posted to the cost ledger control account

Direct Materials

This refers to materials which are purchased for a particular job The figures are obtained from the purchase invoices The routine might be one of the following—

(*a*) *Where suppliers can be persuaded to send invoices in duplicate*—

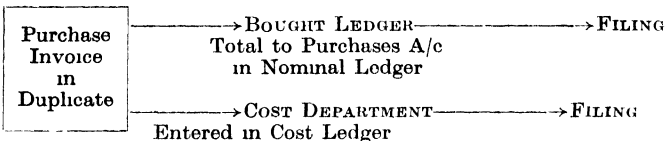


Fig XIV—5

(*b*) *Where one copy only is available*—

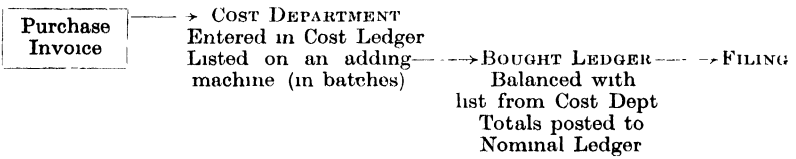


Fig. XIV—6

(*c*) *An alternative, where only a small proportion of the purchase invoices are chargeable direct to jobs*—

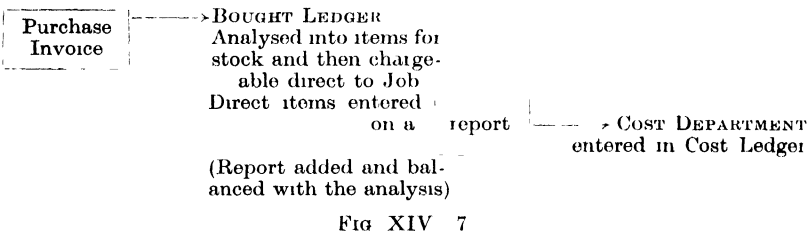


Fig XIV 7

(All the above diagrams have been simplified by the omission of operations not relevant to this chapter)

Analysis of Purchases

It is usually necessary to analyse the purchases to agree with the cost accounts If there are a small number of items, this would take the form of a columnar day book If numerous, the items would be analysed by sorting and adding or one of the other methods discussed in the chapter on analysis.

In a simple form the analysis might produce a summary such as this (it is assumed that invoices for expenses are kept separate)—

	£	s	d.
Purchases chargeable direct to jobs	3541	9	2
Purchases put into stores	2978	11	3
Sundry supplies	391	19	11
Total purchases for the month	£6912	0	4

For the purpose of the general accounts, only the total (£6912 0s. 4d.) is of interest and would be posted to purchases account in the nominal ledger. The costing records take note of the analysis The first item (£3541 9s. 2d.) is posted to cost ledger control account, with which the cost ledger is balanced from time to time The second (£2,978 11s 3d.) is posted to total stores account The third item (£391 19s 11d) relates to those items (e g oil) which are used in the course of manufacture, but are not allocatable to any particular job, it is a part of the overheads

Materials from Store

Here again, the details are discussed in another chapter, that on stores ledgers The issues are recorded on issue notes, which are credited to the stores records and debited to the cost ledgers. These issue notes are added, the total being credited to total stores account and debited to cost ledger control account

Expenses Charged Direct to a Job

Where the circumstances make it possible, expenses should be included in the same routine as either wages or materials For example, if travelling expenses are frequent items, a routine similar to that for wages should be devised for their analysis and entry to the cost ledgers Or, if such items as packing are numerous and shown on separate invoices, they should be handled as are the invoices for materials

In most cost systems there are miscellaneous items of expenses to be handled, each type of item occurring infrequently, but of sufficient size to be charged separately and not mixed with the general overheads These cannot be reduced to a standard routine as the circumstances will vary with each case The essentials are (*a*) a voucher or form to make a basis for the entry, (*b*) a debit to the job account, and (*c*) an entry to the control account, either in detail or in summary form, (*d*) some method of crediting the expense account so that the items are not included in overheads.

Finished Work

Very frequently the procedure is to make numerous parts for stock, these are made against works orders and will have job numbers,

the cost of each job being ascertained and divided over the number of parts to give the price of each

The second stage is to draw parts from store and assemble them to make a complete article A works order covers the assembly of each batch of articles and is given a job number to which are charged the cost of the parts and of assembly

If the parts are produced in exact quantities required to complete a batch, then the intermediate stage can be eliminated by charging the cost of making the parts direct to the batch job account, and not to the stores. This is known as batch costing and saves some clerical work. It loses the advantage of comparing the cost of the same part made at different times

In all cases it is necessary to have a total of finished jobs, for which cards have been taken out of the cost ledger. Often these are summarized for the management, in other cases they may be added on the listing machine The total is a credit to the control account and may be a debit to stock account or to trading account

Oncost and Overheads

These terms refer to those expenses which cannot be directly attributable to a job but must instead be divided on some arbitrary basis Overheads are the amounts payable for any given period—a year, a month, or week Oncost is the amount added in the form of a percentage to each job, with the intention of accounting for the overheads. Usually there is some discrepancy between these two sets of figures, owing to the necessity of estimating the percentage in advance It is not proposed to discuss here the many different theoretical methods, of dividing overheads between jobs, but it is necessary to refer to practical methods of making the records

All the other information for the cost ledgers reaches the cost office on original documents (of various sorts) Oncost differs as it is based on a calculation made in the office itself If it takes the form of a percentage on direct labour cost, a column can be provided for oncost calculations on the time sheet, or piece-work sheets, according to the methods used for analysing labour costs In other cases the calculations are made direct in the cost ledger, either day by day or else as jobs are completed. In all cases it is necessary to have some total of oncost charged to the ledger which can be entered in the control account and compared periodically with the overheads (Once again, this total is easily obtained by means of an adding machine)

Oncost Shown on Time Sheets

If oncost is calculated as a percentage on direct labour, a column can be provided on the time sheets, piece-work books, or other wages record. Here is an example of such a time sheet

TIME SHEET

No. *24* Name *H W. Brown*
Dept. *TR* Operation *Milling*
Week ending *29 June* Oncost rate *120%* [1]

Job	Hours	Wages	Oncost	Posted by
1704	*14*	*1 8 1*	*1 13 8*	
1914	*9*	*18 1*	*1 1 8*	
1913	*10*	*1 0 1*	*1 4 1*	
1748	*7*	*14 0*	*16 10*	
1812	*4*	*8 0*	*9 7*	
Repairs to Plant	*1*	*8 0*	--	
[2]			[3]	
Total	*48*	*4 16 3*	*5 5 10*	

SUMMARY			
Charge to Jobs	*4 8 3*	*5 5 10*	
Indirect	*8 0*	—	
[4]		[5]	

Workman to sign here *H W Brown*
Foreman to sign here *B. Berridge*

[1] The rate may differ for different operations
[2] The workman enters the job numbers and hours
[3] The office divide the wages and calculate the oncost
[4] This heading could be subdivided as necessary
[5] The calculations are checked through this summary

FIG XIV—8

The total oncost is accumulated with a listing machine and entered in the cost control account

The Cost Ledger

There are many varieties of cost ledger to meet special cases, and examples only can be given Often a normal ledger with debit and credit columns is used. In other cases it is convenient to use an analysis ledger with debit columns only, ruled in one of these forms—

Date	Details	Folio	Wages	Materials	Direct Expenses	Total

FIG XIV—9

Wages			Materials			Direct Expenses			Oncost		
Date	Details	Amount	Details	Fo	Amount	Details	Fo	Amount	Details	Fo	Amount

Fig XIV—10

The details columns would be extended or modified as the particular circumstances dictate This form is designed for use where the records may have to be investigated at a later date Each item is posted separately and cross referenced. If there were to be any credits (e.g returned materials) they would be shown in red ink

Frequently the wages, issue notes, etc., are analysed and summarized before being entered in the cost ledger In that case the ruling would be somewhat in this form—

Week Ending	Wages	Materials from Store	Direct Materials	Direct Expenses	Oncost	Total

Fig. XIV—11

There follow three examples of machine-posted cost ledgers which are given as typical but which are not intended to cover all cases, as much must depend on technical considerations.

Cost Ledger with Book-keeping Machine.—Example 1

There were numerous small items for each job and it was convenient to analyse these and post weekly totals The ruling of the cost ledger is shown below. It is designed for a machine of the Remington type

Adding boxes, each adding the column shown below it.

1	2	3	4	5	Crossfooters ↓ X1	↓ X2

COST LEDGER — JOB NO *1723*

Week Ending	Wages	Oncost	Direct Materials	Direct Expenses	Materials from Store	Total
Jan 4	*5 8 2*	*5 8 2*		*2 9*	*1 0 7*	*14 19 8*
Jan 11	*1 1 3*	*1 4 3*	*17 2*			*3 5 8*
Jan 18	*6 0 9*	*6 0 9*	*1 4 0*	*1 8 2*	*18 0*	*15 11 8*

FIG XIV -12

As previously explained, the adding boxes are fixed to the carriage of the machine and each corresponds to a column on the form The cross-footers are for the cross additions

There is a document for each entry These reach the operator in batches, each with its list and total Thus for week ending Jan 4th there would be a batch of wages tickets, another batch for direct materials, and so on These batches are sorted together in job order and posted to the cost ledger in one run In posting the Jan 4th items on the above account, the operator would work across the sheet, £5 8s 2d £5 8s 2d , nothing in the next column . 2s 9d £4 0s 7d Then read the total from the first cross-footer and enter it in the total column This entering would take the item from X1 and add it to X2, where all the items would be accumulated At the end of the run, box 1 would agree with the total wages, box 3 with direct material, and so on

Cost Ledger with Book-keeping Machine.—Example 2

Each item was posted separately . analysis columns were not needed, but details of the items had to be shown A National machine was used, with typewriter keyboard

The ruling was similar to a sales ledger, but without credit column.

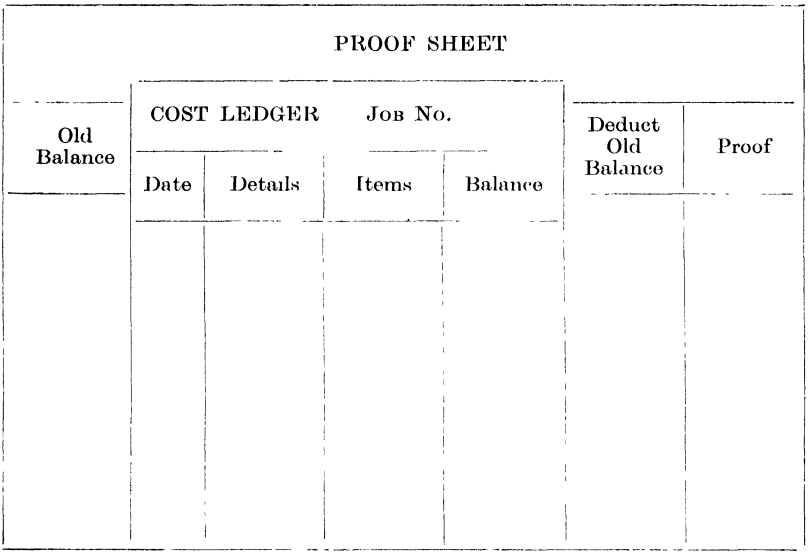


Fig XIV—13

The method of operation and proof was similar to that described in the chapter on sales ledgers Credits took the simple form of the removal of the card from the ledger (this is quite common in cost ledgers) The total of cards removed had to be entered on the control card

In applying the above ruling to another case, the description column would be widened and subdivided as might be necessary, and the heading of the cost card would probably show additional information

Cost Ledger with Book-keeping Machine.—Example 3

When it is intended to add oncost to the figures only at the end of the job, then it is necessary to have a separate total of the items on which oncost is to be calculated In this example, it is assumed that oncost is a percentage on wages. This sheet is designed for a Burroughs machine (which would be specially built automatically to bring the sheet into position for printing in the columns) See Fig. XIV–14

There are no credit columns, but the debit is split into two parts, with total to date for each part The method of operation and proof would be similar to the sales ledger previously described, but the "old balance" picked up would relate to the one part only, not to the whole card (this "old balance" is called "total to date" in the illustration).

When a job is completed, the card would be taken from the ledger and passed to a Comptometer clerk, who calculates and enters the oncost (a percentage on the total wages) and adds together wages, material, and oncost to give the full cost of the job.

COST LEDGER — Job No

Wages				Direct Materials and Expenses	
Date	Reference	Items	Total to Date	Items	Total to Date
Jan 4	*WGS*	*2 4 3*			
Jan 4	*WGS*	*1 18 0*			
Jan 4	*WGS*	*2 9 7*	*6 11 10*		
Jan 4	*GDS*			*2 17 4*	
Jan 4	*GDS*			*5 0*	*3 2 4*
Jan. 11	*WGS*	*2 9 9*			
Jan. 11	*WGS*	*1 19 2*			
Jan 11	*WGS*	*2 13 0*	*13 13 9*		
Jan 15	*PAC*			*11 0*	
Jan 15	*CAR*			*10 3*	*4 3 7*

Fig XIV –14

Works Order Cards in place of Cost Ledger

This method is convenient for small articles or parts where the cost details for any one part do not take much space The works order is ruled to show wage details (time or piece work) on one side, and cost

WORKS ORDER CARD

Part No — Quantity

		£ s d
To Storekeeper Issue the following material	*Price*	
(a)	*(b)*	
Direct Wages, overleaf		
Oncost % on direct wages		*(c)*
Total cost		

(*a*) The office enters this before issuing the card
(*b*) Prices are sometimes entered by the office, sometimes by the storekeeper
(*c*) If the work is at piece rates, this may be entered in advance by the office

Fig. XIV—15

figures on the other. It is a stiff card, designed to go round the factory with the parts which are being made.

If the office enters the price of material and if piece rate wages are known, the cost can be entered before the card is issued, but in that case any scrap or other unforeseen cost must be charged to overheads It is sometimes convenient to have a detachable portion of the card to be retained by the storekeeper, in other cases portions are detached by the workpeople and used for wages analysis. (Examples are given in Chapter XIII)

Assembly Schedule in Place of Cost Ledger

When the job consists in making or obtaining numerous parts and assembling these to build a machine, then it is often convenient to use an assembly schedule in place of the cost ledger By an assembly schedule is meant a list of all the parts which have to be put together to make the machine (or batch of machines) This schedule, which often runs to a considerable number of pages, is prepared before production begins and copies are used by buyers, by the drawing office, and by the assembly foreman One copy, suitably ruled, is sent to the costs office, and the cost of each part is entered in the value column as the information comes to hand When all the items are entered, the cost of assembly is added and the schedule is totalled to give the cost of the job.

The advantage of the assembly schedule method is that any omission is obvious on the face of the sheet. A disadvantage is that the clerical work cannot effectively be mechanized, because the items have to be entered in particular places on the sheets, not in order one under the other To overcome this difficulty, it is necessary to employ a form of slip system

The assembly sheet is not ruled with money columns but has reference columns The information reaches the cost office on loose sheets—works orders, stores issue notes, purchase orders The reference number is entered and the loose sheet is pinned to the assembly schedule (if the sheet has to proceed to another department, a slip must be made to be attached to the assembly schedule) When the folio column shows that all the items have been completed, these sheets can be sorted into order and an adding or book-keeping machine used to prepare a new assembly schedule, showing part number, reference and value If a suitable machine is chosen, any required analysis can also be obtained In this system it is important that a thorough scrutiny of the costs be made when sheets are sorted into order, as an omission is less obvious on the machine-made list than on the original assembly schedule But on the other hand there is far less risk of arithmetical errors in the machine system (a method of proof can easily be arranged). See Fig. XIV–14.

COST OFFICE COPY

ASSEMBLY SCHEDULE Number A S *7041*

Machine *404 Type 3* Date of issue *17 Jan*

Number to be made *6* Date for completion *17 July*

Post Numbers	Source of Supply	Reference	Quantity per Machine	Quantity for Batch	Prices	£ s d
132	*Stores*		*4*	*24*		
404/32	*Works*		*1*	*6*		
404/33	*Works*		*1*	*6*		
404/34	*Works*		*1*	*6*		
404/35	*Works*		*1*	*6*		
401/41	*Works*		*1*	*6*		
404/42	*Works*		*1*	*6*		
173A	*Stores*		*7*	*42*		
404/15	*Works*		*1*	*6*		
404/17	*Works*		*2*	*12*		
173B	*Stores*		*4*	*24*		
82/91	*Bought*		*2*	*12*		
82/99	*Bought*		*2*	*12*		
19402	*Stores*		*144*	*864*		
19413	*Stores*		*12*	*72*		
(*a*)		(*b*)	(*a*)	(*a*)	(*c*)	(*c*)

(*a*) This information is entered when sheet is issued, by typewriter or duplicating machine

(*b*) The works order number, stores issue note, or invoice number is entered here

(*c*) Entered by cost office not in order, but as they come to hand In some systems there are several £ columns, to analyse wages, material, and oncost.

FIG XIV—16

Production Control

There are two extremes in production methods In the one case craftsmen are employed, given the drawings, and told to "get on with it" In the other case full detailed instructions are prepared showing how each operation is to be done, how much time may be taken over it, and what material is to be used Then comparatively unskilled workpeople are employed, each trained in one particular operation. The practical case will lie somewhere between these extremes, but in most cases it is found that some pre-planning of the operations is necessary to make the best use of men, machines, and floor space

When the plan has been made, it is necessary to have an office and works routine to convey the instructions to the people concerned and to see that these instructions are carried out. This routine will depend entirely upon the technical details of the works. Many of the methods

of saving time which have been discussed in previous chapters, can be usefully employed, e.g. continuous stationery, visible cards, paramount sorting (also, if the concern is large, punched card machines).

In this connexion the Ormig Simplex duplicator is of interest. It works by means of a "master" sheet, as described in connexion with invoice systems in Chapter V This master is placed sideways in the drum of the machine and any one or more lines can be transferred on to any required form, both quickly and accurately. Thus from a master representing the assembly schedule the machine will prepare a works order for each part, tickets to accompany the half-made parts through the works, stores issue notes for raw material and stores receiving notes for the completed parts. From an operations master the machine will prepare wage tickets representing each operation and showing the time or piece rate allowed.

Another machine of interest in this connexion is the F F P (Factory Form Production) model of the Adrema addressing machine (see Chapter IX for a description of the machine) When the information has been standardized it can be put in permanent form on the addressing machine plates, and issue notes, wage tickets, progress and assembly lists, or whatever forms are needed, can be printed from these plates whenever a works order is issued.

CHAPTER XV

STOCK AND STORES RECORDS

Issue notes—Summary of issues—Bin cards—Stores record cards—Prices—Stores records and machine posting—Records with values and quantities—Ledgers with values only—Summary stock ledger—The supply position—A more complicated case

Issue Notes have been discussed in the chapter on basic documents. A further example is given here—

(*a*)

REQUISITION AND ISSUE NOTE

12121 (*b*)

To Stores
Issue Goods as under *Foreman*

Quantity	Description	Price	Value	Notes
	(*c*)	(*d*)		Job No. (*e*)
	Total			

Issued by *Storekeeper* Received by

(*a*) The heading and other printing should not be in heavy type. The written matter must stand out.

(*b*) The office must make sure that all numbers are returned from the works

(*c*) Detailed descriptions are best, if clear, but in many trades a code or part number must be used

(*d*) Prices may be entered either by the storekeeper or by the office, if the record is kept there In either case, there must be a regular procedure, e g first in, first out

(*e*) It is often convenient to have the job number near the total. In any case, the job number must stand out, not be masked by other figures

Fig. XV—1

The form of the issue note is entirely within the control of the one factory—there is no outsider to be considered. In some cases a works order is used, with stores requisition and issue note on the back, in

that case the storekeeper initials the order when he issues the material, but does not keep the document. In other cases the requisition and issue note is a separate slip which is handed to the storekeeper in exchange for the goods, the document flowing like this—

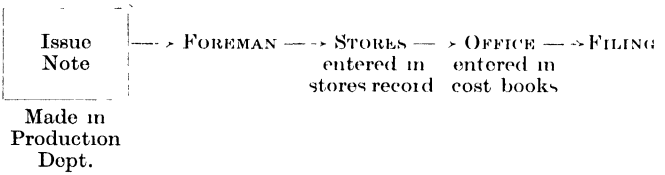


FIG. XV 2

In other cases the foreman has discretion to make the requisitions It is sometimes necessary to have several copies of an issue note, which may be of different colours Particularly, the production department, or other person making out the requisition, may keep a copy in case the original is lost It is not advisable to have separate copies for the stores and cost records, as an item might be entered to cost which had not in fact been issued It is better to allow the one copy to pass through the departments It is essential that the notes are filed in numerical order to make sure that none are lost (as they may well be, handled as they are by non-clerical persons) If a note has to be filed in customer or job files, then a separate copy should be used

Summary of Issues

Where the entries are made to itemized stores records each issue note must be entered separately Where the entry is to a financial record it is often convenient to post in group totals Methods of sorting and summarizing have been discussed in the chapter on analysis In its simplest form the system is—

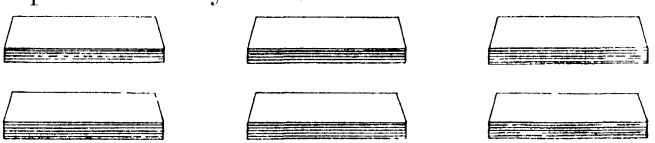


FIG XV—3

The issue notes are sorted into groups, to bring all those for one account together

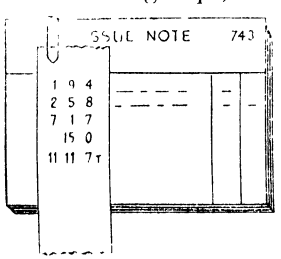


FIG. XV 4

These groups are added on a listing machine and the list pinned in the corner of the batch

STORES LEDGER

HEXAGONAL NUTS

Apr 17	Issues		11 11 7	100 0 0 88 8 5

FIG. XV—5

The total is posted to the stores ledger

Bin Cards

The bin card is exactly what the name implies—it is a card kept with the goods in the bin or rack and showing the movement of the stock The entries are made by the warehouse hands and cannot be as neat as entries made by clerks

If there is a detailed record kept in the office, then the bin card can be in very simple form as below (Note that a tall, narrow card is often convenient.)

Requisition	In	Out	Bal

FIG. XV—6

If there is no other detailed record, then the bin card takes the place of the stores record and must show more detail, as below.

GOODS

UNIT

Max Stock Min Stock

Date	Requisition	In	Out	Bal

FIG XV—7

Stores Record Cards

Cards which show quantities only cannot be properly called a ledger, the term "stores (or stock) record" is better This stores record must be closely interlocked with buying arrangements as in the example The cards are in visible trays (drawn diagrammatically in Fig XV—8)

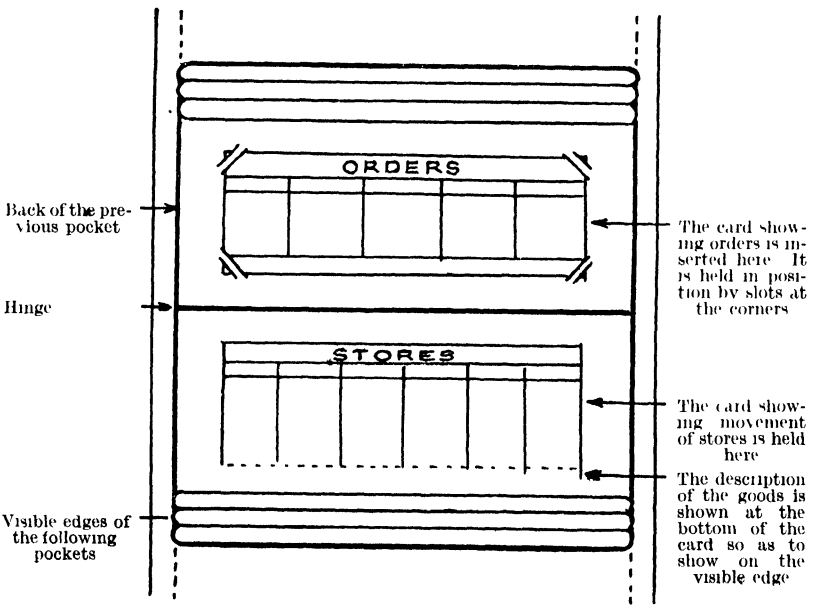


FIG. XV—8

The order card might be in this form—

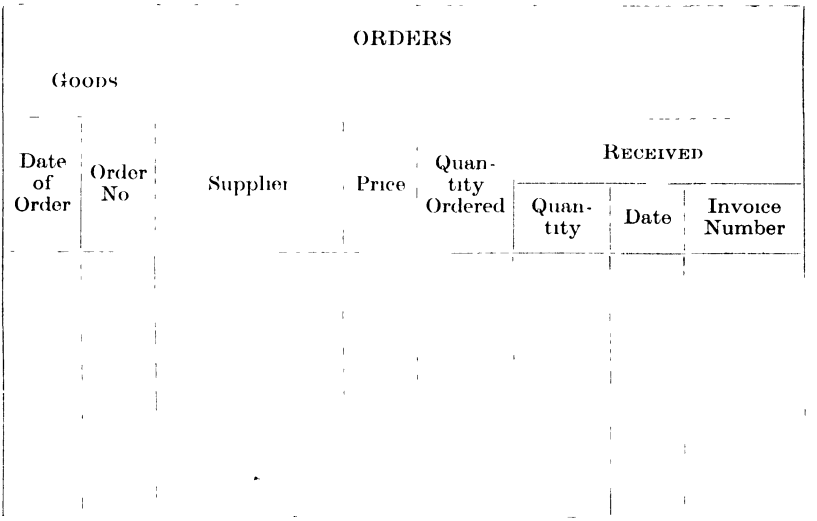


Fig XV—9

and the stores card might be—

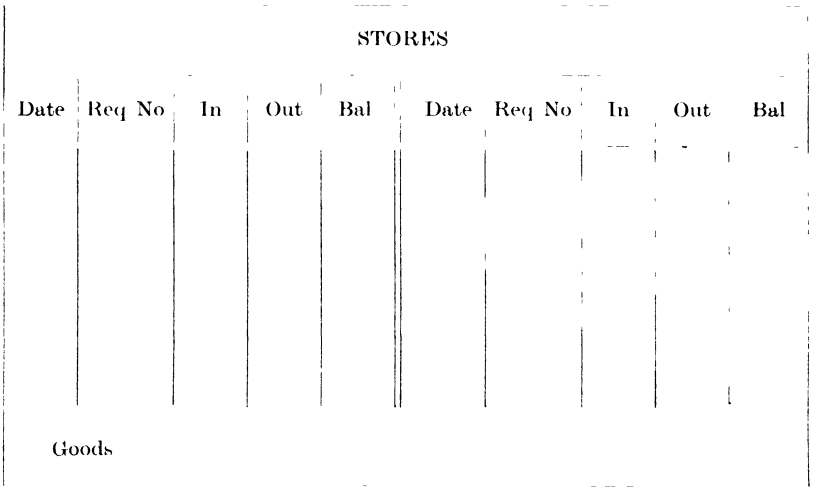


Fig XV 10

Stores Records and Prices

It is frequently necessary to show values on the stores issue notes, either in order to enter the items in the cost account or to prepare a control account, in value, for the stores. If the prices are standardized

they can be taken from a price list, but more usually the prices fluctuate, in which case they must be obtained from the stores record

The stores record cards would then be designed somewhat as follows—

ORDER CARD

DESCRIPTION OF GOODS (*a*)

Part No 710

Date of Order	Order Number	Suppher	Price	Quantity	RECEIVED Date	RECEIVED Amount	
17 Jan	*11204*	*Jones*	*17/3*	*100*	*3 Feb*	*100*	\
24 Feb.	*11295*	*Jones*	*12/-*	*250*	*3 Mar*	*250*	
2 Apr.	*11411*	*Jones*	*12/6*	*250*			
							(*b*)

(*a*) Description and other standard information shown here

(*b*) A tick, or initials, entered here when an item is transferred to the lower card

FIG XV- 11

STORES CARD

Date	Issue Note Number	Price	In	Out	Bal	Date	Issue Note Number	Price	In	Out	Bal
Feb		*17/3*	*100*								
1 Mar	*7223*	—		*3*	*97*						
3 Mar	*7318*	—		*6*	*91*						
4 Mar	*7327*	—		*6*	*85*						
17 Mar	*7610*	—		*3*	*82*						
24 Mar	*7791*	—		*12*	*70*						
31 Mar	*7908*	—		*3*	*67*						

Part No 710

Description is shown on the bottom (visible) edge

FIG XV 12

The goods received are not entered on the stores card until the previous batch is finished To check the stock, items on the order card must be added to the balance on the stores card.

Where it is desired to show each delivery of goods separately, then the following ruling is suggested—

GOODS

Order No	Order No	Order No	Order No
Quantity Delivered	Quantity Delivered	Quantity Delivered	Quantity Delivered
Date	Date	Date	Date
Price	Price	Price	Price

Invoice Note Issue	Quantity Out	Balance	Issue Note	Quantity Out	Balance	Issue Note	Quantity Out	Balance	Issue Note	Quantity Out	Balance

FIG XV—13

This is not suitable for a visible card system, as the columns (usually) need to have space for a considerable number of items. An alternative would be to have a card for each delivery, which might lead to a card being overlooked.

Stores Records (Quantities)—Machine Posting

Stores records which show quantities, and not values, are usually posted by hand This is not because of any difficulty in the machines but because the records have to be de-centralized Where centralized records are required, a machine is quickest and most economical Burroughs have a machine which can add weights (cwt , lbs , or ounces), another which adds lengths (feet and inches) Many classes of machine can handle unit or decimal quantities, as dollar machines can be adapted. The operation might be exactly similar to the stores ledger with values only as described later. It is sometimes considered expedient to use a simpler type of machine for entering quantities only, in which case the following system may be used

The issue notes are handled in weekly batches They are added to obtain a total for proving Next the corresponding cards are plucked from the ledger and the balances on these cards are added (note this point particularly). The form of the card is—

STORES NUMBER *12123*

Date	Description and Number		Items	
3 June	*INV*	*1841*	*240* +	Old Balance before posting
			240 *	
	BAL		*240* +	Pick up old balance
7 June	*188*	*2743*	*10* –	Enter the items
8 June	*188*	*2748*	*12* –	
10 June	*188*	*2810*	10 –	
			208 *	Print the balance

FIG XV —14

All the items are posted in one column, the operation being (*a*) pick up the old balance, (*b*) post the item, (*c*) take a total from the machine At the end of the batch, the new balances are added. The total should agree with the old balance less the total of items posted

The advantage of this method lies in the simple type of machine (only one register and no carriage movement). The disadvantage is that the operation is less automatic than the orthodox method, and the method of proof is more elaborate.

PROOF LIST

Issues

Oct 10			
280	35	0	0
360	32	2	3
195	9	0	7
17	1	14	0
5		6	8
3182	270	4	1*

STORES LEDGER

MATERIAL *Castings* STOCK NO *1212*

(*Technical or buying details here*)

RECEIPTS		ISSUES		REQUISITION		BALANCE		
Quantity	Value	Quantity	Value	No	Date	Quantity	Value	
					Oct 1	240	15 0 0	
		10	12 6	2456	Oct 3	230	14 7 6	
		16	1 0 0	2621	Oct 4	214	13 7 6	
		25	1 11 3	3513	Oct 5	189	11 16 3	
		50	3 2 6	3789	Oct 7	139	8 13 9	
200	13 18 3			389	Oct 8	339	22 12 0	
		5	6 8	4727	Oct 10	334	22 5 4	

agrees with pre-list of items to be posted

FIG XV–15

Stores Ledger, showing both Values and Quantities

Practical difficulties arise in a stores ledger which shows both values and quantities, as reference has to be made to the ledger twice for each item, firstly to find the price and secondly to post the item It is not practicable to do both operations at one time (unless a multiplying machine is used) as the papers have to pass to the calculators before the items can be posted For this and other reasons it is often found more convenient to keep two records, one showing quantities and the other values, particularly as the values can often be kept under groups or classes of items, which reduces the number of accounts Where the value of the items is high and where it is convenient to show both sets of information in one record for simplicity of reference, then there is no difficulty in designing a form of ledger to meet the case

A Burroughs book-keeping machine can be used for this purpose. The "banks" or "columns" of keys are split into two groups (*a*) those which are to print and add quantities, and also in a non-add position to print reference numbers, and (*b*) those which are used for sterling amounts

The ruling for such a ledger kept on a Burroughs machine might be as shown on the previous page

The quantities and values are printed at the same time The method of proof is similar to a sales ledger, (*a*) pick up the old balance, not printed, (*b*) enter the item, (*c*) machine automatically prints the new balance, (*d*) again pick up the old balance, not printed, (*e*) the machine automatically deducts the old from the new balance and prints this difference on the proof list The total of the proof list should then agree with the pre-list of items to be posted

There would be an obvious advantage in making the calculations while the items are being posted as there would be less handling of papers and therefore less waste time This can be done on a Burroughs calculating accounting machine The machine can handle only decimal, not sterling, figures, but this difficulty can be overcome, e g by the keeping of stores accounts in shillings and decimals of a shilling

Another Example

In many cases it is convenient to show narrative as well as figures, and a typewriter book-keeping machine is convenient. In one case a tailoring concern wish to show what becomes of each roll of cloth and how much remains in stock at any time A Remington accounting machine is used, Fig XV—16 shows the forms and arrangement of adding boxes

A new card is started whenever a roll of cloth is purchased The posting of goods received is therefore simple, as there is no old balance to pick up and the item is entered direct to the balance columns To post items issued, the procedure is (*a*) pick up old balance, which

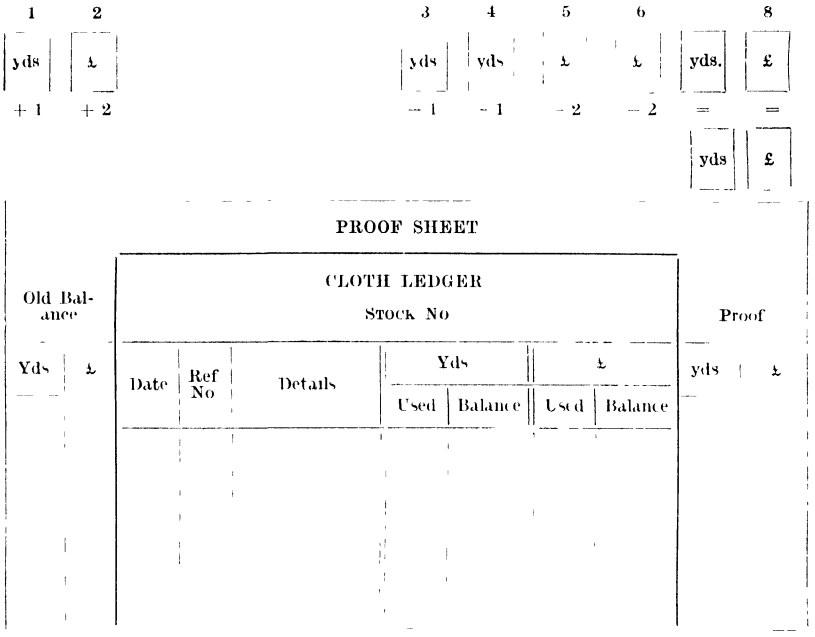


FIG XV 16

shows on the proof sheet only, (*b*) enter the details, yards and value, (*c*) the machine automatically prints the new balances, yards and £'s (*d*) again read and type the old balance, in the proof column As both cross footers are used for the computation of balances, one for yards and the other for £'s, they are not available for proof purposes Instead, the vertical adding registers are used, the operator glancing at registers 1 and 2 and comparing them with 7 and 8 after each entry

Stock Ledgers which show Values but not Quantities

By showing the values of goods, they are reduced to a common denominator It is not possible to add together lbs of butter, yards of tape, and sheets of foolscap to give any useful answer, but the sterling value of these can conveniently be added and put in account form It therefore follows that whereas quantity records are of individual items, value records often (in fact usually) represent groups of items For example, a retail store might keep stock records (quantities) of all items held, but a stock account (values) for each department The two records relate to the same transactions, but the latter will have much less detail Because of this, it is frequently convenient to summarize the entries (e g issues) before posting to the stock ledger

The stock ledger can be mechanized and for this purpose is similar to any other ledger Any of the usual book-keeping machines may be used, as in the example shown on page 200

PROOF SHEET

Old Balance	STOCK RECORD — GROCERIES DEPT Date Reference	Debit	Credit	Balance	Deduct Old Balance	Proof
277 4 8					277 4 8	17 4 0 —
419 5 3					419 5 3	103 12 1 —
316 11 2	Jan 1 BFD	201 8 3		201 8 3	316 11 2	25 3 2 —
280 15 0	4 ISS		130 4 1	70 4 2	280 15 0	77 4 0 —
583 8 4	6 PUR 7192	513 4 2		583 8 4	583 8 4	171 2 9 —
	11 ISS		171 2 9	412 5 7		(a)

(a) The total of this column agrees with the pre-list of issues

FIG XV –17

The example given is for a machine without typewriter and which therefore abbreviates the description (ISS = issues) There would be no difficulty in posting each issue separately, but they are usually summarized first to save time and space The method of proof is as described for the sales ledger. In fact this particular ledger is quite like any other, and any of the recognized methods may be used

Note that both debit and credit must be calculated on the same basis Manufacturing concerns calculate both at cost prices Merchant houses sometimes calculate both at selling prices, as in the next example

Summary Stock Ledgers

Where the sections or departments are not numerous, the ledger can conveniently be put in summary form, as in this example—

A multiple shop company with some 100 branches wished to keep a record of stock at each branch There was a weekly issue of stock and a weekly return of sales, so that it was convenient to make a weekly summary. The summary was made on a machine of the Remington type, in this ruling—

BRANCH STOCK SUMMARY

Week ending *19 Apr*

Br No	Balance from Last Week	Goods at Selling Price	Other Charges	Sales	Returns to Warehouse	Price Adjustments	Balance
1	1324 8 1	104 19 3		124 8 2	1 7 0	12 1	1303 0 1
2	2701 2 9	171 12 2		180 14 0			2692 0 11
3	3002 14 0	200 5 9	1 15 2	250 17 1	22 9 0		2931 8 10
4	1721 9 3	150 13 0		153 2 9		2 7 1	1716 12 5
5	1844 12 2	182 7 4		177 15 3	13 0		1848 11 3

FIG. XV—18

The branch is sent a statement in this form—

BRANCH STOCK STATEMENT

Week ending *19 Apr*

Branch No	Balance from Last Week	Goods at Selling Price	Other Charges	Sales	Returns to Warehouse	Price Adjustment	Balance
5	*1844 12 2*	*182 7 4*		*177 15 3*	*13 0*		*1848 11 3*

FIG XV—19

A new statement is inserted in the machine for each line of typing (i e each branch) There are adding boxes for each column, to agree with pre-lists. the new balance is computed by and read from the cross-footer

The advantage of this summary form lies in the very compact weekly record produced on one sheet for easy reference It is very convenient where the figures are for immediate use, but is not so handy where an investigation of any particular branch has to be made for a period of weeks If unusual entries arise it is hard to know where to insert them in the summary—the "Dr and Cr" ledger is more flexible

The Stock and the Supply Position

It is often desirable to know not only the stock in hand, but also the potential stock after goods on order from suppliers have been received and customers' orders have been fulfilled To record this compactly and with efficiency requires some ingenuity and a thorough understanding, both of the possibilities of machine accounting and of the real needs of the people who are to use the record. The example given on page 202 shows the solution found in one particular case.

The practical point is that all the columns are not used at the same time. When customer items are being posted the first cross-footer computes the balance of customers' orders outstanding When supply items are posted, the same cross-footer computes the balance of orders on suppliers. In the same way, the second cross-footer is used either for actual or available stock, according to the type of item being posted. The actual and available stock columns are never in use at the same time. In the diagram of adding boxes it has been assumed that twelve adding boxes are used; actually this could be reduced by changing the position of the boxes according to the columns used for different types of item.

PROOF SHEET

STOCK CARD

STOCK NO *1212W*

OLD BALANCE				ORDERS FROM CUSTOMERS			ORDERS ON SUPPLY			STOCK		PROOF	
Orders	Stock	Date	Details	Ref No	Ordered	Delivered	Balance	Ordered	Received	Balance	Actual	Available	Orders	Stock
—	—												—	—
—	—	*Jan 1*	*Boff, Buddy*	*G222*				*100*		*100**		*100*	—	—
—	—	*Jan 10*	*Boff*	*R738*					*50*	*50**	*50*		—	—
—	—	*Jan 15*	*Boff*	*R801*					*25*	*25**	*75*		—	—
—	—	*Jan 20*	*Silas, K*	*S880*	*30*		*30**					*70*	—	—
—	—	*Jan 22*	*Silas, K*	*S930*	*25*		*55**					*45*	—	—
—	—	*Jan 24*	*Silas, K*	*A935*		*40*	*15**				*35*		—	—
15	*35*	*Jan 27*	*Silas, K*	*A990*		*15*	*0**				*20*		*15*	*35*
—	—												—	—

Arrangement of adding boxes

1	2	3	4	5	6	7	8	9	10	11	12
+ 1	+ 2	− 1 − 2	− 1 − 2	− 1	+ 1 − 2	− 1 − 2	− 1	− 2	− 2	=	=

Cross-footers → 1 (Orders) 2 (Stock)

FIG XV—20

STOCK CARD

PART NO *124*

	FINISHED STORES			WIP OR SUB-CONT			RAW MATERIAL			TOTAL			
MINIMUM ⟶	*480*			*3000*			*1440*			*4920*			
Date	Ref	P up	In Out	Bal	P up	In Out	Bal	P up	In Out	Bal	Total Bal	Total Old Bal	Nett Items	Part No
	Bfd			*475**			*3021**			*1423**	*4919* △			*124*
12 Sept	*24370*	*475*	*12*	*487**	*3021*	*12*	*3009**	*1423*		*1423**	*4919* △	*4919*	*0** ⌐	*124*
12 Sept	*00834*	*487*		*487**	*3009*		*3009**	*1423*	*22*	*1445**	*4941* △	*4919*	*22** △	*124*
12 Sept	*102*	*487*	*240*	*247**	*3009*		*3009**	*1445*		*1445**	*4701* ⌐	*4941*	*240** △	*124*
12 Sept	*24736*	*247*		*247**	*3009*	*24*	*3033**	*1445*	*24*	*1421**	*4701* ⌐	*4701*	*0** ⌐	*124*
12 Sept	*Scrap 15*	*247*		*247**	*3033*	*20*	*3013**	*1421*		*1421**	*4681* ⌐	*4701*	*20** △	*124*
	—	1	2	3	4	5	6	7	8	9	10	11	12	

STOCK CONTROL

PART NO *124*

FINISHED STORES			WIP OR SUB-CONT			RAW MATERIALS			TOTAL				
480			*3000*			*1440*			*4920*			⟵MIN	
Bal	Min	Diff	Bal	Min	Diff	Bal	Min	Diff	Total Diff	Total Bal	Total Min	Date	Part No
487	*480*	*7**	*3009*	*3000*	*9**	*1423*	*1440*	*17**	*1* △	*4919*	*4920** ⌐	*12 Sept*	*124*
487	*480*	*7**	*3009*	*3000*	*9**	*1445*	*1440*	*5**	*21* △	*4941*	*4920** ⌐	*12 Sept*	*124*
247	*480*	*233**	*3009*	*3000*	*9**	*1445*	*1440*	*5**	*219* ⌐	*4701*	*4920** ⌐	*12 Sept*	*124*
247	*480*	*233**	*3033*	*3000*	*33**	*1421*	*1440*	*19**	*219* ⌐	*4701*	*4920** ⌐	*12 Sept*	*124*
247	*480*	*233**	*3013*	*3000*	*13**	*1421*	*1440*	*19**	*239* ⌐	*4681*	*4920** ⌐	*12 Sept*	*124*
13	14	15	16	17	18	19	20	21	22	23	24		

FIG. XV—21

A More Complicated Case

Many interesting examples could be given to show the application of machines with several adding registers and cross-footers to particular problems Here is one, from an engineering works

It is desired to know not only what completed parts are in stock, but also uncompleted parts in the hands of sub-contractors or in work in progress and the castings or other raw material available, at the same time it is desired to have a method of controlling any shortage as compared with a pre-arranged minimum. This is achieved with a Remington machine with a very wide carriage and a large number of adding boxes (many of these are dummies, used for cross adding only) Two cards are inserted in the machine, side by side, with a proof sheet behind them, somewhat in the manner shown in Fig XV—22

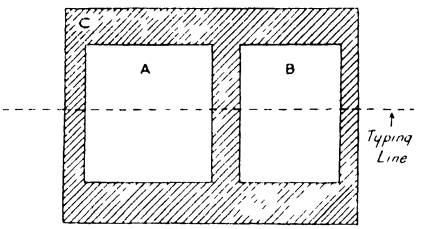


FIG. XV—22

C is the wide proof sheet, covered by a carbon as usual A and B are the cards, shown in detail on page 203, which are inserted for each item of stock.

Both goods in and goods out are in the same columns, the credit (out) items being in red on the original card, are underlined in Fig XV–21. There is an adding box to each of the columns which have been numbered to make clear the arrangement of cross additions, as follows—

Box 1 adds in cross-footer	1		
„ 2 adds or deducts in cross-footer	1		
„ 3 deducts from and clears cross-footer	1	and also adds in cross-footer	2
„ 4 adds in cross-footer	1		
„ 5 adds or deducts in cross-footer	1		
„ 6 deducts from and clears cross-footer	1	and also adds in cross-footer	2
„ 7 adds in cross-footer	1		
„ 8 adds or deducts in cross-footer	1		
„ 9 deducts from and clears cross-footer	1	and also adds in cross-footer	2
„ 10 adds in cross-footer	1	and also deducts from and	
„ 11 deducts from cross-footer	1	clears cross-footer	2
„ 12 adds or deducts and clears cross-footer	1		

The second card has a similar arrangement of the cross-additions The reader can work out the details from the clearance marks, i e. a star (*) represents the first cross-footer, and a triangle (△) represents the second.

When the posting has been completed, the stock control cards pass to a progress officer, who knows from them what shortages there are and where the trouble arises, and can take appropriate action.

CHAPTER XVI

PUNCHED CARD MACHINES

BRIEF description of methods—A card—Dual purpose cards—Pre punching—Filing and disposal of cards—Sales ledger—A second method—Sales analysis—Stock records and sales invoices—Wage records—Income tax—Another example—Some practical points—A note for the student—The machines illustrated

PUNCHED card methods might be described as mechanized slip systems, but with the difference that the use of particular machines gives a standard type of slip (or card) which will be described here An actual installation sometimes appears intricate to the outsider because he cannot distinguish principles from the great bulk of detail, because he cannot see the wood for the trees Therefore, before working methods are discussed, a brief outline of the principles involved is given.

The system should be considered in three parts· (*a*) the original document containing the information, (*b*) the cards and machines to handle them, (*c*) the records and totals which are required Occasionally a card will serve as an original document and also as a part of the mechanism, and some such cases will be illustrated Except for these dual-purpose cards, it is better to think of the card as being part of the machine, not part of the book-keeping, just as the ribbon is treated as part of the typewriter The information is recorded on the cards in a form which the machine can use, that is to say by punched holes The machines sort these cards, add the figures where necessary, and print summaries as required. It is these summaries which constitute the book-keeping The cards can be designed and the machines set so as to produce summaries in any form, and with more or less detail according to the needs and wishes of those controlling the accounting arrangements

It is assumed here that the reader will make himself an opportunity to see the machines, either installed or on exhibition. The descriptions will, therefore, be brief and main attention will be given to the form of the summaries and the design of the card necessary to produce them.

There are two makes of machines—Powers and Hollerith—and there are various sizes and types of machines in each range. These are illustrated towards the end of this chapter There are also differences in the size of card used for these various machines, the capacities ranging from 21 columns to 130 columns, but so that the reader may not be confused, only two types of card (36 column and 65 column) are used throughout to illustrate methods, it being understood that in a practical case some other size of card might prove more suitable.

Brief Description of Methods

The machines are operated by cards, in which holes are punched. Fig. XVI–1 shows a card on which purely numerical information is

carried. The column in which any hole is punched indicates the type of information which it represents, and the number of spaces from the top indicates the value.

The holes are made with a punch, of which two types are available—the hand punch and the automatic key punch. (The reader should refer to the illustrations later in the chapter.) With the hand punch the depression of the key perforates the cards, whereas with the automatic key punch the depression of the key merely "sets up" the appropriate die and the card is punched "en bloc" by the depression

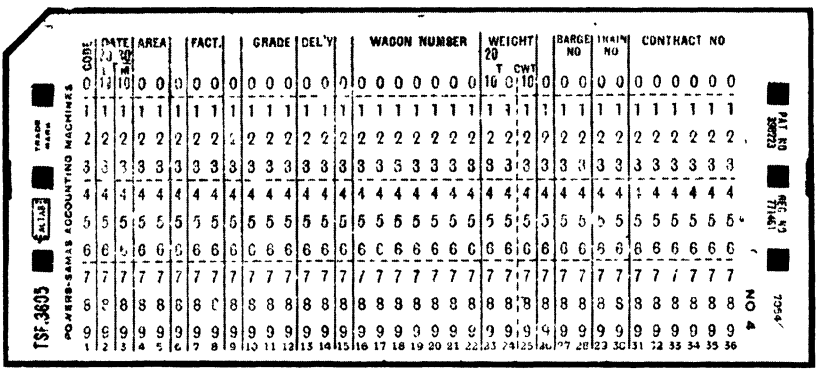


FIG XVI—1

of the punch key after the dies have been set up for all the columns to be punched. Punching with this is extremely rapid and an operator is said to be able to punch about 12,500 holes an hour, but the speed will depend upon various factors and particularly upon the legibility and lay-out of the documents from which the original information is obtained

The accuracy of the punching is checked by a different operator with a verifying punch This is similar in operation to the hand punch, but instead of perforating the cards, the depression of the key verifies that the previous punching operation is correct Where the punching of the card does not coincide with the depression of the keys of the verifier, the machine refuses to function.

The cards are sorted by the automatic sorting machine, the machine operating on one column at a time. It has one box for each punching position of the column, plus an additional box for "rejects," i.e cards with no punching in the column. As an example, the card in Fig XVI—1 may be used for coal records If an analysis by grade of coal is needed, each grade is given a number recorded in columns 10, 11, and 12. The machine is set to sort on column 12, then on column 11, and finally on column 10. At the end of this process the cards for each grade will have been brought together and all cards will be in their correct numerical sequence.

The tabulator translates the information punched in the cards into printed form When fed with cards it will either print all the information from the cards, or will print only from selected columns Simultaneously with the printing of this information it will add the amounts on the cards and will automatically print the totals of groups of similar cards Alternatively, the machine can be made to print these totals only without listing out the details from each card Thus, if it was fed with the sorted cards as in the previous paragraph, it could be set to print either a list of the deliveries with the total weight of each type of coal, or only a total of each type of coal

In addition to the machines already mentioned, viz hand and automatic key punches, sorters and tabulators, there are also available other machines for specific uses These are (*a*) reproducing punch, which automatically produces a new pack of punched cards from an already existing pack, (*b*) summary card punch, which, when attached to the tabulator, automatically produces a summary or balance card simultaneously with the printing of a total by the tabulator, (*c*) multiplying punch, which will read figures from a card, calculate the product, and punch the answer into the card, (*d*) cross-adding punch, which adds or subtracts up to four amounts punched in a card, and punches the resultant total into the same card, (*e*) interpreter, which will print on the face of the card the interpretation of the holes punched in it, (*f*) interpolator, which automatically compares two packs of punched cards and groups, interleaves or divides them according to the agreement or disagreement of the designations punched in them (sometimes called a collator)

Detailed Description of a Card

The card in Fig XVI—2 measures $7\frac{3}{8}$ in $\times$ $3\frac{1}{4}$ in and has 65 columns numbered across the bottom It has been designed for the invoicing and sales analysis of a colliery Column 1 indicates the type of card It is punched 3 representing Sales Analysis Columns 2 and 3 represent the day of the month, which is punched 17 Columns 4 and 5 represent the month and are punched 11, indicating November

The next columns, 6 to 21, are for the destination of the coal, which is printed alphabetically It will be seen that, with the exception of the A and B positions, each position in these columns can be used for three different characters When only one hole is punched in each column, the appropriate numeral is printed by the tabulator If, however, the "A" position is punched in addition to one of these holes, the left-hand letter is printed, whilst if the B position is punched with the same hole, the right-hand letter is printed The destination punched is "Tamworth"

Columns 22 to 26 give the Advice Note No , which is 10459 Columns 27 to 30 and 31 to 33 are for the Customer's No and Account No. Note that it would be much more cumbersome to describe these

alphabetically, so they are listed and a number assigned to each. The same procedure is adopted for the Destination. This is punched alphabetically in columns 6 to 21 because it is required so to print on the invoice, but it is also punched in code in columns 34 to 36 to facilitate sorting. Note also that by using what are called the over-punching positions of column 34 (indicated by 10, 20, and 30) the capacity of this field is increased from 999 to 3999, the actual number punched in this case being 2350 Column 37 indicates the Colliery No. (5), whilst the quality of the coal (16) is indicated (in code) in columns 38 and 39. Columns 40 to 42 are used to record the appropriate Form G code, whilst column 43 indicates how sent (3, G.W.

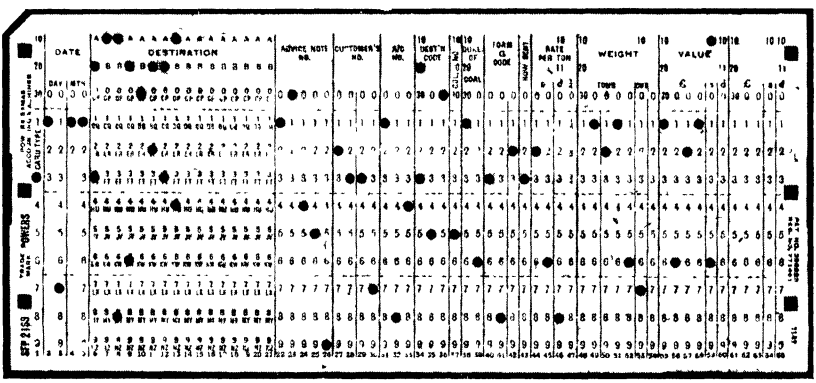


FIG. XVI—2

Rly.). The rate per ton is punched in columns 44-47 and the weight and value in columns 48 to 54 and 55 to 60 respectively Columns 61 to 65 are unused, but are available for recording any other suitable information.

The full information punched in the card is—

Type of Card, 3 (Sales Analysis); Date, 17 Nov.; Destination, Tamworth, Advice Note, 10459, Customer No., 23/37; Account No, 184; Destination Code, 2350; Colliery, 5, Quality of Coal, 16; Form, G, Code, 38/2, Sent, 3 (G.W. Rly.), Rate per Ton, 26/8, Weight, 1216 Tons 7 Cwt , Value, £1621 16s.

Further illustrations are given.

Dual-purpose Cards

The printed numbers in each column, showing what each hole represents, are not essential and can well be omitted. The machine is not concerned with them, and the operators soon become familiar with the values of the different positions and are able to read the punching without any printed guide other than the column headings, which, of course, must not be omitted. The omission of the printed

numbers leaves space for writing and allows the card to be used as an original document as well as a means of operating the machines. Fig. XVI—3 is typical.

This is an internal voucher, part of the costing record, serving the dual purpose of job ticket and a record of such information as time spent on a job, the charge for it, and the cost account to which it is to be charged. The card would originate in the office, would pass to the works as an instruction for certain work to be done, would be completed and signed by the foreman (or his clerk) on completion of the work, and would then pass to the inspection department with the goods The stores inspector would initial the card and enter any scrap. The

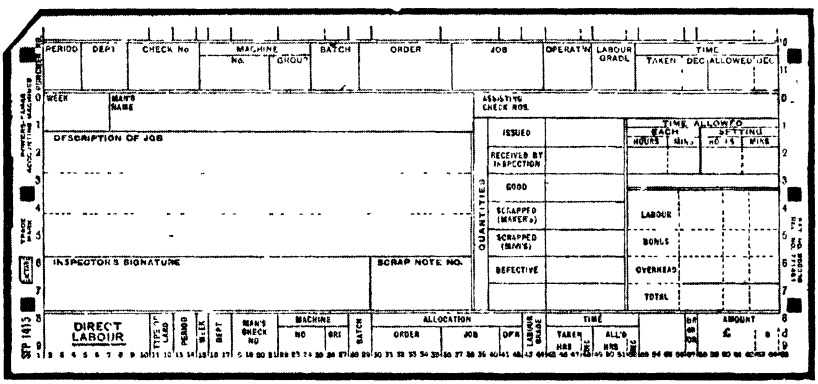


FIG. XVI—3

card then returns to the office, where the information written on it is transferred into holes by means of an automatic key punch, which allows the card to be read while it is being punched This is a typical example showing the large amount of information such cards will hold. Other uses for dual purpose cards are material requisitions, clock cards, pay tickets, etc.

Pre-punching

For certain types of work in which part of the information is standard, cards are sometimes punched in advance For example, in a factory producing standard products in fixed batches or quantities, sets of master materials and job cards are prepared and kept in a permanent file. Then whenever an order is placed on the factory, the appropriate set of master cards is extracted from the file and by means of the reproducer, a new pack of cards is produced identical to the master pack Any necessary additional information, such as order number, is gang punched into these new cards, after which they are passed through the interpreter, which prints on them in the appropriate panels the information punched into them. They are then ready to serve as the

materials requisitions or the job tickets for the particular order, following the routine described for dual purpose cards, but in this case it is only the completing information which has to be punched into them.

Another example of pre-punching is given later in the description of a stock control system

The advantages of using pre-punching methods when possible are—

(1) Economy in punching time Automatic gang punching is a very rapid operation, much quicker than ordinary punching

(2) Guaranteed accuracy Provided the master card is correct, the accuracy of the duplicates is guaranteed

Filing and Disposal of Cards

It is very necessary to have a ruling as to the length of time the punched cards are to be stored, otherwise one is liable to accumulate an unnecessarily large number of cards In deciding upon storage periods, a distinction must be made between ordinary punched cards, which in effect serve merely as part of the operating mechanism, and dual-purpose cards, which must be considered as original documents and kept for the same period as other similar documents Very occasionally, cards may serve a permanent purpose as part of a record system, e g an insurance company might keep its register of insured persons on cards which would be kept in a permanent file for use as and when claims were made, and at each quinquennial valuation Apart from dual-purpose and special permanent cards, the cards are generally only of temporary value, as all necessary information will have been recorded on the schedules which are produced on the tabulator

Where there is a likelihood of analyses being required in the unknown future, it is usual to reduce the number of cards to be stored to a minimum by the preparation of summary cards, either by punching from tabulations, or by means of a summary card punch attached to the tabulator In all cases the system should be so designed that the information is tabulated in permanent form at the time, and if this is done the cards can normally be destroyed quite soon after the work has been completed

Those cards which have to be kept, either temporarily or permanently, should be filed in cabinets designed for that purpose with separate divisions all clearly labelled as to contents Slipshod methods of filing are worse than useless, and if the cards cannot be properly filed it is better they should be destroyed

Sales Ledger

Fundamentally, there are two different methods of handling this work. In the one, which may be called the orthodox method, the machines quickly and efficiently prepare the ledger and statement in a form similar to hand-written double-entry methods. In the other a

different technique is used, based on the special facilities given by punched cards. There are advantages in each method and opinions differ as to which is the better. In addition, variations on each method must arise, dependent less on the machines than on the nature of the work in particular cases First the orthodox method is described.

In this particular case the work consists of entering sales, returns, cash received, etc., on a ledger and statement, usually monthly, and agreeing the balance on the ledger with a control account.

In most cases the balances are only wanted at monthly intervals, and between those dates the balance shown in the ledger is necessarily incomplete; but when required, the up-to-the-minute balance can

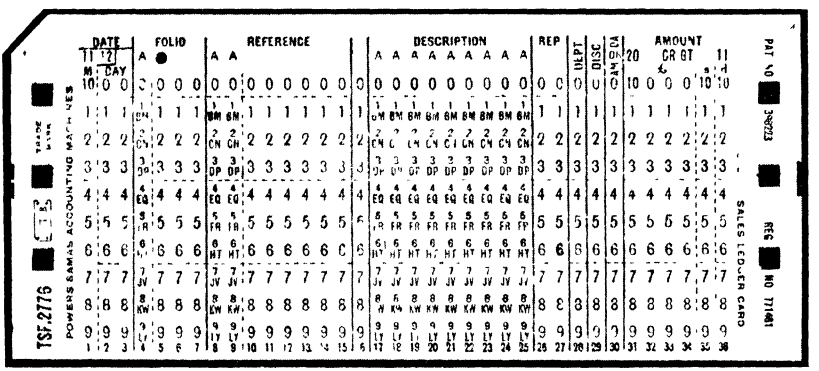


FIG. XVI—4. A SALES LEDGER CARD

always be obtained very quickly by the tabulation of all a customer's cards punched to date since the production of the previous month's statement.

Where ledgers are kept by hand or book-keeping machine methods, it is necessary for the items to be entered day by day as they arise to avoid any accumulations of work. On the other hand the machines using cards are so rapid that the sorting and tabulating can be left to the month end, such an accumulation being within the capacity of the machines.

The arrangement of the card will vary somewhat from case to case, but Fig. XVI—4 may be taken as a typical sales ledger card. These cards are punched daily from invoices, credit notes, cash vouchers, etc., the class of transaction being shown alphabetically (i.e., invoice, returns, cash, etc.) in columns 17–25. Cards are also punched for the balances from the previous month—usually by means of the summary card punch, which produces these balance cards automatically when the statement is prepared. All these cards are filed until the month end, usually in customer number (i.e. folio) order to facilitate reference when up-to-the-minute balances are required. Each fresh day's

cards are rapidly inserted in their correct order in the file at one run through by means of the interpolator.

At the month end the cards are passed through the tabulator with the sheet feed device in operation. This enables sets of forms consisting of statement and one or more duplicates interleaved with carbon paper to be automatically fed into the machine, tabulated and ejected without retarding in any way the speed of tabulation The tabulator deducts each customer's credits from debit amounts and automatically prints the balance outstanding, and at the same time accumulates these balances and provides at the end of the run a grand total for control purposes. A carbon copy of each statement is filed in the permanent sales ledger binders.

The addressing of the statements can be done either with an addressing machine prior to dispatch or, if an alphabetical tabulator is used, by the tabulator when the statements are tabulated. If an addressing machine is used, great care should be taken to ensure that the right name is put to each statement, and to enable this to be checked the address plates (or stencils) should show the customer number, which is then compared with the similar number tabulated on the statement If the addressing is done by the tabulator, a standing file of pre-punched

Dr to

MESSRS SHERIFF & CO
Castle St
1204 Nottingham

ROBIN HOOD
SHERWOOD

Date	Account No	Ref.	Description	Debit	Credit and Closing Balances
Jan 1	*1204*		*Balance*	*293 9 2*	
Jan 5	*1204*	*5283*	*Goods*	*33 11 6*	
Jan 7	*1204*	*1741*	*Cash*		*136 17 5 Cr*
Jan. 29	*1204*	*6135*	*Goods*	*91 2 9*	
Jan 30	*1204*	*2032*	*Cash*		*120 0 0 Cr*
					* *161 6 0 Dr.*

The final item in this column is the net amount outstanding

FIG. XVI—5

name and address cards is kept, which are sorted in with the detail cards prior to the tabulation of the statements This method of addressing is practicable only if the alphabetical feature is required on the tabulator for other purposes also It would be uneconomic to use an alphabetical tabulator for the sole purpose of addressing the statements

It is not usually necessary to prepare a detailed day book, although this can easily be done by tabulating the invoice cards daily More usual is a summary day book, containing daily totals with a suitable filing system to enable the invoices making up that total to be found, if required later, for audit or other purposes. From this and other summaries a control account, in sections if necessary, is prepared

The statement would be in the form as shown in Fig XVI—5

Sales Ledger (Second Method)

In the method just described the balance shown on the previous month's statement is brought forward and cash received is recorded In the second method, neither of these is shown, but only the items remaining outstanding at the end of the month The cards punched for cash received are not placed in the file but, instead, the corresponding cards for the sales items cleared by the cash payment are withdrawn from the file, thus ensuring that at any moment the file contains only cards representing unpaid items Only in cases of payments on account where the amount of cash does not exactly clear any particular debit items is the cash card placed in the file No balance brought forward cards are punched at the month end and the statements always show full details of all items outstanding With this method the withdrawing or "pulling" the cards introduces the human element, and in order to prevent errors, the cards withdrawn are immediately tabulated with the corresponding cash cards with the machine set to total at each change of customer number If the pulling has been performed correctly the balance in each case is "NIL" Any debit or credit balance will indicate incorrect pulling which must be rectified before proceeding with the work.

Compare the previous example with this statement (the differences are in the figures, not the form)

As these statements do not show cash received, they are not in themselves a satisfactory permanent record of the customer's account The paid cards, together with cash and discount cards, are therefore tabulated on "history sheets" To understand these they may be considered as ledger sheets, to which items are posted only when paid. An example is shown in Fig. XVI—7 which appears on page 214

The history sheet (paid items) and the current statement (unpaid items) together give a complete record.

MESSRS SHERIFF & CO
Castle St
Nottingham
1204

Dr. to

ROBIN HOOD

SHERWOOD

Date	Account No	Ref	Description	Debit	Credit and Closing Balance
Nov 2	*1204*	*2395*	*Goods*	*83 17 2*	
Nov 17	*1204*	*509*	*Allow'ce*		*4 12 3 Cr*
Dec 11	*1204*	*4162*	*Goods*	*77 6 10*	
Jan 5	*1204*	*5283*	*Goods*	*33 11 6*	
Jan 29	*1204*	*6135*	*Goods*	*91 2 9*	
Jan 30	*1204*	*2032*	*Cash*		*120 0 0 Cr*
					* *161 6 0 Dr*

The final item in this column is the net amount outstanding

FIG XVI—6

HISTORY SHEET

1204

SHERIFF & CO

Date	Account No	Ref	Description	Debit	Credit
Sept 1	*1204*	*238*	*Goods*	*100 4 8*	
Sept 8	*1204*	*383*	*Goods*	*50 13 0*	
Sept. 8	*1204*	*384*	*Goods*	*30 0 5*	
Nov 8	*1204*	*1350*	*Cash*		*180 18 1 Cr*
					*
Sept 9	*1204*	*519*	*Goods*	*2 7 7*	
Oct 3	*1204*	*1529*	*Goods*	*71 9 0*	
Oct 17	*1204*	*493*	*Allow'ce*		*3 12 7 Cr*
Dec 3	*1204*	*1512*	*Cash*		*70 4 0 Cr*
					*
Nov. 12	*1204*	*2872*	*Goods*	*34 19 2*	
Nov 18	*1204*	*3131*	*Goods*	*76 7 3*	
Nov 27	*1204*	*3636*	*Goods*	*25 11 0*	
Jan 7	*1204*	*1741*	*Cash*		*136 17 5 Cr.*
					*

FIG. XVI—7

Sales Analysis

Where each invoice refers to one class of goods only and there is only one line on an invoice, it is sometimes possible to use the sales

ledger cards for an analysis of sales, but as this condition rarely obtains, the usual practice is to punch separate specially designed cards for sales analysis purposes

Stock Records and Sales Invoices

The methods in use vary greatly An example is given to illustrate the principles involved (Fig XVI—8)

The company are wholesale boot and shoe factors The basic idea is that a file (called the stock file) contains a card for each pair of shoes in the warehouse As the shoes are sold, the corresponding cards are

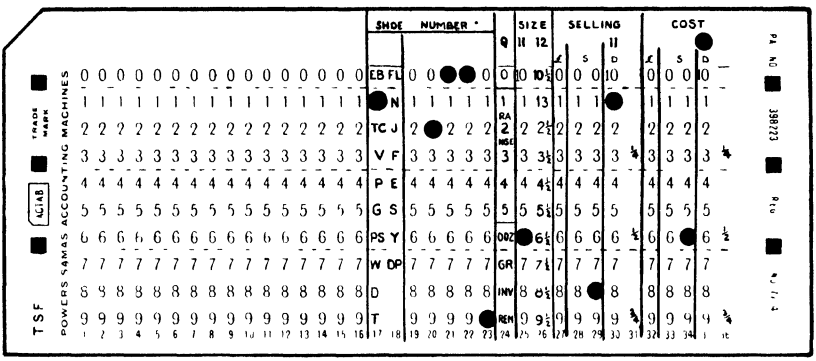


FIG XVI—8

taken from the stock file and used to prepare the invoices The routine is—

(1) The cards are pre-punched. That is to say they are punched in quantities in advance and put away until wanted To reduce the number of cards it is often convenient to punch cards to represent a dozen similar pairs, such cards being of a distinctive colour

(2) On the arrival of the goods, the warehouse enters the details on a goods received sheet, which is sent to the office for pricing

(3) From this goods received sheet pre-punched cards are transferred to the stock file

(4) As customer's orders are received, the corresponding cards are pulled from the file If there are no cards corresponding to the shoe required, the clerk knows that there are no such goods in stock

(5) The cards pulled from the file are passed through the tabulator to obtain—

(*a*) instructions to warehouse, in sections to correspond with the divisions of the warehouse,

(*b*) packing lists,

(*c*) invoices, with whatever office copies are needed. The addressing machine is used to enter the customer's name and address.

(6) From the same cards the sales analysis is obtained. This is done

by sorting the cards into the required order and passing them through the tabulator

(7) After completing their cycle of operations, the cards return to the pre-punched file to be used again when required (always assuming that the prices are unchanged)

Note that in this particular business both the cost and selling prices are (usually) known before the goods arrive, but this might not be so in other cases



FIG XVI 9 FILING TRAY OF STOCK CARDS

Wage Records

There are innumerable variations of method, but this may be taken as typical

Each week there are three cards for each man (*a*) gross wages card, (*b*) standard deductions card, (*c*) tax deductions card The latter is described and illustrated in the next section Fig XVI—10 shows a gross wages card. These would be punched each week from the clock cards or piece-work records The standard deductions are usually the same from week to week and the cards can be used time after time (Fig XVI—11)

Figs XVI—10 and XVI—11 are used to produce the following records—

(1) The pay roll. The batches of cards are brought together and mechanically sorted by clock number so as to bring together the three cards (gross, tax, and deduction) for each man. The completed

pack is then passed through the tabulator to produce a pay roll, which shows clock number, gross earnings, tax deductions, total standard deductions, and (automatically computed by the tabulator) net amount payable. If thought advisable, the workers' names can be

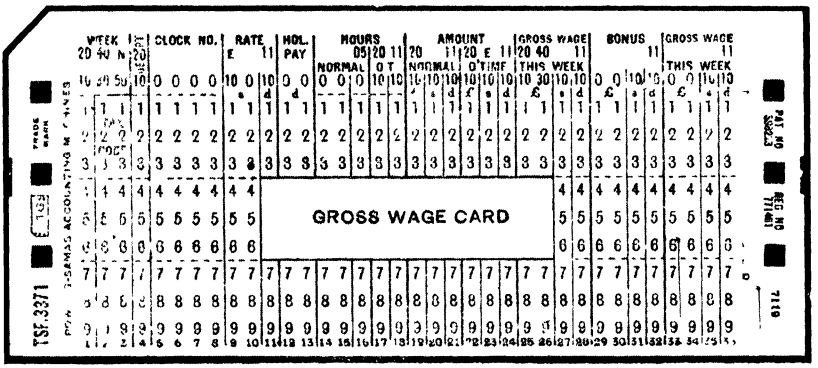


FIG. XVI—10

entered by the use of a suitable tabulator and card In other cases, details of the gross wages may be shown (e g hours worked, overtime) These variations will depend upon the circumstances of the particular concern

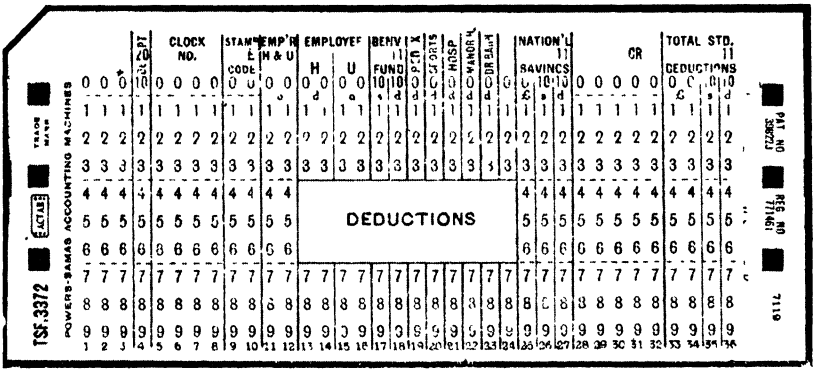


FIG XVI—11

(2) A pay slip, for insertion in the wage packets. This may be a carbon copy of the pay roll, guillotined into strips, or it may be obtained from the same cards by a separate tabulation on to small forms.

(3) Summary of standard deductions The standard deductions cards are sorted from the others and tabulated to show the various classes of deduction in columns and to obtain a total of each class for the week.

(4) Earnings and tax records. The cards are filed at the end of each week Periodically they are removed from the file, several weeks cards being sorted together by clock numbers, and tabulated to produce the earnings and tax record for each man.

TAX CALCULATION SHEET

WEEK NO.	CLOCK NO.	TAX CODE	GROSS WAGE THIS WEEK	GROSS WAGE TO DATE	CUMULATIVE TAX BRT. FWD.	CUMULATIVE TAX TO DATE	TAX THIS WEEK
4	2487	11	5. 4 0	20. 10	2. 12 0	3 16 0	1 4 0
4	2503	11	5. 2.6	19. 8.0	1. 18.0	3 10 0	1 12 0
4	2507	11	5. 10.3	19. 10.0	1. 16.0	3 13 0	1 17 0
						ENTERED BY HAND FROM TAX TABLES.	ENTERED BY HAND AFTER DEDUCTING TAX BRT. FWD FROM TAX TO DATE.

FIG XVI—12

Sometimes the pay roll information is concentrated on the one card, as described in the next section (second example)

Income Tax, Pay-as-you-earn

Punched cards enable the items to be sorted into order of code and

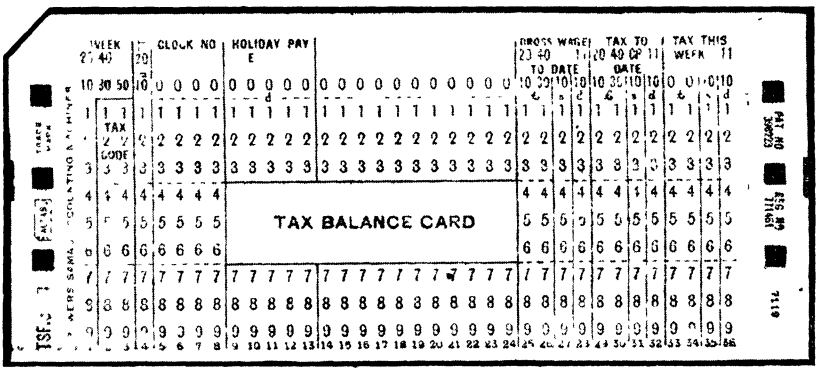


FIG XVI- 13

amount and therefore simplify reference to the tax tables Various methods are used, two being described here.

Method 1 —The tax card is shown above As soon as the gross wages cards (see previous section) are available, they are sorted with the previous week's tax cards, into order of tax code. They are then put through the tabulator to produce a tax calculation sheet in the form shown in Fig. XVI–12.

The machine automatically computes the gross wages to date When,

this tax calculation sheet has been completed with the aid of the tables the new tax cards are punched from it. These new tax cards are used, with the gross wages cards and standard deductions cards to produce the pay roll

Method 2 —The tax, total deductions, and gross wages are shown on the one card, illustrated below. The routine is—

(*a*) Using a reproducing punch, transfer some of the information from last week's card to new cards for the current week. This is an automatic operation, the machine being set and the cards left in it until the operation is complete The information brought forward in

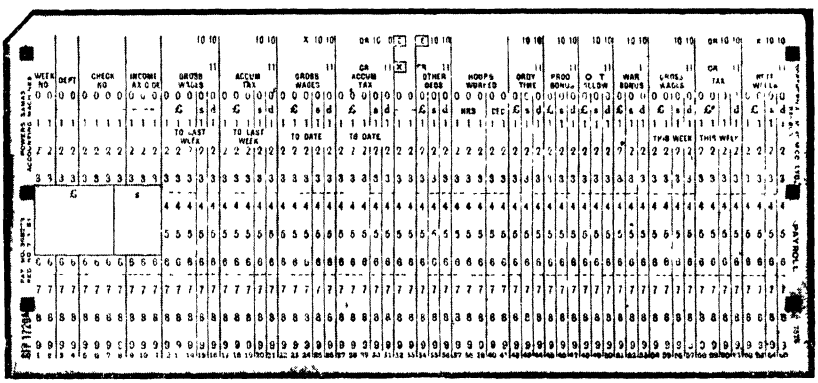


FIG XVI 14

this way is: department, clock number, total deductions, gross wages brought forward, accumulative tax brought forward.

(*b*) The cards are passed through an interpreter That is to say, the information conveyed by the punched holes is typed on the card by the machine This makes the clock number clear for the next operation .

(*c*) The gross wages for the week are punched from the clock card.

(*d*) The cards are passed through a cross-adding punch which computes and punches the gross wages to date.

(*e*) The cards are again passed through the interpreter so that the gross wages to date may be clear to the operator using the tax tables

(*f*) The cards are sorted, first into code numbers, then within each batch representing a code number, into order of gross wages

(*g*) An operator punches the accumulative tax, reading from the tables

(*h*) The cards are passed through the cross-adding punch, which computes firstly the tax for the week, and secondly the net pay.

(*i*) The cards are now complete and after being sorted into the required order are passed through the tabulator to produce the pay roll.

(*j*) A subsidiary set of cards is used to produce the summary of standard deductions.

Some Practical Points

The accountant and business man is less interested in the machines as wonderful engineering products than in the systems of which the machines form a part Those who supply the machines know this, and have staffs of systems experts who will give excellent advice on practical problems. None the less, the user often prefers to design or modify his own system and it is advisable to point to some pitfalls which await the unwary

First a warning must be given against installing punched card machines in a badly organized works or office The machines depend upon correct basic information being available at the time when the cards are punched A hand-written record may be slow and cumbersome, but it does permit the correction of errors without undue disorganization and delay, but not so a highly mechanized system. It is useless to arrive late at a railway station, and similarly it is useless for information to arrive late at the punching department—the sorting programme will be disorganized A particular example may be taken from purchase invoices. In a large works these invoices may have to be sent to numerous individuals to be checked against the goods, and passed for payment Should the invoice be delayed or mislaid, through doubtful allocation of duties, overworked or merely careless staff, or any other reason, then the figures which the office produce will be unreliable. If the office contains numerous clerks working by old-fashioned methods, they may be able to find time to chase round the works looking for the missing papers and make good their lost time, perhaps by overtime. If on the other hand there are but two or three girls and a battery of machines, there is no margin available for this chasing. Innumerable examples might be given, all pointing the moral that where the office or works is badly organized, put it in order first and only then consider mechanization of the accounts

Another warning must be given against an over-reliance on totals without permanent records of the items. This is fatally easy with punched cards as with all slip systems The theory is that the cards can always be re-sorted and tabulated, but this is not so easy in practice as there may be a large number of cards to be sorted and in some cases a doubt as to how the particular total was obtained (e.g. what exact period it covered). The details may be needed for the audit, or perhaps for a Government cost investigation or for some unforeseen purpose. It may take longer to prepare detailed lists, but tabulation is rapid and time is saved in the long run In particular, it is advisable to be very careful about installing punched card machines merely because they appear to save records.

It is as well to remember that clerks working under a simpler system do much besides the mere book-keeping (e.g. replying to customers' queries) and that such work will still be needed under a mechanized

system. The machines do everything but think, and provided that it is not overlooked that book-keeping includes some thinking, punched card methods are properly described as one of the very greatest of labour-saving devices.

Note for the Student

In answering an examination question it may be necessary to give an example of a card for use with these machines It would be impossible to draw a card in full in the time available and the following diagrammatic method is suggested

Draw the rectangle 6 inches by 3 inches Mark off your 26 cross and 10 down spaces of $\frac{1}{8}$ inch, with a margin at top and bottom and at sides Now mark off the numbers 0 to 9 on the left This framework can, with practice, be drawn very quickly It remains to divide the card and head the columns, according to the details required by the question, and this will be where thought will be needed It may not be necessary to use every column, if all the necessary information is shown a few spare columns do no harm

An example is shown below—

Day	Month	Serial Number	Class of Goods	Area	Traveller	£	s.	d
0								
1								
2								
3								
4								
5								
6								
7								
8								
9								

FIG XVI—15

Hollerith Machines

These machines are illustrated in Figs XVI–16 to XVI–24 and the cards used in Fig. XVI–25

The Hollerith key punch is used to perforate the cards. Each time a key is pressed a hole is punched and the card moves forward one space

In appearance and method of operation the Hollerith verifying key punch is similar to the key punch illustrated below, but the keys are blunt and can only be depressed where a hole has been punched.

The Hollerith Electrical Sorting Machine

The Hollerith electrical sorting machine is used to arrange the cards in the order required The machine is set to sort by a particular column

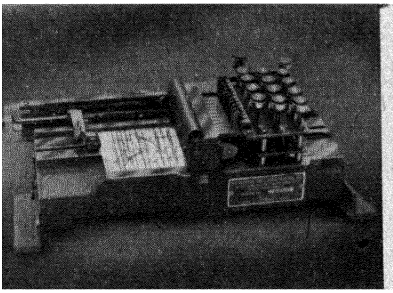


FIG. XVI—16 HOLLERITH 38-COLUMN KEY PUNCH

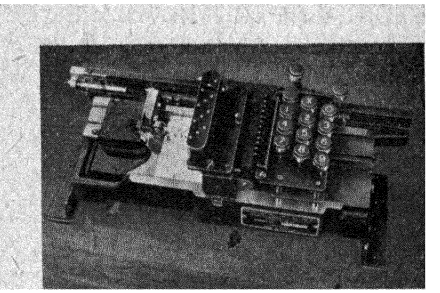


FIG XVI—17. HOLLERITH 38-COLUMN VERIFIER

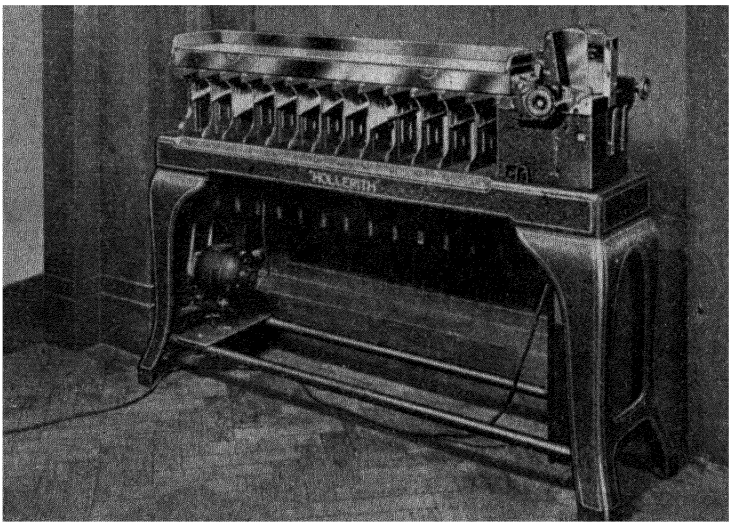


FIG XVI—18 HOLLERITH ELECTRICAL SORTING MACHINE

on the card. The pile of cards is put in the container (here shown at the top of the machine on the right) and the machine drops them into the receiving pockets. There are thirteen of these—one for spoilt or unpunched cards, ten for the numbers 0—9, and two for the extra

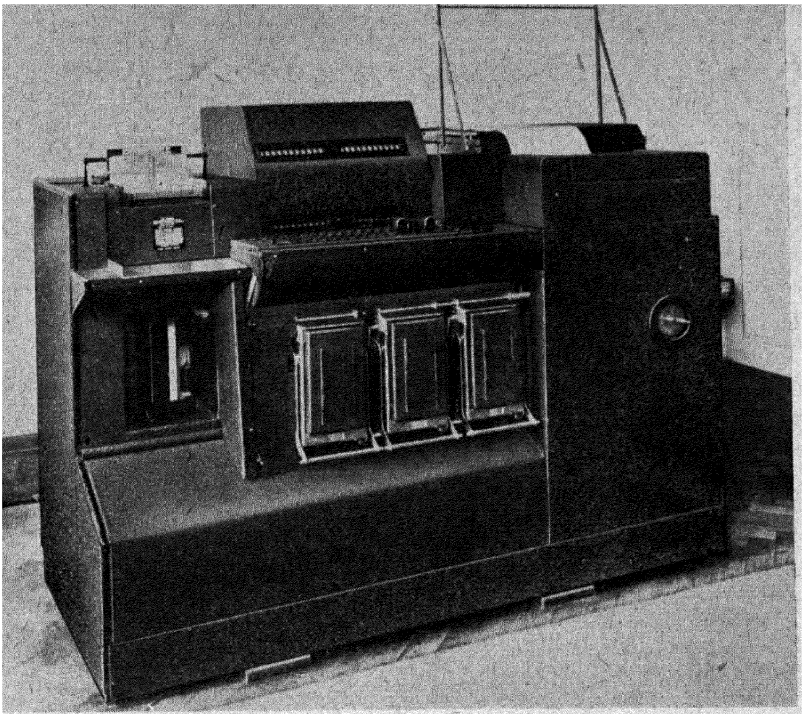


FIG. XVI—19. HOLLERITH 80-COLUMN ELECTRICAL TABULATOR

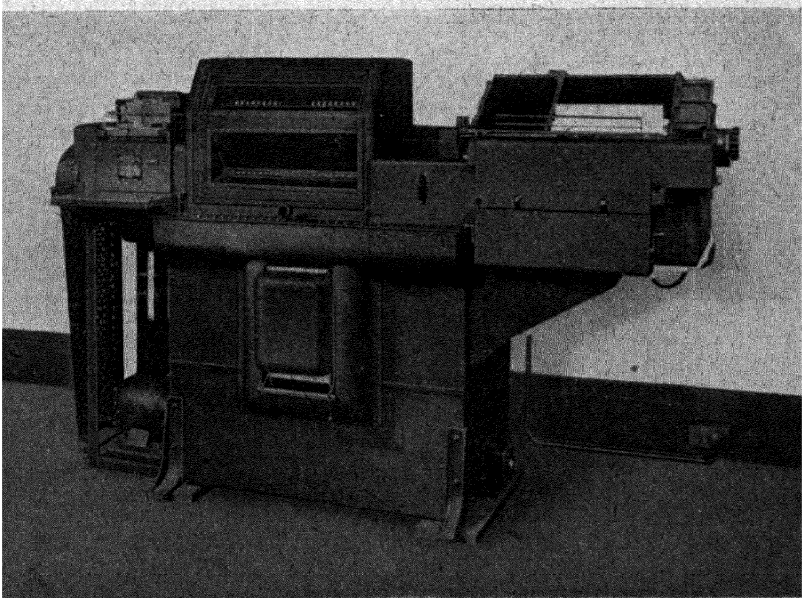


FIG. XVI—20. HOLLERITH 38-COLUMN ELECTRICAL TABULATOR



FIG. XVI—21. HOLLERITH COLLATING MACHINE



FIG. XVI—22. HOLLERITH ALPHABETICAL PRINTING DUPLICATING PUNCH

hole spaces at the top of the card used for alphabetical (and other) work

The Tabulating machine uses the cards, which have already been sorted into order, to produce totals and printed lists, summaries, ledgers, or whatever records may be needed The form of the

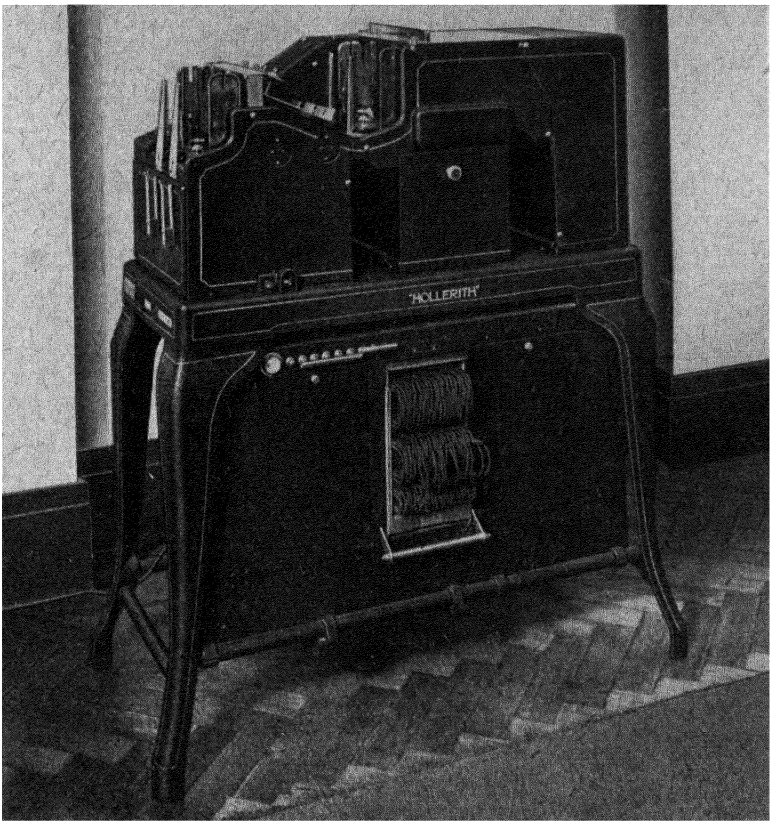


FIG XVI—23 HOLLERITH COMPARING REPRODUCING GANG PUNCH

tabulator will vary according to the number of adding registers needed and the type of printed record required

The machine can be set to print all the information on the cards, or part of the information, or to add the figures recorded on the cards and print the totals only. Alternatively, the figures punched on the cards can be cross-added and the total printed

The operation is electric and controlled through a "panel" which is similar to a telephone switchboard. Plugs are inserted to connect any

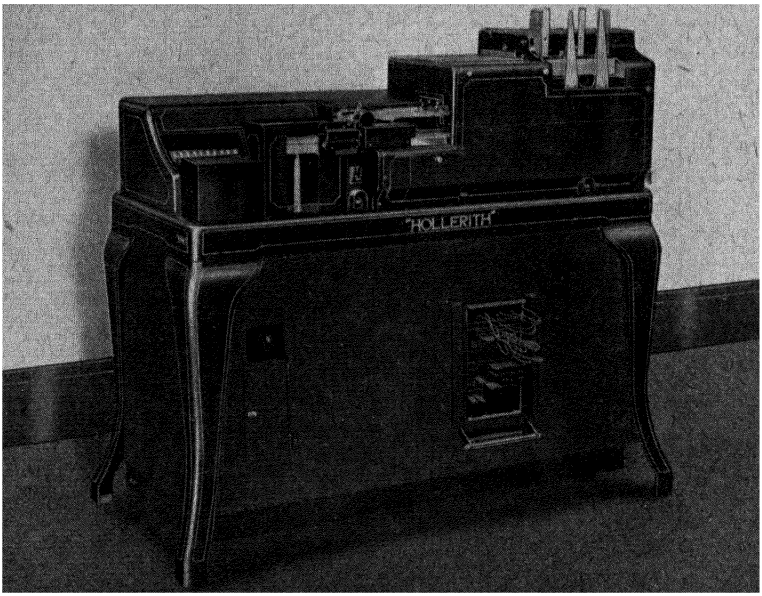


FIG XVI—24 HOLLERITH MULTIPLYING PUNCH

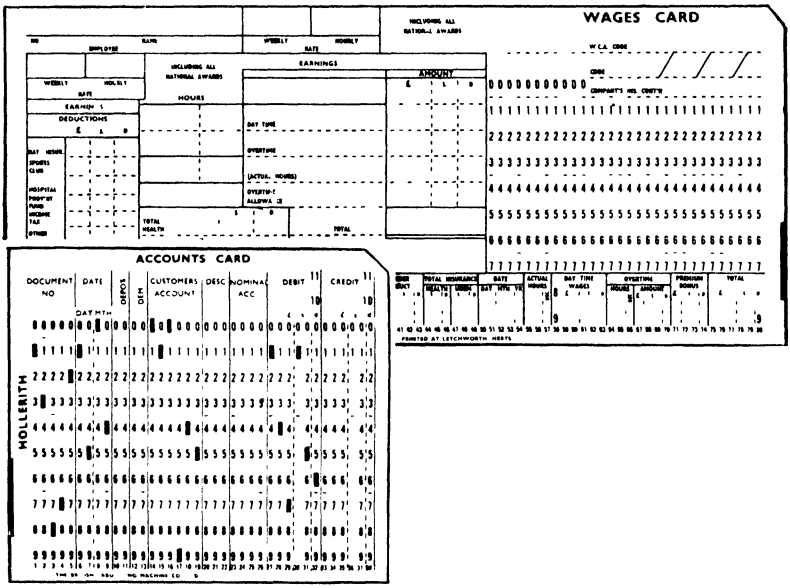


FIG. XVI—25. REPRESENTATIVE HOLLERITH CARDS

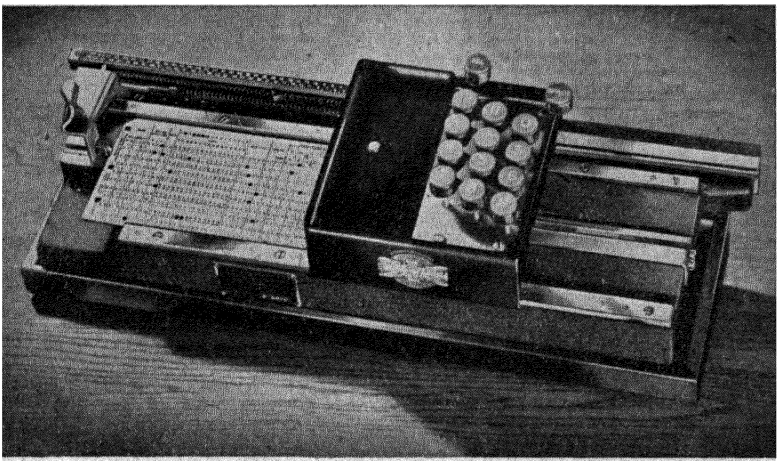


FIG. XVI—26. POWERS-SAMAS KEY PUNCH

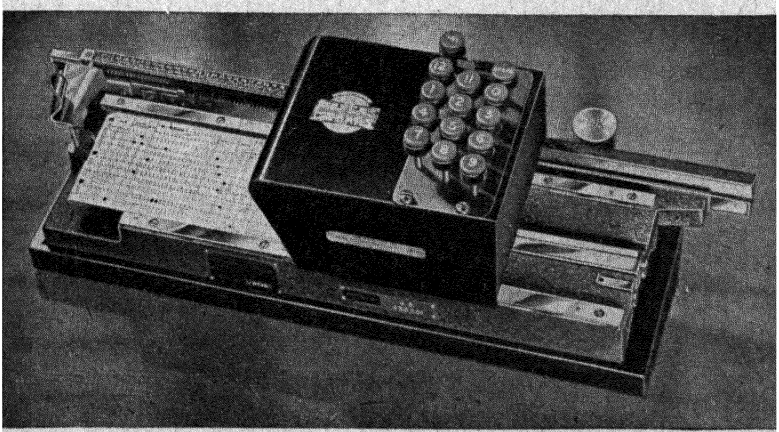
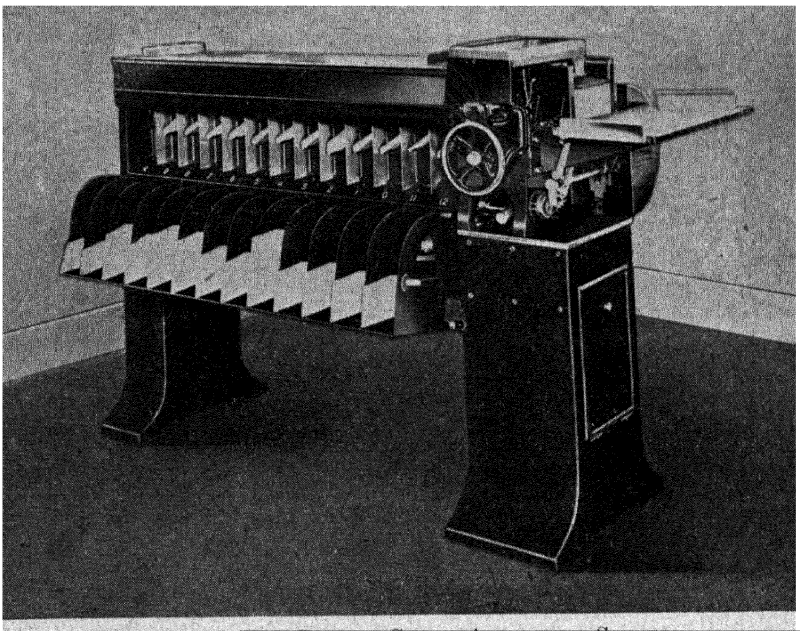


FIG. XVI—27. POWERS-SAMAS VERIFYING PUNCH



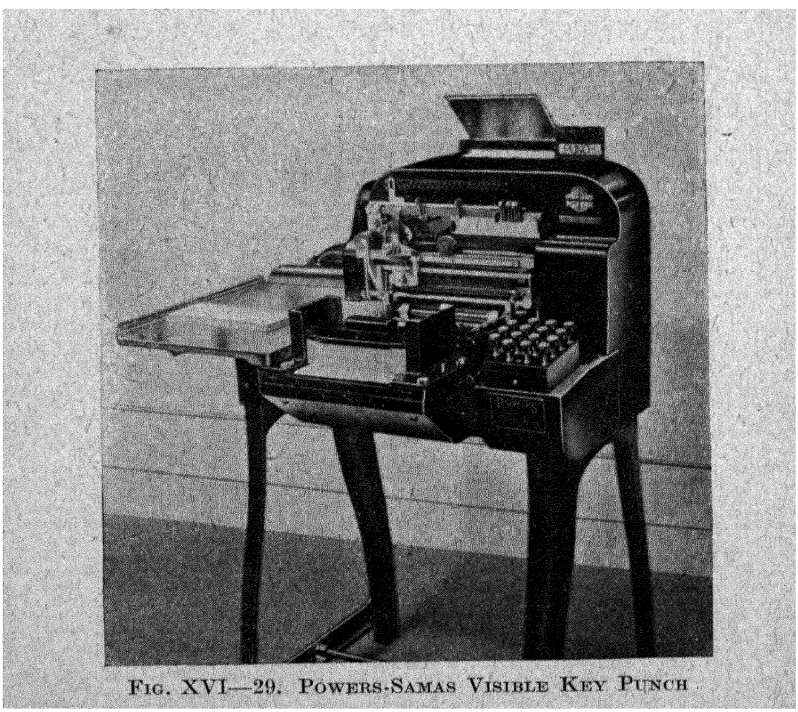


FIG. XVI—29. POWERS-SAMAS VISIBLE KEY PUNCH



FIG. XVI—30. POWERS-SAMAS TYPEWRITER KEY PUNCH



FIG. XVI—31

particular part of the card with any other and with the adding and printing mechanisms

This will merge or match two packs of cards at one operation.

The multiplying machine (Fig XVI—24) picks up two figures from the card, multiplies them and punches holes to represent the answer Alternatively it will pick up a constant multiplier from one card, pick up a figure from another card, which it multiplies by the constant multiplier.

An example of the former method can be taken from costing The

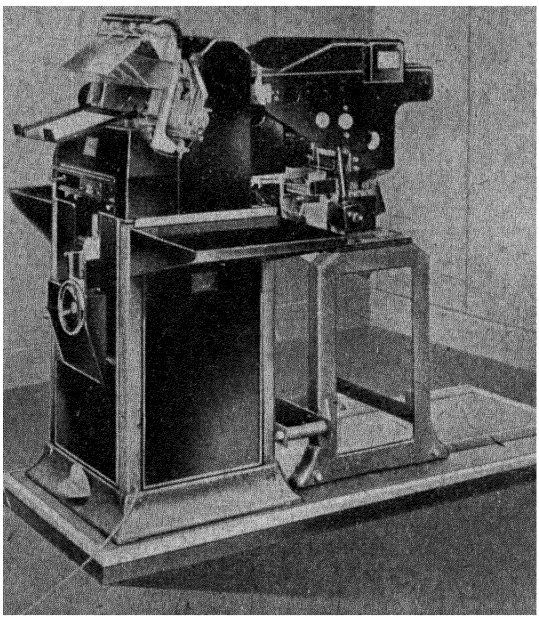


FIG XVI—32

card may be punched with hours and rates of wages, the machine multiplies these and prints the answer

An example of the latter method might be tax calculations. A control card would show the rate of tax, and the machine would calculate the amount of tax and punch each following operative card.

The Hollerith Machines are supplied for use with two sizes of card containing respectively 38 and 80 columns. Since the two cards vary only in width, an interchangeable feed can be supplied in sorters and tabulators, enabling both sizes to be used (but not, of course, simultaneously) in the same machine

Powers-Samas Machines

These machines are illustrated in Figs. XVI–26 to XVI–29

The visible key punch is used where the information to be punched has to be read from the card.

The typewriter key punch records the information on the card both in punched holes and in type (Fig XVI–30)

Interaction of Machines

Both Hollerith and Powers-Samas machines can be arranged to punch cards while other work is done

In Fig. XVI—31 a Hollerith tabulator is attached to a punch which will punch summary cards Example, sales invoices may be made on the tabulator while the punch makes cards, showing a total for each invoice, for sales ledger posting, or, if ledgers are being posted in the machine, balance cards are automatically punched at the conclusion of each individual posting

Fig XVI—32 shows a Summary Card Punch connected to a Powers Tabulator, enabling balance cards to be punched automatically, whilst the Tabulator is used for ledger posting

CHAPTER XVII

CALCULATING

THE main types of office calculations—Key-driven machines—Various models—Set-up machines—Some examples—Comparison of the two types—Combined calculating and accounting machine

IN this chapter, the usual types of office calculations are first discussed, with examples Then some of the principles behind these calculations are mentioned, leading to examples of the calculating machines available

The invoice is the most common document for which calculations are necessary Usually the calculations are so many at so much, the items added, and a percentage taken off Sometimes there are chain discounts, or maybe volumes to be calculated Similar to the invoice are credit notes, stores issue notes, and many other original documents Stocktaking calculations are also similar to those on the invoice

An example of an invoice on which there is a chain discount is given below—

INVOICE

14149

Quantity	Details		Price Each	Discount	£	s	d
144	*American-made HSS Drills*						
	No 100 Taper Shank	$\frac{1}{4}$″	*2/6*		*18*	*0*	*0*
72	*do*	$\frac{5}{16}$″	*3/9*		*13*	*10*	*0*
144	*do*	$\frac{1}{2}$″	*5/0*		*36*	*0*	*0*
					67	*10*	*0*
			Less	*50/12½/2½*			
					28	*15*	*11*
					NETT		

FIG XVII—1

In long form the calculation would be—

	£	s	d
At list prices	67	10	0
Less 50%	33	15	0
	33	15	0
Less 12½%	4	4	4
	29	10	8
Less 2½%		14	9
	£28	15	11

Chain discounts arise for two reasons—firstly because it is convenient to print list prices in the catalogue and to make any changes in the form of a discount to avoid reprinting the whole catalogue, and secondly because merchants may be allowed a wholesale discount Here 50 per cent may be the catalogue discount, 12½ per cent to the merchant, and 2½ per cent in lieu of cash discount.

Below is a time sheet before the calculations are made The wages of £4 17s 9d has to be divided over the jobs in proportion to the hours spent

This type of calculation is common, particularly in connexion with costing

TIME SHEET

Job	Hours	Wages
17148	*5¼*	
19233	*7*	
21401	*18*	
18183	*7½*	
18222	*10¼*	
Total	*48*	*4 17 9*

Fig XVII—2

PIECE-WORK RECORD

NAME *T Parker* DATE *5 June*

Operation No	Parts Completed	Price	Bonus	Bonus	Total
714	*17*	*5*	*7 1*	*25%*	
823	*103*	*3¾*	*1 12 2*		
942	*81*	*4*	*1 7 0*		
			3 6 3	*16 7*	*4 2 10*

Fig XVII—3

Piece-work calculations usually comprise so many articles at so much, perhaps plus a percentage as bonus, and added.

The calculations are very similar to those on the invoices.

A typical piece-work record is shown in Fig XVII—3.

An invoice necessitating foreign exchange calculations is shown below. The calculation is to divide (or multiply) a figure in one currency by a given exchange rate to convert to another currency

INVOICE

11123

CHARLES K PRICE & CO
CHICAGO

Quantity	Details	Price	$
483	Wheels type 3H	2 20 doz	88 55
301	,, ,, 4H	2 30 doz	69 19
			157 74
		@ 4 02½ =	£39 3 9

Fig XVII—4

The preparation of a dividend list (example below) necessitates calculations such as so many shares at a certain percentage, less income tax

DIVIDEND LIST

3½% for the half-year, less tax at 9/ in the £

Folio	Name	Shares	Gross Dividend	Tax	Nett
A1	*Mrs V Adams*	*100*	*3 10 0*	*1 11 6*	*1 18 6*
A2	*S A Andrews, Esq*	*250*	*8 15 0*	*3 18 9*	*1 16 3*
A3	*C P Anderson, Esq*	*375*	*13 2 6*	*5 18 1*	*7 4 5*
A4	*J J Anderson, Esq*	*100*	*3 10 0*	*1 11 6*	*1 18 6*

Fig. XVII—5

Types of Calculation

The above examples are certainly not exhaustive, but it is surprising how common office calculations fall into a limited number of groups—

(1) Miscellaneous adding and subtracting

(2) So many articles at such a price, as on invoices and in piecework calculations This is much the most common type in commercial offices

(3) Percentage calculations of various sorts, including discounts and interest

(4) Division of a figure *pro rata* to certain other figures, as in the time sheet illustrated

(5) Foreign currency.

If the same kind of calculation occurs frequently it will become very familiar to the operator, whether or not a machine is used But there are always some miscellaneous calculations which crop up at intervals If such items are of an unusual or special nature they may have to be explained carefully to the calculating clerk, and this may take more time than the actual calculation In such cases it is sometimes more convenient to supply the technician or senior accountant with a simple machine, which he can use himself, instead of concentrating all calculations in one office

Calculating machines are of the following classes—

(1) Key-driven machines, i e those in which the depression of the keys operates the mechanism

(2) Set-up machines—those in which the figures are first set up with keys or levers, and a further lever has to be moved to operate the machine

(3) Machines which combine calculating with some other function These are the Burroughs typewriting-calculating machine and the multiplying punches used with punched cards

(Further sub-classes are sometimes made, but the division is more mechanical than functional)

Key-driven Machines

Although the keyboard is similar to a listing-adding machine, the operation is entirely different, as the depression of the key operates the adding wheels directly.

The shillings and pence columns are used only for addition and subtraction, decimals being used for multiplication and division. As there is no printing mechanism and as there is one operation (press key) instead of two (press key and pull handle) adding is very much more rapid than on a listing machine Subtraction is by means of complementary figures, and to assist in this the complements are printed (in small type) on the keys. Thus to deduct £7 13s. 10d.,

the operator adds £992 6s. 2d. (with as many nines on the left ha[redacted] may be needed) This becomes second nature to a trained and ex perienced operator and is almost as fast as adding

Multiplication is a process of repeated addition. Thus, to multiply 1514 by seven, the fingers are placed on the keys representing 1514 and are pressed seven times To multiply by ten the fingers are moved to the left Thus if the same figure (1514) had to be multiplied by 27, the fingers are placed over keys 1514, pressed seven times, then moved

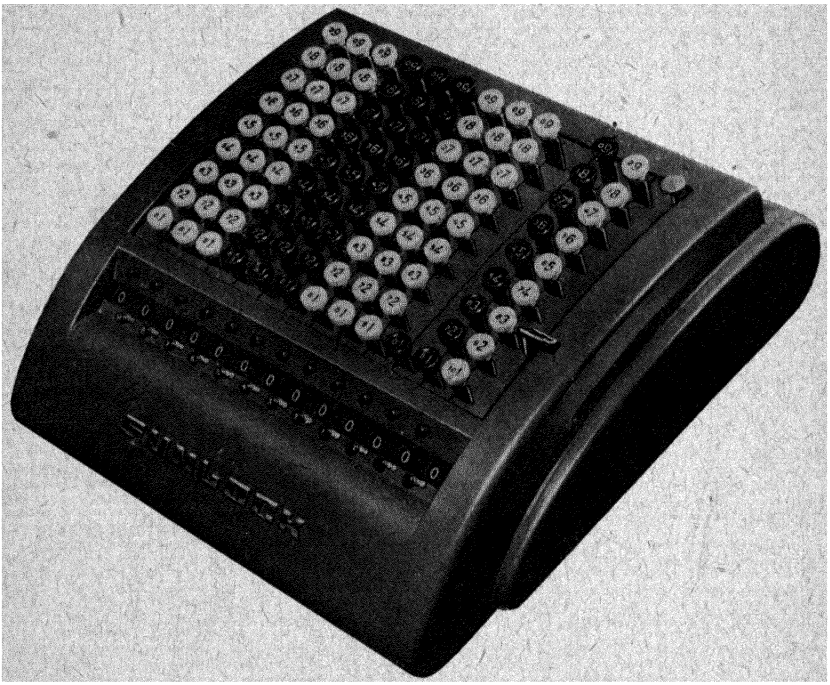


FIG. XVII—6 SUMLOCK

one column to the left without altering their relative position, and pressed twice.

Division is a process of repeated subtraction by reciprocals, which, although it sounds complicated to the uninitiated, is done remarkably quickly by a trained operator.

Key-driven machines should be operated by touch, that is to say, the operator should have her eyes on the papers from which she is working while her fingers find the keys. To assist this, the keys are made with slight differences in surface. In adding, for the same reason, it is usual to use only the first five keys—it is quicker to press the "3" key twice than to move the finger to the "6" key To make the best use of these machines, the operators should be thoroughly trained,

the machine makers provide special schools for the purpose. Illustrations of machines of this type are given in Figs XVII–6 to XVII–10

The Sumlock is a British-made calculator.

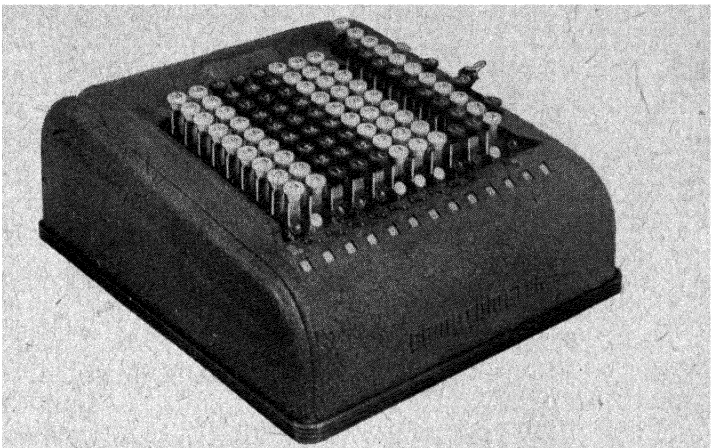


FIG. XVII—7. COMPTOMETER (HAND MODEL)



FIG. XVII—8. COMPTOMETER (ELECTRIC MODEL)

The Comptometer is a well-known key-driven machine It is available in various sizes. Electric and dual register models are also available.

The Burroughs calculator is another well-known machine of this type. The machine with two registers is shown here. Electric and hand models are made in various sizes

The Plus adding machine is a smaller key-driven machine. As

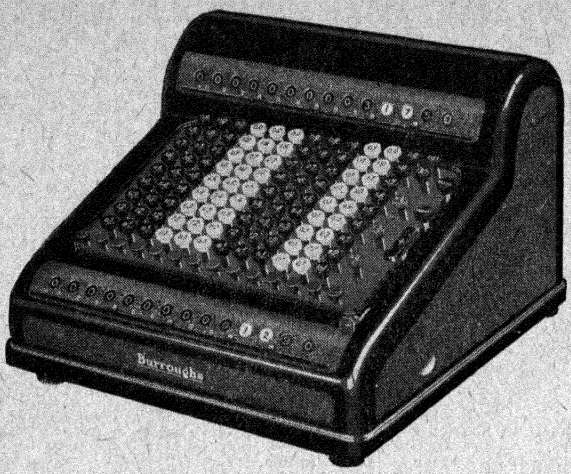
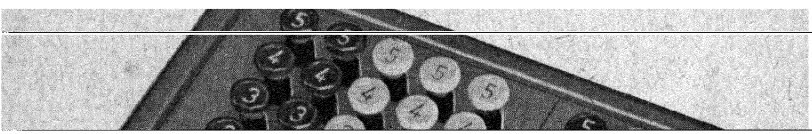


FIG. XVII—9. BURROUGHS CALCULATOR WITH TWO REGISTERS



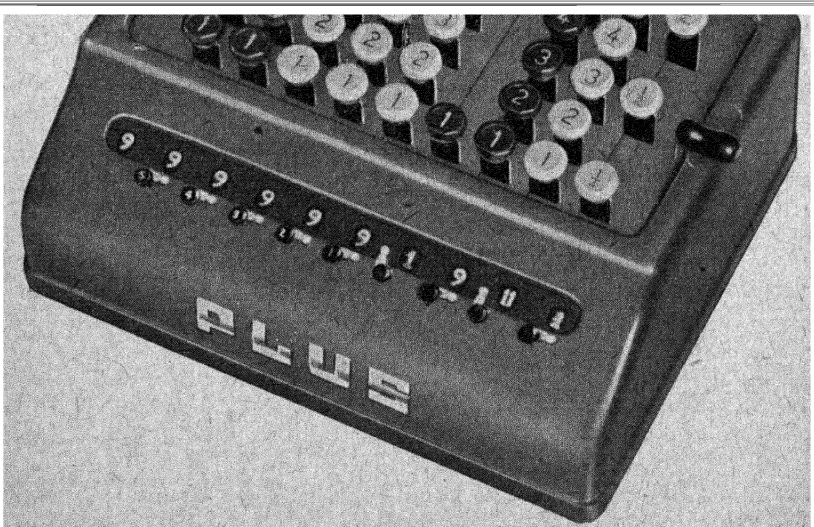


FIG. XVII—10. PLUS ADDING MACHINE

already explained, in adding by touch only the first five keys are used Where, therefore, a machine is needed for adding only, the Plus is both economical and convenient

Set-up Machines

There is a wide range of these machines, some are described here as examples of the various types The characteristic feature is that the figures are set in the machine by levers or keys and as a second

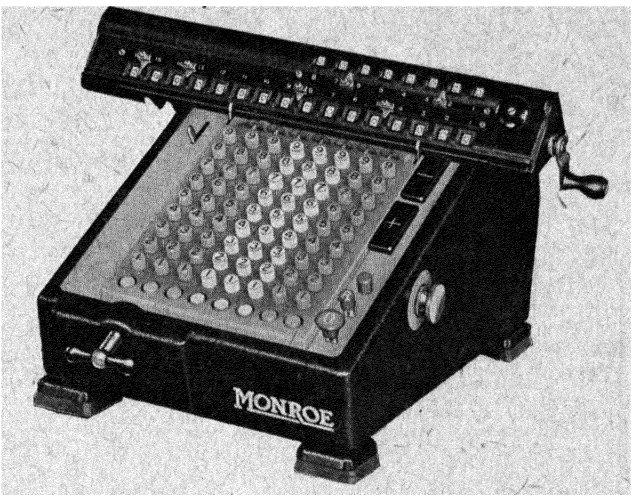


FIG XVII—11 MONROE CALCULATOR PORTABLE ELECTRIC MODEL

operation a handle is turned (or a button pressed, if it is an electric machine), which moves the calculating mechanism

The essentials of these machines are—

(*a*) Keys or levers, which set the figure to be multiplied (the multiplicand)

(*b*) A means of turning the mechanism, after it has been set—two revolutions to multiply by 2, three revolutions to multiply by 3, and so on

(*c*) Registers fitted with dials, which show the answer (product) and also the number of revolutions (multiplier).

(*d*) A carriage or means of moving the product register relative to the set up levers, from units to tens, hundreds, thousands positions

(*e*) A quick means of returning the keys or levers and the dials to the starting position.

The Monroe portable electric model is illustrated in Fig XVII—11

The keyboard, by which the multiplicand is set, is reminiscent of the adding machine On the left are two larger keys, the operating bars, marked plus (+) and minus (—), which cause the machinery to revolve. The register at the top shows how many times the

machinery has revolved in the multiplier The product shows in the longer register. The knob at the bottom moves the carriage and, at the end of the operation, the registers are cleared with the lever on the right of the carriage.

The method of working is best illustrated by an example. Say that 1234 is to be multiplied by 2453 The number 1234 is set by depressing the keys, as in the case of an adding machine The carriage is moved into a convenient position and the operating bar marked + is depressed, while the mechanism revolves three times Now the carriage is

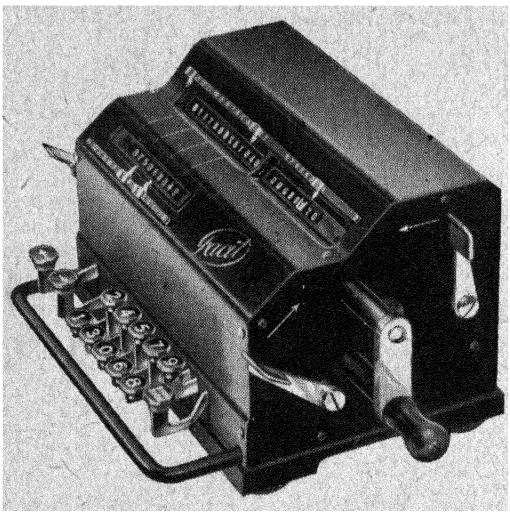


FIG. XVII—12 FACIT CALCULATOR

moved one step to the right and the mechanism revolved five times Next, the carriage is moved a further step to the right and the mechanism revolved four times, and finally the carriage is moved one more step to the right and the mechanism revolved twice The multiplier 2453 shows in the revolution register and the answer 3,027,002 in the product register

This is, in effect, a process of repeated addition, with the use of the carriage for multiples of ten Division is by repeated subtraction There are numerous short cuts which can be used by an operator accustomed to the machine

Facit Machine

The Facit machine is a compact and convenient hand-operated calculator. The multiplicand is set by the ten keys, figure by figure, as has been described for the Sundstrand adding machine This multiplicand appears in the lower register The mechanism is revolved by the handle on the right, and the number of revolutions (multiplier)

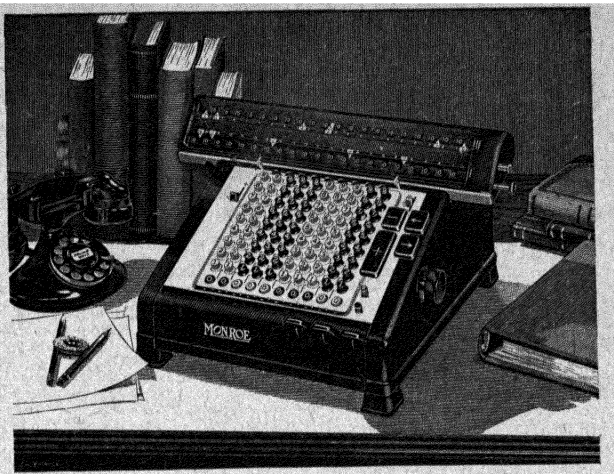


FIG. XVII—13. MONROE AUTOMATIC CALCULATOR

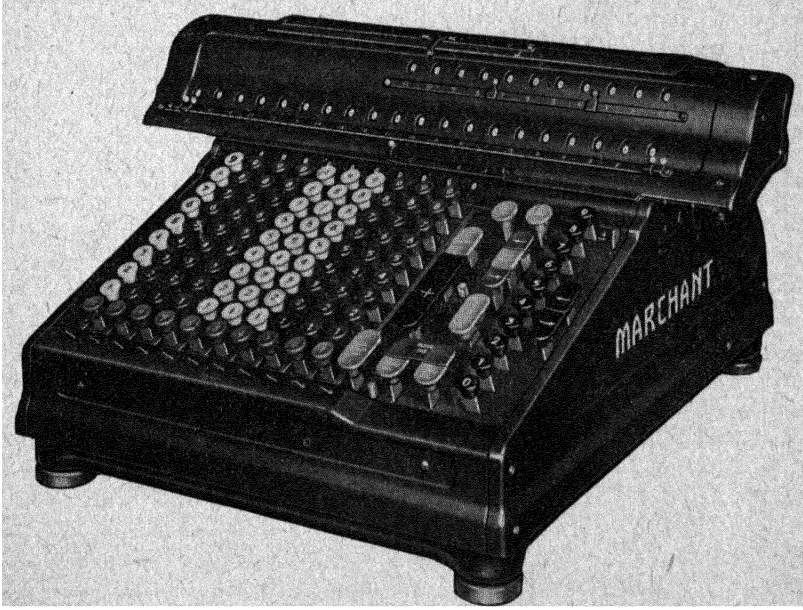


FIG XVII—14 MARCHANT AUTOMATIC CALCULATOR

shows in the right-hand register The product shows in the top left register

Set-up Calculators

Machines are available with various automatic mechanisms In a fully automatic machine, the two numbers are set in the machine and

are automatically multiplied (or divided) without further action by the operator. This is only of real advantage if the operator can make use of the time released while the wheels are turning, e g. by reference to papers to find the figures for the next calculation

Two fully automatic machines are illustrated in Figs XVII—13 and XVII—14

Comparison of Set-up and Key-driven Calculators

The key-driven machine has the advantage that the wheels are turned immediately the first operation is made, the set-up machines require two separate operations—setting and lever movement This is at its greatest in straight adding In multiplication the setting is done once for the whole calculation, and the lever turning is quite as quick as key depressing In division the set-up machines have an advantage, as the method used on the key-driven machines is more complicated. Most office calculations are a mixture of multiplication and addition, with division comparatively infrequent, and if these additions and multiplications are so inter-mixed that they must be done on the same machine, key-driven machines are commonly used On the other hand, the key-driven machine is limited because trained operators are needed, and in many cases it may be convenient to have a set-up machine available for use by persons engaged on technical or confidential work, who may prefer to work the calculations themselves instead of explaining them to an operator Further, many special cases arise where there is a volume of work involving division, for which set-up machines of the automatic type are particularly suitable

Burroughs Calculating Accounting Machine

This machine not only makes the calculations but also records the figures It is similar in general form to the Burroughs typewriting accounting machine previously described A practical difficulty is the decimal method of working, which makes the machine unsuitable for sales ledger work in Great Britain For some stock records and certain forms of costing, decimals create no difficulties, and here the machine can be of great advantage, as two operations, recording and calculating, are combined. Naturally the calculations take a certain time, which makes the posting operation slower than on a non-calculating machine, the advantage is in the reduction in handling of the papers

An example can be taken from stores records If value and quantities have to be recorded in the same ledger then the movement of the document (stores issue note) might be as shown in Fig XVII—15

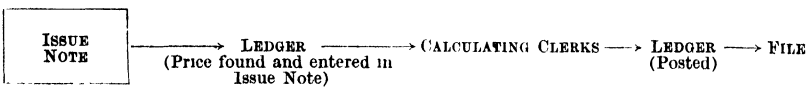


Fig XVII–15

With this calculating and accounting machine the movement would be—

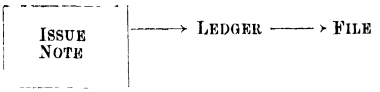


FIG XVII—16

It must be remembered that the handling of papers is the most costly of all office operations

CHAPTER XVIII

THE AUDIT OF MECHANIZED ACCOUNTS

THE auditor's outlook—Analysis—Additions—Day books—Ledgers—Sales ledger —Purchase ledger—Cash and wages—Punched cards—Conclusion

THE mechanization of the accounts makes no difference to the fundamentals of auditing, but brings changes in the practical routine, it is with this practical side that we are concerned here Without considering the auditor's legal obligations, he is, in practice, usually concerned to satisfy himself that (*a*) the balance sheet is correct, (*b*) the company's funds have not been misapplied, (*c*) he has adequate information for the company's tax returns

The auditor and the general manager each have a use for the books and figures, but their outlook is different The manager puts the emphasis on immediate use of the figures and upon economy He has little use for information which is old, often weeks or days are of importance to him The auditor, on the other hand, wishes the records to be permanent, to be available after the lapse of a year, even when he has checked the figures, he still wants the records left in case he may wish to refer to them again Some modern systems tend to gain in immediate use and economy at the expense of permanency (slip systems in particular), and the auditor must see that his client is not carried away by the advantages from the one point of view without fully appreciating the difficulties from the other If the client wishes to use an unorthodox system, then he must see that the clerical work is well done, the auditor can help to put right muddled figures which are in a form to which he is accustomed, but if the books are both unorthodox and confused, there is no hope for them The auditor should discourage small concerns from experimenting with new systems as the small client cannot afford to employ expert staff, and his experiments are likely to lead to trouble rather than economy

This is not to say that the auditor must be a died-in-the-wool conservative, he should be at least as well informed as his client There are many well tried labour-saving ideas and methods which he can encourage the small or medium-sized client to use Some forms and systems used with machine accounting have become so generally adopted as to constitute a new orthodoxy The large concern can, of course, spend time and money to find the best method of doing each particular office job, and the auditor's point of view can have full consideration.

Analysis

Most analysis is unimportant from the auditor's point of view. It does not usually matter to him whether an item is haberdashery, grocery or hardware, it is all merchandise to him, and he will include

all the items in purchases or sales as the case may be Often this type of analysis is in some form which is difficult to check subsequently, but he will make no complaint, it is no concern of his

On the other hand, certain limited types of analysis are of great importance to him, particularly expense and capital items, which he needs for tax purposes For this reason it is often convenient to separate invoices for goods from expense invoices, the former being analysed by some economical slip system and the latter by the more cumbersome but permanent analysis day book.

Additions

The auditor is sometimes puzzled whether he needs to check machine-made additions. The answer is simple He should never rely on a machine addition unless he sees the machine doing it Some machines have locking devices and other gadgets to prevent the operator from faking a result, but the auditor or his clerk cannot be expected to understand the limitation of any particular machine

This does not mean that the auditor must check every addition He should approach the matter exactly as he would any other set of books which had already been balanced—he is entitled to rely on the system. He would check a proportion, what this proportion is will depend upon the type of transaction He would check a larger proportion of wages additions than of sales additions

Day Books

Apart from those cases where analysis has to be in permanent form, few big concerns now keep day books This sometimes puzzles the old-fashioned auditor, but need not do so if he considers what functions the day book was intended to serve From his point of view these were two—to record the items immediately, thus reducing the chance of juggling with the figures, and to enter the items one under the other to be added Both these objects are attained in a modern office by adding the invoices daily on a listing machine and thus providing a total with which all subsequent work must agree

These daily totals should be entered immediately in a convenient permanent book and the machine lists kept in case the auditor should wish to refer to them The serial numbers of the invoices should be recorded to enable the auditor to see that every item is entered

It might be objected that the auditor is not concerned with any sales invoices which might be omitted from the book (any more than he can be concerned with items that have never been invoiced at all) Against this there is the possibility of an invoice being correctly sent to the customer, but not entered in the books, which might give the cashier an opportunity to misappropriate the money subsequently received. This is usually made difficult by separation of the cashier

from the ledgers, but the auditor should be given the additional safeguard arising from the immediate recording of all sales in list form

In this connexion the auditor should note that the proof sheet prepared when posting the ledgers on certain machines is not a day book, as the items are not entered as they occur, but only when they are posted.

Ledgers

Some auditors find the three-column type of ledger less convenient than the old debit and credit form This is mainly a matter of habit and prejudice, but there is something in it, as this example shows—

(*a*) *The old form of ledger*—

J JONES & CO

Dr PENMAENMAWR *Cr*

Date			£	s	d	Date			£	s	d
June 3	Goods	17143 17	5	8	2	June 8	Returns	151	1	17	0
June 4	Goods	17201 18	1	3	1	June 17	Allowance	151		10	0
June 17	Goods	18117 23	7	19	3	June 30	Balance	c/d	12	3	6
			£14	10	6				£14	10	6
June 30	Balance	b/d	12	3	6						

FIG XVIII 1

The auditor has to add the debit and credit columns and tick the totals already written down

(*b*) *The new form of ledger*—

JONES & Co

PENMAENMAWR

Date			Debit			Credit			Balance		
			£	s	d	£	s	d	£	s	d
June 3	Goods	17143	5	8	2						
June 8	Goods	17201	1	3	1						
June 8	Returns	151				1	17	0	4	14	3
June 17	Goods	18117	7	19	3						
June 17	Allowance	151					10	0	12	3	6

FIG. XVIII—2

The auditor has to add the debit and credit columns and in each case to write down his own answer and to deduct one from the other to find the balance Additional operations—two totals to write and one deduction to make

If this had to be repeated many thousands of times, it would be a serious matter In practice he is given the ledgers ready balanced and checks only a small number of accounts to satisfy himself that they are what they purport to be The loss of auditor's time is very small in proportion to the gain in convenience to his client This is one of the cases where the auditor must overcome his prejudice, and the sooner he does so the better

The Sales Ledger

The auditor can usually rely on his client to make sure that the goods sold are charged to the customers If any such are omitted, the auditor has little chance of finding out He should satisfy himself that there is a sound system, well carried out, and that the posts of cashier and ledger clerk are held by different persons Beyond this he gains very little by checking postings or comparing the invoices with the ledger This is so whether the books are posted by machine or kept by hand (assuming always that the books have been balanced)

At the year end the auditor must satisfy himself that the balances shown on the sales ledger are genuine and should be included in the debtors To do this he himself takes charge of the customers' statements, which he first checks with the ledger He then affixes to the statements a gummed label, asking the customer to refer any queries to the auditor (address stated), and the auditor himself sees that these statements are posted

Similarly, with the customer's ledger of a bank or building society The auditor is not concerned with the method of producing the ledger, so long as there is a permanent record on which he can act

On the other hand, if an auditor does find a machine-posted ledger which is out of balance and badly kept, he should strongly and immediately insist that proper staff be employed to put the ledger in order or that, alternatively, the books be kept by hand The systems of machine posting are designed to be balanced currently and do not lend themselves to subsequent detailed checking There is no day book and often the pre-lists which are made on the adding machine do not show invoice numbers There should be ways, not necessarily rapid ways, by which an auditor can if need be check any items, but if the ledger is badly kept, then as likely as not the filing will also be bad Machine ledgers are like the little girl in the nursery rhyme "who had a little curl"—when they are good they are very, very good, but when they are bad they are horrid Fortunately, most users are well aware of the dangers.

The Purchase Ledger

The auditor checks this to ensure that all items owing are included when the balance sheet is made up, to confirm that payments are in respect of goods actually received, and to satisfy himself that no items of a capital nature, or which should be separated for tax purposes, have been included in the purchases The standard routine covering the second and third purpose, was to vouch the purchase day book with the invoices and to check the postings to the ledger Where there is no day book, it is not much use to vouch the invoices to the machine lists—it is better to vouch direct to the ledger The common sense of this is even clearer where the American system is used, with a payments list in place of the ledger (See Chapter VIII for details of the American system) The auditor seldom checks or vouches the whole of the items He tests a reasonable proportion of the whole There may either be a certain month's invoices or else certain accounts picked at random and checked from beginning to end of the year.

To satisfy himself that all items have been included for balance sheet purposes, the auditor should check the suppliers' statements as at the date of the balance sheet Under the usual British system, the client checks these statements every month and does not pay unless a statement is sent Under the American system, the client does not check the statements automatically, but relies on his internal organization to make sure that no invoices are lost Therefore the auditor will find in the latter case that statements at balance sheet date are of even more importance than in the former case

Cash and Wages

Machine-entered records of cash and wages usually follow much the same form as hand-entered records This means that there is little or no change in audit routine

The wage sheets are often added as they are prepared on the machine, and the wages clerks often tell the auditor that it is a waste of time to check the additions The auditor should avoid the temptation to agree with this (and so save himself work) Such additions can usually be faked by an expert machine operator who is so inclined In a big works the best safeguard is a separation of the work of making out the sheets and putting the money in the packets between different people and, of course, the auditor is entitled to rely on the system of internal check if there is one

Certain cash registers provide an exception to the general rule that the auditor should not rely on the machine A copy of the list is locked in the machine and the auditor may be the only person allowed access.

Punched Card Systems

The card is sometimes used as a basic document and bears the

signature of the person authorizing the transaction, but apart from these exceptional cases, the auditor should treat the card as part of the mechanism, not part of the record If he does this, then his audit proceeds on the same lines as any other machine-posted system If he wishes to check the ledger he refers direct to the invoices, and so on. Those records which an auditor needs must be put in permanent form before he handles them—he cannot, as a rule, look on the cards as permanent. As, however, the machine will rapidly print information from the cards, the auditor should have no difficulty in obtaining the schedules he needs

Often the books (particularly the nominal ledger) show totals only, the details being on the cards If the auditor is concerned with income tax, he should ask for schedules of the more important expense and capital items to be prepared at once It is not wise to wait until the tax inspector makes inquiries before listing the information, as that may be years after the event and the cards will have been put away with many others and may not readily be found

Generally

Often the introduction of machine accounting into a client's office improves the quality of the book-keeping because regular balancing is made easy, but apart from that, from the auditor's point of view, books well kept by hand and balanced on double-entry lines are as good as they can be Mechanization is intended to help the client, not the auditor Speed and economy are the keynotes The auditor must make sure that this urge for speed and economy does not mar his permanent record, but he must not be a drag on his client Therefore he should understand machine accounting better than does his client—not the particular details of any one machine, but the general method common to many Only in this way can he spot the unusual transaction amongst the many normal ones.

APPENDIX

Diagrams of Office Systems

THE difficulty in the description of an office system lies in the many different aspects to be considered It is useless to try to show too much in one diagram; the result is only confusion The aspects to be considered and diagrams recommended are—

(1) The people in the office and their relation to each other. A responsibility chart should take the form of a family tree

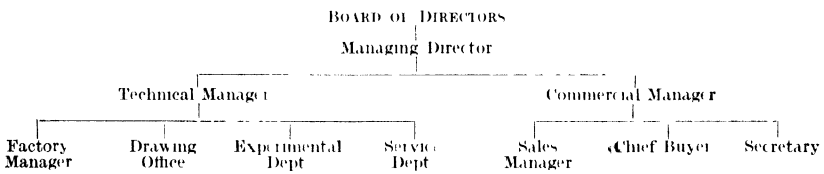
(2) The figures and how they interlock If the books are in orthodox form (as described in any book on book-keeping) then a list of the books is all that is necessary If some are of a special nature, a specimen ruling should be attached Where costing or statistical work is involved, a balancing chart is needed

(3) The basic documents, what information they convey and how they are used These should be shown in flow diagrams

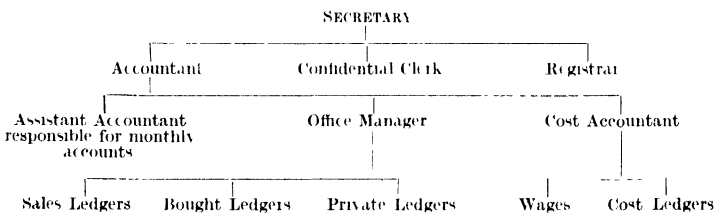
(4) Special details of machine systems and interlocking forms These should be separated from the diagrams referred to above as they make them too elaborate Special types of diagram are used for these purposes

Responsibility Charts

The details will differ in each case This example is given to show the method



Instead of overburdening one chart with too much detail, it is better to make subsidiary charts—



Balancing Charts

These show how the figures interlock It is sometimes necessary to show where the information comes from, but, if possible, that should

be cross-referenced to a flow diagram which is a simpler form (see the next section)

A distinction must be drawn between different ways of agreeing the figures ' For brevity, the following symbols are used—

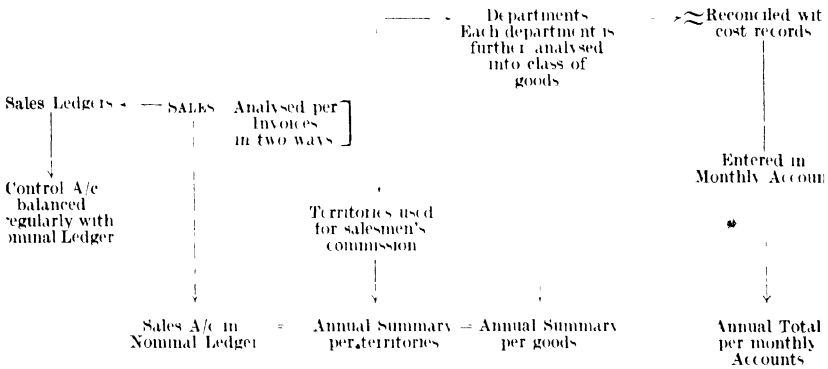
= is used either where the figure is identical (e g the total of the sales analysis = the sales account in the normal ledger), or where the accounts are agreed exactly on double-entry lines (sales ledger accounts = total debtor's account)

≈ is used where the accounts are reconciled, that is to say they are agreed subject to certain known adjustments (e g cash book ≈ bank pass book)

≠ is used where the figures should agree in theory, but where there is no regular check to see that they do (this is very common in practice, particularly with relation to costing or analysis systems)

The following examples show the method of drawing these charts (There is also an example in Chapter XIV, a costing system)

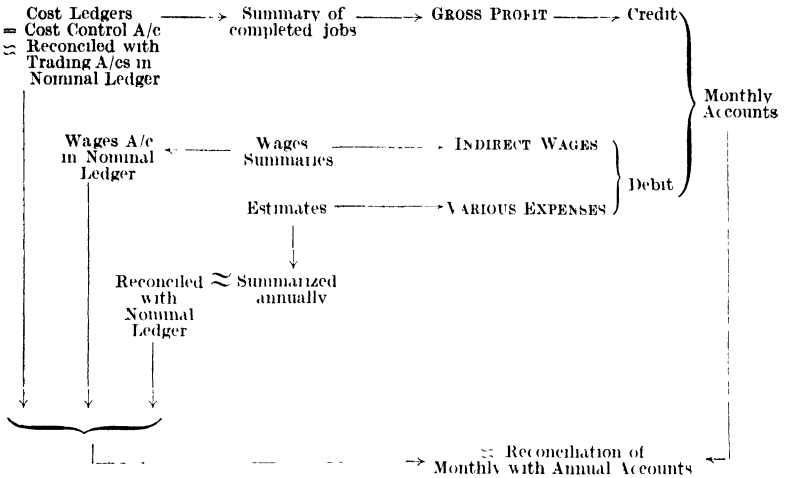
A Sales Analysis



A System of Monthly Accounts

The student will find these balancing charts a little difficult to draw until he has had practice, because each chart has to be separately designed, there is no standard lay-out He should start by charting some actual system which he knows. Later he can practice theoretical or imagined systems such as might be needed for an examination. It is worth while to take this trouble as this method indicates, in a simple chart, information which would take much narrative, and, further, the chart shows any inconsistency which might be hidden in the narrative.

It is necessary to restrain one's enthusiasm or the chart becomes over-elaborate. It may be better to split it into two or more charts



Flow Diagrams

These show what information a document or sheet conveys, where it goes, and how the information is used In practice it is often convenient to have a file of specimen forms with the diagram drawn on each (A sheet would be inserted for forms which come from outside and are therefore of varying size and ruling) Alternatively, the flow diagrams can be quite separate from the actual forms, particularly when a new system is being designed or when an examination question has to be answered

It is necessary to have a standard form of diagram so that it will be easily understood The movement should be from left to right, where the document goes should be shown in capitals or otherwise made distinct from what happens to it, abbreviations and symbolic methods of representation should only be used if the reader is likely to understand them

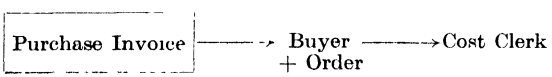
The following abbreviations and diagrammatic short cuts are recommended—

(1) Ch where figures are checked with another document.

(2) C P. where details are compared with another document

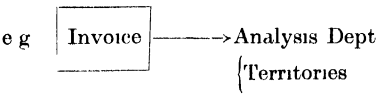
(3) X to indicate that carbon copies are made, e g | Invoice | ×3 means that three documents are made at one typing.

(4) + in these diagrams indicates that documents are matched and continue their journey together, e g.



means that the purchase invoice and order are together forwarded to the cost clerk.

(5) A bracket — { — indicates that the papers are sorted into groups for the purpose of analysis—



means that the invoices are sorted geographically.

(6) In order that it may stand out, a document conveying information from person to person is enclosed in a rectangle, e g Invoice

Many examples of flow diagrams are given throughout this book

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