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MODERN BOOKBINDING

A TREATISE

COVERING BOTH LETTERPRESS AND STATIONERY BRANCHES OF THE TRADE, WITH A SECTION ON FINISHING AND DESIGN

BY

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LEICESTER:
RAITHBY, LAWRENCE & CO., LTD.
DE MONTFORT PRESS
1944

PREFACE.

BOOKBINDING apprentices and journeymen, particularly those in the stationery trade whose experience has of necessity been limited, have long been in need of the means of obtaining additional information and a wider knowledge of their craft. The general standard of workmanship has, on this account, been allowed to fall to a very low level, although the Technical Schools, where these have been established, have done much towards a remedy. A text book offers a ready means of obtaining this additional information and, by its treatment of the subject, *i.e.*, by describing the numerous operations in the process of bookbinding stage by stage, and at the same time explaining their purpose, it is felt that this book will serve a very useful purpose.

On the other hand, for the sake of those who are attracted to the trade as a handicraft, no previous knowledge on the part of the reader is assumed and the technical phrases have been avoided. It is said that a trade cannot be acquired from text books, but it is my experience as an instructor that, given the opportunity for practice and a reliable source of information, whether it be a teacher or a book, rapid progress can be made even with the difficult craft of bookbinding.

ALEX. J. VAUGHAN.

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MODERN BOOKBINDING.

INTRODUCTION.

THE difficulty in compiling such a text book as this lies not so much in describing the numerous operations as in their arrangement to assure that no confusion will arise between the various branches. There is a fairly marked distinction between that part of the trade that deals with books for reading, known as letterpress binding, and those for written matter or accounts, known as stationery or vellum binding. Each of these may again be divided into four groups according to the particular class of work involved, making eight in all which may be detailed as follows:—

LETTERPRESS BINDING.

1. EXTRA LEATHER BINDING.
2. LIBRARY BINDING.
3. MISCELLANEOUS BINDING.
4. PUBLISHERS' BINDING.

STATIONERY BINDING.

1. EXTRA ACCOUNT BOOKS.
2. MANIFOLD BOOKS.
3. EXERCISE AND NOTE BOOKS.
4. GENERAL OFFICE STATIONERY.

EXTRA LEATHER BINDING is a class of work of which there will always be a steady, if limited, demand. The construction of the book is based upon that of the old binders inasmuch as machines are avoided. All plates are guarded and sections sewn together by hand, the boards should be securely laced to the book by means of the five cords; tight backs should be used wherever possible, and for the cover sheepskins should be avoided and calf used for small books only.

LIBRARY BINDING. Books of this description require to be exceptionally strong and durable, but at the same time the bindings must not be expensive. The sewing may be by hand or machine, but good thread should be used and the sections sewn upon at least four strong tapes. Split boards combined with a tight back and a French groove produce durable books, and strong canvas is better than cheap leather.

MISCELLANEOUS BINDING. Under this heading may be included the work of the average book buyer who desires something better than the publisher's cover. The binder undertaking this work should possess a wide knowledge of the trade and should be able to produce a series of attractive covers within a wide range of qualities.

PUBLISHERS' BINDING is a very important branch of the industry. Books as first issued rarely have expensive covers, although it is the practice in England to bind in cloth boards. The quantities involved are usually very large and machines are extensively used for their production. The method of binding is one that is usually known as casing.

EXTRA ACCOUNT BOOKS. The second division of this book describes this class of work. Machines cannot be used to any great extent in their production unless loose-leaf books are included. The principles involved are quite different from those of the lighter letterpress work.

MANIFOLD BOOKS. For the production of books of this description a number of exclusive operations such as numbering and perforating are involved.

EXERCISE AND NOTE BOOKS. Such books must be inexpensive and machines are used wherever possible.

GENERAL OFFICE STATIONERY. The operations involved in the production of stationery bindings are often used for work other than the making of books, and such articles as pads, blotters, files, etc., would fall under this heading.

The third division of this work attempts to cover all those operations included under the term "finishing."

Although titled "Modern Bookbinding," elaborate descriptions of machines have not been allowed to displace those of the equivalent hand operations. The work of binding a book consists of a sequence of these operations commencing with the printed sheet which were formerly carried out by hand methods which, therefore, should form the basis of the training of the machine minder. The everyday book has been made possible by the introduction

of machines and by a modified method of binding known as "casing." Attempts are being made to produce machines that will bind a book throughout, but upon examination they are found to consist of a number of appliances linked together, or else the ordinary binding methods have been replaced. A modern commercial binding workshop must be equipped with a number of machines each undertaking a separate operation, the books passing from one to the other in the process of binding.

FOLDING MACHINES are expensive, but their work compares favourably with hand methods and their saving in labour is very great.

GATHERING MACHINES are very cumbersome, but they are useful where the work passes automatically to the wire stitching machines.

SEWING MACHINES are expensive, but where good materials are employed they are capable of producing fair work as compared with hand methods, with an enormous saving of labour.

CUTTING MACHINES are now indispensable in every workshop, with the exception of that of the amateur.

ROUNDING AND BACKING. These operations may be done by separate machines or they may be combined into one, in which case the saving in labour is considerable. The backing machine is not an expensive piece of apparatus and a careful operator can produce work that compares favourably with hand work. All the above machines may be employed in the leather bindery without affecting the usual methods in the construction of the book.

CASE MAKING. This is an expensive machine, but its output is very large in the case of long runs.

CASING-IN. The saving in labour is not so great as that of case making, but it is a wonder that such a complicated operation can be done by machines at all.

AN INDEXING MACHINE is useful in the stationery binders' workshop, and the work of ruling, perforating and numbering cannot be undertaken by hand methods.

MODERN BOOKBINDING.

SECTION I.

LETTERPRESS FORWARDING.

THE PAPER

STUDENTS of printing and bookbinding should possess a fair knowledge of paper, the varieties of this material being so numerous that if a selection has to be made without this knowledge serious mistakes are bound to occur. The printer is usually concerned with the surface, while the binder is chiefly affected by its thickness, therefore, collaboration between paper maker, printer and binder is necessary in order to produce a book that is satisfactory from all aspects. From the point of view of the bookbinder, thick paper should not be used for small books, neither should very thin paper be used for large ones, for in the first instance the reduction in size gives the feel of a thin card, whereas in the latter the paper will not support its own weight when the book is opened.

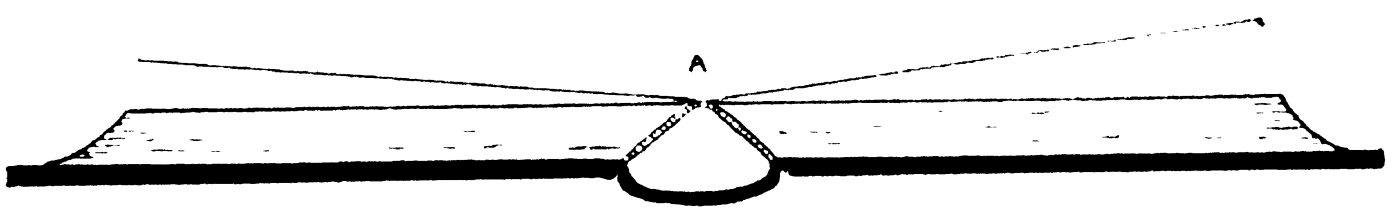
It is true that the bookbinder is in a position to design his binding to allow the book to open well whatever the thickness of the paper, but this is only gained by adding to the cost of the work or at the expense of the durability of the book. The diagrams will illustrate this point: (1) Shows how a book consisting of limp paper opens, when it will be seen that, if a fair margin has been allowed, no strain is placed upon the sewing and the covering material on the back edge is unaffected, in fact, the latter may be attached direct to the sections, producing what is known as a tight back and a very durable binding; (2) shows how a book opens where a thick paper has been used. Here the binder, in order to allow the leaves to open into the back, finds it necessary to restrict the amount of lining material attached to the sections and to produce what is known as a hollow back, but it is evident when one's attention is drawn to the point A that durability has been sacrificed. The third figure illustrates what happens when a thick paper has been used, in spite of which the binder has used a tight back—a very common fault.

It is beyond the scope of this book to attempt to describe how paper is made, although it is a subject which should be taken up by

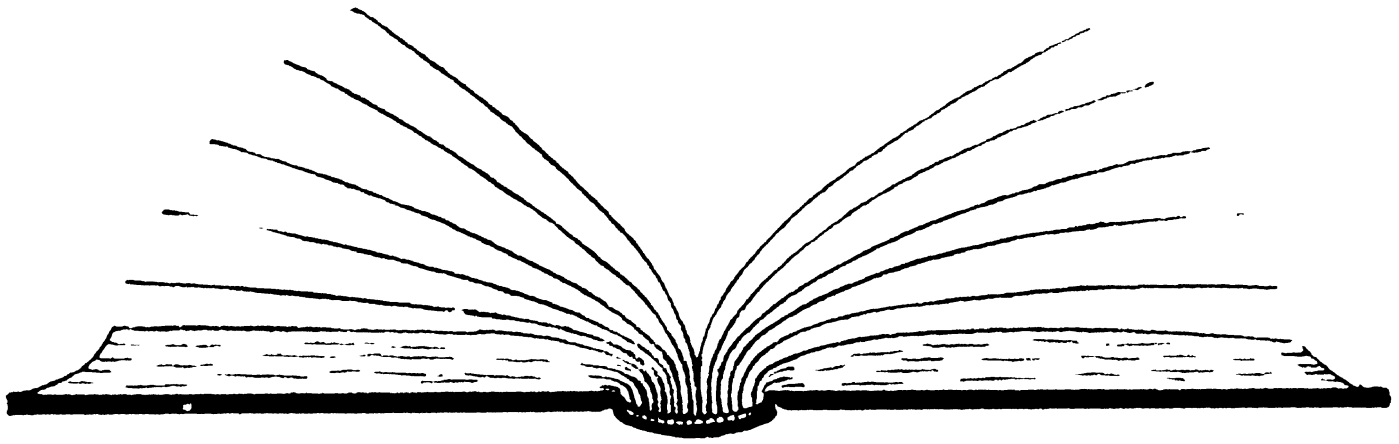
every student of book production. Any remarks, however, which will help to a better understanding, or enable the numerous qualities and varieties of paper to be identified at sight, must be of service.

What do we understand when we speak of quality in paper? Usually we mean that the finest materials have been used in the manufacture and used in the right way. This definition is of little service, however, for such a paper would be too expensive for general use, and might be quite unsuitable for the purpose to which it is applied. For the purpose of this book, then, shall we say that

A LIMP PAPER BOOK BOUND WITH A TIGHT BACK



A STIFF PAPER BOOK BOUND HOLLOW BACK.



EFFECT OF A TIGHT BACK BINDING UPON STIFF PAPER.

quality in paper consists in the complete accomplishment of its purpose—a definition which may be applied to any manufactured article.

Paper consists of a combination of the following materials: (1) A fibrous material; (2) a sizing material; (3) a mineral matter for filling or loading; (4) colouring matter. Varying proportions and qualities in these materials produce the innumerable varieties of paper we have to-day.

(1) The fibrous material may be placed into classes as follows: (*a*) Cotton, flax and hemp from rags; (*b*) chemically-pulped wood; (*c*) esparto grass, straw; (*d*) mechanically-pulped wood. Rag papers are strong, durable and permanent; chemical wood produces

a fair paper and is a useful source of fibre on account of abundant supply; esparto produces a very light, bulky paper when used alone, but usually has other fibres mixed with it; mechanical wood is only suitable for newspapers and the like, as papers of this material soon discolour.

Of the sizing materials these are of two distinct classes, gelatine size and resin size. In the case of the first-named method the paper is passed through a bath of weak gelatine as a separate operation after manufacture. Such papers are said to be tub-sized and the method is always employed where a good or medium quality article is required, especially if it is of any permanent value. Where resin has been used this material is added to the pulp during the beating process, thereby dispensing with an operation with a subsequent reduction in the cost of production. Such papers are said to be engine-sized and should not be used for works of permanent value, although they form a useful series for everyday commercial letterpress and stationery books.

Of the loading materials these consist of certain minerals, such as china clay for the cheaper papers, barytes, gypsum, satin white, etc., for others. Their effect is to fill the spaces between the fibres, whereby the paper becomes more opaque and subject to a smoother surface being obtained, two qualities desirable in letterpress work. Used to excess, china clay becomes an adulterant to the detriment of strength and durability. Art papers have these mineral matters coated on the surface as a separate operation, whereby a glass-like surface is obtained for the printing of fine blocks; imitation art papers have an excess of clay added to the pulp, whereby a similar result is obtained at less cost. Neither of these papers should be used in works of permanent value.

Of the colouring materials these are added to the pulped fibres and vary considerably in quality. Here again we can divide these qualities into two classes, those which fall under the heading of pigments, and those chemical extracts of coal tar known as aniline dyes. The pigments, such as ultramarine, smalts, prussian blue, etc., are permanent and are used in the best papers; the dyes, of which there is a very large range of colours, are used in all the commercial and cheap coloured papers and vary considerably in permanency.

So much for a brief description of the materials used in the production of paper, but much depends upon the method of manufacture. Shall we again divide papers into classes, this time according to methods of manufacture. I can think of three which are quite distinct. There are those that are made without the use of elaborate machinery and are known as hand-made papers; then there are those papers that have been manufactured

by machines, but have been tub-sized, as previously mentioned, and finally, there are the engine-sized papers. The hand-made papers are expensive and are always associated with the best materials; the industry is an important one and is maintained by the demand for fine papers for artists' use, for extra printed letterpress books, and for important account books. Machine-made papers, however, come very close to the hand-mades when associated with good materials and are tub-sized. There is one point of distinction between machine and hand-made papers which will always identify them. The machine, by causing the fibrous pulp to flow on to an endless web, forms a continuous length of paper which is wound on to a reel. The fibres themselves naturally tend to arrange themselves parallel with the direction of the flow and, although special precautions are taken to avoid this by giving the web a transverse motion, there is always a "direction" in machine-mades. The strength of the paper is always greater against the direction and a tear is always more or less ragged as compared with the other way. Paper always stretches when wetted, but this stretch is much greater against the direction than parallel with it, therefore, if a square sheet is wetted along two edges at opposite directions one edge will remain fairly straight while the other will tend to frill. These properties of machine-mades are of the greatest importance to the bookbinder. A book opens much better and easier if the machine direction of the paper runs from head to tail and because of this the binding is more durable; the general opinion is, that if the strong direction of the paper is across the book, it is more durable, but this is not so. This property of machine-mades affects a number of folding and pasting operations throughout the progress of binding and will be mentioned again under these headings.

Papers are sold in quires of sheets and in reams. A quire consists of 24 sheets, and a ream is usually 20 quires or 480 sheets, but there are several variations from this ream. A "perfect" ream contains 21½ quires, 516 sheets, which allows about 3 per cent. for waste. A 504 ream is also used by printers, which only allows 1 per cent. waste. A ream of "news" contains 500 sheets.

Paper is often sold by weight and the number of lbs. in a ream is an indication of the thickness of the sheets when the quality and size remain the same.

The particular qualities required in a paper that is to be used for printing are different from those in a paper to be used for writing. Printings require a fairly smooth surface and should be opaque. They should not be sized too heavily, as printing ink dries partially by penetration. Writing papers, on the other hand, require a particular surface for the pen and must be fairly heavily sized, or the thin ink will penetrate through or spread.

The paper sizes which follow are those of the "printings," as it is with letterpress binding that the first part of the book is concerned. We shall return to the subject of "writings" in the second portion of the work, which deals with stationery binding.

THE SIZES AND SUB-DIVISIONS OF PRINTING PAPERS.

Paper is usually sold in flat sheets to a number of standard sizes. Twenty-four sheets form a quire and twenty quires make up a ream of paper—480 sheets. While this twenty-quire ream continues to be used for writing papers, it is very inconvenient to printers who always deal with parts of, or multiples of, a thousand. Other "reams" have, therefore, been adopted, namely, twenty-one quires (504 sheets) which allows four sheets for imperfections; or twenty-one and a half quires (516 sheets) giving sixteen sheets for "overs." There is now a movement on foot to make the ream of paper 500 sheets, and to do away with all others on account of their complications.

The more common sub-divisions of papers are as follows:—

Folio is a sheet cut or folded once into two parts.

Quarto or 4to is a sheet cut or folded twice into four parts.

Sixmo or 6mo is a sheet cut or folded thrice into six parts.

Octavo or 8vo is a sheet cut or folded three times into eight parts.

From this it will be seen that the sub-divisions of paper are very numerous and it is only possible to give the most familiar.

Pott. This small size is becoming less used with the introduction of larger machines in book production.

Foolscap. A small paper usually supplied double size. Extensively used as a writing paper and for "official" printing. (See the second section of this book).

Crown. A size extensively used for bookwork. The quarto forms a useful medium-sized, rather square-shaped book, while the octavo is the familiar book of poems or novels.

Demy. Another popular book paper, a size larger than crown. The quarto is useful for illustrated books, while the octavo is the familiar text book.

Medium. Forms a rather large series of books.

Royal. A large paper extensively used for catalogue covers, cards, drawing papers.

Imperial. For large portfolios, cards, drawing papers.

SIZES AND SUB-DIVISIONS OF PRINTING PAPERS IN COMMON USE FOR BOOKWORK.

Size.	Folio.	Quarto.	6mo.	8vo.
Foolscap ... 17 × 13½	13½ × 8½	8½ × 6¾	6¾ × 5⅝	6¾ × 4¼
Crown ... 20 × 15	15 × 10	10 × 7½	7½ × 6⅝	7½ × 5
Demy ... 22½ × 17½	17½ × 11¼	11¼ × 8¾	8¾ × 7½	8¾ × 5⅝
Royal ... 25 × 20	20 × 12½	12½ × 10	10 × 8¼	10 × 6¼
Imperial ... 30 × 22	22 × 15	15 × 11	11 × 10	11 × 7½

Size.	12mo.	16mo.	24mo.	32mo.
Foolscap ... 17 × 13½	4½ × 4¼	4¼ × 3⅜	3⅜ × 2¾	3⅜ × 2⅛
Crown ... 20 × 15	5 × 5	5 × 3¾	3¼ × 3¾	3¾ × 2½
Demy ... 22½ × 17½	5¾ × 5⅝	5⅝ × 4⅜	4⅜ × 3¾	4⅜ × 2¾
Royal ... 25 × 20	6⅝ × 6¼	6¼ × 5	4⅛ × 5	5 × 3⅛
Imperial ... 30 × 22	7½ × 7⅓	7½ × 5½	6 × 5¼	5½ × 3¾

SIZES OF PRINTING PAPERS.

Pott ...	15 × 12½	Demy ...	22½ × 17½
Foolscap ...	17 × 13½	Medium ...	23 × 18
Post ...	19½ × 15½	Royal ...	25 × 20
Crown ...	20 × 15	Super Royal	27½ × 20½
Copy ...	20 × 16½	Elephant ...	28 × 23
Large Post	21 × 16½	Imperial ...	30 22

THE MARGINS.

THE bookbinder should preserve the margins of a book as much as possible. Where these have been made narrow, either by the printer or by the bookbinder when cutting the edges, the appearance of the page is marred. Of recent years it has become a practice to leave the edges of a book uncut, in order to preserve its margins as much as possible, but while this may be preferable in some cases, it will not do for works of reference, owing to the difficulty in finding particular pages.

A method of deciding book margins, employed by some printers, is as follows: The back margin is determined by the width of the page. The head margin is then made one and a half times this distance. Now in order that the combined back margins do not exceed that of the fore-edge, the latter is made at least twice that of the former, and to assure that the printed page is well raised, the margin at the foot is two and a half times that of the back margin.

FOLDING.

In this, the early stage in the production of a book, a number of very important factors have to be decided. When the paper and size have been determined, we require to know how the individual "sections" or "signatures" are to be made up. The sections are those units which are to be sewn together to form the book. If these sections are too thin the labour required in sewing is increased, the book takes a bad shape, and a number of binding operations are seriously affected. If they are too thick the book is weakened and "starts" or steps occur on the edges. Factors that determine the best make up of the sections are: (1) The size of the book; (2) the thickness of the paper; (3) the thickness of the book, therefore, any rules can only be used as a guide.

A "page" is one printed side, and a "leaf" therefore consists of two pages. A "sheet," when applied to a book, is two leaves or four pages. A section should seldom consist of less than four sheets or sixteen pages, on the other hand eight sheets or thirty-two pages can only be used if the paper is thin. A dummy copy of the proposed book will prove very valuable in forming a decision not only for the general make up, but for a number of subsequent binding operations.

The printer delivers the sheets for the books flat, and the first operation is folding.

Folios. In this the full size sheet of paper is folded once, therefore folios are large books. It follows, the section will consist of one sheet only, but this is remedied by printing on double or quad paper or by inserting one within the other.

Quartos. In this case the sheet is folded twice or if printed on double-size paper it must be folded three times. Books are called after the size name of the paper from which they are made and from the subdivision of that size, hence we have demy 4to, crown 4to, etc. Quartos form rather square-shaped books and are used where a broad opening is required.

Octavos. Here the sheet is folded three times, dividing the paper into eight. It is perhaps the most common of all the book shapes, especially as the 8vo section is a convenient one in many ways.

Twelvemo. This forms a small square volume. It is rather difficult to make up and perhaps the best method where the folding is to be done by hand is to fold for sixteen pages and insert an eight-page section.

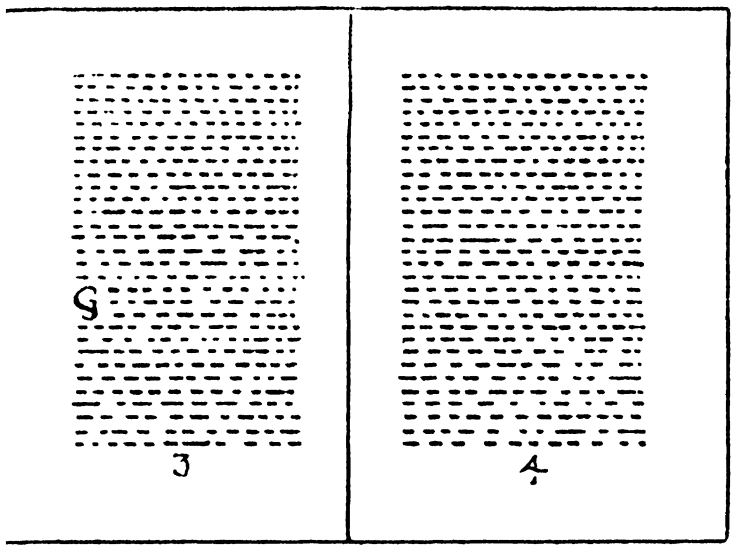
Sixteenmo. Makes a very small book when desired. The sections themselves become too thick unless the paper is very thin.

Where the paper is to be folded by hand the only tool necessary is a bone folding stick. The sheets are placed with the lowest page number underneath and on the left-hand side of the operator. During the operation there is a danger of breaking the paper or of smearing the newly printed matter. Best work is "folded to the print," in which case the operator carefully observes that the printed matter "registers" accurately one upon the other as the sheet is folded. To "fold to the paper" is much easier, but is liable to be inaccurate.

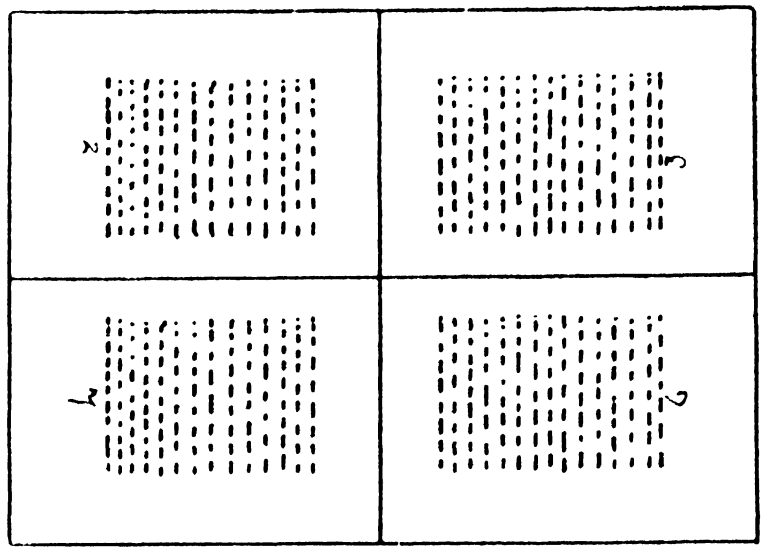
If the experiment is tried it is found that there is a limit to the number of times a sheet may be folded, which depends upon the thickness of the paper. It will be noticed that an unsightly crease is formed at the third or fourth fold. It can be remedied by printing so that the section may be folded in two separate pieces and inserted one within the other or, if this cannot be done, the other remedy is for the operator to cut through the bolt with a knife immediately before the last fold.

The operation of folding is undertaken by the women's section of the workshop and hand folding can be executed at the rate of about one thousand folds per hour, which is too slow for the enormous output of printed books in modern times. Folding up to four thousand sheets per hour is claimed by some of the modern folding machines. This result is achieved by automatic feeds, and by

FOLDING



FOLIO.



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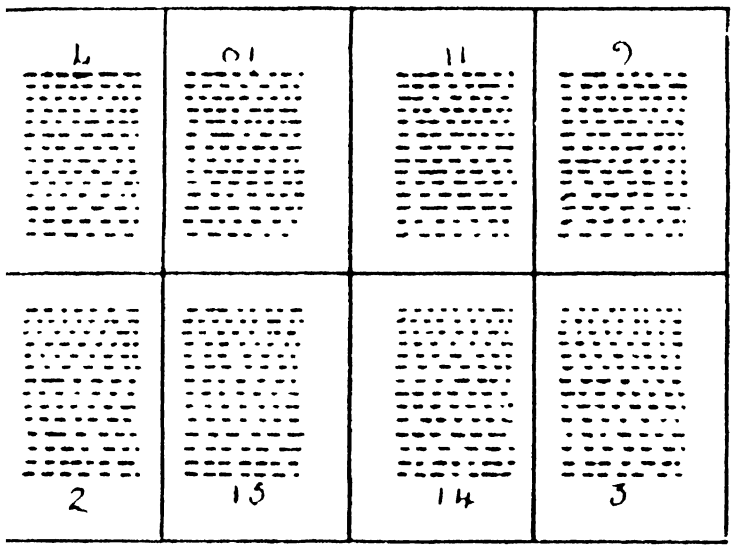
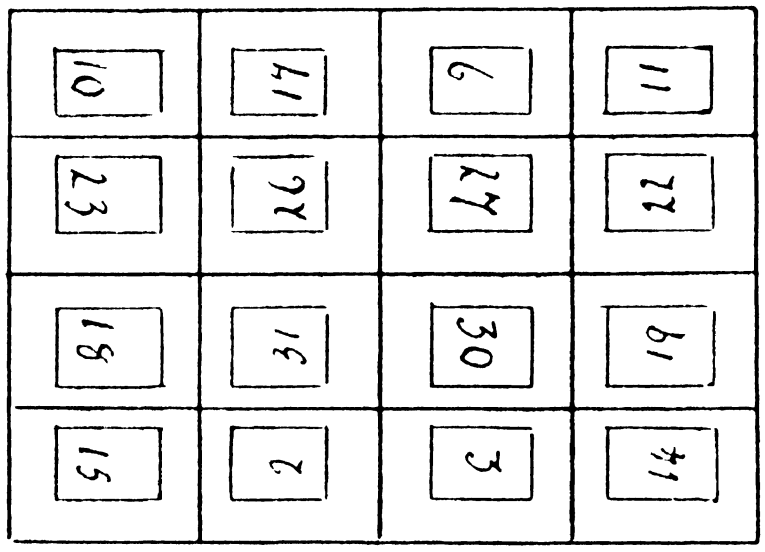


8vo.



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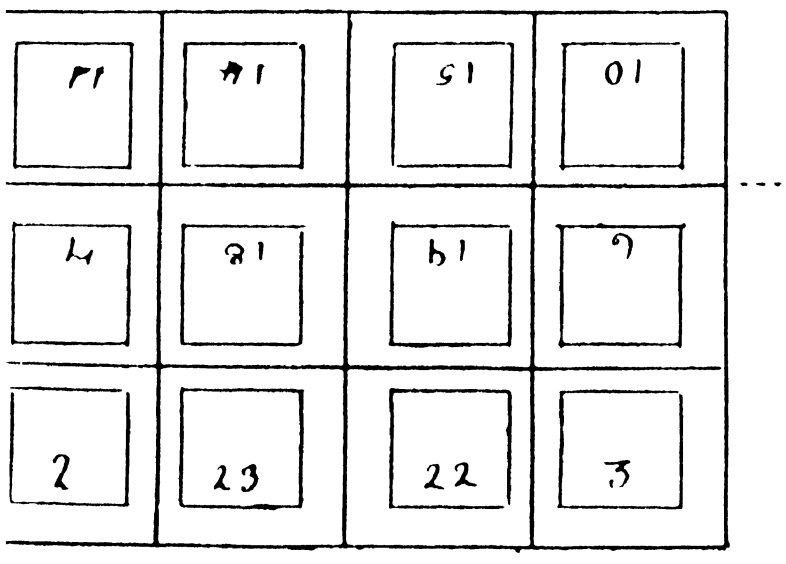

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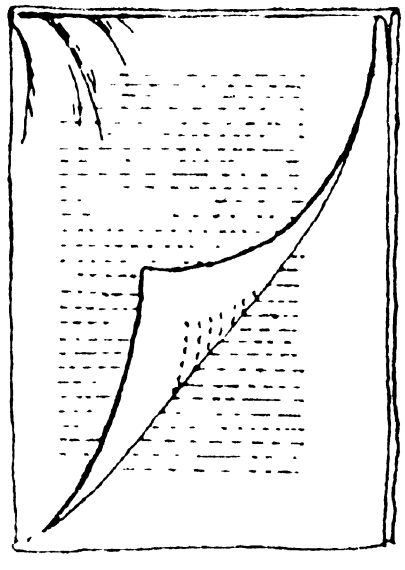
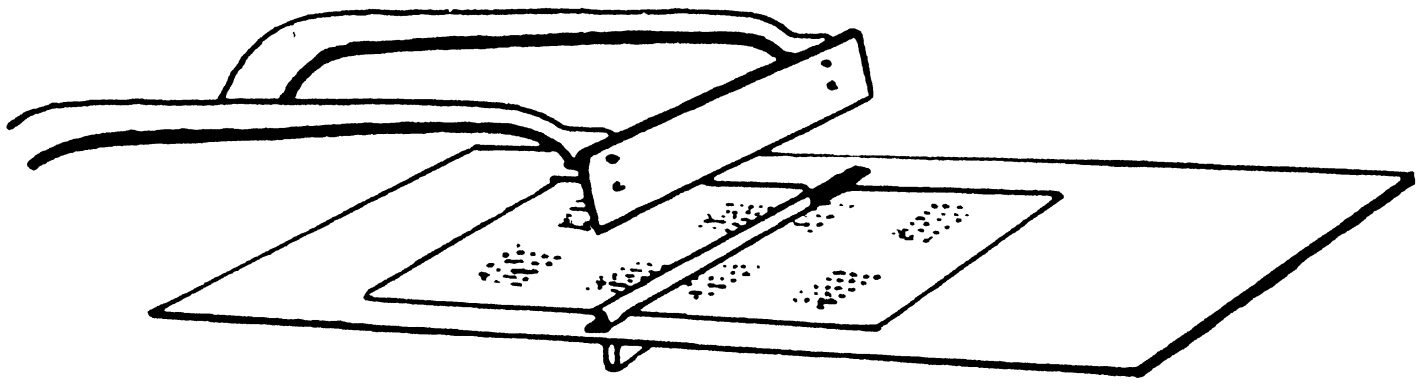


CREASES CAUSED BY THICK PAPER ON AN EXCESSIVE NUMBER OF FOLDS

printing two sections on one sheet, which the folder divides, folds simultaneously, and delivers either separate or inserted one within the other as desired. In this case it is the folding machine that determines the make up of the book and the printer must know its requirements at the time the type is imposed. Correct register is usually obtained by collaboration between printer and binder, whereby each use the same two lay edges, which are marked at the time of printing.



FOLDING MACHINE ACTION.

After the sheets are folded, the question of storage must be considered. The sections identified by a letter or a number at the foot of the first page of each, which is known as "the signature," from which the term is sometimes applied to the section itself. In the operations that follow it is necessary that all the signatures that compose the book are available, as they have to be gathered up into correct order.

GATHERING.

The operation that follows folding is gathering, which consists of collecting the various signatures together to form the complete book. It is work that is carried out in the women's section of the workshop and, although the work itself requires no great skill, care in organization is required in order to prevent mistakes. The signatures are placed in their correct order along a bench, the operator gathering them up one at a time to form a complete book, which are then piled "back and fore-edge," to separate the volumes. Arrangements can be made to gather another on the return journey, unless it can be managed to finish at the starting point. Both folders and gatherers should be continually on the look out for errors and bad sheets, as in the later stages of the book a remedy is difficult.

Gathering machines are usually associated with automatic wire stitchers for magazine work. An interesting device designed to

assist this operation is a circular table, which is made to rotate at the will of the operator, who is able to gather without walking about, also more than one can work from the same pile of signatures.

PLATES AND SINGLE LEAVES.

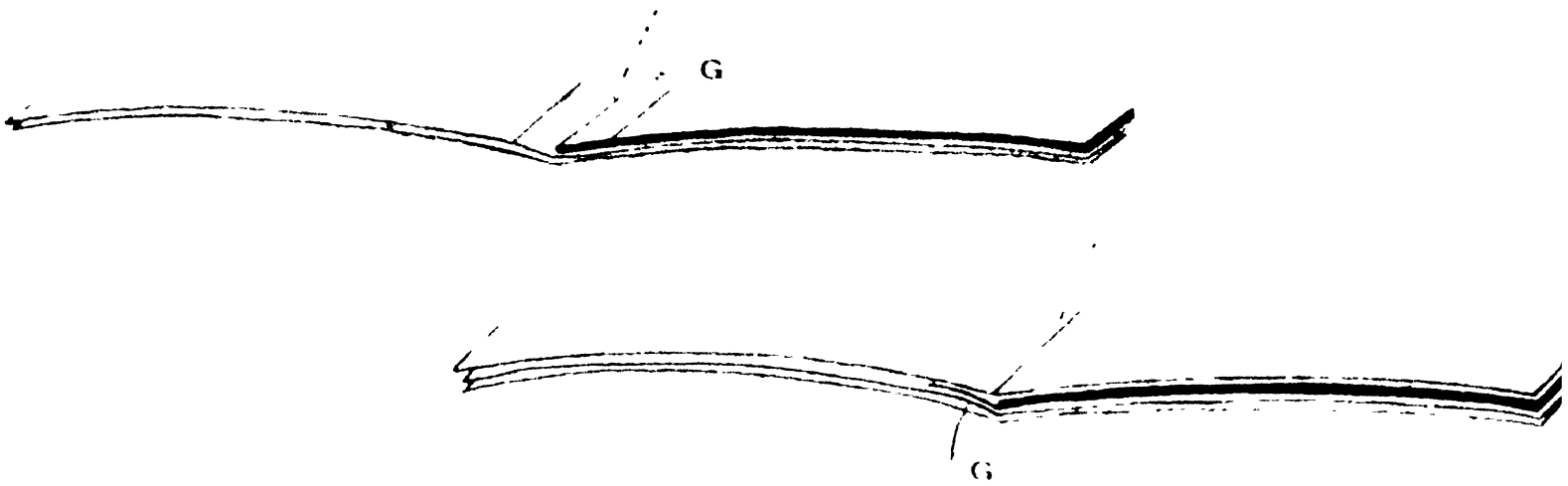
Upon opening a bound book and looking into the back it will be seen that the binder relies upon the fold in the paper in order to secure the sections together, therefore, any leaves without this fold will require special treatment. Where the paper used for the text is unsuitable for printing the special illustrations these are run off on single leaves, and are known as "plates," for it is seldom convenient to arrange for a fold in the back. The binder has a choice of three methods of attaching these single leaves to the rest of the book, none of which, however, is entirely satisfactory. The best but most expensive method is to supply a fold to the back of the single leaves by means of pasted paper strips, called "guards." Another method is to sew through the side of the paper, which is known as overcasting; or the single leaves may be pasted to the adjacent leaf of the book, which is the easiest and simplest of the three methods.

Guarding. The paper selected for the guards should be strong but thin; strong to hold the plate securely, thin in order not to cause an appreciable increase in the thickness of the back of the book. The strips may be half-an-inch to three-quarters of an inch wide, according to the size of the book, and should be cut parallel to the grain of the paper. The best method of pasting them is to lay them upon a well-pasted slab, rub them down through a piece of paper and lift off as required. The figures illustrate the various positions in which the plate is likely to occur relative to the section. Points to remember are: (1) The guard should occur on the underside of the plate where possible; (2) the needle when passing through the centre of the section, in the sewing operation to follow, must pass through the guard. Where the plate takes the form of a stiff mount it may be cut some half-an-inch from the back, whereby the guard forms a hinge, in which case paper is not strong enough and linen should be used. Guarding is by far the best method and should always be used for permanent bindings, but the number of guards that may be used in one book is limited, owing to the increased thickness in the back.

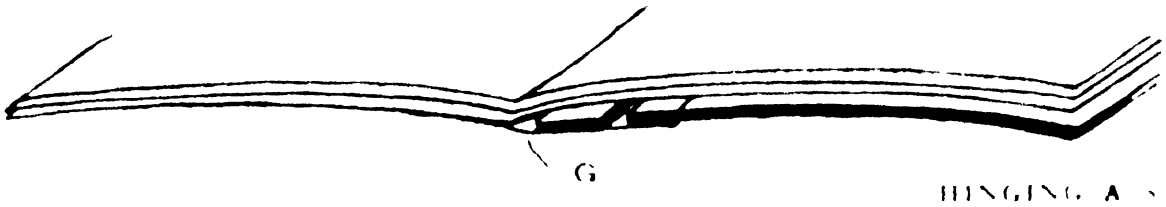
Oversewing will be dealt with under "sewing."

Pasting. In this case the plates are laid out as shown in the figure, whereby a narrow strip of each is exposed which is pasted. The pasted plate is simply placed in position in its signature and

PLATES.

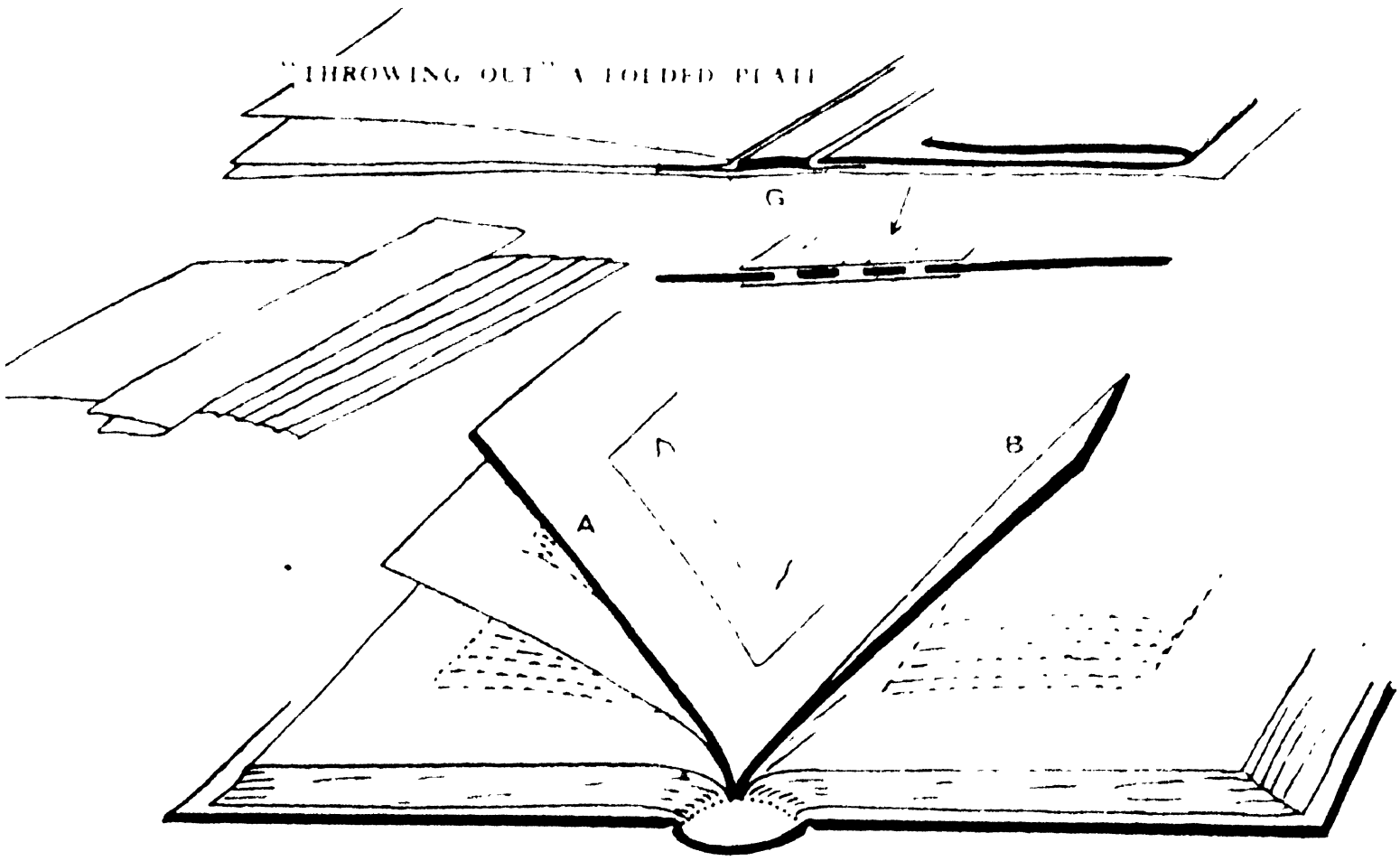


GUARDING PLATES



HINGING A STEEL PLATE

"THROWING OUT" A FOLDED PLATE



EFFECT OF PASTING PLATES INTO A BOOK

allowed to dry under a weight. The objection to this method is the drag that the plate gives to the leaf to which it is pasted, and the extra strain causes both leaf and plate to break away. To reduce this objection to a minimum, the width of the paste should be kept as narrow as possible—one-eighth of an inch being sufficient for average books—and to place the plate as far into the back as possible.

The operation of attaching the plates has been dealt with after the "gathering," but the work may be done before, according to circumstances.

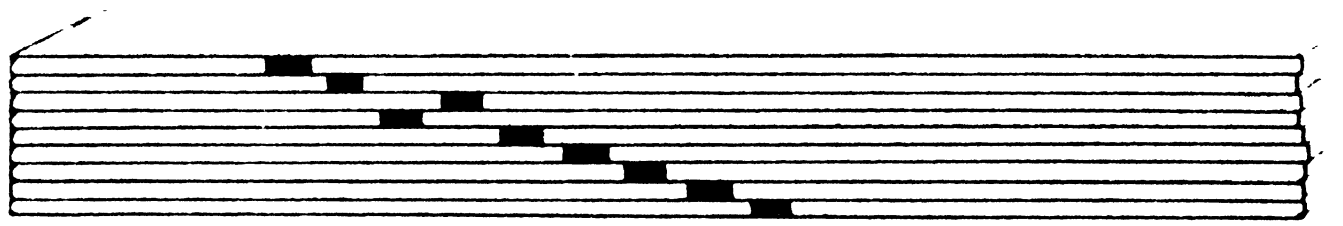
COLLATING.

This operation consists of an examination of the book to assure that all sections are in proper order and it is perfect in all other respects. The term is often confused with "gathering," owing to the resemblance to the word "collect." It is an important operation and should not be neglected. New books are usually collated immediately before sewing, but an important work should also be examined afterwards in case of displacement by that operation. Bound books that are to be rebound should be collated immediately upon arrival, so that it may be exchanged if imperfect, otherwise, should it be pulled to pieces before the error is discovered, the publisher is not liable for a new copy.

The general make-up of a printed book is as follows: (1) There are one or two blank leaves at each end which may consist of tinted paper—these are the "end papers," and should not be considered as part of the book itself, but rather as part of the binding; (2) the half-title, frontispiece, title, preface, contents, list of plates, etc., are found at the front of the book and are usually numbered in Roman figures; they usually form the signature A, and, because the subject matter is seldom decided until the rest of the book has been printed, this section is left until the last; this is the reason why the page numbers are different from the rest of the text; (3) the Introduction or Chapter I follows with signature B, commencing with page 1; (4) if the whole of the illustrations have been printed in with the letterpress they are treated as printed pages and the numbering will follow on, otherwise they are treated as plates, and their position is determined by a list of plates to be found in signature A; (5) with regard to the signatures, letters J, V and W are usually left out and if there are more sections than there are letters in the alphabet they take the form of A1, A2, etc., or AA, BB. A book with running volumes may have the signatures run consecutively, or they may start again at each book with the vol. number in addition to the letters. The collation of new work is much simplified if the following is adopted: at the time the sheets are printed, a small black mark is arranged to fall on the outside fold,

the position of which is altered a little at each signature. The result of this is a series of steps are formed on the back of the gathered book, but should a section become displaced, the sequence is broken and the error at once apparent. See illustration.

CORRECT.



INCORRECT—ONE SECTION DISPLACED.

In the case of old books, manuscripts, or rare editions, considerable experience with this class of work is necessary; the wording of the advertisements, the size of the leaves, flaws in the engraved plates are of importance and collation proceeds with the aid of a magnifying glass.

PULLING.

The sequence of operations previously described apply to the book delivered to the binder in sheets, but the re-binding of second-hand books is an important branch of the trade. When a book comes for re-binding it is first collated, then it is "pulled," that is, it is taken to pieces, so that it is in the same state as the new book immediately after it is "gathered."

If the book has originally been "cased" in cloth, throw the boards back and cut through the joints back and front and the old case will come clean away. With a leather-bound book throw the boards back but do not cut right through the joint, but cut through the strings that you will find holding the boards to the book, when the binding can be pulled clear away without danger to the sections. After the cover has been removed, the sections have to be separated with the least possible danger to the paper. Carefully remove the end papers, but do not throw them away as they will serve to keep the end sheets clean while the book is being handled. Next find the middle opening of the first section and cut through all the cords that you will find there, then turn over the leaves until you find the end of that section. Place the hand firmly upon the rest of the

book and pull the section away, starting at the head. Clear right away all the ends of thread and any pieces of glue that may be attached as each section is pulled off. Carry on in this manner throughout the volume. Be sure that the pieces of thread and glue do not fall back between any of the sheets, as when the book comes to be pressed they will cut and mark them. If you fail to cut all the threads before pulling the section off they will tear through the paper. If the section refuses to come away without tearing, owing to the amount of glue present, try laying the book on a solid bench and beating the back with a round-faced hammer. This breaks up the glue somewhat and will not damage the sheets if a round-faced hammer is used. If this fails the glue must be soaked off; an operation that should be avoided if possible. The book is to be placed in the press between boards leaving the back out about a quarter of an inch. Cover the back well with thinnish paste and allow to soak for about ten minutes. After this time the paste and the softened glue can be removed readily by means of a wooden scraper. Do not use hot water as it will soak into the sheets and carry the glue with it. The book must thoroughly dry before any attempt is made to pull it, as the wet paper will tear.

When a book is pulled an examination should be made for any torn sheets or stains, involving operations to be explained in our next chapter. After that the plates are to be considered, the treatment of which has already been described. Should any sheets become broken down the fold during the pulling, they had best be treated as plates and guarded together.

WASHING AND MENDING.

The paper in an old and faded book can be renovated to a surprising extent, but it is costly, so that anything beyond the simplest cleaning and repair would soon cover the cost of a new copy, unless the book is exceptionally rare and valuable. The various methods described below are arranged in the order of the expense involved. Each piece of work in hand should be considered on its own merits, i.e., the nature and extent of the stains and the cost of their removal.

Dry cleaning. Thumb marks, pencil marks, dust and other surface disfigurements account for a large number of the stains in books, especially public library works, and these can be removed by dry cleaning. The materials required are: a piece of hard and a large piece of soft rubber, a piece of cuttle-fish bone or a few sheets of the finest sandpaper obtainable. A good clear bench is required, covered with a piece of white paper. The soft rubber used in the usual manner will remove most of the surface marks. Deal with

one sheet at a time and keep the rest of the book at arm's length away. Dust the sheet and the bench free from pieces of rubber as each is completed and be sure that these particles do not get between the sheets, or upon other work that may be about. The hard rubber is to be used where the soft one fails; for hard pencil marks, etc. The cuttle-fish bone is a substance that acts like a very fine pumice stone. It should not be used if the paper is at all thin, but otherwise it will be found to remove ink marks, provided they are on the surface and not soaked through.

Any sheets that cannot be cleaned by the above methods are to be placed upon one side for one of the wet processes. Nothing can be done with art paper, for the rubber marks the surface by dulling it and in any of the wet methods the paper will be ruined.

The size bath. Many of the stains that cannot be removed by an india-rubber are caused by dampness and are called water stains. Dampness is also the cause of the paper becoming soft and woolly, owing to the original size becoming perished. The size bath will not bleach the paper white, but will level down these water stains, and by renewing the original size render it strong and sound. The materials required are: a large enamel dish as used by photographers, 15 × 11 in. is the largest in use and makes a useful size, with perhaps a smaller one in addition for smaller sheets. The bath is used hot, so that some form of heating apparatus is required and the usual form of gas heater will do, provided the stand is large enough to support the dish firmly. A bone folder will be required; select one with rounded ends to avoid risk of injuring the wet paper.

Place two cakes of best quality gelatine into one gallon of cold water and when well soaked heat up to about 120 degrees F. One should just be able to detect a stickiness when a little of the solution is placed between finger and thumb. The sheets are placed in one by one and pushed under with the folder. If sizing only is required they may be taken out immediately; for water stains fifteen minutes is all that is required. The method of drying off the paper depends upon the number that you have to deal with. A dozen sheets or so may be placed between blotting paper and then spread over a paper-covered board to dry. For a large number, as they are taken out lay them carefully one upon the other, and upon a clean piece of paper, until there is a pile about one and a half inches thick. With another sheet of clean paper and then a piece of stout millboard top and bottom this block of sheets is screwed up between the cheeks of a laying press which has the effect of squeezing out the superfluous moisture, assists drying, and renders them easier to handle.

If lines are used for drying, great care must be exercised, as our sheets are still wet and tender. The string or rope must be

absolutely clean; better hang some clean waste paper over them first. An implement in the form of a T square will greatly assist hanging the sheets over the line.

Ink stains, fox marks. Of the stains that cannot be removed by the above methods ink stains and what are known as fox marks are the most frequent. Ink stains take the form of marginal notes, signatures, etc.; fox marks are small brown spots, the cause of which has not been ascertained with certainty. One sheet will be fairly clear, while another will be covered with them. They are not found upon very old books, but appear to be in some way connected with the introduction of machines for paper making. For removing ink stains and fox marks some form of chemical bleach is required.

BLEACHING BY PERMANGANATE OF POTASH METHOD.

Of the many bleaching agents used in the industries they all have a more or less harmful effect upon the fibres of the material. The effect may take years to make itself felt, therefore, with most materials it is of little consequence, for it has become worn out from other causes before then. With books of any permanent value it is different, and a hundred years is not too long to expect the paper to last, considering the number that are in existence to-day that have been printed four or five hundred years ago and with the paper in excellent condition.

Permanganate of potash is here suggested as the least harmful method of bleaching the stains from paper. It turns the sheets a dark brown, so that a second bath is required which consists of a weak solution of sulphurous acid, and then a third bath of hypo-sulphate of soda to neutralize any acid remaining.

The stock solution consists of one ounce of permanganate crystals dissolved in a pint of hot water and bottled for use as required. The first bath consists of two ounces of stock solution to a pint of cold water, into which the sheets are placed. The time required for the permanganate to do its work is about five hours if used cold, but this time may be reduced to half an hour.

The solution is then poured off and the dish is placed under running water, where it remains until all the purple solution has disappeared. The sheets themselves will be found to be of a deep brown colour. The second bath consists of 1½ ozs. of sulphurous acid to a pint of very hot water, into which the sheets are placed one at a time and removed immediately they are bleached white, which only requires a few seconds, into a bath of cold water. It will expedite the bleaching if they are transferred from hot water into

the acid solution. The proportions for the third bath are: 1 oz. of hyposulphate of soda to half-gallon of water. When dissolved the sheets may soak in this solution for half an hour, after which they are placed under running water for an hour or so. If the stains are not removed to your satisfaction the operation may be repeated. The hot liquids have had the effect of removing all the size from the paper, therefore it will be necessary to re-size them as previously described. If a few sheets only from a book have been selected for washing they will probably become too white to match the rest and it will be necessary to tone them down. Tea, coffee, burnt sugar are some of the stains used and they may be added to the size solution. A very weak bath of permanganate will make them a slight brown tone. It will be necessary to try experiments with pieces of paper and each test must be dried off, as the tone is different when wet. The method to dry off the sheets is described in the paragraph on sizing. Do not confuse sulphuric acid (H_2SO_4) with sulphurous acid (H_2SO_3). The latter contains one atom less of oxygen, and in acquiring this atom from the paper removes the brown stain which was caused by the oxidizing action of the permanganate.

THE CHLORIDE OF LIME PROCESS.

The following process for washing sheets makes use of the well-known substance, chloride of lime, for removing the stains. It is not so safe as the permanganate of potash, but it is nearly so if the neutralizing baths are used as described. It is more certain in its action and requires less time.

The stock solution consists of ½ lb. of chloride of lime to one gallon of water. For the first bath take 4 ozs. of stock solution and add to two pints of water. This is used hot or cold according to the nature of the stains and the substance of the paper. Try the effect of using the bath cold and if it does not remove the stains sufficiently heat up until it can just be handled. The time should not exceed half an hour, when the lime water is drained off and the sheets rinsed in cold water.

The following bath will neutralize any lime left in the paper, the time required being half an hour. Muriatic acid 1½ ozs. to hot water half-gallon. Empty off and rinse in cold water.

The hypo. bath will neutralize any acid. Hyposulphate of soda 1 oz., warm water half-gallon. The time required about half-hour and rinse.

The sheets will require sizing as before described.

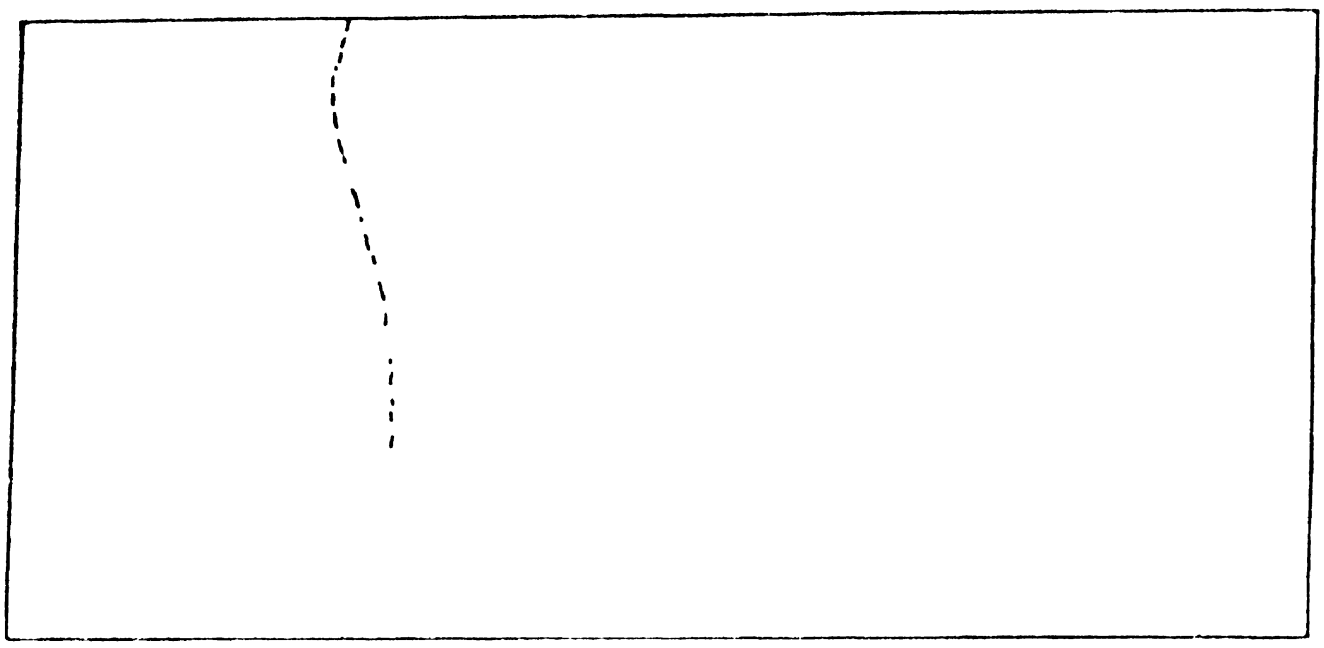
MENDING.

To mend paper and to leave the join invisible is, if not impossible, so laborious that it becomes prohibitive for the usual run of work. Always aim at a clean and workmanlike repair. Pasting strips of paper over the torn place, apart from its untidy appearance, usually defeats its own ends for, by making the sheet stiff in these places, it is more liable to tear at others.

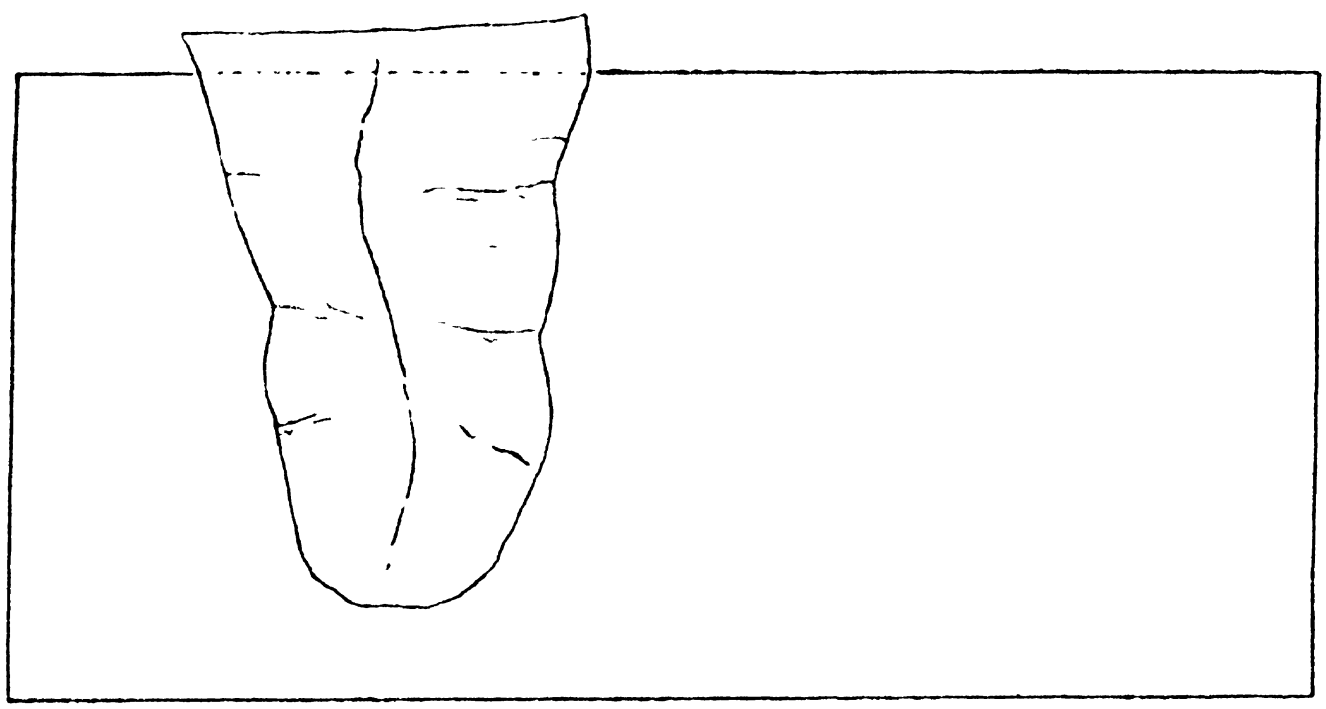
Materials. The following materials should be kept together in a box ready to execute any mending required : a piece of plate glass about 6 in. square, to pare the paper on, etc.; a very sharp penknife; a pot of clean, white, stiffish paste made from cornflour; one or two small pencil brushes; a supply of Japanese tissue paper, and some ordinary tissue. In a shop where there is much mending to do a collection of genuine old papers is kept, which are used to supply a missing blank leaf or a corner. Old end-papers of books that have come for rebinding will keep this collection supplied.

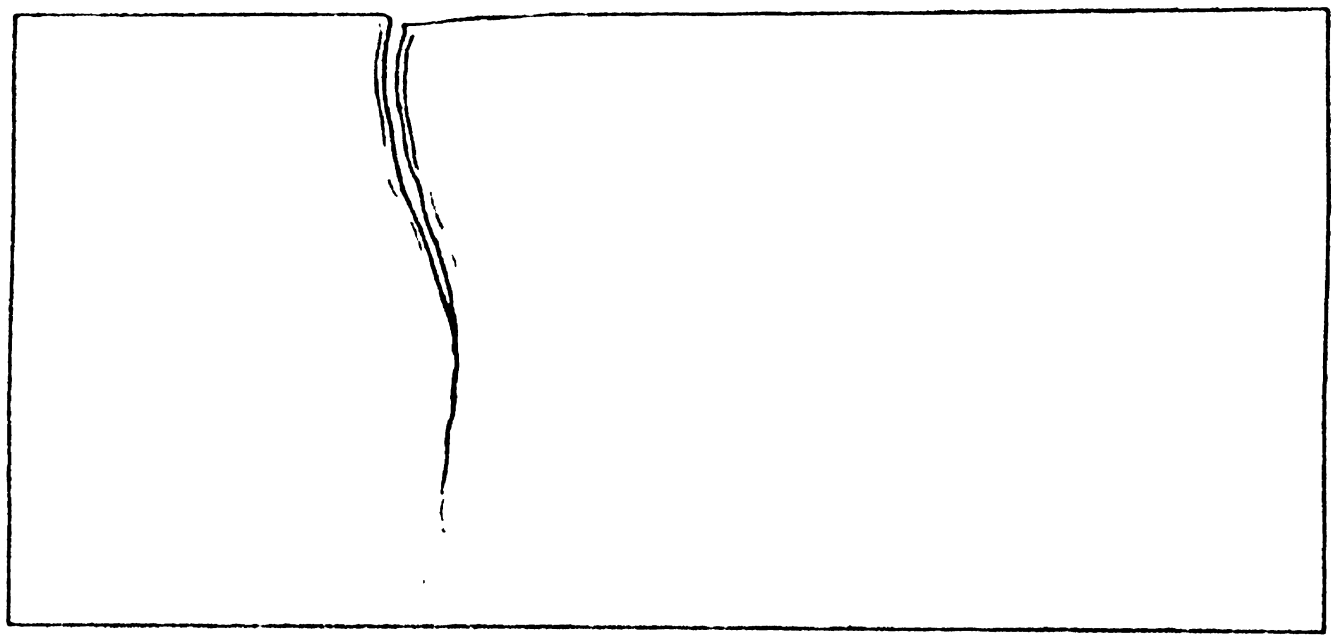
The tear. The ordinary tear is the simplest to mend and of most frequent occurrence. The two edges are always to be found more or less frayed and slightly overlap when placed together. With one of the pencil brushes carefully paste these overlapping portions, lay a piece of Jap. tissue upon the plate glass and then the torn sheet with the edges carefully placed together, and over this another piece of tissue, and rub down a little with the ball of the finger. When dry the tissue paper will be found to have stuck along the join and this is to be pulled off very carefully in the direction of the tear, letting that remain that refuses to come away. The torn edges will be found joined together, and the Jap. tissue being thin and remarkably strong will be almost invisible. The paste used should be fairly stiff and made of cornflour, as ordinary paste will stain thin papers.

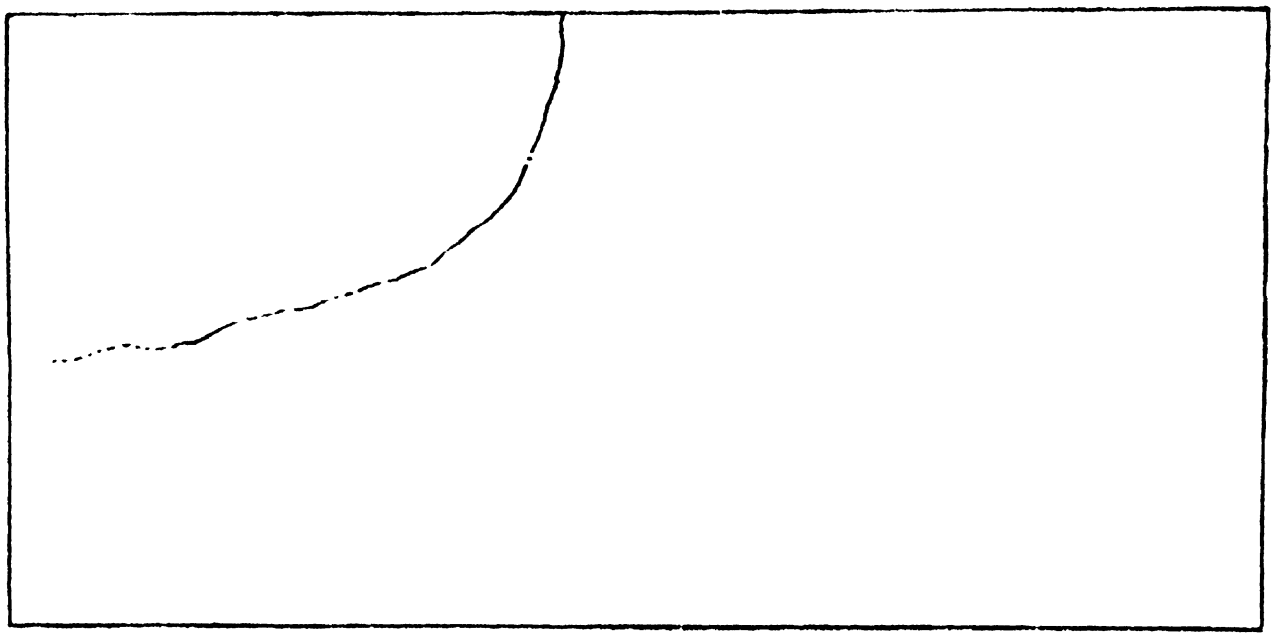
Replacing a corner. To replace a missing corner it is first necessary to search among the collection of old papers for a piece that matches the torn leaf exactly. It must be the same in shade, thickness and texture. If the paper is a "laid," the wire marks must run in the same direction as the original. Having selected a suitable piece, trace out the outline of the missing corner upon it by means of a blunt point and then tear the new corner piece off one-eighth of an inch outside this outline. By tearing, the result will be a ragged edge overlapping that of the torn edge of the leaf by an eighth of an inch, but if it has not frayed out sufficiently it must be pared thin by means of a very sharp knife upon the piece of plate glass. The new corner is fixed into position in a similar manner to the way a torn leaf was mended. The overlapping edges are pasted and rubbed down between pieces of Jap. tissue and allowed to dry.



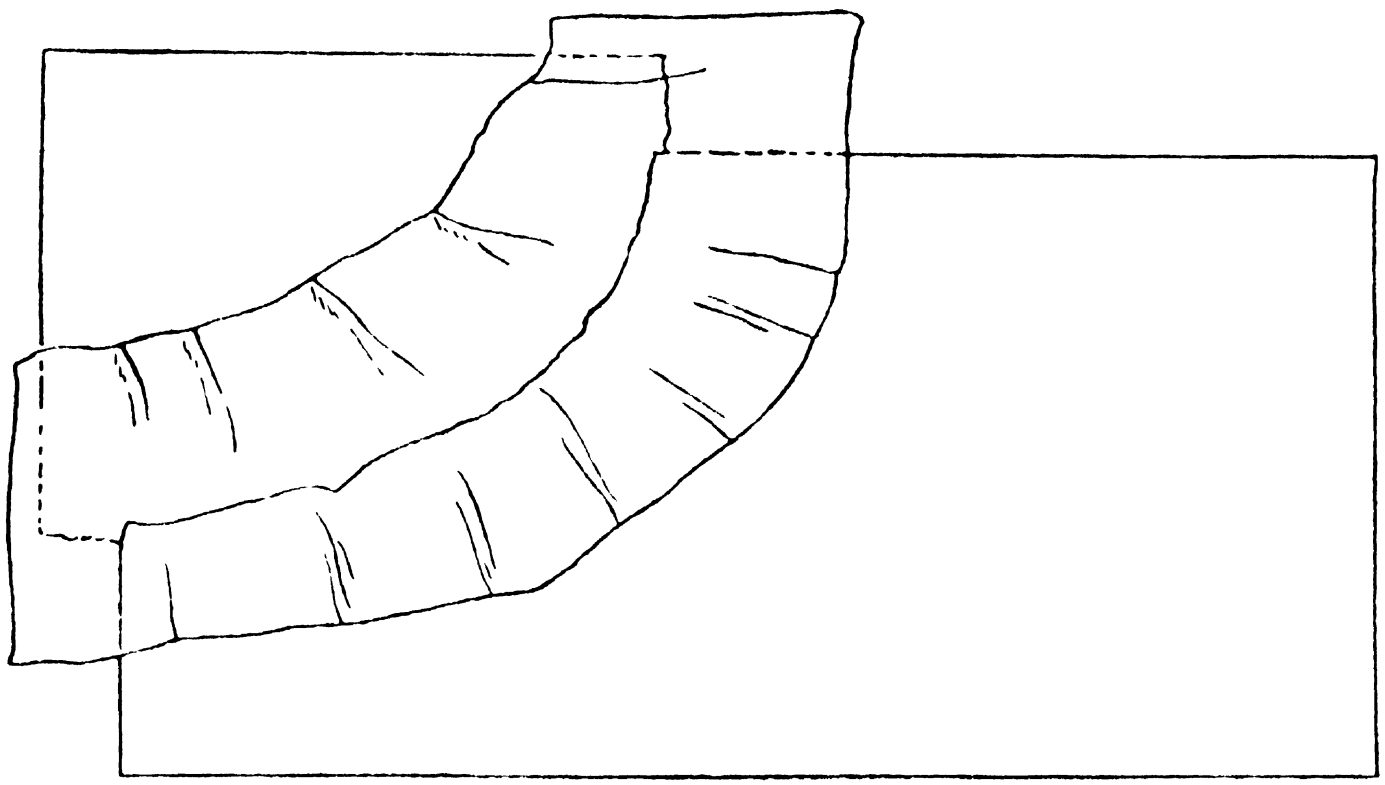
MENDING A TEAR.

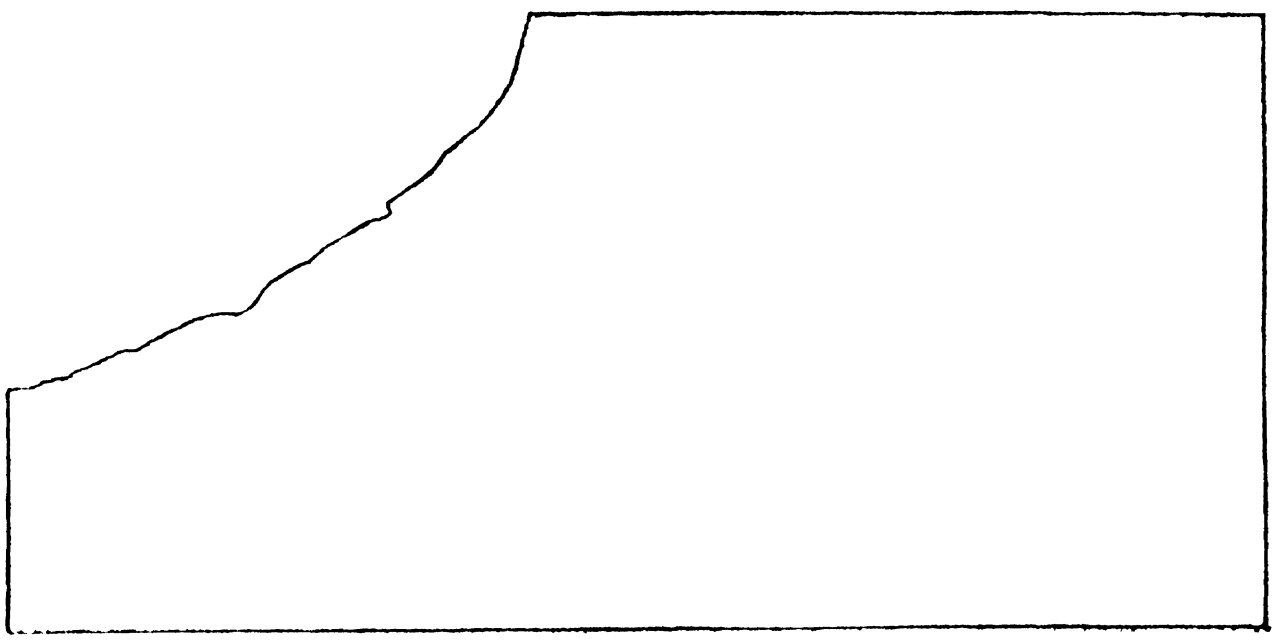






REPAIRING A CORNER.





The tissue is then carefully pulled away and the join smoothed ov with fine sandpaper or cuttle-fish bone. If the missing corner ha contained any of the print this must be facsimiled on the new on the letters being carefully drawn in with a very fine pen. It may b necessary to borrow another copy of the book for this purpose.

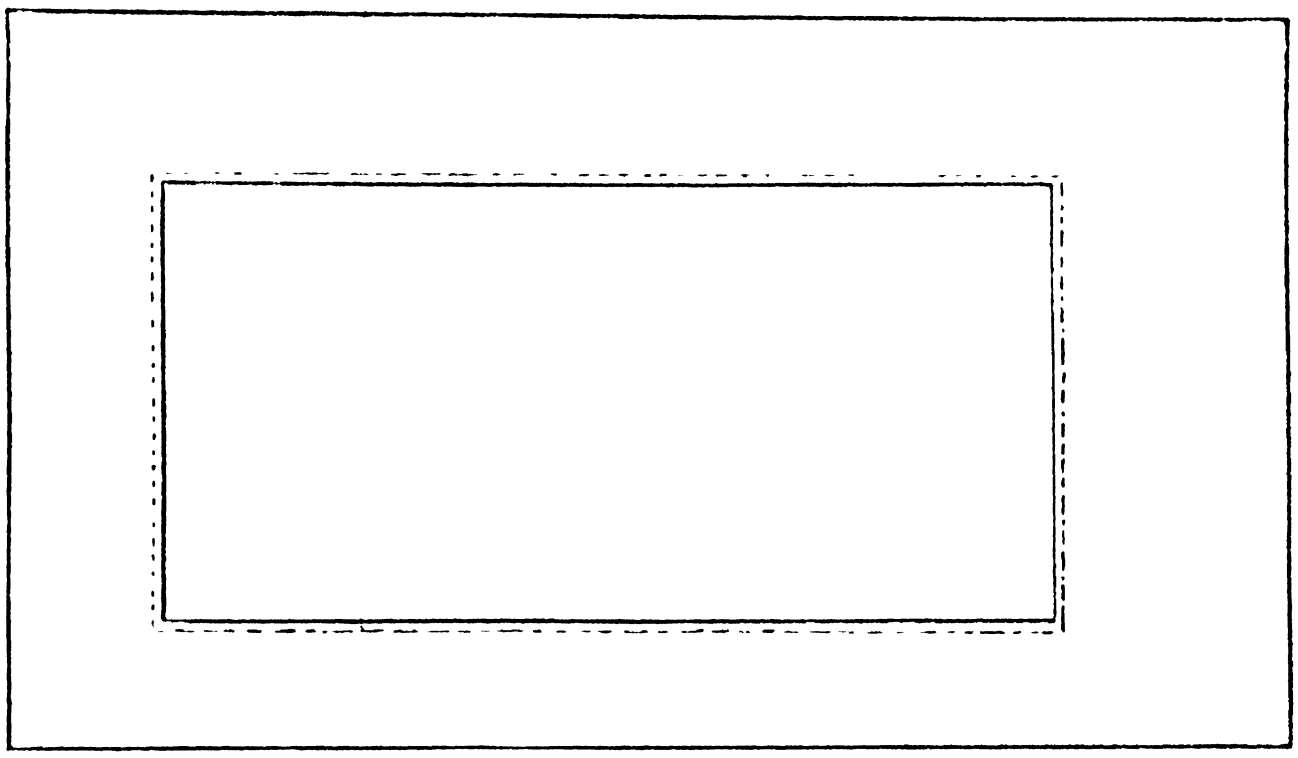
A large hole in the sheet may be replaced in the same manner a a new corner, but small holes, such as those caused by the bool worm, are best filled up with paper pulp. This is made by scrapir up blotting paper and mixing with a little thin paste.

A page is said to be inlaid when the original margins are cu completely away and what remains is fixed into a new sheet o paper. This method is useful in the following cases: When th margins are very much torn and dilapidated, or when adding extr illustrations to a book it is required to bring them out to siz Inlaying should never be used, however, to repair a scarce an valuable book, as any cutting away of the original paper wi decrease its value.

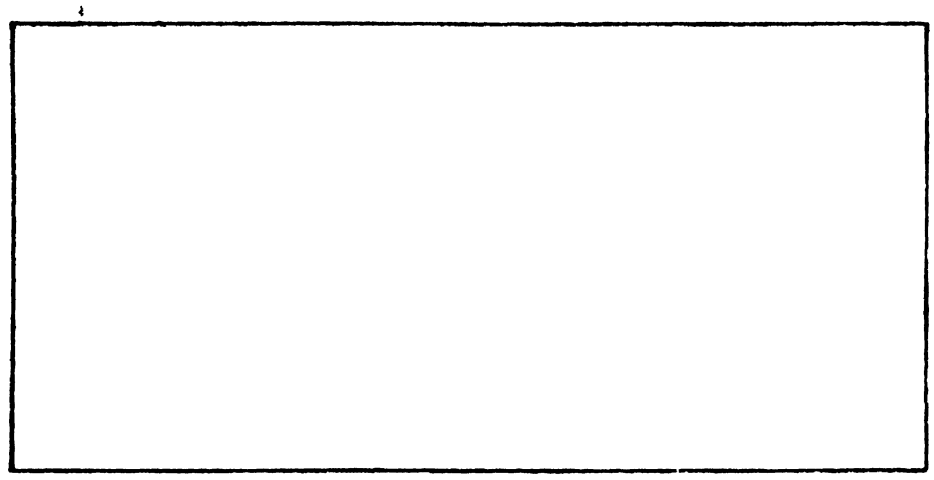
The paper for the inlaying should be carefully selected, should match the original in colour and texture, and should b arranged, if practical, that the grain runs from head to tail, rather tha across the book. A sheet of tin, a thin steel straightedge and a shar penknife are required to do the cutting. With the plate trimme round and in position upon the paper, mark it by pricking throug each corner with a needle, and connect up these points with a fair pencil line. With the divider, mark points one-eighth inch insid this line and cut through with a knife and straightedge; the resu being a frame of paper as figure. The plate placed in positio will overlap the inside edges of the frame one-eighth inch a round, and if the paper is at all thick this overlap will mark th rest of the book when pressed, so that it will be necessary to pa them down a little. It is required to paste the back of the plat one-eighth inch all round, and for this purpose the piece of pape that was cut out of the frame will be useful, as when placed dow upon it will leave this margin exposed ready to be pasted with small brush. Before the dampness has had time to stretch the pape lay the plate down in position on the frame and rub down with th hand through a piece of waste. When dry, one or two lines rule round in pencil or ink will sometimes improve the result.

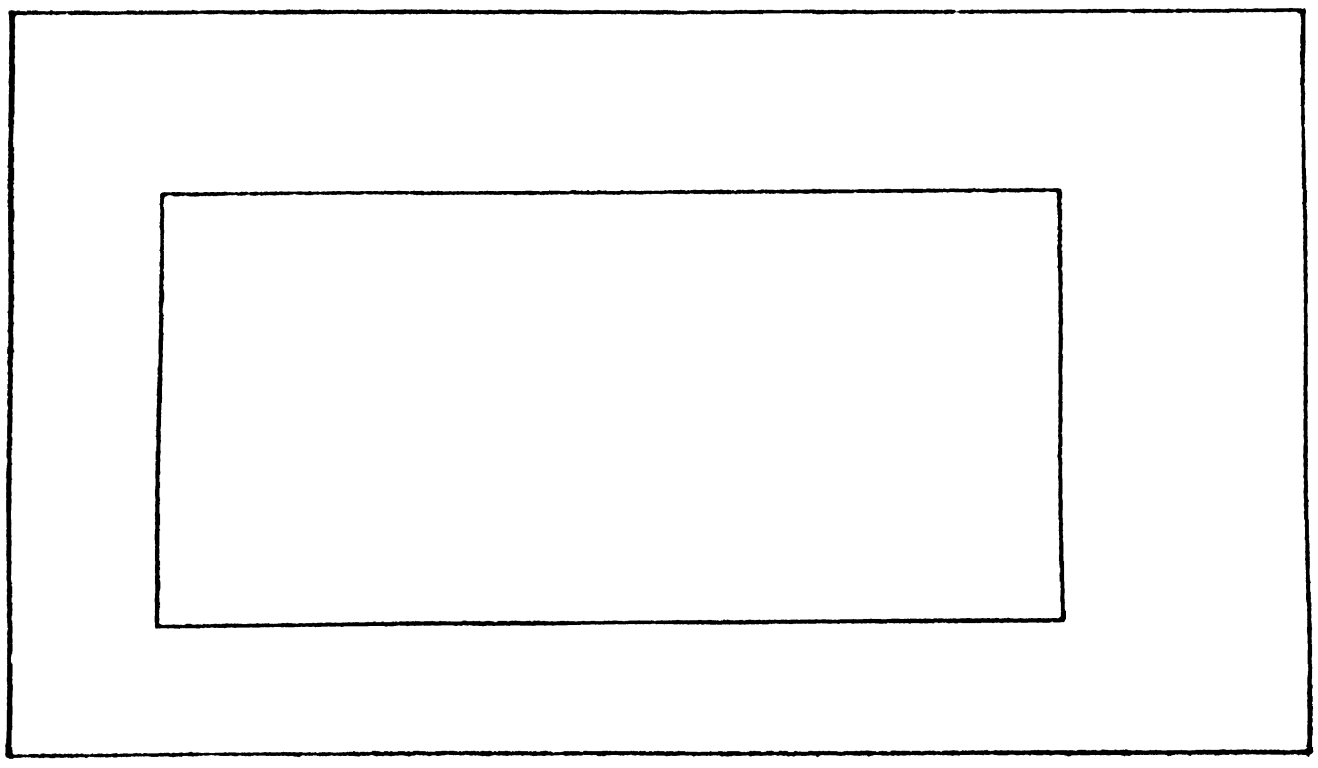
ROLLING AND PRESSING.

A book undergoes a number of pressings during the process o binding, for by this means a slight felting action takes place betwee the individual sheets and a firmness or solidity occurs. Publishers



INLAYING A PLATE.





new books, however, must be pressed with care, owing to the danger of set-off from the newly-printed sheets. Permanent bindings should receive a good pressing immediately before sewing, either by means of the screw press or the rolling machine. The press used takes a number of forms, many of which are but modifications of the well-known screw press adapted to large sizes. The nipping press, as its name implies, is used where the application of a slight pressure for a very short period is required.

The pressing operation at this stage consists in building the work up underneath the screw, placing special hard card pressboards between every three or four sections, and applying a good pressure over several hours. Rolling replaces pressing when the quantity of the work is large, as it is quicker and the amount of floor space is not required. In this case three or four sections at a time are placed between thin sheets of metal and rolled, whereby a similar effect to pressing is obtained. "Extra" leather bindings should be both rolled and pressed.

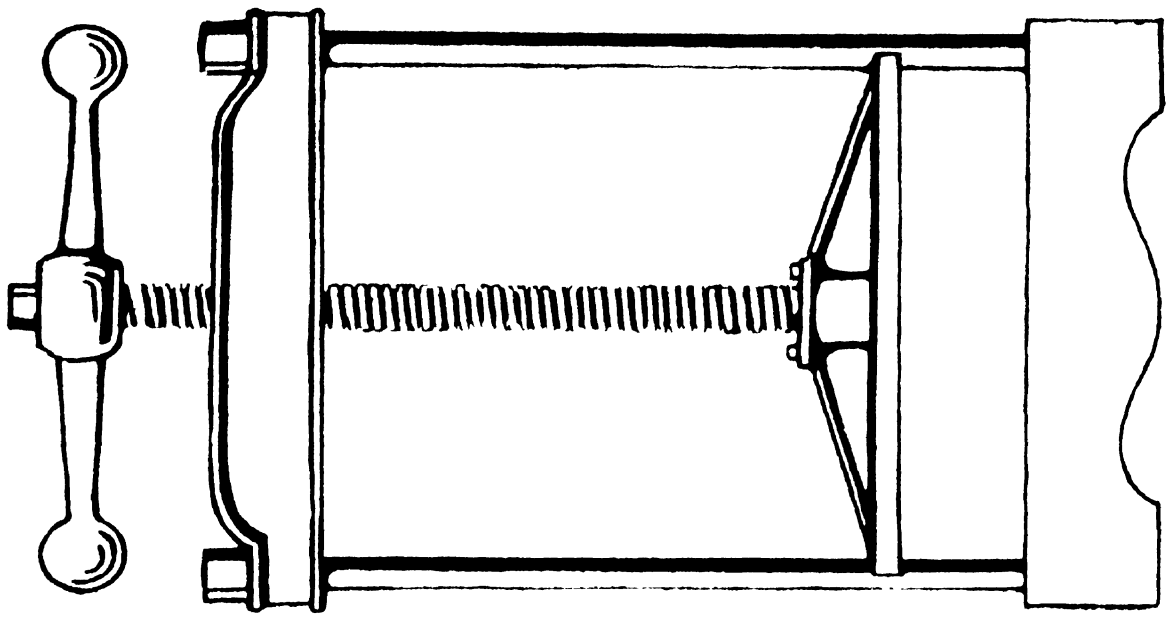
MARKING UP FOR SEWING.

Before a book is sewn by hand the back is required to be marked with a pencil as a guide for the needle, and in certain cases shallow saw-cuts are needed across the back, into which the threads may rest. This work directly follows the rolling and is conveniently done by the same operator.

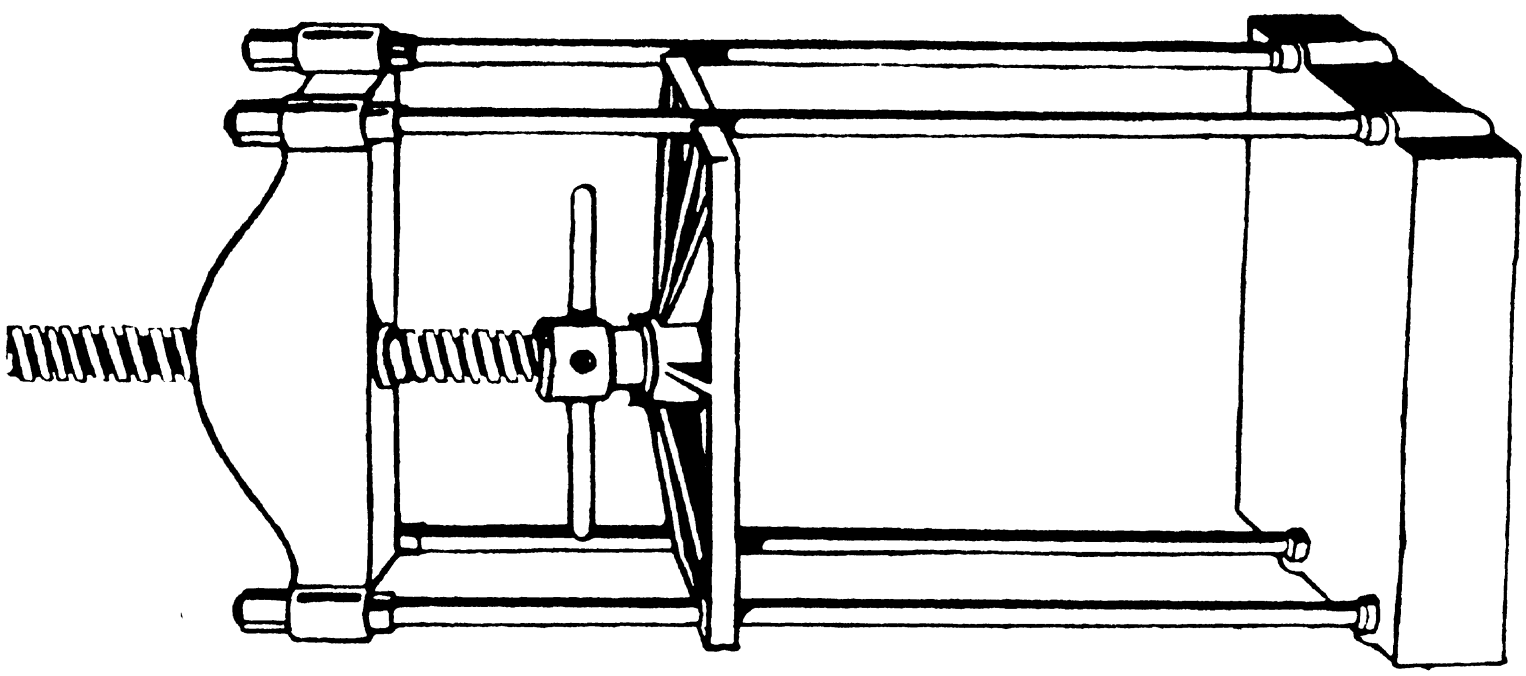
The sections are knocked-up square to the head and back and placed between pieces of strawboard. The whole is then gripped between the cheeks of a laying press, back uppermost. The markings for the various sewings are shown on page 27, where it will be noticed that all of them have a saw-cut at a distance of about half an inch from each end, this is for what is known as the kettle stitch. Where a book has five bands their position requires careful consideration. The back is divided into six panels, so that the first five are equal, but the one at the foot is about one-third greater than the rest. The first back shown on page 27 is the marking for five cords, where those occur outside forming raised bands. The second is where these cords are sawn-in, which is necessary where a hollow back is required. The third back is the marking for four tapes.

SEWING.

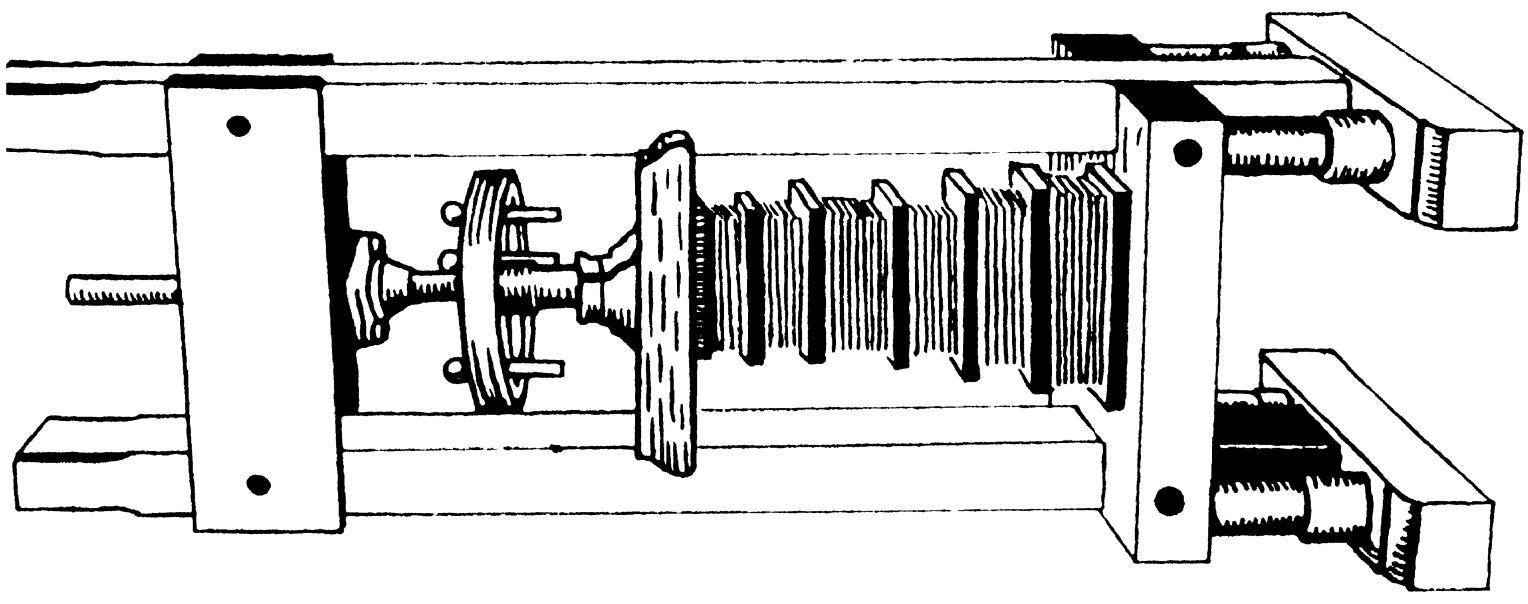
Sewing is perhaps the most important of the many operations that go to complete the binding of a book, for all that follows is built upon it, and, if the sewing is weak, adding strength and weight to the cover will only help to shorten the life of the book as a whole.



NIPPING PRESS.



IRON STANDING PRESS.



A FRENCH PRESS.

The methods employed by the early binders were undoubtedly very durable. They employed five or seven heavy cords to which each section was securely sewn, and which finally formed the raised bands across the back of the book. By this means the sewing becomes firmly secured to the actual cover of the book. The introduction of the hollow back and thin "sawn-in" strings has produced less serviceable bindings, because the sewing has been separated from the covering material and they do not support one another in making the sections of the book secure. Where the expense will not allow the employment of the heavy cords, the use of flat tapes is advocated in place of thin strings wherever possible, as by this means a comparatively broad band of the sewing threads is made secure by the lining material.

The various styles of sewing that will be described in this book are as follows:—

Flexible and double flexible sewing. The sections are sewn together upon fine heavy cords which ultimately form the raised bands across the back. It becomes necessary to use great care to assure that these bands retain their position throughout the binding, which must be a tight back.

Library sewing. The sections are sewn on to three or four tapes. This style is both economical and durable, and is admirably suited to both library and cloth-cased bindings.

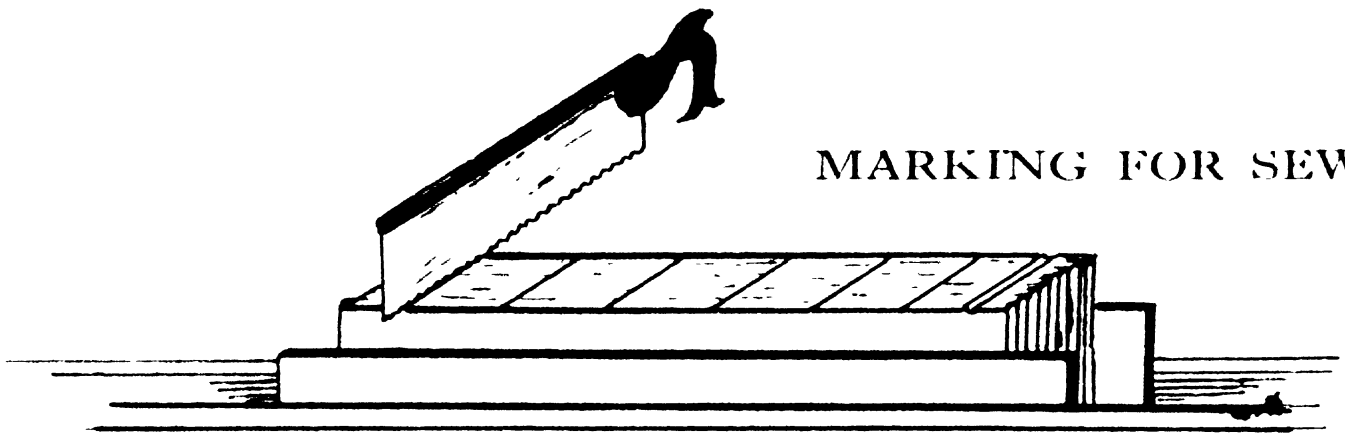
Sawn-in sewing. It is necessary to use this sewing for all leather bindings that require a hollow back. Books to be covered in calf or any of the cheaper leathers that will not stand being pasted against the back must employ it, and also wherever the paper is too stiff to allow anything but a hollow back to be used.

Machine sewing is suitable for commercial work in large quantities. Where strong tapes are employed and good thread used, excellent results are obtained.

Oversewing is required where the book is in single leaves.

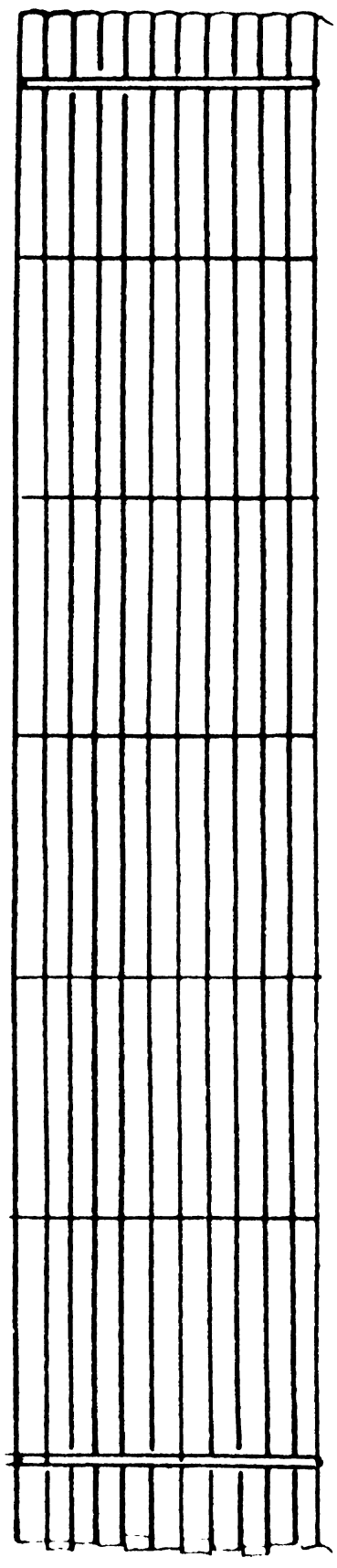
The wire stitch is used for pamphlets and work of a temporary character only.

The equipment for hand sewing is fairly simple. It consists of the sewing frame with its keys in addition to the needles, with perhaps a pressing board or two. Special bookbinder's thread should be used, which consists of unbleached flax. This thread is made up into about eight grades of thickness, the selection of which requires careful consideration, as upon it depends the amount of "swell" in the back, and subsequently the shape of the book. The cords or strings used must be of a good quality, as they have to be laced into the boards. Hempen twine should be used, and as

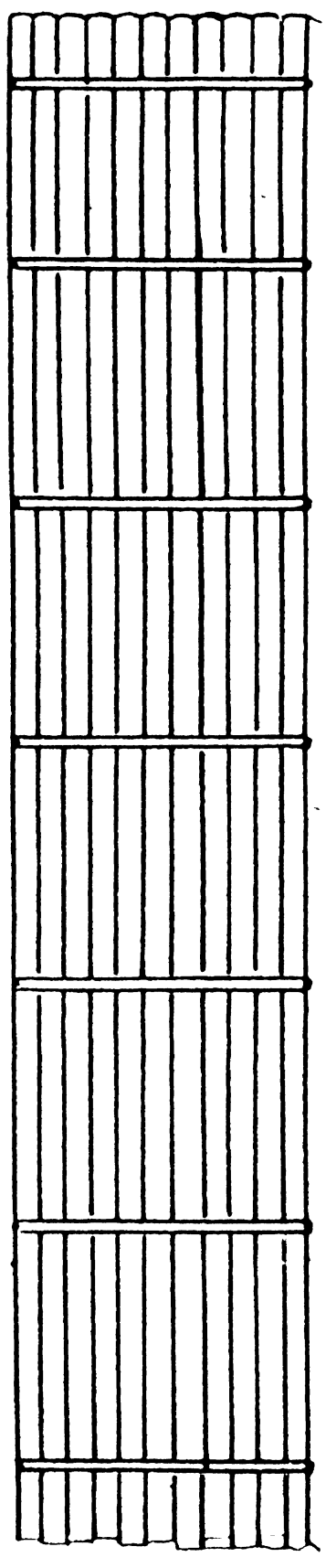


MARKING FOR SEWING.

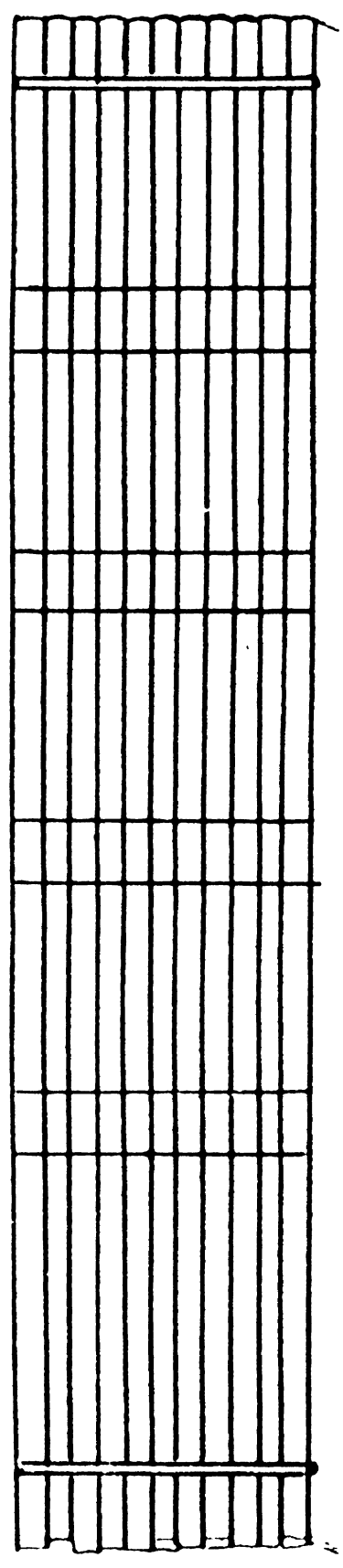
MAKING THE SAW-CUT FOR THE KETTLE STITCH.



FOR
FIVE BANDS.



FOR FIVE
SAWN-IN STRINGS.



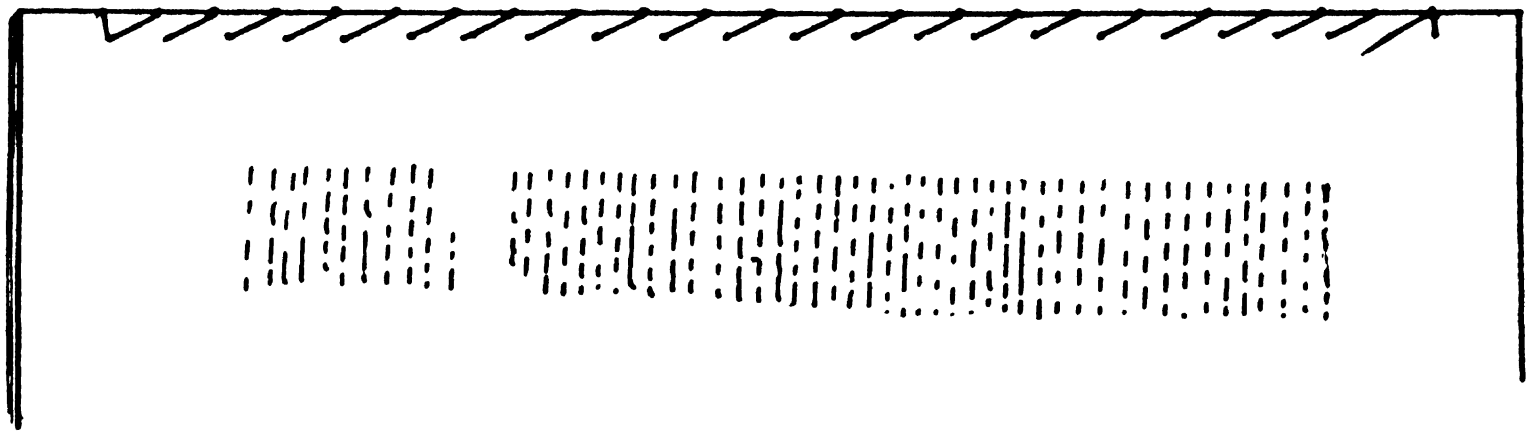
FOR LIBRARY-STYLE,
FOUR TAPES.

a test for quality, one end should be frayed out to the extent of four or five inches, when the brush so formed should be soft and at the same time retain its strength. Tapes used should consist of linen and it is important that there is no stretch.

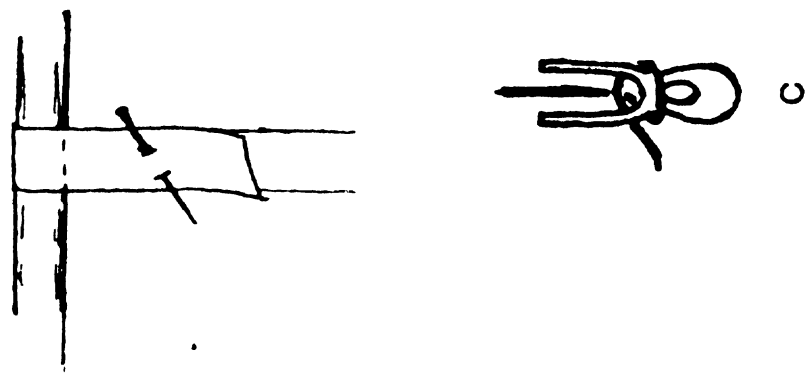
Flexible and double flexible sewing. The sewing frame is fitted up with five stout cords as shown. The loops A are attached first, containing a length of cord according to the thickness of the book to be sewn—for this style of sewing only one book may be used on a set of cords. Now take a key and place the cord between the prongs at such a distance that will allow it to reach the underside base of the frame. Bring the loose end round as shown at C, and the whole is then slipped between the slot and the metal key turned crossways when the upper pull of the cord should cause it to grip. The remaining four cords are treated in a similar manner and the whole tightened up by means of the screw D. It should now be possible to slide the cords until they coincide with the position of the five bands of the book.

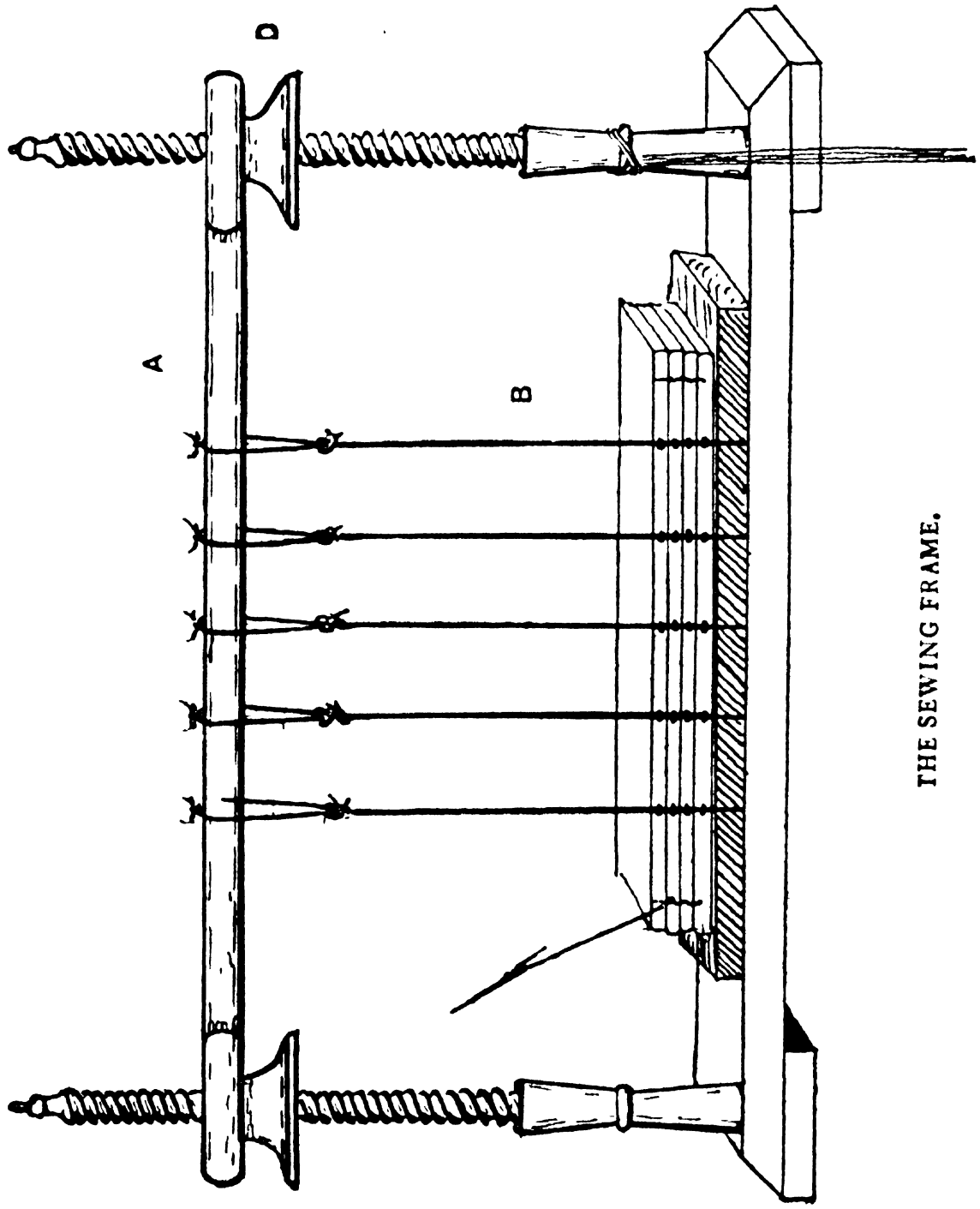
The operator sits in front of the frame and a little to the left; the book to be sewn is placed at the back within arm's reach. The first section is taken and placed face down in position upon the bed of the frame, the left hand is placed in the middle opening. The course of the needle is shown in the diagram, where it will be seen that it proceeds through the saw-cut from the outside, then out and completely encircles each cord. The thread is to be drawn tight at every band, and in so doing the pull must be in the direction it is travelling, otherwise the paper will be cut at the fold. The second section is placed into position and the operation repeated, but in the opposite direction, bringing the needle back to the loose end of the first to which it has to be made secure before proceeding with the third section. The sewing proceeds in this manner until the whole book is completed. The thread as it reaches each end is secured to the previous section, forming what is known as the "kettle stitch," or catch up stitch. As the needle becomes exhausted of thread a new length is connected to the old one, but always on the outside of the book and preferably at the kettle stitch. With flexible sewing it is necessary to keep the swelling in the back reduced as the work proceeds and not leave it to the binder, this is done by beating the sections with a piece of stick after every six or so. Each book must be cut off the frame as it is finished, leaving a clear two inches of cord on each side.

The library sewing. With this sewing four strong tapes take the place of the five cords. They may be simply pinned round the top bar and at the base a square form of key is used. They need not be pulled very tight, but they must be kept flat.



OVER-SEWING.



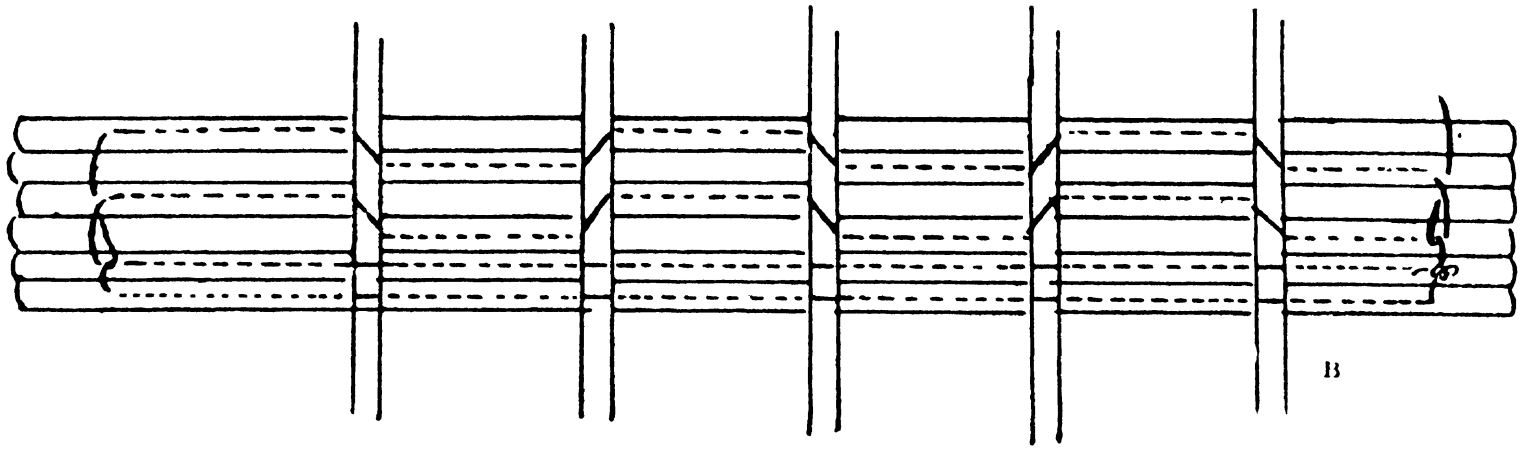


THE SEWING FRAME.

The path of the needle is shown, where it will be seen that it proceeds outside the tape, but does not encircle it. Otherwise the work is the same as the style previously described, but will be found to be much easier, as it is not necessary to pull the threads tight at every cord. Two or more books may be sewn on one batch of tapes, provided there is sufficient to allow each book two inches on each side. This form of sewing is suited to library and other commercial work as it is strong and economical; it is, however, not suited to ordinary leather binding, as it leaves no cords to attach the boards, but requires what is known as a French joint.

The sawn-in sewing. The book is marked up for five bands and two kettle stitches as for flexible work, but all marks consist of shallow saw cuts. The frame is fitted up with fine cords which must be thin enough to fit the cut. The thread may travel round the cord without completely encircling it, in which case the work is much simplified, but the sewing is generally weak. On the other hand the flexible method may be employed with the usual precautions as regards swelling, etc. The result of sewing a book sewn-in is that there are no projections on the back, whereby the forwarder is at liberty to employ bands or not, or to use a tight or hollow-backed binding. For small and light books four cords may be used instead of five.

Sewing two-on. With all the sewings previously described it is possible for the operator to arrange that two sections be caught up by the thread as it travels the length of the book. Such a book is said to be sewn *two sections on* instead of *all-along*, but it is quite

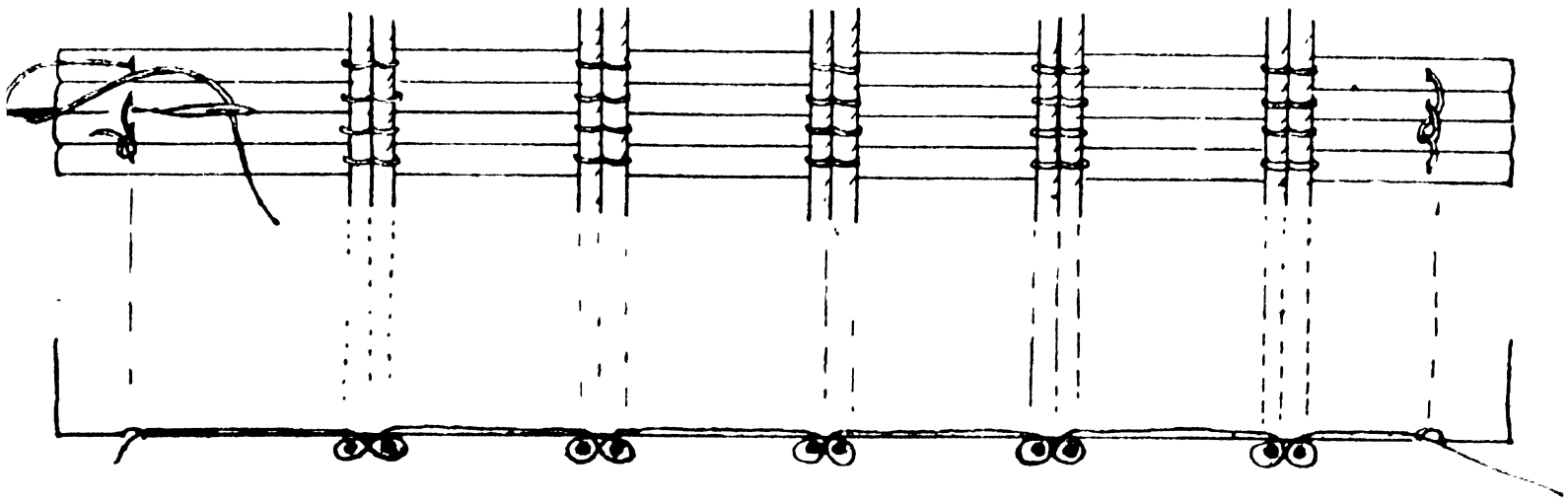


SEWING TWO SECTIONS ON.

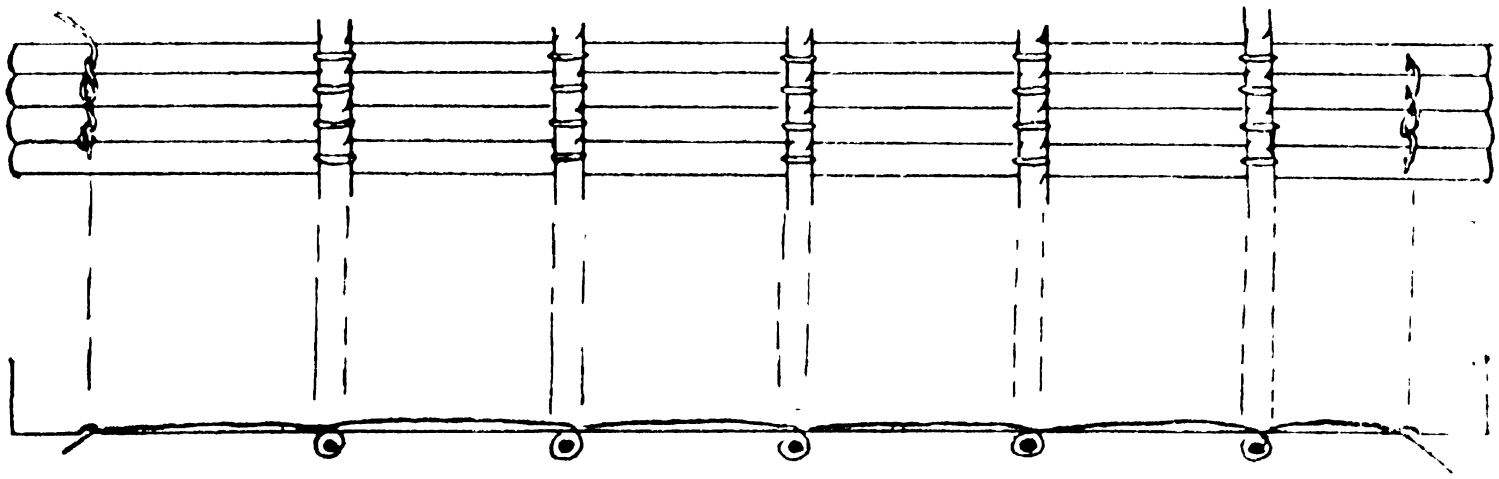
obvious that such a method has only half the strength. It has one advantage, however, and that is it reduces the swelling in the back in the case of books consisting of very thin sections; and only under these circumstances should it be employed for leather bindings. In all cases the first and last sections should be sewn all-along.

Oversewing. It sometimes happens that a book is supplied to the binder in single leaves or a rebinding job is in such a bad condition that it is necessary to take some of the back away. In either

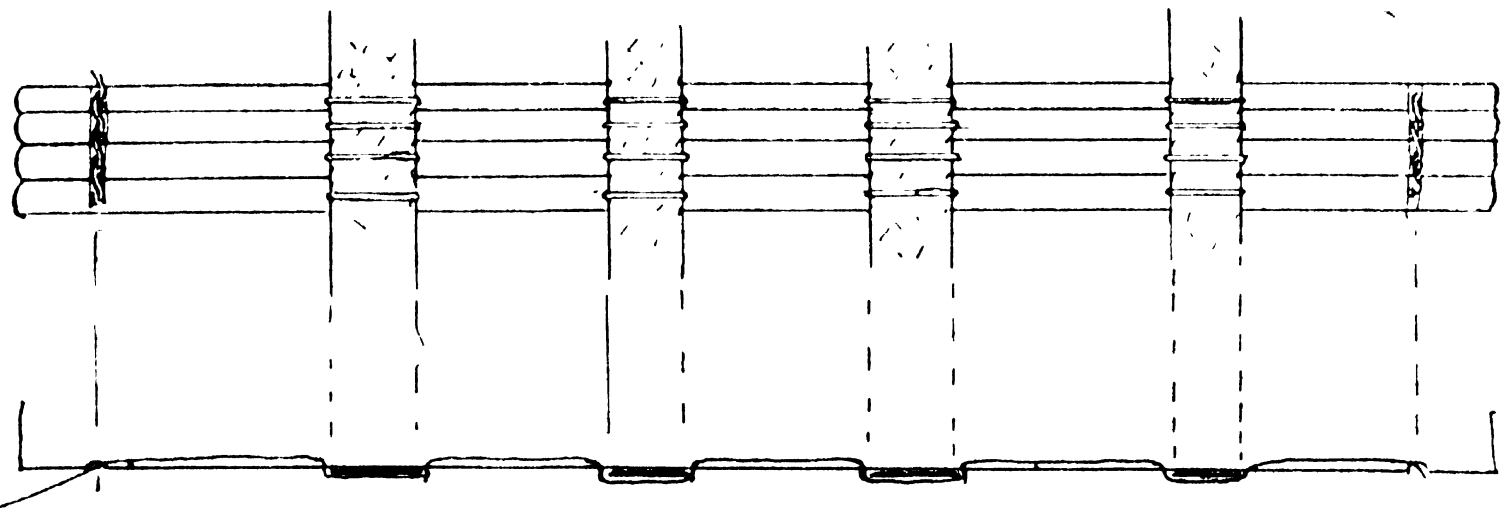
HAND SEWING.



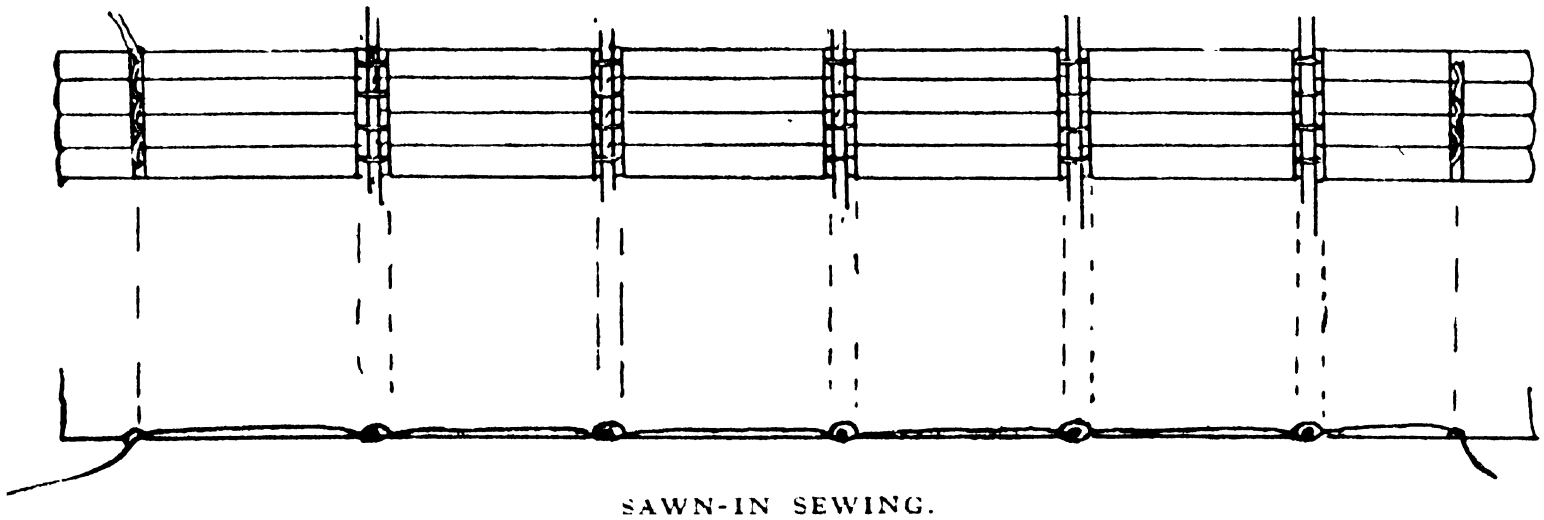
DOUBLE FLEXIBLE SEWING.



FLEXIBLE SEWING.



LIBRARY-STYLE SEWING.



SAWN-IN SEWING.

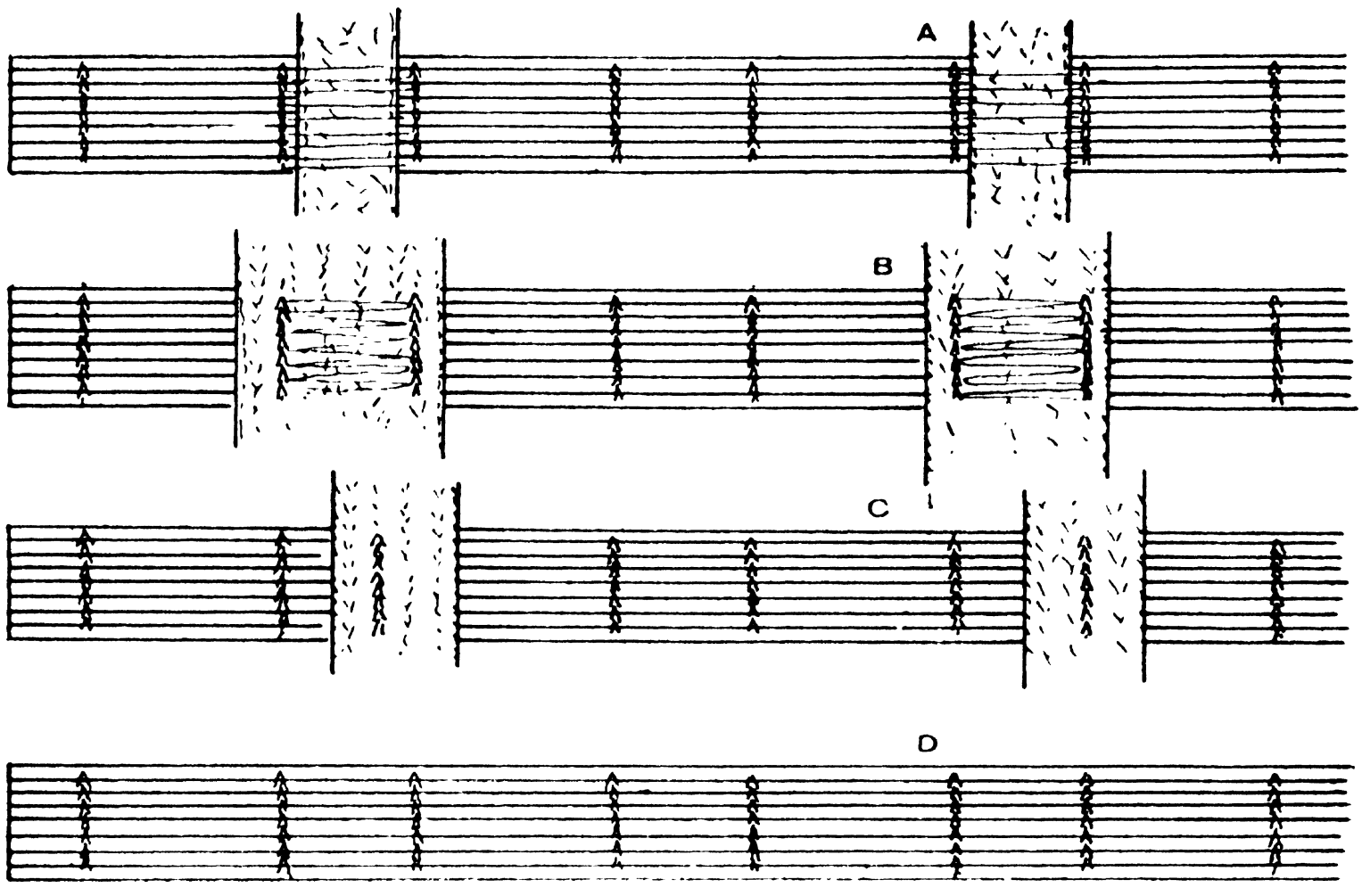
case it will be necessary to remake the sections by *oversewing* or *overcasting*. The usual method is to knock the back up square and glue the leaves so that when dry they may be broken up into convenient sections. In this state they are oversewn as shown in the diagram; the whole book being treated in this manner including the plates which do not require guarding. The sections may now be beaten along the back to set the threads into the paper, after which they may be sewn together in any of the styles previously described.

It follows that an oversewn book can never open right into the back, but the fault may be reduced to a minimum by keeping the stitches small and uniform. Some binders oversew the first and last sections of all books in order to give these additional strength, but here again the stitches must be kept narrow.

Machine sewing. Hand sewing is a fairly lengthy operation and for many years attention has been directed towards the employment of machines for this work. At first wire was used in place of thread, but later methods were found of using the latter material. As in the case of all machines in this trade the work does not reach the standard of hand sewn books, and they are at the best advantage where large quantities of books of one standard size are concerned. The operator sits in front of the machine with the pile of ready-gathered books which are fed, one section at a time, upon an arm. This takes them into the machine which sews them to a set of tapes ready prepared at the rate of about two per second. The operation is continuous, the whole pile being sewn together as one book to be cut up afterwards. No previous marking up is necessary. The principal difference between machine sewing and that of hand work is that instead of the thread passing along the whole of the section a number of smaller independent stitches are made. It is by this means that adjustments for different size books are made, it is only necessary to place a stitch or two out of action for smaller work. Modern machine sewing approaches hand work very close where the quality of the materials are the same and its employment is increasing rapidly.

Wire stitching. The wire-stitching machine is a piece of apparatus that is capable of driving a wire staple through the back and side of a book and clinching it on the other side. The wire is fed from a reel and there is an adjustable table so that it may be used for stitching through the side, or it may take the form of a saddle when required through the back. The great objection to the side stitch, apart from the fact that wire is used, is that the book is difficult to open, but there is no doubt about it being strong.

MACHINE SEWING PRACTICES.



A. SEWING ROUND THE TAPES.
B & C. SEWING THROUGH THE TAPES.
D. WITHOUT TAPES.
F. METHOD FOR SAWN-IN STRINGS.

PASTING UP.

This is a minor operation which comes between sewing and attaching the endpapers. The student, no doubt, will have noticed that a book that has had to withstand considerable use shows signs of wear at the end two or three sections, therefore, a little extra care bestowed upon these will add to the durability of a binding. I touched upon this point in the chapter upon sewing, where it was suggested that oversewing the end sections would help them to withstand the extra strain. Another method is to paste up the end leaves by opening them out, one at a time, and rubbing a very narrow strip of paste (not more than one-eighth inch) down the back and closing again. The important openings for pasting are the junctions between the end sections and the first and last

three leaves. It is not necessary to oversew or to paste up books that are to have any of the sewn-on endpapers described in the next chapter.

ENDPAPERS.

The endpapers of a book are those leaves that are added by the binder to serve as a protection for the title page, etc., to cover the inside of the board, and to form the joint. They take a variety of forms, from the simple folded sheet of cartridge paper pasted to the end sections to elaborate ends made of silk or leather. The paper that is finally pasted down on to the board is called the board paper, and may consist of specially printed papers, marbled or tinted papers, etc., selected to harmonize with the leather or cloth cover.

The object of endpapers is to protect the first and last sheets of a book, but this object may easily be defeated by the use of an unsuitable stiff paper that only helps to drag these sheets away from the back.

In the chapter on sewing I roughly divided the classes of bindings into four groups, namely, "extra" work, library binding, miscellaneous and calf bindings, cloth work; and the student is asked to keep these groups in mind throughout this and the following chapters. In a similar manner I shall divide the various endpapers into three groups.

(1) *The folded sheet*, for cloth work.

(2) *The "made" end* is suitable for the cheaper leather work, for half calf and for library work.

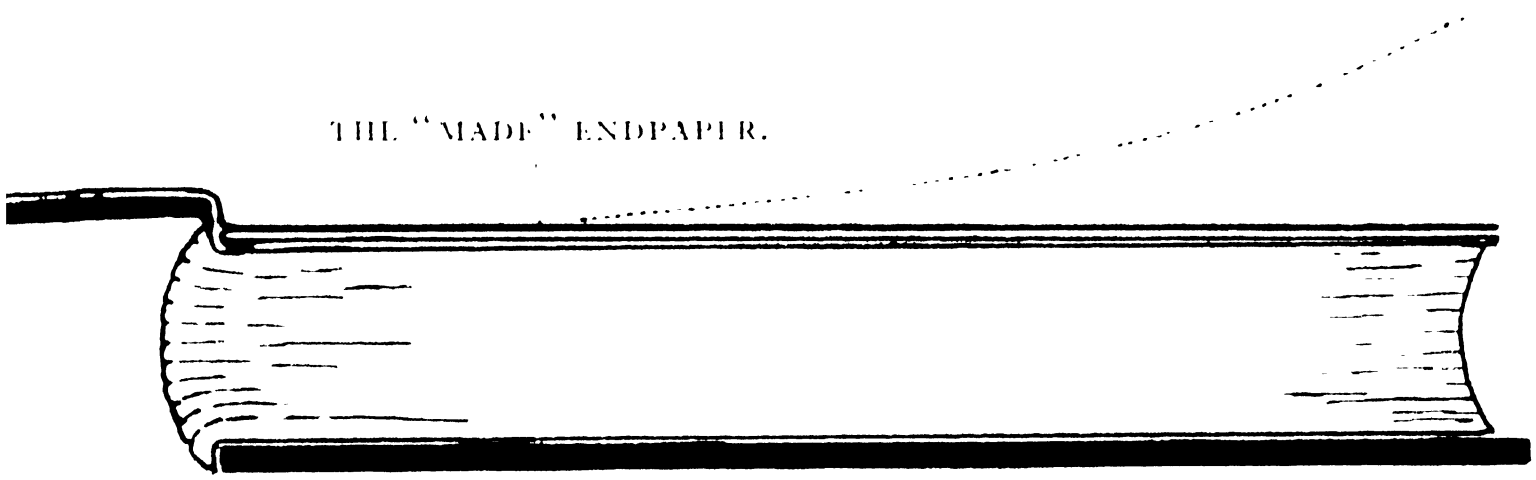
(3) *The zigzag endpaper* is considered by many the best for "extra" bindings. With slight modifications silk or leather may be used as well as paper. This endpaper is sewn on.

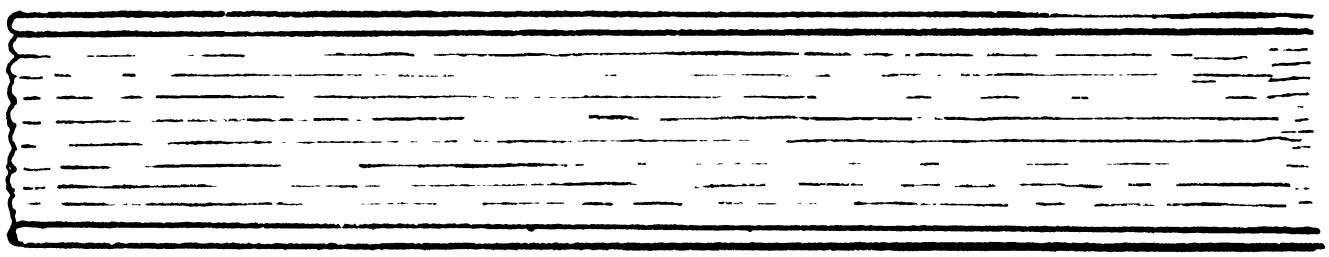
(1) *The folded sheet.* The simplest endpaper that one can have consists of a single folded sheet edged with paste to the first and last sections. A thin cartridge paper is perhaps the best, where white is not objected to, although all kinds of tinted or decorated papers are used, many of which have but little strength and very soon break down the joint. With this form of endpaper two or three sections at each end of the book should be slightly edged together with paste, and the outside one of all should be oversewn. If this is done, and the pasted strip upon the cartridge is kept narrow so that it does not drag upon the other sheets when opened, the result is quite satisfactory for the class of binding known as cloth casing.

(2) *The "made" end.* The diagram will explain this endpaper, which is one that, with slight modification, is used very extensively. When marble paper is used for ends it is necessary to line it, as the

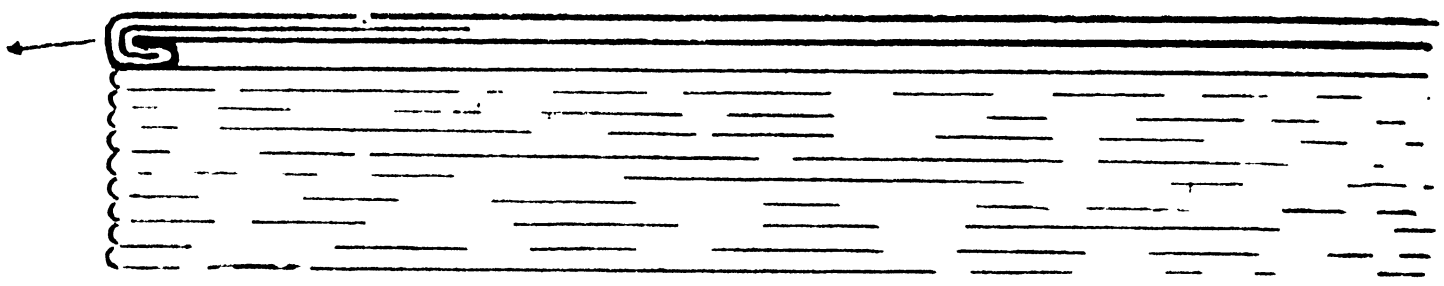
ENDPAPERS.

THE "MADE" ENDPAPER.





THE FOLDED-SHEET ENDPAPER.



THE CLOTH JOINT

under side is always more or less disfigured. Now it is important that the board paper itself is not too thick, as there is not sufficient room in the joint, which means that this portion of marbled paper must not be lined, but the half that is next the book only ; and this result is obtained as follows:—The marble and a sheet of white paper are folded and pasted together one above the other. The whole, when dry, is edged inside an additional white sheet and the endpaper is completed. It is best sewn to the book, but may be edged on with paste if desired. If the former, the needle should pass through the white sheet, as shown by the arrow in the figure, and not through the marble or tinted paper.

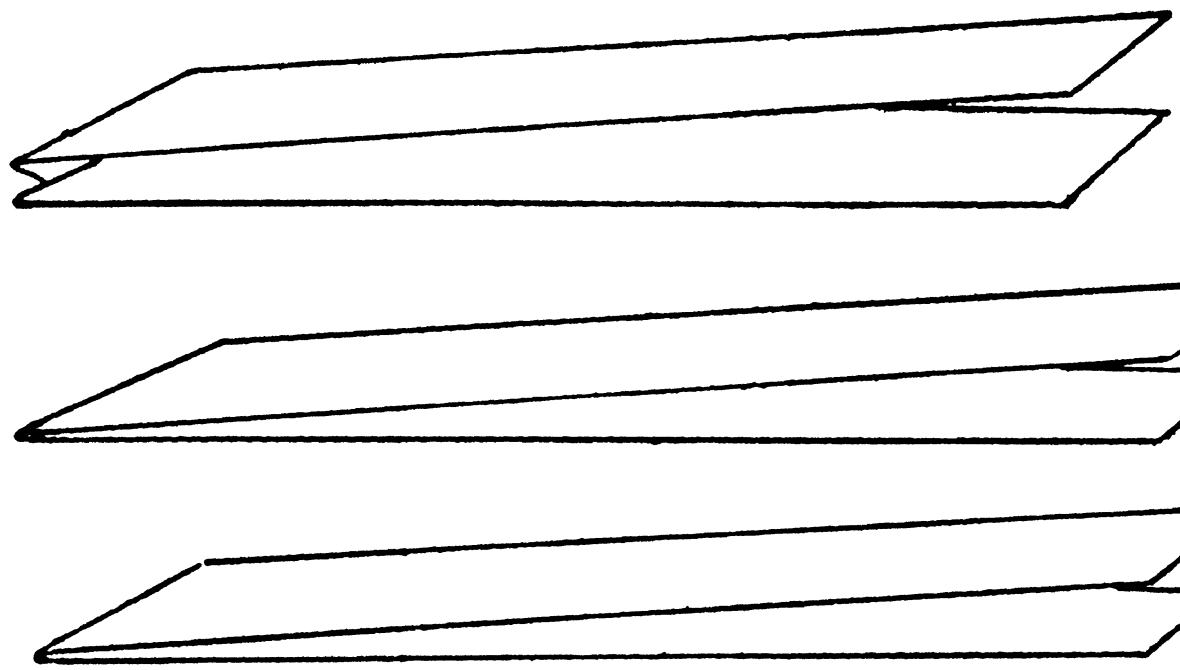
The term "made" is generally applied to an endpaper that is lined in this manner and there is one important point in connection with it. When two sheets of paper are pasted together the one that receives the paste will always draw the other and cause it to curl towards it. The reason is this:—Paper always swells when damped and shrinks again as it becomes dry, therefore, the pasted sheet has become stretched a little before the other is applied, so that, as the dampness leaves them again, the former will shrink a little more than the latter, causing the paper to curl towards it. When a book is opened at the first board it is very objectionable to find the flyleaf curl towards you, as indicated by the dotted line on page 35, and the remedy is to paste the white sheet first when making the endpapers.

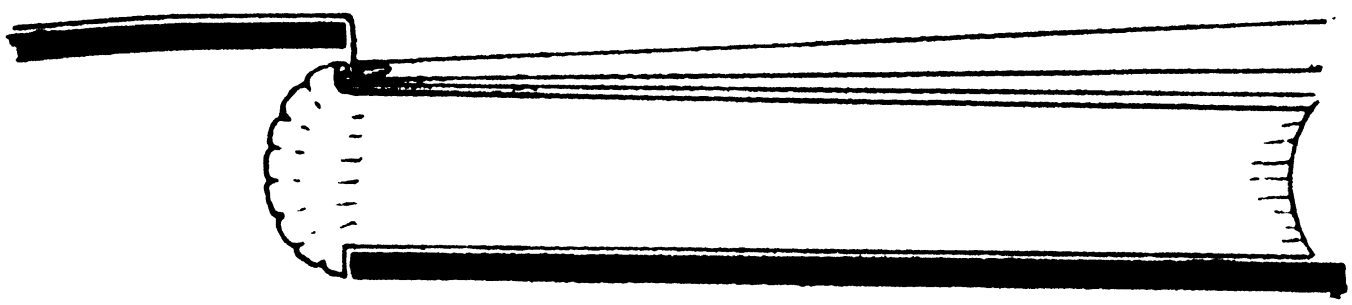
The cloth joint. This particular variety of end is useful where strength is required and the appearance of a strip of cloth down the joint is not objected to, such as the books of a public lending library. But this strip of cloth simply pasted down the joint is of little use, it must be sewn on to be effective. Page 35 illustrates a very simple method of making such a joint. A strip of cloth is placed into a folded sheet of cartridge which is then again folded about a quarter of an inch from the back (this second fold is best effected by placing a steel straight-edge along the correct distance from the back and working a folding stitch underneath). When this endpaper is sewn to the book the folded strip is placed inside in each case and the needle passes through it as indicated by the arrow in the figure.

When the time arrives for pasting down the joint, the top sheet is torn away and the cloth is pasted or glued over on to the board. If the sheet that is torn away is clean it may be used as the board paper, otherwise a fresh piece must be cut to size and pasted on.

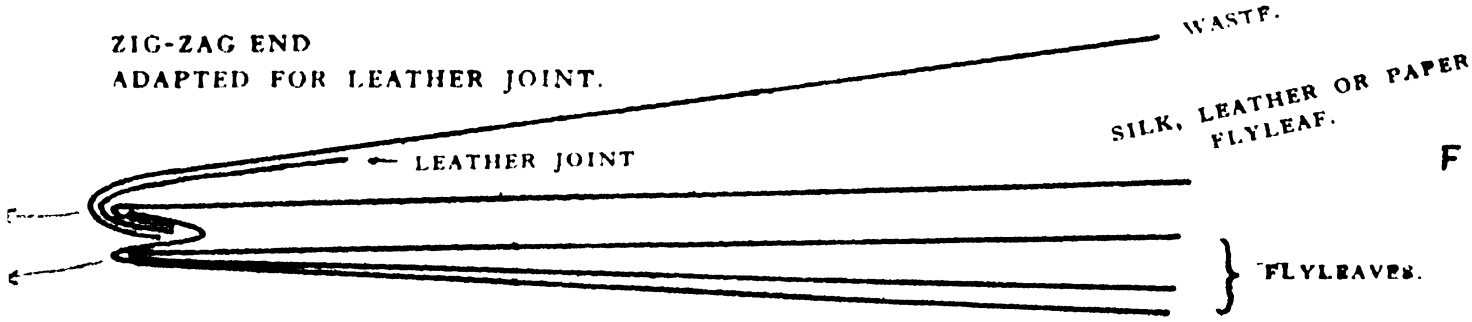
(3) *The zigzag endpapers.* The diagrams will help to make the method of construction clear. A, B and C are the components of

THE ZIGZAG ENDPAPERS.





ZIG-ZAG END
ADAPTED FOR LEATHER JOINT.



one endpaper. A and B consist of good quality white or toned paper, a hand-made for preference, C is the board paper which may be white, coloured, marbled, etc., or it may consist of a piece of silk lined with paper according to the taste of the binder. B and C are folded once in the usual manner, but A is folded to form a zigzag, whose width should not exceed one-eighth of an inch for small books up to quarter inch for folios. The board paper C is then pasted for an eighth of an inch along its edge and placed in the zigzag as shown at D, and kept under a weight until dry, after which the additional white sheet B is placed into the other gusset (without pasting) and the endpaper is complete. The result should be, the top leaf a white (this is waste to protect the board paper from injury and should be marked as such), next the board paper and then three leaves of white coming next to the book. These endpapers are sewn on to the book, the needle passing through the extra white sheet C, as shown by the arrow in diagram D, this may be done after the book is cut off the sewing frame, but if the ends are made beforehand all the sewing can be done together.

Diagram E illustrates this form of endpaper in use. The waste leaf has been torn away and the board paper has been brought over and pasted down. Now, when the board of a book is thrown back there is always a tendency for the first few leaves to be pulled up with it, and the zigzag end has been designed to reduce this fault, for the gusset G allows the board paper to be drawn up a little without straining the other leaves.

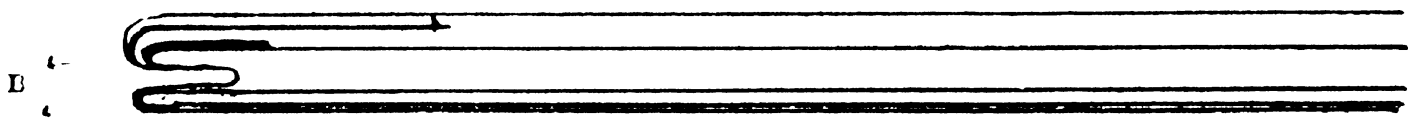
Leather joints, silk and leather flyleaves and doublures. This work would not be complete without a description of these, although the demand for them is somewhat limited, owing to the expenditure of time involved. The inside joints of a book may be of leather and they are usually cut from the same skin as the cover. The result is a leather border all round the inside of the board, enclosing a panel which is called the doublure and which may be filled with paper, leather or silk. The first flyleaf of a book also may be of the same material as the doublure. The materials used for this class of work should be of the very best that can be obtained; all leather must be cut out free from marks or flaws; the colours must be carefully selected to blend with one another, and the workmanship to be the best that one can give. The chapters on leather and leather paring must be studied in conjunction with this.

The leather joints are first cut out from those parts of the skin that remain after the cover has been selected. They consist of two strips about three inches wide and one inch longer than the book in hand. The thickness this leather is required must depend upon

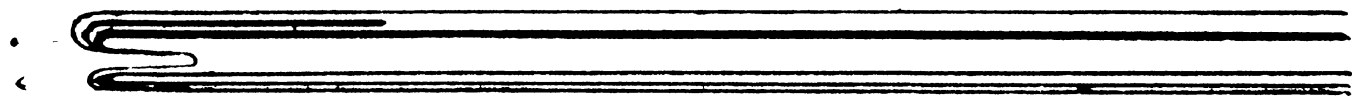
the size of the book, a folio having a wider joint will stand the leather being thicker than an octavo or a quarto, but under any circumstances levant morocco will require to be reduced down to half its original thickness. After shaving, each piece is cut straight along one edge with a knife and rule and then pared down as thin as possible to a depth of a quarter of an inch along this edge.

It is necessary to leave the joints now to deal with the rest of the endpaper. One diagram shows the arrangement for paper flyleaves. The usual zigzag is made from white paper, but one of the leaves is cut off. The marble or other tinted paper that has been selected for the flyleaves is edged with paste into the gusset, completing the zigzag again (if white is chosen for the flyleaves this operation is unnecessary, but plain white is seldom satisfactory for the first opening of a book). The thin edge of the leather joint is next edged and then another sheet of paper to serve as a protecting waste. With the additional white sheet added, the end is ready for attachment. This endpaper must be treated as two sections when sewing to the book, the needle passing through both places as indicated by the arrows in the figure.

Silk flyleaves. The difficulty with this material is that it is always ready to fray out at the edges and the only remedy is to turn them in and, as this can only be done after the book is trimmed, arrangements must be made for their attachment as one of the last operations. The usual zigzag is made and a narrow strip of the silk is pasted round the fold—I have indicated this by thickening the line (B). Without this strip a narrow band of white would be



SILK FLYLEAF.



LEATHER FLYLEAF.

seen when the silk pad was finally placed in position. The leather joint and the protecting waste are pasted into the gusset; the additional white sheet is added and it is ready to be attached to the book, which is done as explained above by sewing through both folds. The silk pads themselves will be dealt with in the chapter on "Siding and pasting down."

Leather flyleaves. The two pieces selected are shaved all over, but not more than sufficient to remove the roughness from the back, as if some weight is left they will lie flat in the book. A straight edge is cut along each piece, which is pared very thin for about a quarter of an inch, an operation requiring great care. The zigzag sheet of paper is made, one side of which is pasted and placed into position on the leather so that the thin edge can be pasted and turned into the gusset. When both are made they are rubbed down well and then dried between blotting and under a weight. The leather joint and its waste protecting sheet are then edged on as in the previous cases, when it will be noticed on referring to the diagram that the top fold consists of two thicknesses of leather in addition to the paper, and this is likely to make it thick and clumsy unless the paring is very carefully done.

There is one important point in dealing with leather joints and that is, the strip is liable to mark the title page, etc., when the book is pressed. The remedy is to insert a piece of thick blotting paper between the joint and the flyleaf, which may be tipped with paste on to the leather to keep it in position all the time the book is being forwarded.

FORWARDING.

The work of letterpress binding may be divided into sewing, forwarding, covering and finishing. The term forwarding, strictly speaking, includes the work required to bring the book on from the sewer until it is ready to receive its leather cover, but now it is used to distinguish the bookbinder from those who do the decoration, lettering and other finishing work.

At this stage in the progress of the binding of books it is very important the several methods employed do not cause confusion. An attempt will be made to give a complete ordinal of four distinct methods of forwarding a letterpress book. Some of the operations to be described will occur in all four, others in two, on the other hand some will apply to one method only. *The beginner is strongly advised to decide upon the style of binding he is to attempt, and to make a list of the sequence of operations as given in the following paragraphs.*

In-board forwarding. This method has been employed from the oldest times and is still the best. It may be said to treat bookbinding purely as a handicraft, for the apparatus required is comparatively simple and for this reason is the method for the amateur or semi-amateur craftsman. The in-board forwarding bench

consists of "cutting press" with its "plough" and stand on "tub." When these are not in use the plough is removed and a large wooden board laid over the press supplies a flat working bench. Other tools required are hammer, beating iron, shears, large dividers, steel straight-edge, rough knife, folder, bodkin, backing and cutting boards, square, etc. The operations occur in the following order, and those not included in this list may be passed over by those using this particular method:—Endpapers, fraying the slips, gluing, rounding, backing, boards cut to size, boards attached, pressed and back cleaned off, edges cut in plough, edge decoration, head bands, lining backs, covering, finishing, pasting down endpapers.

Out-board forwarding is quicker than the in-board method, but an expensive guillotine is needed. The operation occurs in the following order:—Endpapers, gluing, cutting edges in machine, rounding, backing, boards cut to size and attached, backs cleaned off, head bands, back linings, covering, finishing, pasting down of endpapers.

Library style. Either the plough or the guillotine may be used for this method. The operations are as follows:—Endpapers, gluing, cutting, rounding and backing edges, boards prepared, boards attached, clean off backs, covering, finishing, endpapers.

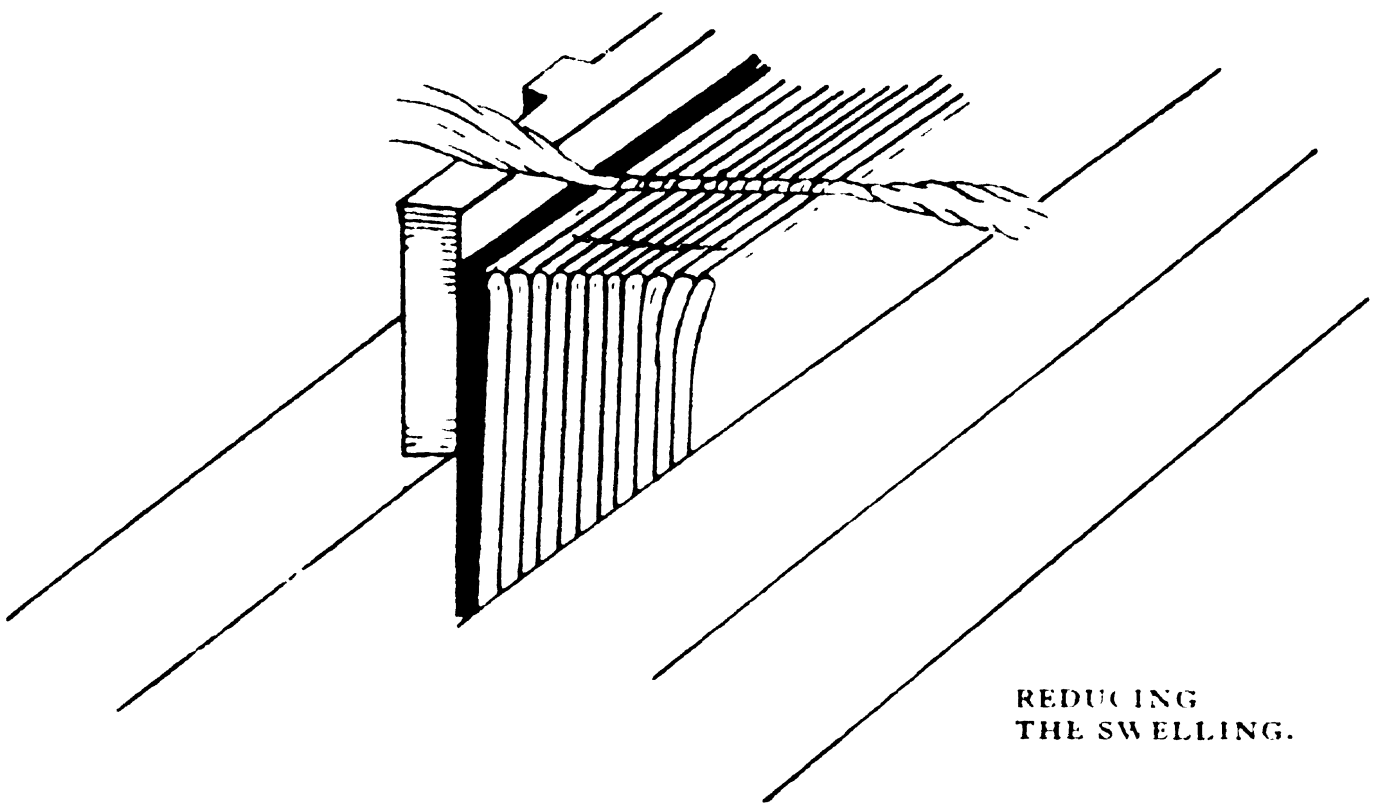
Casing. This is the usual method adopted for cloth bindings:—Endpapers, gluing, cutting in guillotine, edges, back linings, case making, casing-in, finishing. In the case of the last two styles if the plough is used, the books require to be rounded and backed after the fore-edge is cut, but before the ends have been so treated.

GLUING, ROUNDING AND BACKING.

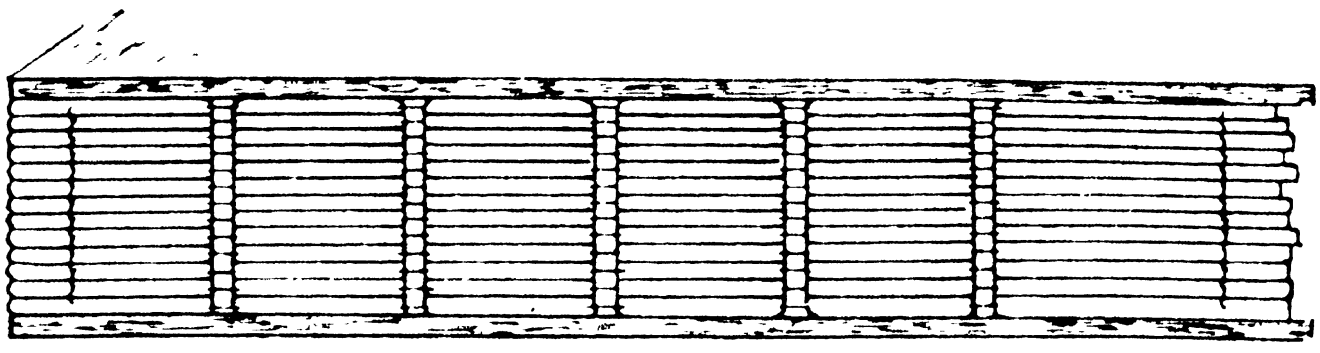
Fraying the slips. In the case of books sewn on cords it is necessary, at this stage, to fray out the slips, as the loose ends are called. A bodkin inserted between the strands and pulled to the end half-a-dozen times will do what is necessary. There is a danger, in the case of thin books, of pulling the cord right away from the book, which would be serious, as the sewing would become loosened, but only care is necessary to avoid this. When completed, the slips should be quite soft and pliable and free from any hard places.

The swelling. As previously mentioned, the folds and the threads have caused the back to become thicker than the fore-edge. This is known as the swelling and it is important that it should not be too much, although a little is necessary if the book is to "round" properly. It is not sufficient to lay the book on the bench and beat

down the back with a hammer, for a bad shape would result. A convenient method is shown below. The laying press is used to hold the book and the beating iron is placed to one side while the sections are hammered down on the other. The hammer used by bookbinders is one that is specially made for the purpose and has a rounded face which does not damage the paper. After this beating it will be found that the cords will require adjusting, owing to the thickness of the back being reduced. At this stage the forwarding is undertaken in batches, that is, from ten to twenty books are brought along together.

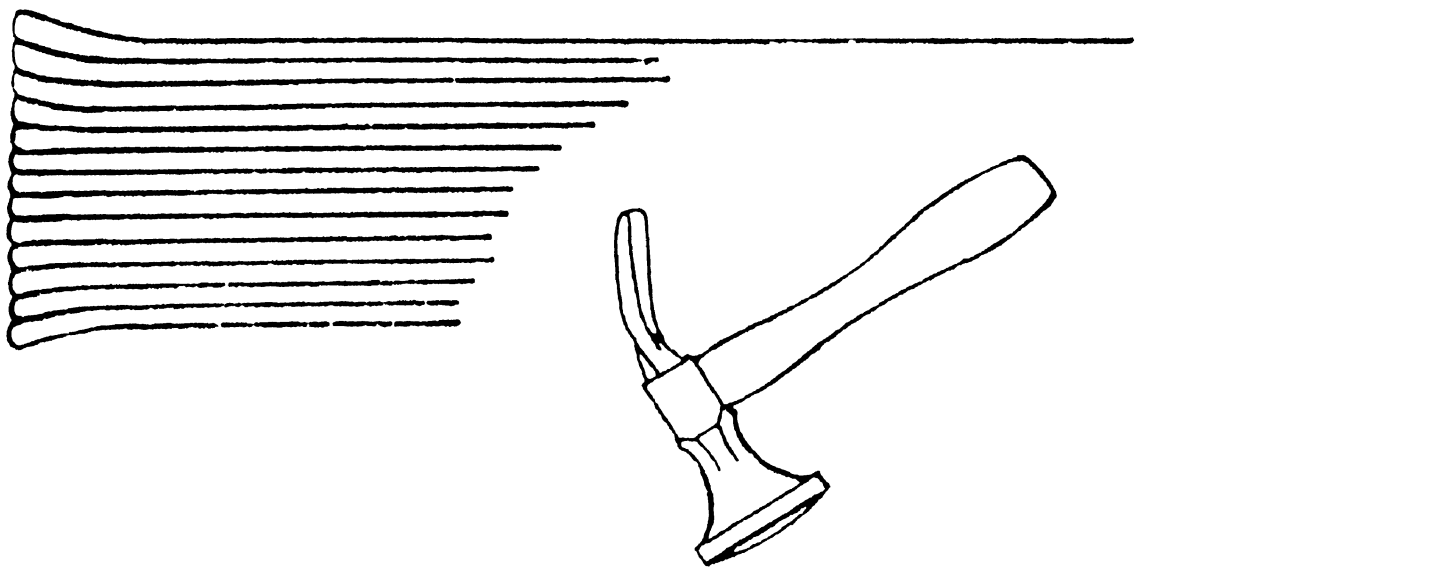


REDUCING THE SWELLING.



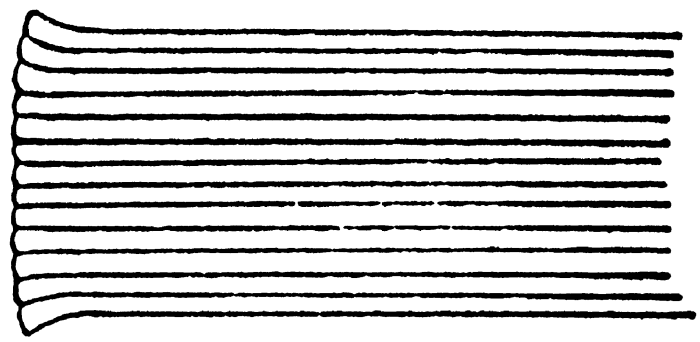
BOOK READY FOR GLUING THE BACK.

Gluing up. This operation consists in rubbing thin glue into the back of the sections, whereby they are held together more firmly. It is important that it is carefully done, for upon it depends the final shape of the book. The head and back must be knocked perfectly square and level at the time of gluing and the liquid must be confined to the back sections, and not allowed on the slips. Above is an arrangement whereby this may be accomplished—the book is placed between two pieces of waste board and the slips tucked away

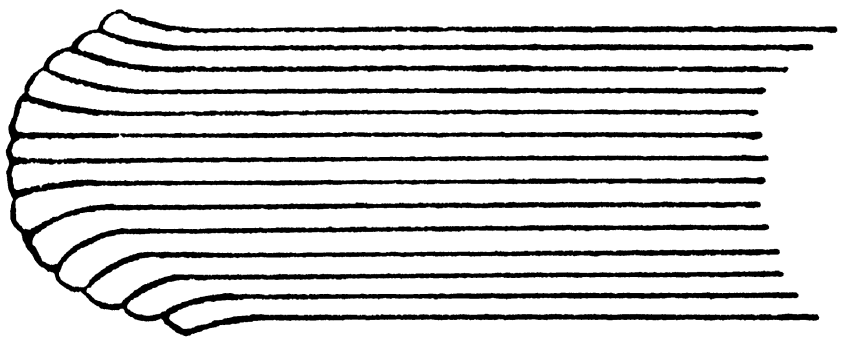


ROUNDING THE BACK

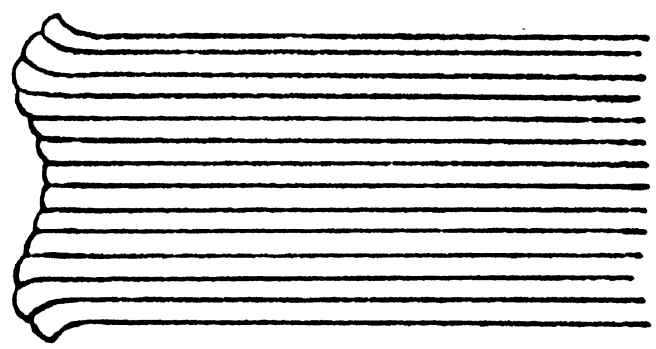
THE ROUND BACK.



THE FLAT BACK.



EXCESSIVE ROUNDING.



A SUNKEN BACK, DUE TO LACK OF ROUNDING.

between them; the head and back are knocked up square and the fore-edge gripped between the cheeks of a laying press while the back is being glued.

Rounding. This operation should take place as soon as the glue has become set, but before it has had time to dry hard. The book is laid upon a flat, solid bench and the fore-edge is held with the left hand, the fingers being on the top and the thumb on the edge of the paper. Our round-faced hammer is taken in the right hand and the top sections are beaten. This will cause the book to assume the shape shown on page 43. Now if the book is turned over and the operation repeated the familiar round back will be acquired: heavy beating is not required.

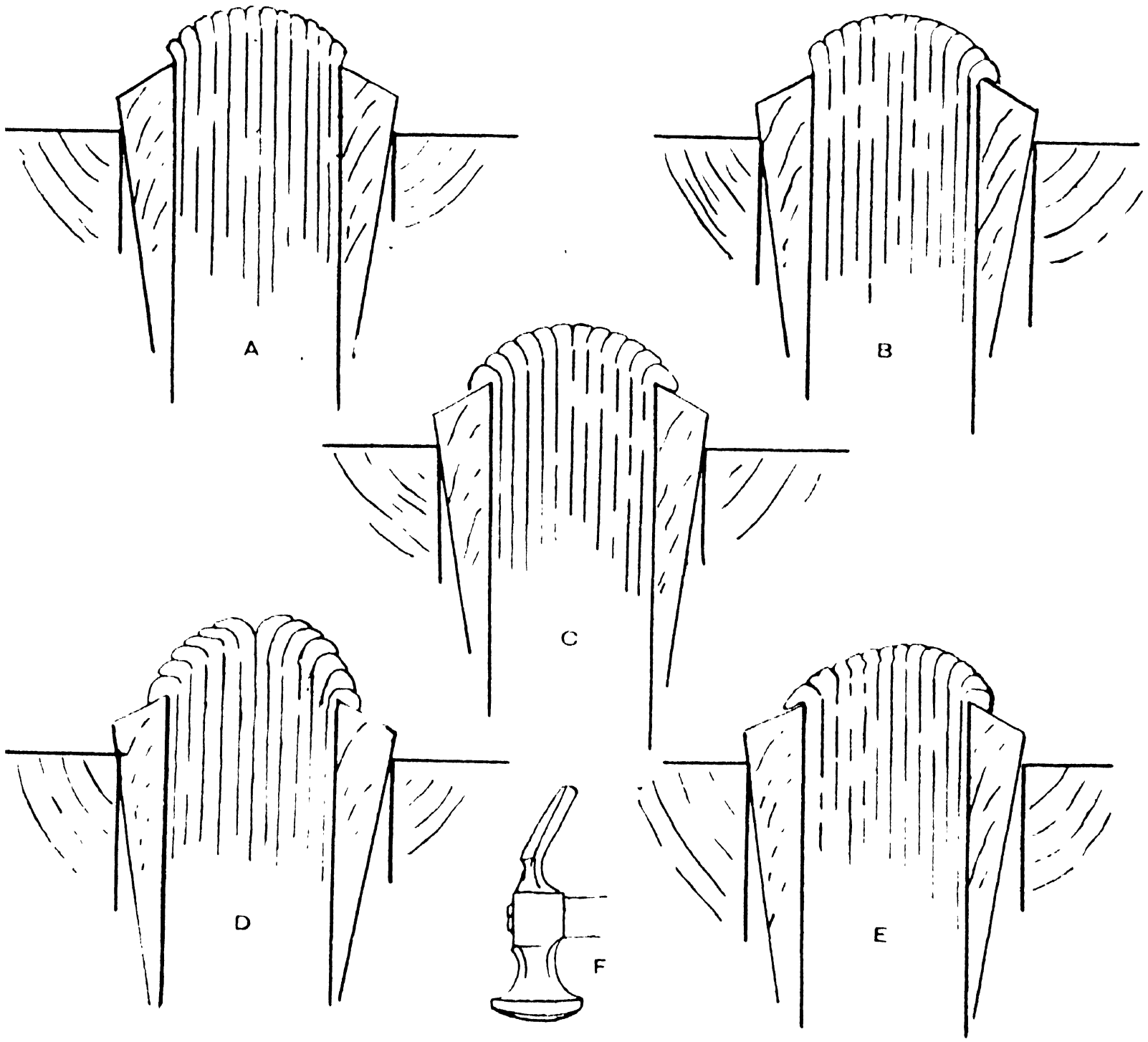
The object in rounding books is threefold:—(1) It takes up the swelling in the back; (2) it gives the familiar round shape to the fore-edge; (3) it prevents the back of the book from sinking in if this operation is neglected. If the rounding is overdone, as it happens where there is excess of swelling, a bad shape results; a good rule is not to allow the back to exceed a third of a circle. On the other hand a flat back or a semi-flat back has attracted many binders.

Backing. Immediately after rounding and while the glue is still a little pliable the book is backed. The laying press and a special pair of V boards (wedge shaped), known as "backing boards," are required. These latter are placed one each side of the book, parallel to the back, and at a distance from the fold in the endpapers a trifle more than the thickness of the board that it is intended to use for the binding, i.e., if it is a quarto volume a board one-eighth inch thick may be used and our distance may be three-sixteenths. With the boards in position, the whole is gripped tightly in the left hand and lowered into the press, which should be tightened as soon as they are lowered (Fig. A). A little practice is required, as it is rather difficult to grip the book at the right moment and without the boards slipping. The press must be screwed tight with the iron pin, at the same time making sure that both screws are used so that the cheeks become parallel. The back of the book is now hammered until it assumes the shape shown in Fig. B, the object being to beat the sections over on each side, keeping it a good shape all the time. Books sewn on tapes or sawn-in strings are easier to back than those that have raised cords, for in the latter it is necessary to use a small hammer between the bands for fear of cutting through the threads.

The object in backing is threefold:—It binds the sections to one another independent of the sewing; it forms a slight fold down the back of the sections, which eases the general opening of the book; it forms a "groove" or joint for the boards of the book.

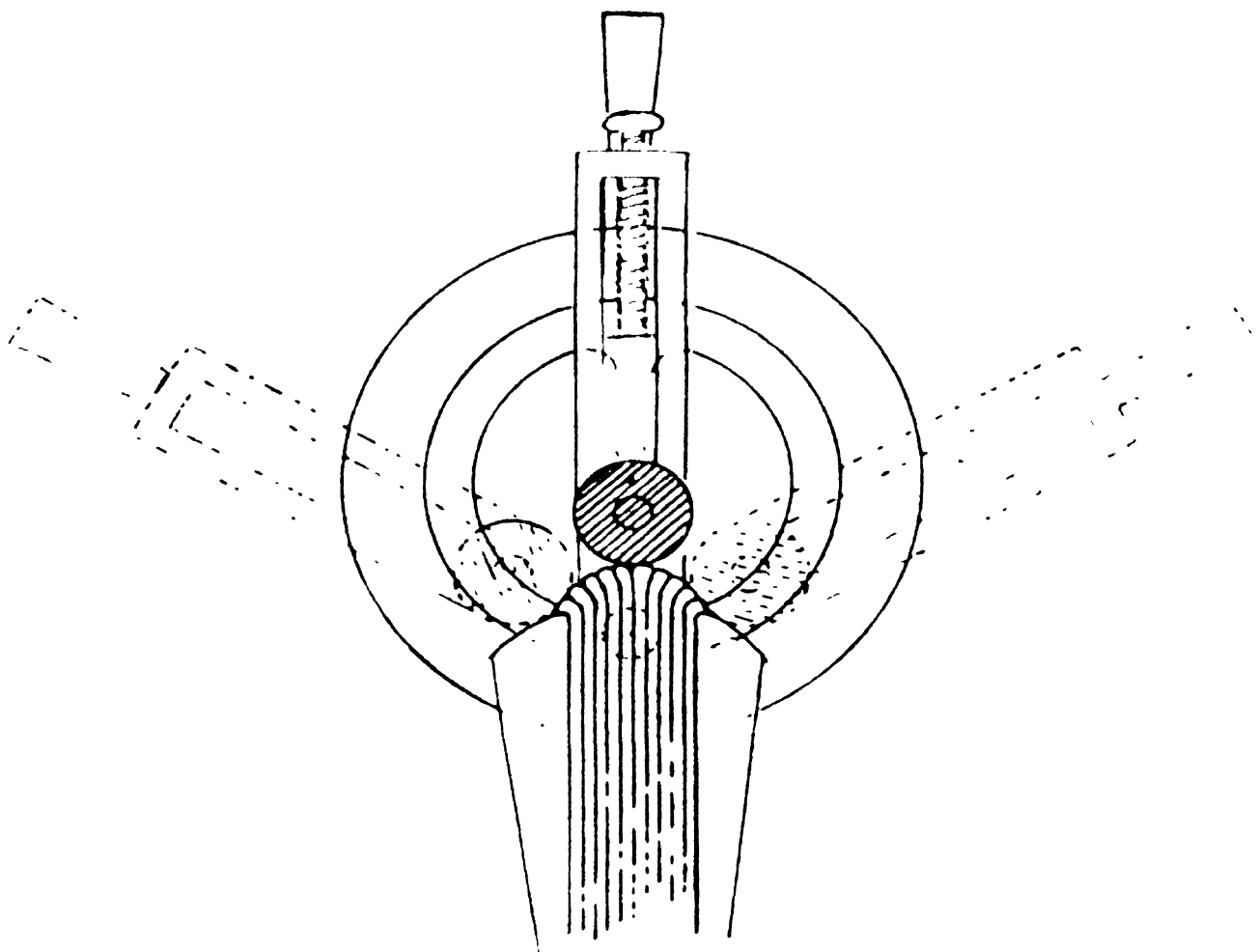
There are separate machines for both rounding and backing, and there is also a machine that will do both operations at one feeding in of the work. In this case the backing boards take the form of a pair of iron jaws which grip the book and by means of a sliding motion round the back. In place of the hammer for backing, an iron roller forces the sections over. The saving of time in the case of the

BACKING.



A. THE BOOK IN THE PRESS READY FOR BACKING.
B. ONE SIDE BACKED.
C. THE BOOK BACKED.
D. DEFECT CAUSED BY TOO MUCH ROUND.
E. A COMMON FAULT IN BACKING.
F. HEAD OF BACKING HAMMER.

backing machine is considerable, and although the work is inferior to the hand method a fairly high standard can be obtained, especially if the work of the roller is assisted by the backing hammer.



BACKING MACHINE ACTION.

THE BOARDS.

The boards used by bookbinders may be divided into three qualities—best black millboards, machine boards, strawboards.

Best black millboards are very tough, but rather heavy, and are made from disused rope. It is the best quality to use for all work that has to withstand considerable wear and tear, such as library bindings, provided that the rest of the materials used in the binding are strong in proportion.

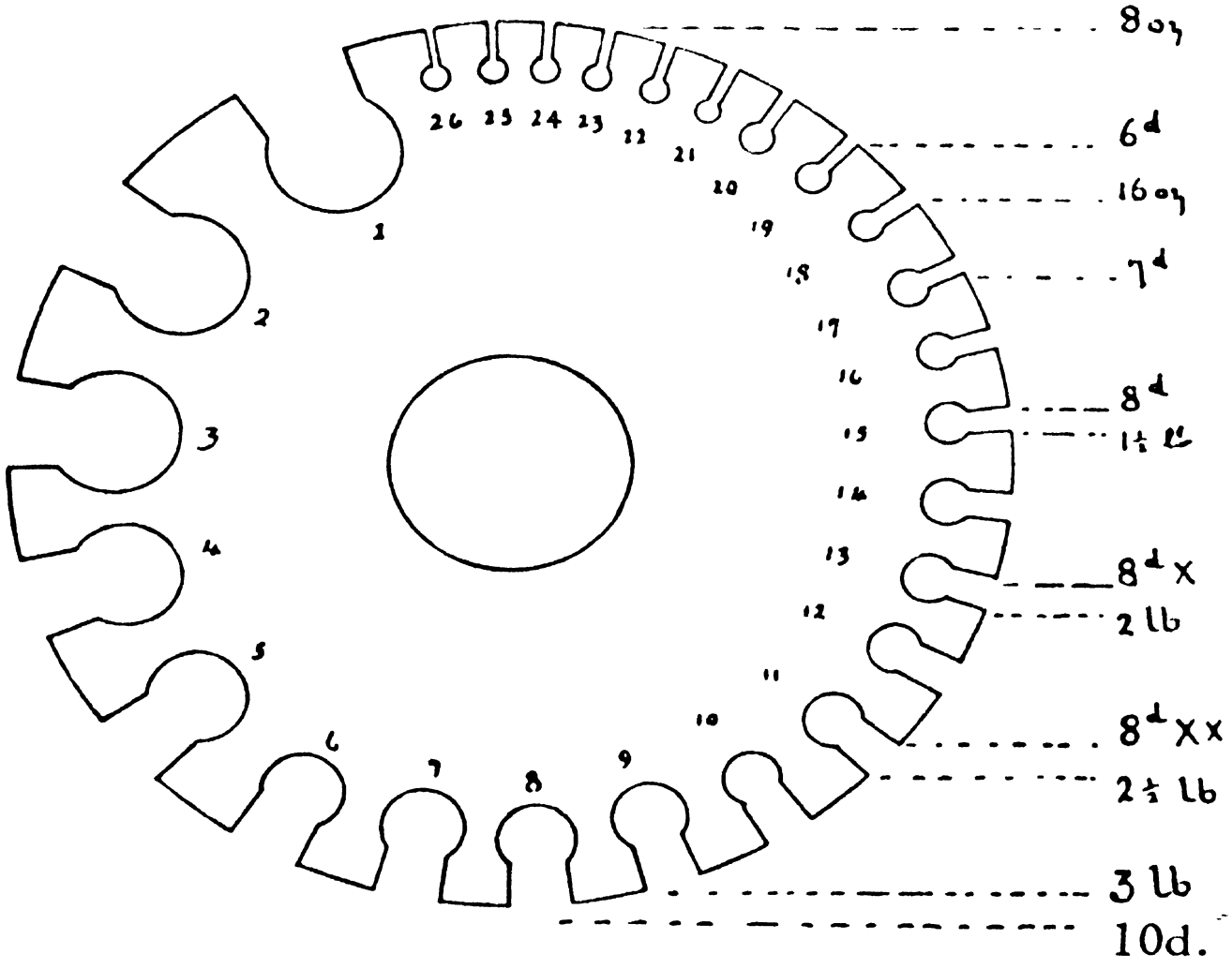
Machine boards. Under this heading is included a wide range of boards made by machines, but from various sources of fibre. Wood pulp, waste paper pulp, and certain fibrous materials, by-products of various industries, are used. They are not so heavy as millboards and certain qualities are fairly tough.

Strawboards. These, as their name implies, are made from straw. The cheapest form of board made, they are imported from Holland in large quantities. They are soft without being tough and readily

warp. They should not be used for permanent bindings, but are useful for other classes of work on account of the abundant supply.

The system in use for gauging the thickness of boards is a complicated one. Millboards and machine boards use a number of thicknesses, to which the following names have been given:—Sixpenny, sevenpenny, eightpenny, eightpenny X, eightpenny XX, and tenpenny. These have no connection with the prices of the board at the present day. Strawboards are made up into a comparatively few large sizes, of which 30 × 25 in. is perhaps the most common. Their thickness is denoted by the weight per board, but for this purpose the size 32 × 22 in. is used. The usual weights are 4 oz., 8 oz., 1 lb., 1½ lb., 2 lb., 2½ lb., and 3 lb., which gives a series of thicknesses from that of a post card to approximately one-eighth of an inch.

The standard wire gauge offers a ready means of indicating board thicknesses where an exact specification is required. While its use is at present limited, its adoption by H.M. Stationery Office will, it is hoped, sooner or later cause it to become more general and for this reason the accompanying diagram has been prepared.



MILLBOARD AND STRAWBOARD THICKNESSES BY COMPARISON WITH THE STANDARD WIRE GAUGE.

STRAWBOARD SIZES :

22 × 32 in. and 25 × 30 in.

MILLBOARD SIZES:

Pott, 17¼ × 14¼ in.
Foolscap, 18½ × 14½ in.
Crown, 20 × 16¼ in.
Small half royal, 20¼ × 13 in.
Large half royal, 21 × 14 in.
Short, 21 × 17 in.
Small half imperial, 22¼ × 15 in.
Half imperial, 23½ × 16½ in.
Mid. or small demy, 22½ × 18½ in.
Large mid. or large demy, 23¾ × 18½ in.
Medium, 24 × 19 in.
Small whole royal, 25½ × 19½ in.
Large whole royal, 26¾ × 20¾ in.
Extra royal, 28½ × 21½ in.
Whole imperial, 32 × 22½ in.

PREPARATION OF THE BOARDS.

The warping of boards is the source of considerable trouble to the average bookbinder. The cause is the unequal distribution of the natural moisture. If one side only of a board is exposed to dry air this will shrink and cause it to warp; again, if one side is lined with paper, which has already stretched with the paste, a shrinkage occurs on drying which will cause the board to warp. Advantage may be taken of this to counteract a pull in a certain direction as, for instance, the pull of the covering material of the book. For this reason the boards of a book should be lined with paper on the insides, but if it is considered desirable to line on both sides, on account of the danger of impurities in the fibre, the side nearest the book should receive an extra one. This operation is usually done after the boards have been roughly cut to size.

The moisture of the paste and glue used in bookbinding work dries, not so much by evaporation into the air as by penetration into the material of the book, and it may be months before this moisture is finally dried out. During this time the books should never be allowed to lie about with one side exposed to the air, but kept under weighted boards.

CUTTING BOARDS.

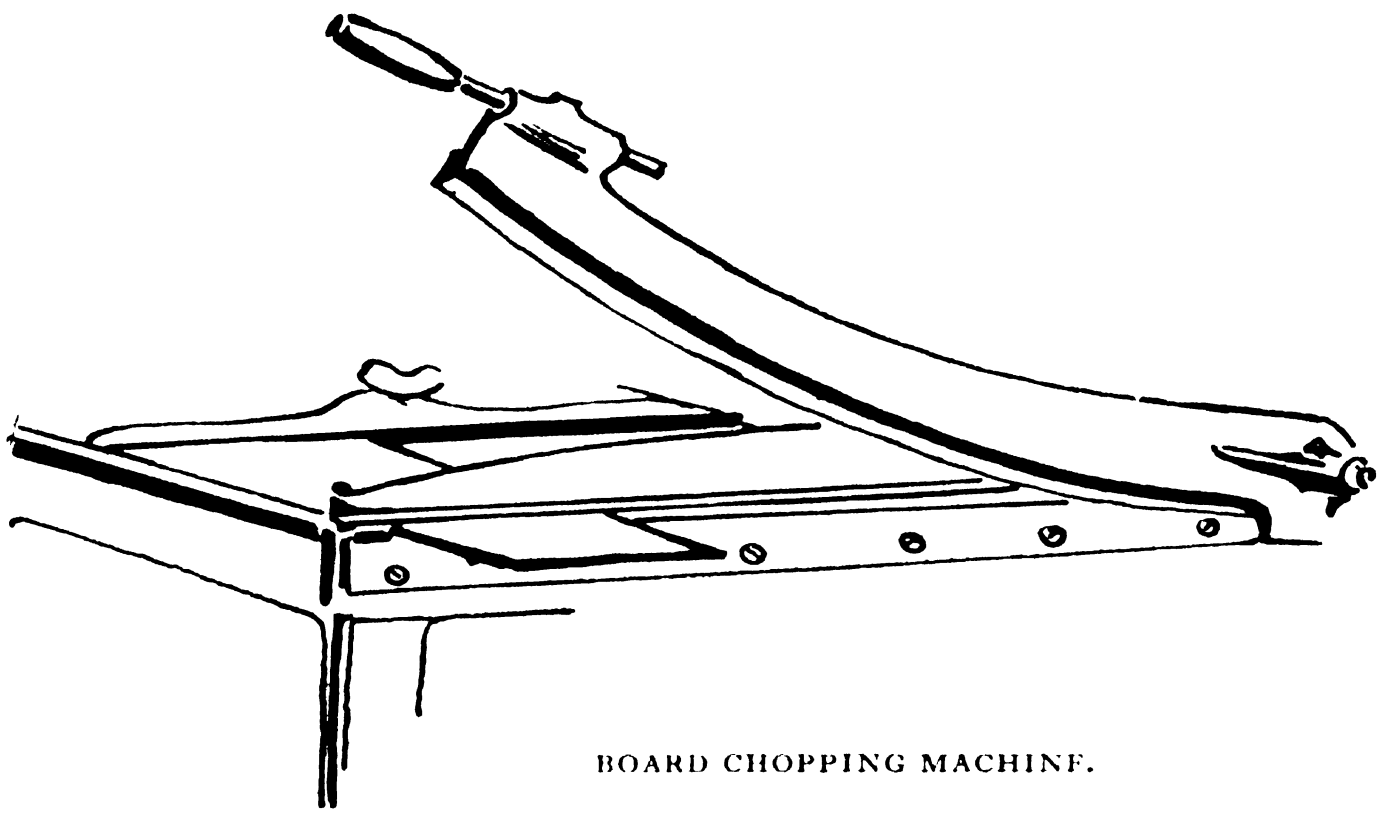
The board chopping machine is the handiest for miscellaneous work. It leaves a rather rough edge in the case of heavy boards, which may require a trim round in either a guillotine or the plough.

The rotary card cutter is the best machine for wholesale card cutting, as it is both accurate and fast.

The guillotine may be used, as its output is large, but generally speaking it is not accurate enough.

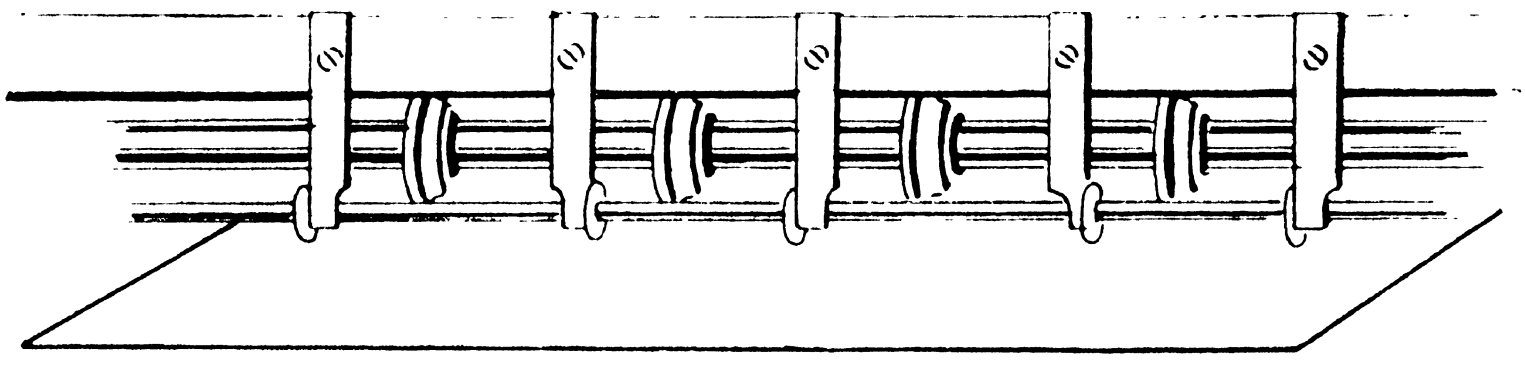
The plough may be used, as it produces a perfectly square edge and if skilfully used is accurate.

The above machines are not able to deal with boards the thickness of which exceeds a quarter of an inch. In this case it is



BOARD CHOPPING MACHINE.

necessary to make them up by gluing thin ones together *after* they have been cut to size; the guillotine may be used to trim thick boards, provided this trim does not exceed one-eighth of an inch.



ROTARY CARD CUTTER.

In the case of in-board forwarding it is necessary to cut the boards to size before the edges of the book are trimmed, therefore it becomes necessary to estimate their size. The portion of board that usually overlaps the edges of bound books is called "the

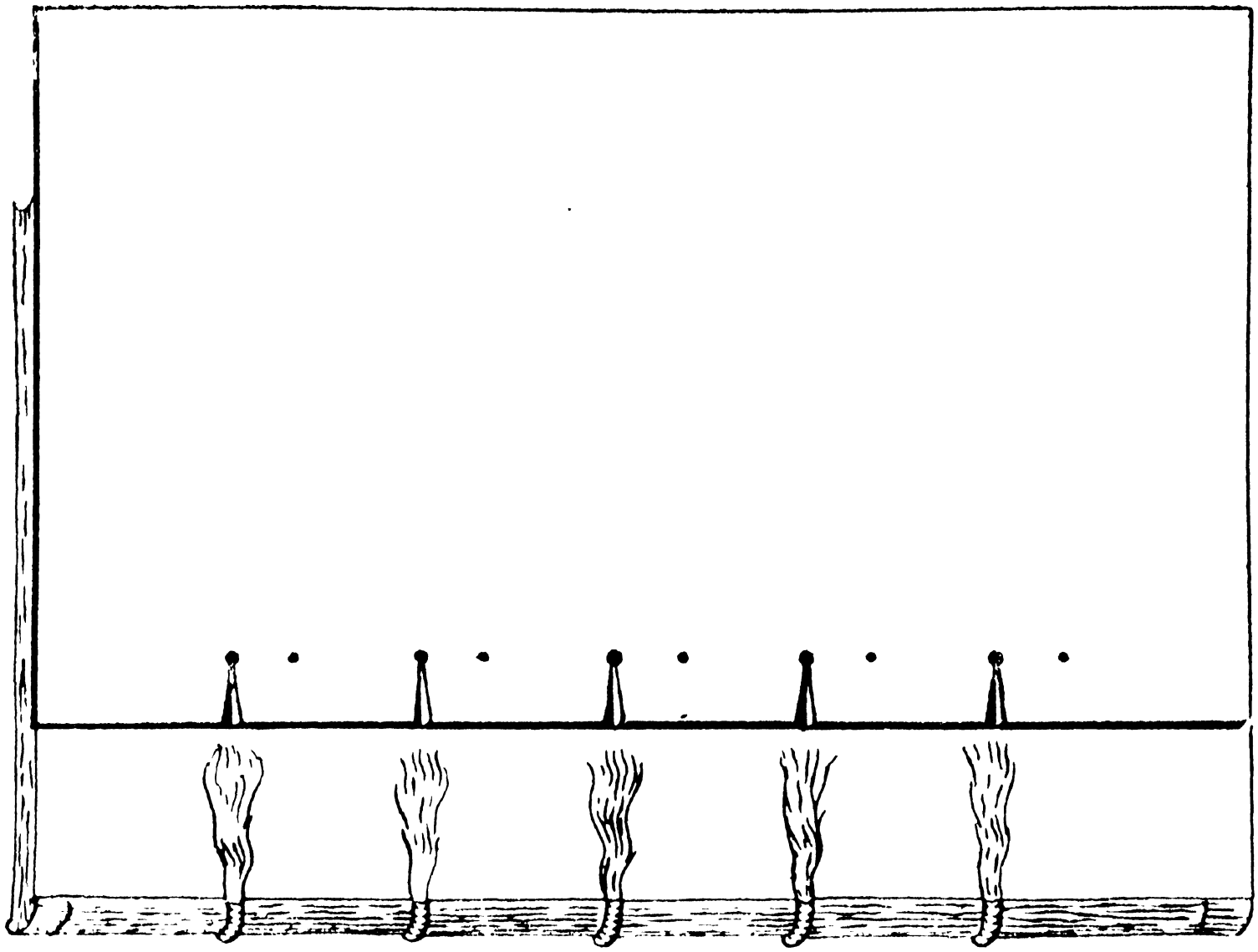
squares," and this distance, which is about an eighth of an inch in the case of an octavo volume, is approximately equivalent to a trim of the paper. The dimensions of the boards, then, are as follows:— The width is measured from the groove at the back to a distance one square beyond the estimated trimmed book, the length is usually equal to the book before trimming, the squares being equal to that trim. It is important that the boards are made perfectly square, as the book will be cut to them.

LACING IN THE BOARDS.

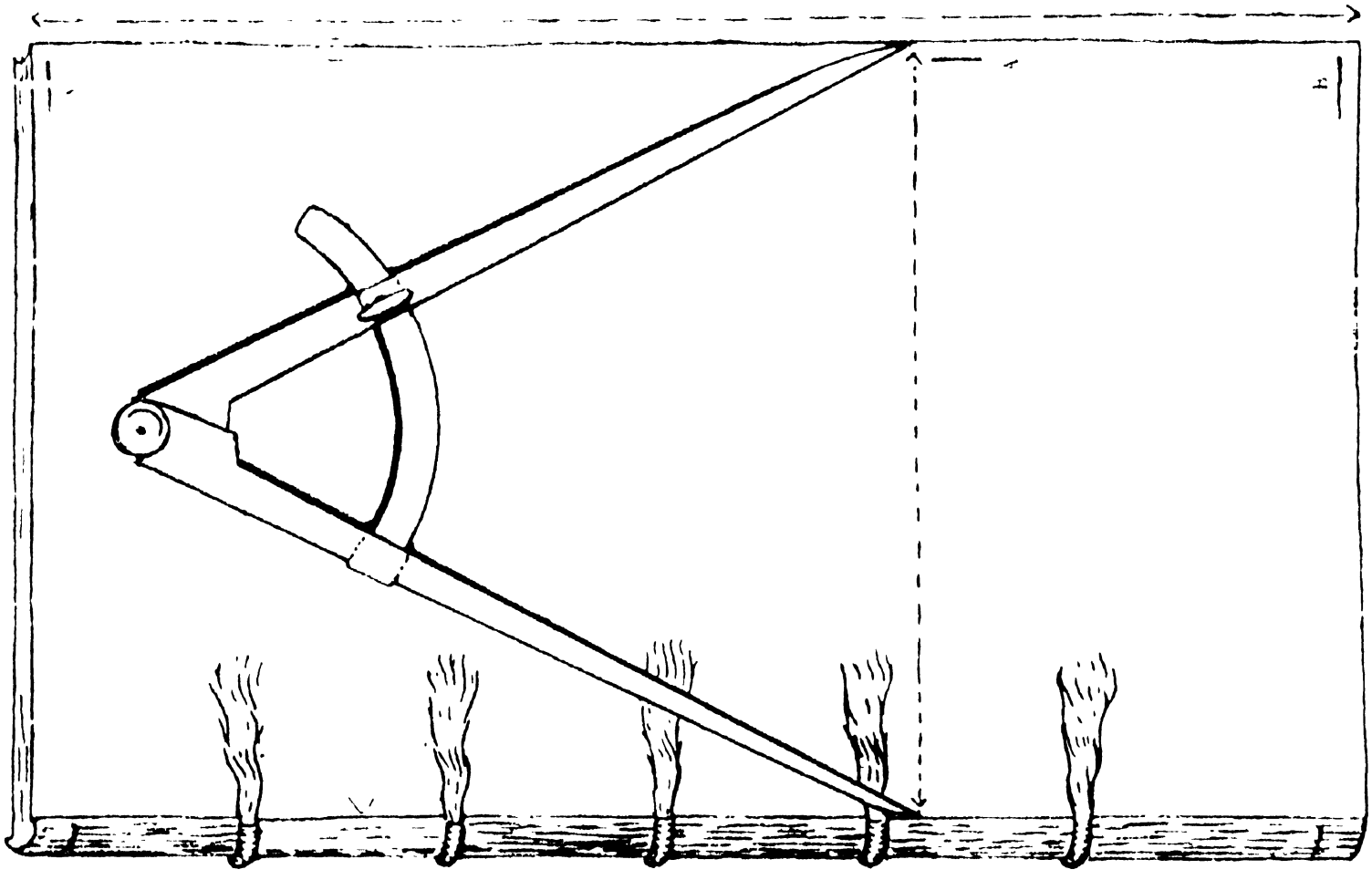
Neatness in attaching the boards to the slips is very important, as any unevenness will show through the leather in the finished book. Placed in their exact position against the groove, a pencil mark is made opposite each of the slips. The boards are then removed and treated as shown; for this purpose a hammer, bodkin, dividers and the rough knife are required. With the dividers set at half an inch, mark a line upon the boards at this distance from the back edge. From this mark to the edge and in the exact position of the slips, neat V-shaped slots are made. At the end of each of these slots the board is pierced with the bodkin, after which it is turned over and five more holes are made at a distance of about three-eighths inch from each of the others. With regard to the slips themselves where they are very thick, as in the case of a flexible book with heavy bands, it may be necessary to cut a little away for neatness sake, but as this is cutting away the strength of the binding, as much as possible should be allowed to remain.

With both boards prepared as above, everything is ready for attachment. The slips are to be well pasted and laced through the boards as shown, that is, through the hole at the end of each slot and out again at the corresponding one a little distance away. With this done to both boards the strings are pulled tight, the holes closed a little with the hammer and the loose ends that protrude through the board are cut off flush.

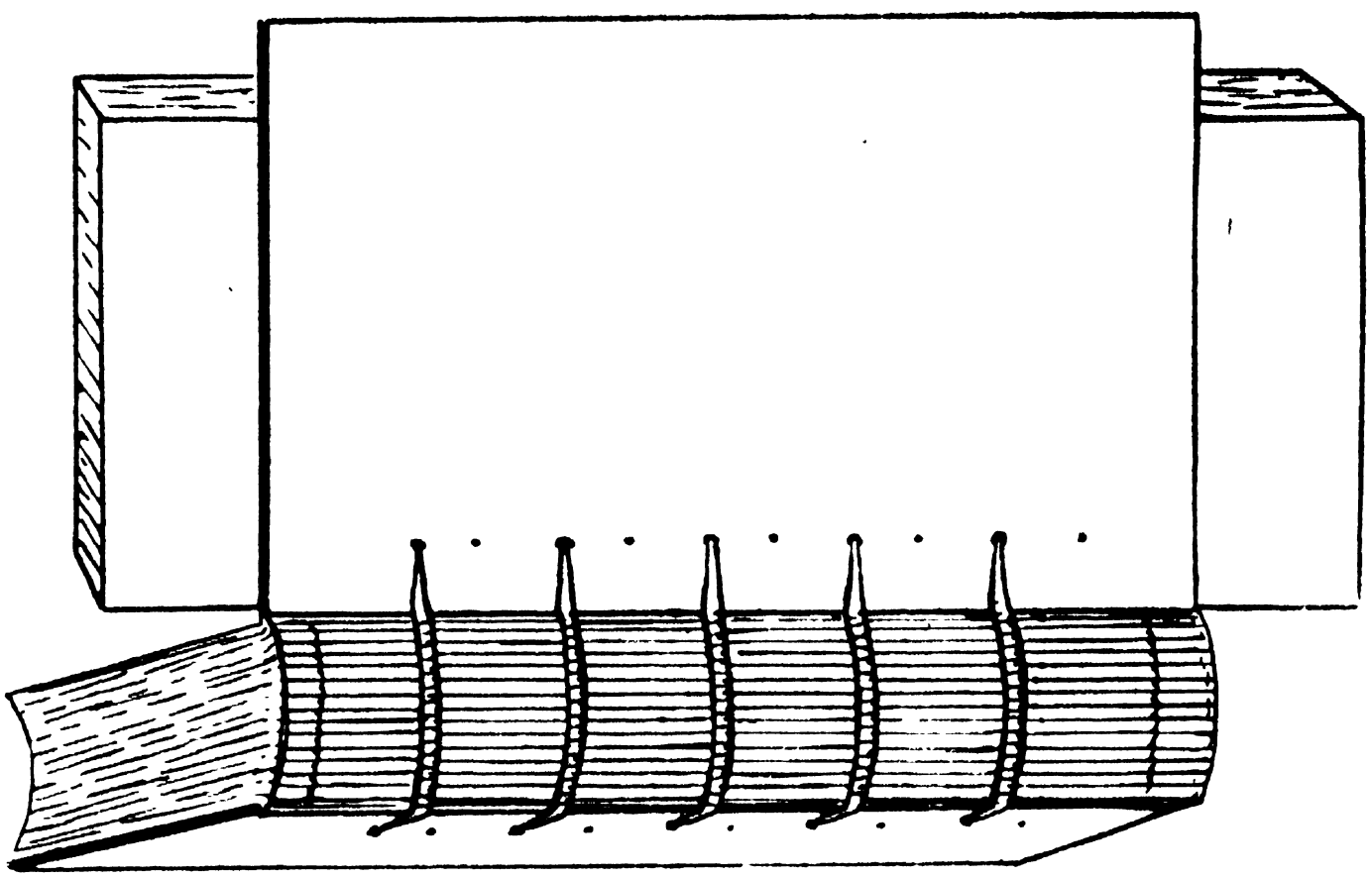
The boards are now attached, but it will be noticed that something must be done to level the surface down or the holes will show through the leather. In the first place the boards are placed, one at a time, upon a beating iron and everything is made as flat and level as possible with the round-faced hammer. Both sides of each board are treated in this manner, and, afterwards, while the paste is still a little moist, the books are built up in the press with a stout piece of tin each side of both boards, and a good pressure applied.



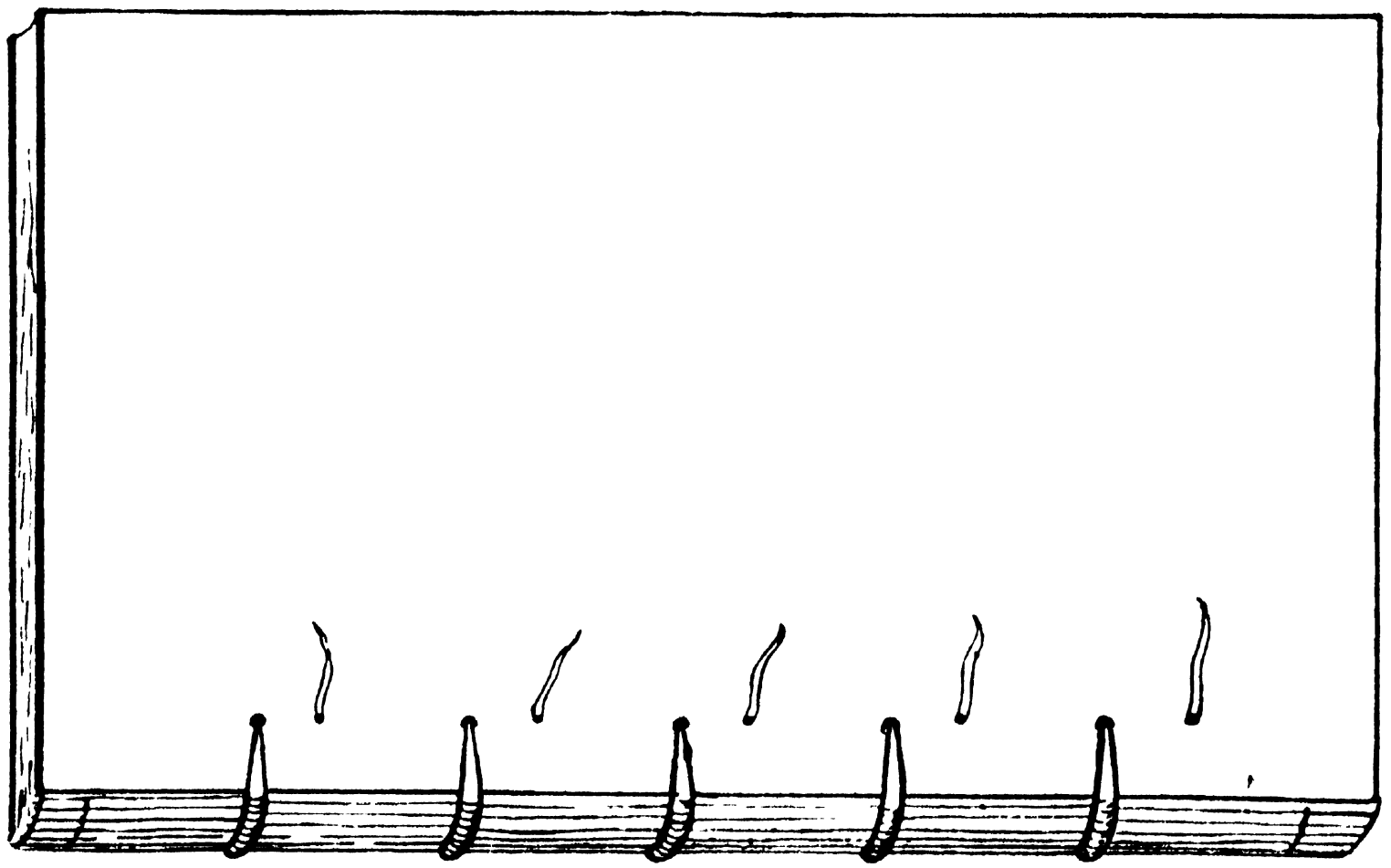
BOARDS PREPARED READY TO BE LACED ON.



ESTIMATING THE BOARDS FOR IN-BOARD WORK.



BOOK IN POSITION FOR HAMMERING THE SLIPS.



SLIPS LACED THROUGH THE BOARDS.

THE SPLIT BOARD AND FRENCH JOINT.

The boards of a leather-bound book that is sewn on tapes are attached in a very different manner to one sewn on cords. Being an exceptionally strong method is one of the reasons for advocating tapes for library bindings. In the first place the boards themselves are made up different, each consisting of a thin strawboard pasted to a millboard; but the paste is not allowed to come within two inches of the long edge with the result that, after they have been pressed, a split is formed. The boards are then squared up and cut to size as explained for the laced-on variety, but with one important exception : a groove of about one-eighth of an inch is allowed down each joint—in other words, the boards do not fit right up to the backing, but a short distance away. This groove forms what is known as the "French joint."

A library style binding cannot be cut "in boards," so that before they can be attached the necessary trimming must be done (see cutting), also any edge decoration.

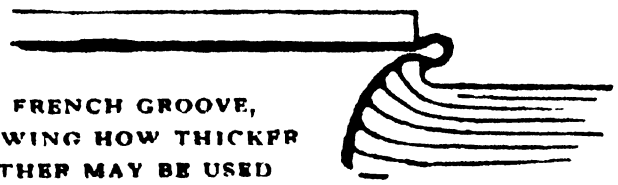
To fix the split boards the tapes are first glued down to waste sheet of the endpaper, which is then glued and folded over forming a flange, which is afterwards cut down so that it will fit into the split in the board. With a small-sized brush a little glue is worked into the splits and the flange is slipped between. Both boards are attached at the same time and while the glue is still wet they are carefully set in position with the squares equal, after which the book or books are placed into the press without delay

CLOTH BINDINGS.

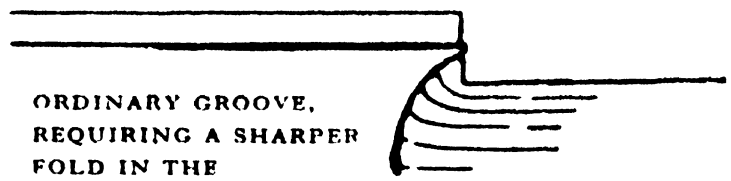
The boards of a book bound in cloth, by the method known as "casing," are not attached to the book at all at this stage, but they may be cut to size and placed into position until such time as they are required.

CLEANING OFF THE BACKS.

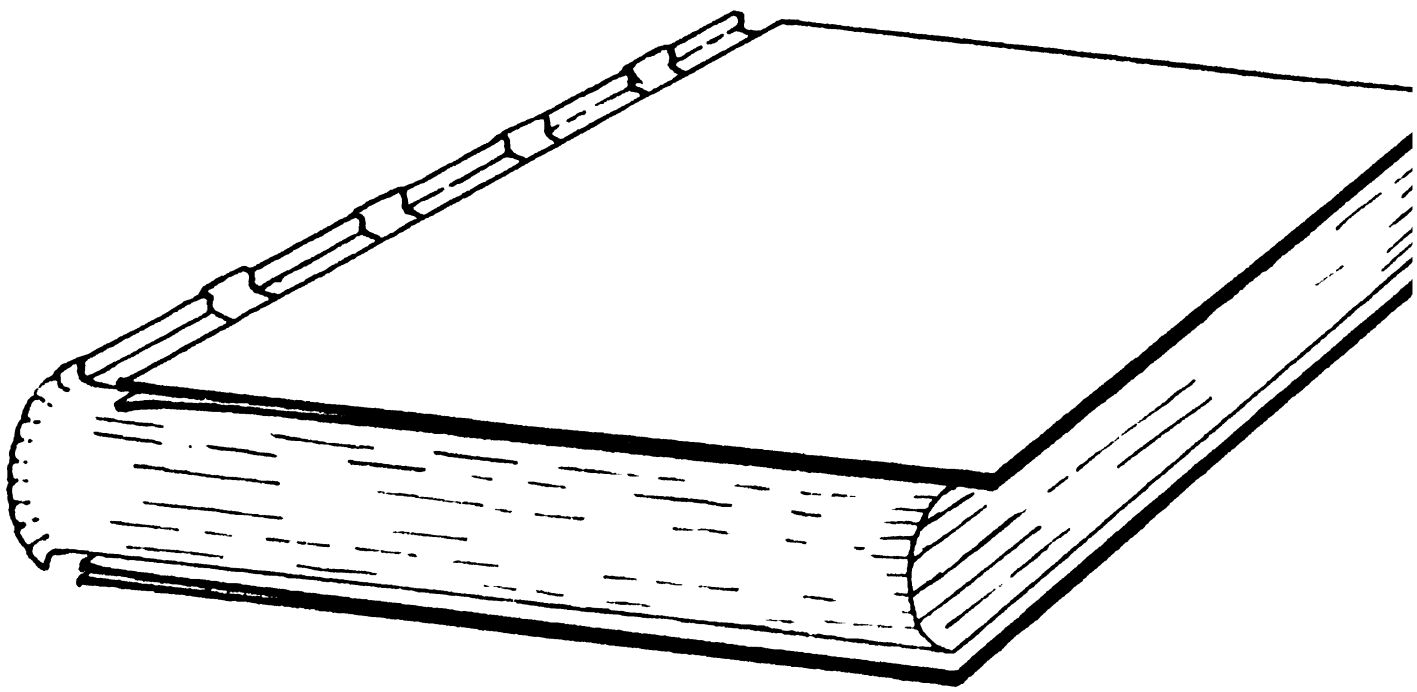
It will be noticed that the operation of backing has caused the glue on the back of the book to become broken and rough, and, apart from this, glue is undesirable. While the books are in the press after the boards have been attached is a convenient time to clean the backs. They are pasted over and a little time is given to allow the moisture to soften the old glue. At this stage the book is scraped by means of a flat stick and cleaned with paper shavings. This results in the removal of the old glue and paste from the surface of the back, but with no reduction in strength, for it remains between the sections. The books must dry thoroughly before removal



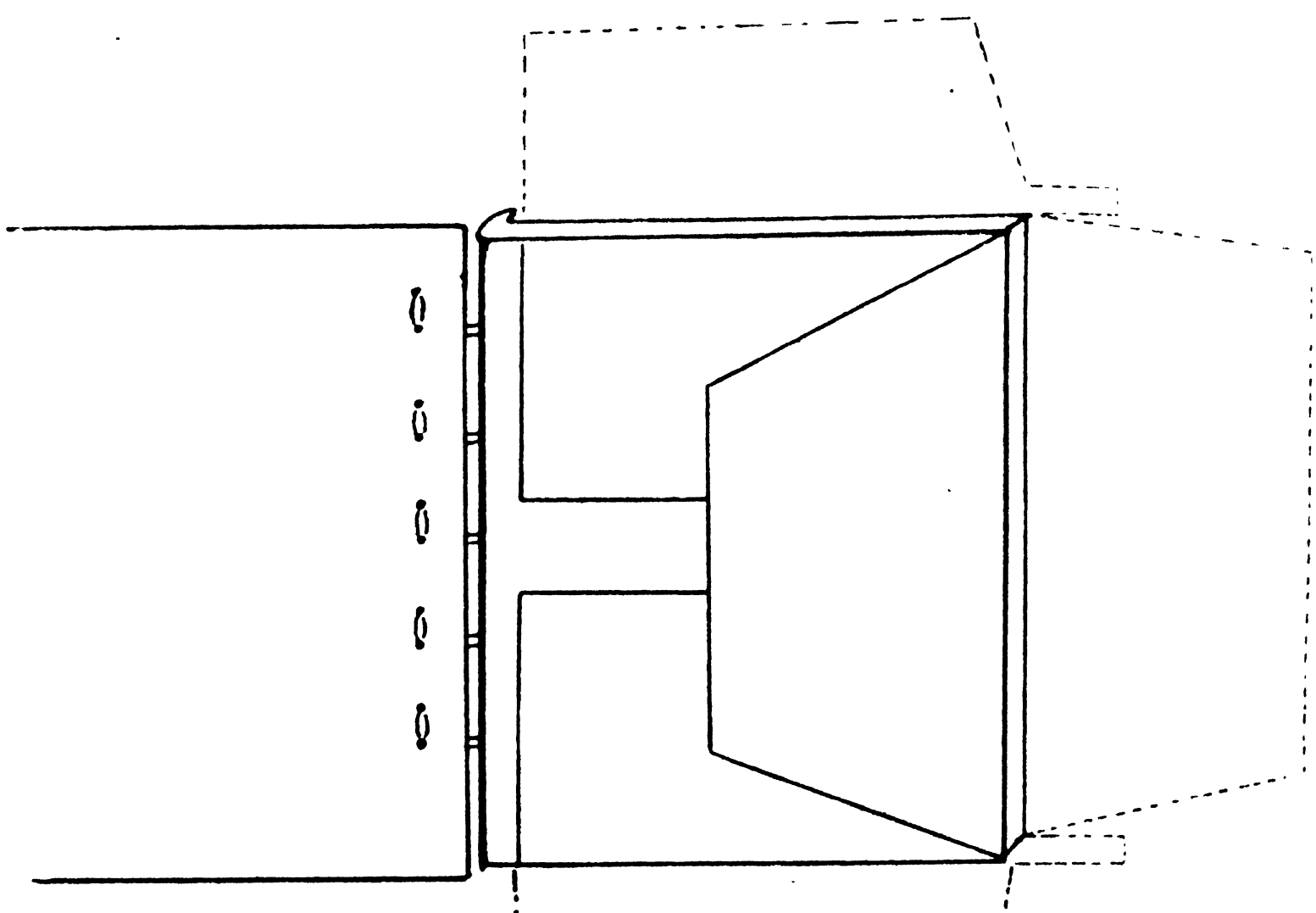
THE FRENCH GROOVE, SHOWING HOW THICKER LEATHER MAY BE USED FOR THE COVERING.



ORDINARY GROOVE, REQUIRING A SHARPER FOLD IN THE COVERING MATERIAL.



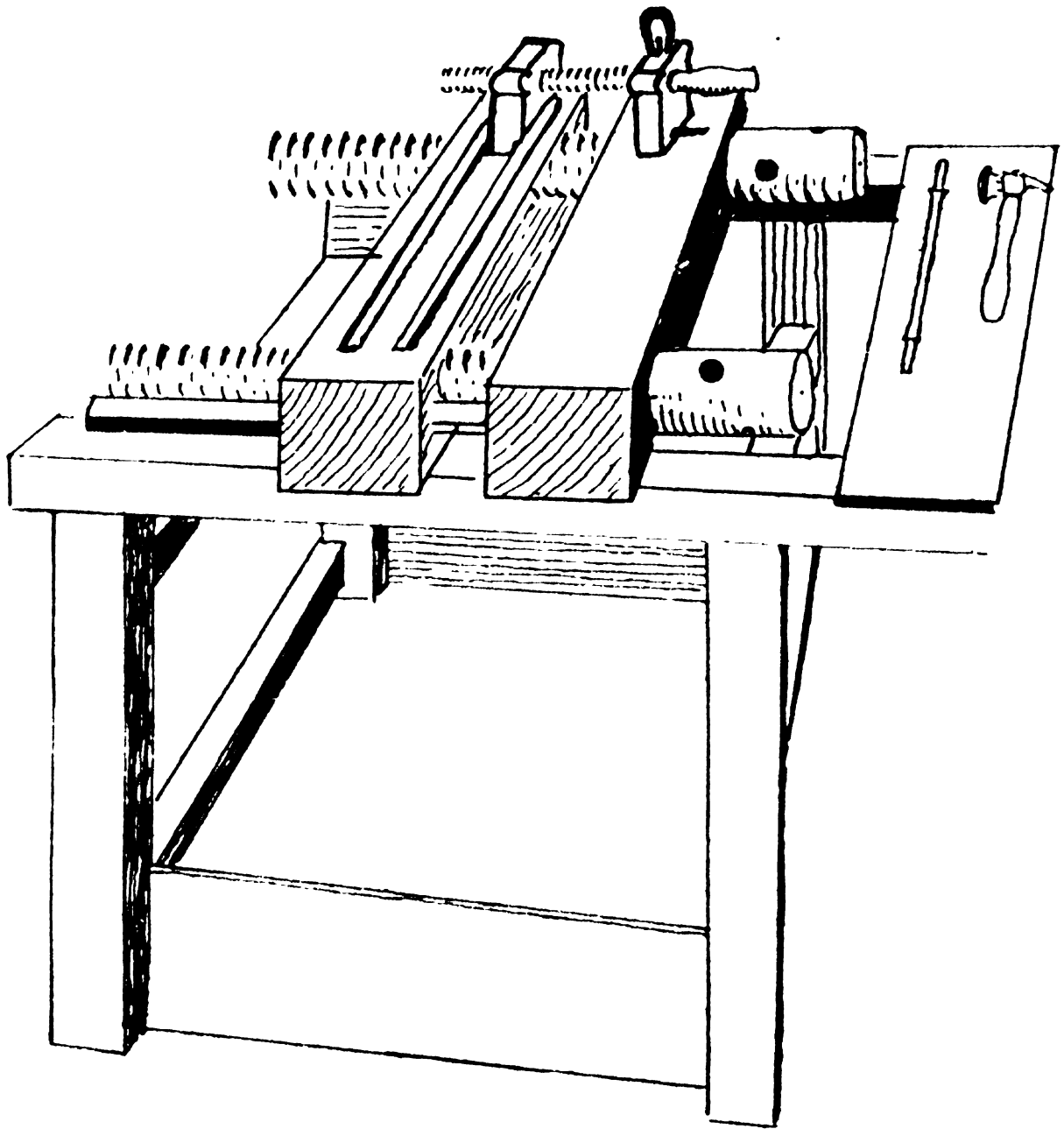
ATTACHING THE BOARDS, LIBRARY-STYLE BINDING.



CAPPING THE EDGES

CUTTING "IN-BOARDS," USING THE PLOUGH.

In order to make this work complete it is considered necessary to include a description of the use of the plough for trimming the edges of books. The guillotine has largely superseded this method on account of the greater output, but for fine bindings, or for amateur use where the trade is treated as a handicraft, it is still employed.



THE LAYING OR CUTTING PRESS AND PLOUGH.

The plough together with its press and stand are illustrated, and it will be seen that it consists of two uprights connected by a wooden screw. The whole is capable of a backward and forward movement along the two slides attached to the press, and the right-hand portion is also capable of a gradual motion to the left by slowly turning the handle of the screw. The plough knife is fixed to the base by means of a bolt, whereby it can be removed readily for regrinding. When properly adjusted the knife should travel level with the top of the press.

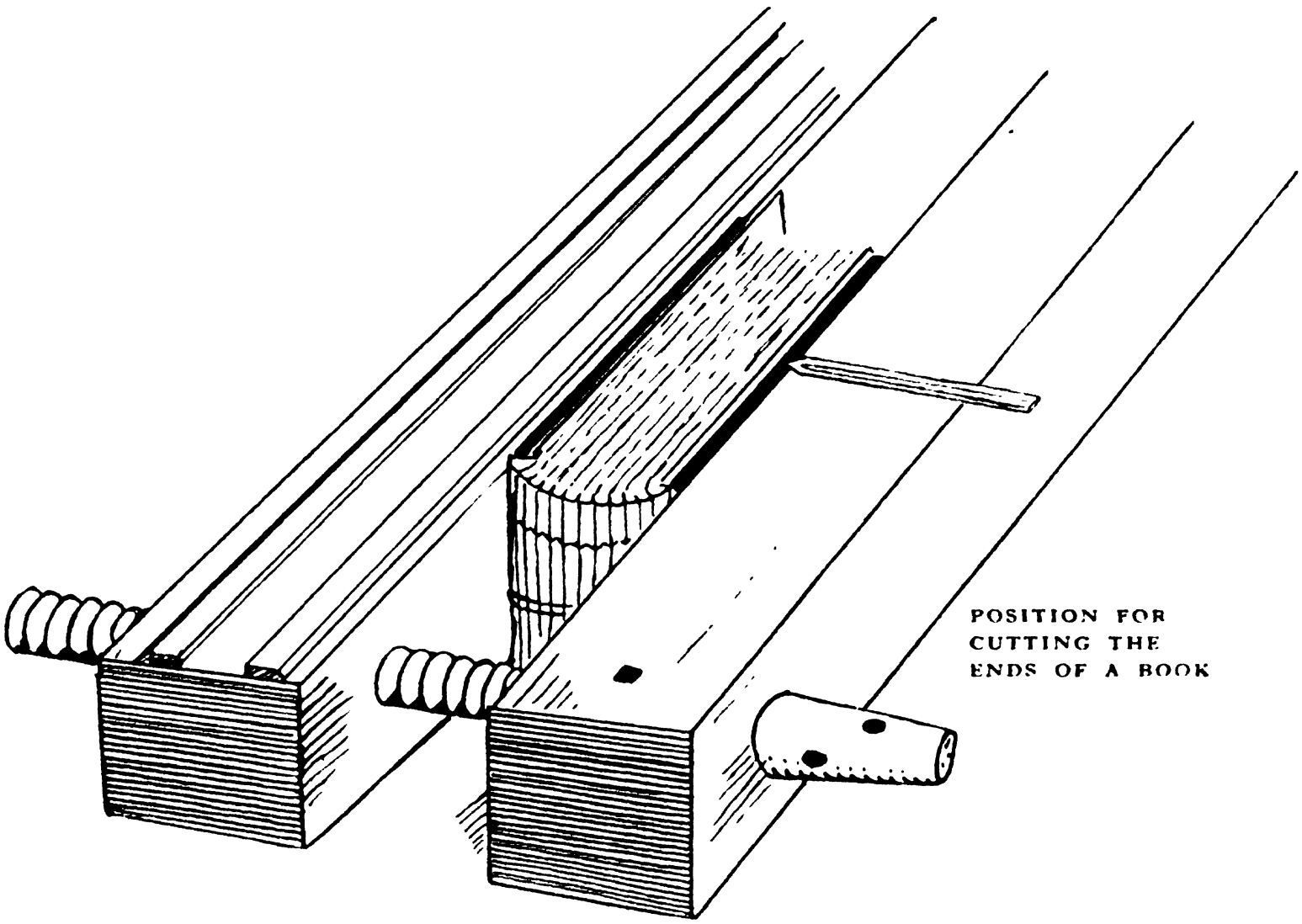
To trim the head of a book the front board is lowered about one-eighth of an inch and a piece of waste card is inserted behind the back endpaper. It is then lowered into the press as shown in the diagram and the screws tightened. In this position the plough may be worked backwards and forwards with a firm motion and, as the knife gradually advances, the edge is cut. It is advisable to cut only as the knife recedes, or there is a danger of a piece breaking away from the head, and care should be taken that the action is stopped immediately the last sheet has cleared or the back board will be spoilt. The tail edge is treated in exactly the same manner, and if the size of the boards has been estimated correctly, the knife should clear the shortest sheets.

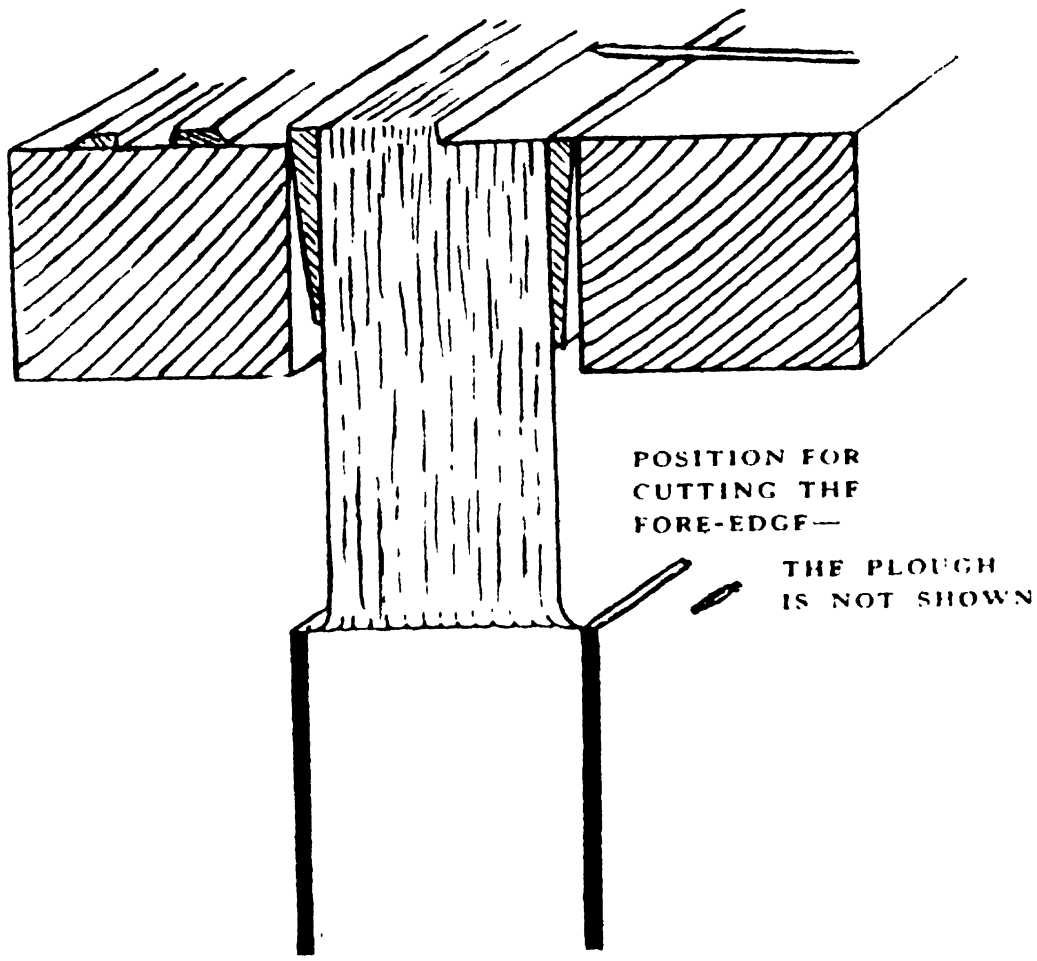
Cutting the fore-edge is rather more difficult on account of the round of the book. A temporary flat back must be obtained during the operation by the method shown. Before this is done, however, the endpapers are marked to the width of the boards, as it is necessary to trim a "square" beneath this mark. Wedge-shaped cutting boards are used, the back one being placed level with the mark, but the front one a square below. The steel "trindles" are now extracted and the book is lowered into the press so that the front board is perfectly level and the back one a little above, as shown. The beginner may find that several attempts are necessary before the correct result is obtained. In this position the fore-edge may be trimmed with the plough and the knife may cut in both directions. Upon releasing the book it should spring back to its original round shape and the boards should be found to overlap the edges by a neat square.

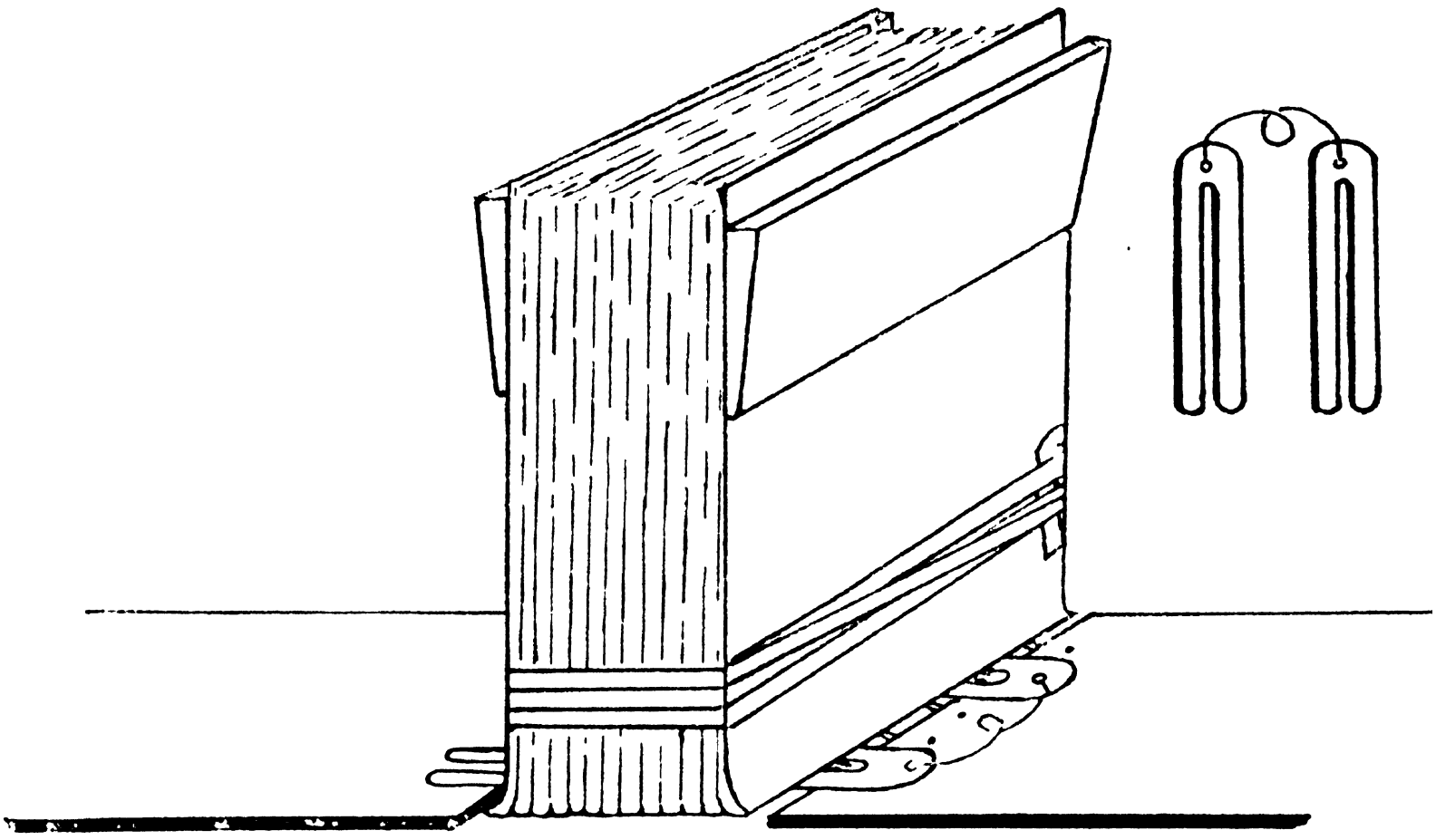
THE CUTTING MACHINE OR GUILLOTINE.

The action of the guillotine knife is very different to that of the plough. Coming down with a diagonal motion it is forced through the paper and leaves it again in the course of about two seconds. Under these conditions a rounded book would break away at the corners, therefore the edges are trimmed before the operation of rounding and backing.

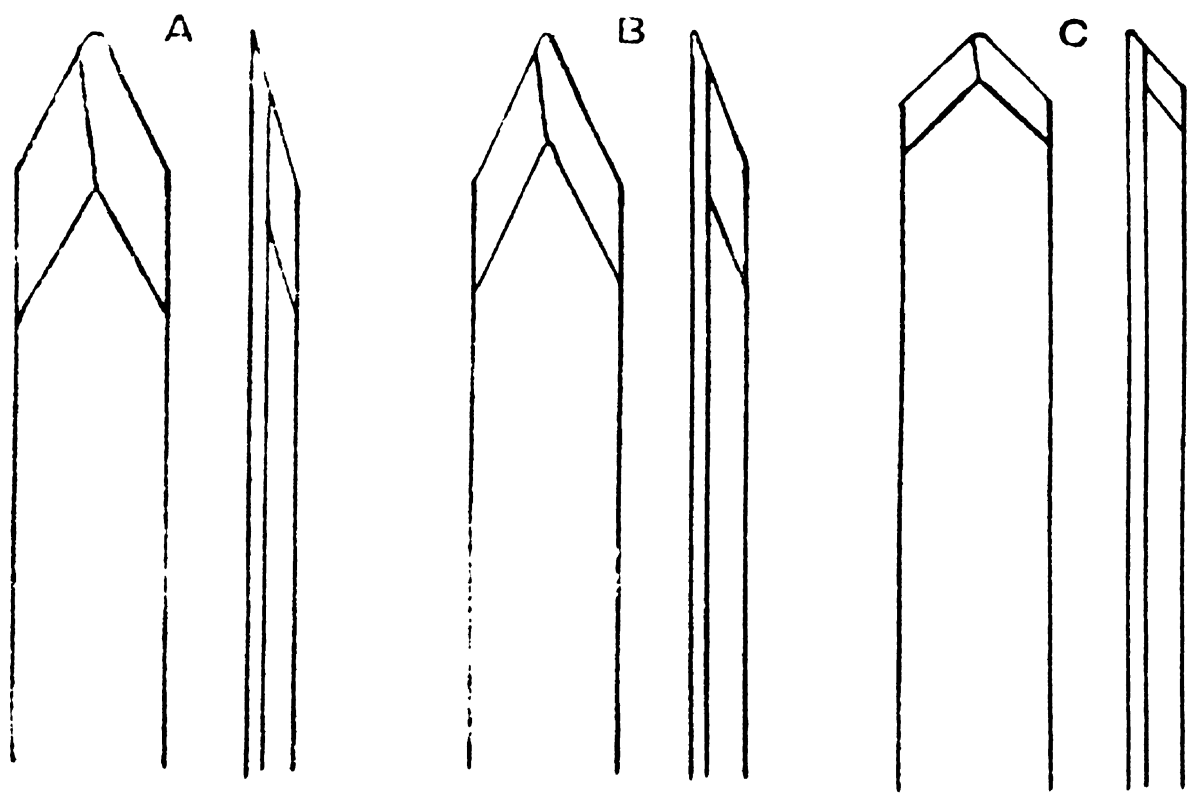
Trimming the fore-edge is a fairly simple matter. The back of the book is placed against the gauge, which is then brought forward until it is estimated that the knife will take off the required trim; the clamp is then screwed down and the knife lowered. The tail is the next edge to be cut, which means that the top edge is placed against the gauge. Whether the book may be clamped direct depends upon circumstances, for if there is no appreciable swelling


POSITION FOR
CUTTING THE
ENDS OF A BOOK


POSITION FOR
CUTTING THE
FORE-EDGE—
THE PLOUGH
IS NOT SHOWN

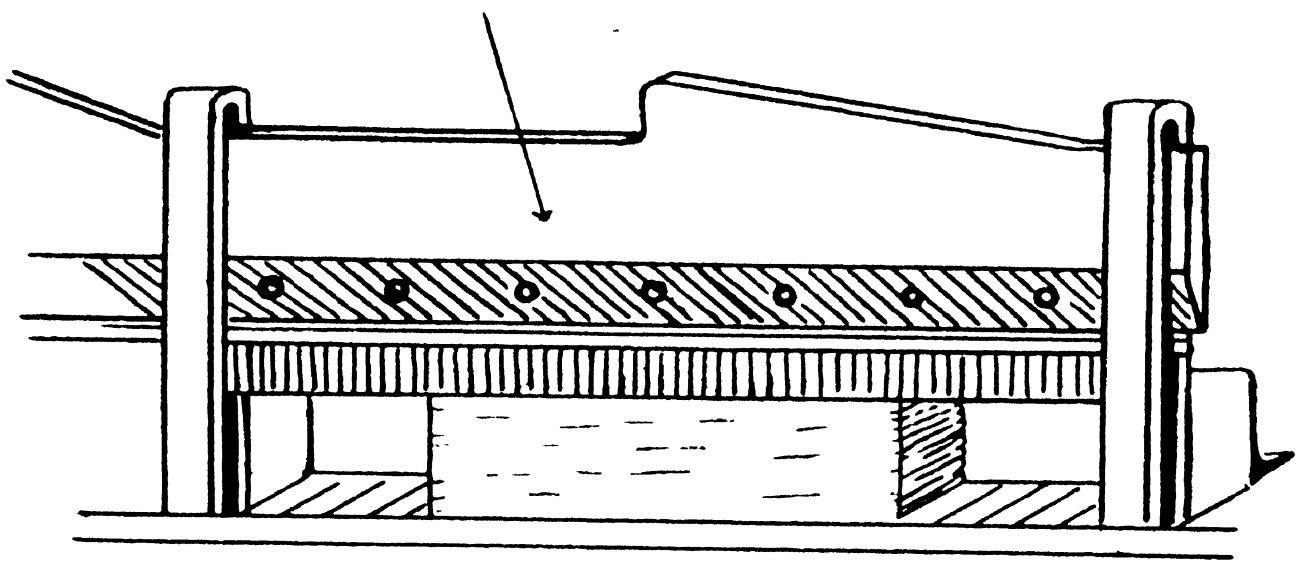


TEMPORARILY SECURING A FLAT BACK WHILE CUTTING THE FORE-EDGE.

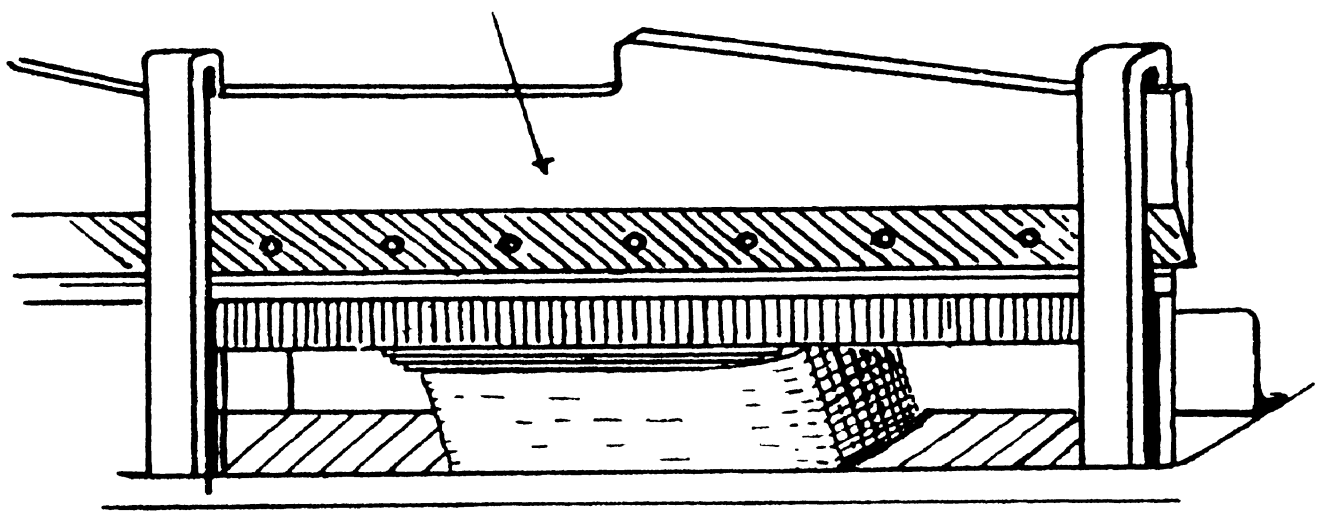


PLOUGH-KNIFE GRINDING.

in the back this may be done. Otherwise it becomes necessary to pack up the fore-edge with pieces of card as shown. The head is the last edge to be trimmed and it is very important that the cut is square with the back. It will be noticed that the bed of the machine which contains the gauge is ruled with a number of parallel lines. These are for the purpose of squaring paper and books, for they should be at right angles to the knife itself.



CUTTING THE FORE-EDGE IN THE GUILLOTINE.



CUTTING THE HEAD IN THE GUILLOTINE.

The guillotine will cut boards up to about three-pound strawboard, but care must be taken not to overload the machine with too high a pile. Thicker boards may be trimmed round the edges with comparative ease, whereas any attempt to cut them in half may cause damage. This risk is reduced in the case of machines employing a double shear motion of the knife. Another improvement in the guillotine is a self-clamping arrangement whereby this operation becomes automatic; machines with three knives are used for wholesale bookwork, whereby three edges of a pile are cut at one operation.

When to cut. The extent to which the edges of books may be trimmed depends upon various circumstances, but the binder is seldom wrong in cutting as little off as possible. Books in temporary bindings should be *uncut*, while many permanent leather bindings have the edges trimmed at the *top only*. A rough-cut edge has the sheets trimmed round, but no attempt is made to cut down to the shortest ones, which under the circumstances are called "proof." Library works and books of reference in general should be cut *solid*, owing to the difficulty in turning the leaves when the edges are rough.

GILDING EDGES.

The edges of a book may be gilt, marbled, sprinkled, plain coloured, or they may be left plain.

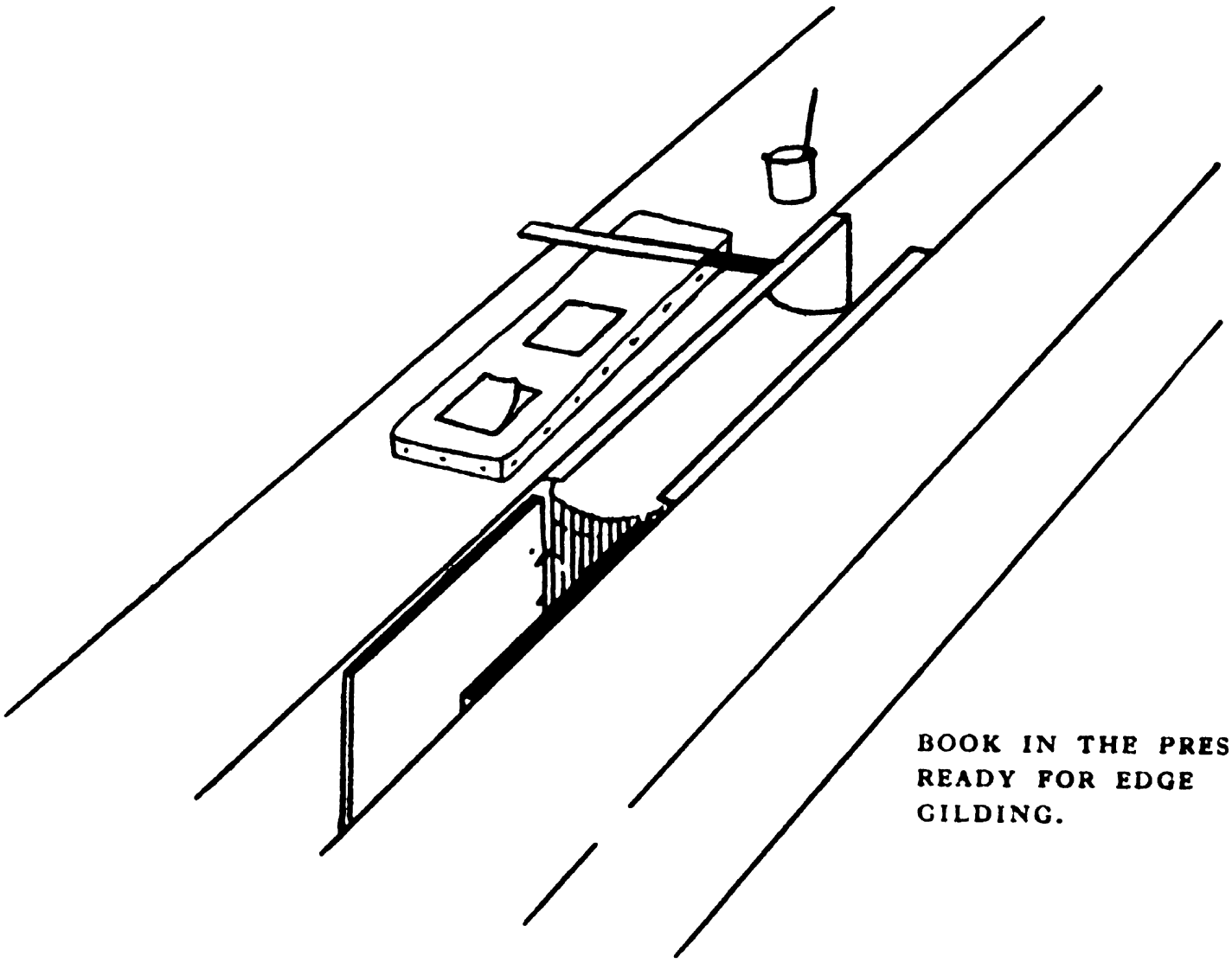
The gilt edge. Far above all other means of finishing the edges of a book is the gilt edge. Apart from its appearance, it keeps the dust out of the paper and it also prevents, or helps to prevent, modern papers from fading round the edges by keeping out the light.

The laying press and a pair of cutting boards are used for gilding, also the following articles should be kept in a box ready for use—a flat burnisher and an agate "tooth" burnisher, both of a large size and good quality; a gold cushion and knife, a steel scraper, an ordinary nail brush, some pieces of sandpaper of various grades, a saucer and sponge, a small covered pot and a long-haired camel-hair brush for glair, a small quantity of black lead and a red chalk called "armenian bole." The burnisher must be strong, as the pressure required is considerable; the red chalk is to be obtained from any large colour firm, and the glair is prepared as follows:—From a good-sized egg separate the yolk and drop the white into two-thirds of a pint of water. The mixture is then well beaten up and allowed to stand for several hours, when, after it has been strained through muslin, it is ready for use.

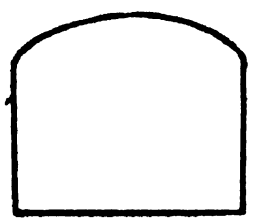
Dealing with the head of the book first it is screwed up into the laying press as shown opposite. The cutting boards used must be planed up straight every time they are used and must be exactly level with the edges of the paper. The boards of the book are not to be gilded with the edges, as they may contain some impurity that would prevent the gold from sticking. The whole should be placed well down into the press, so that the weight is felt right on the edge of the book, and a good pressure applied.

To obtain the necessary smoothness the edge is first scraped and then sandpapered. All scratches and any roughness will show on

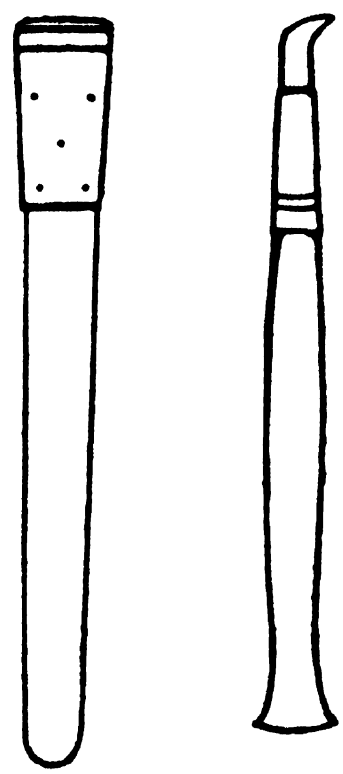
EDGE GILDING.



BOOK IN THE PRESS READY FOR EDGE GILDING.



THE SCRAPER.



THE BURNISHERS.

the burnished gold and must be removed; therefore, a book that has been badly cut gives the gilder considerable trouble. A little of the armenian bole is mixed with water to form a paste and applied freely to the edge. This serves a double purpose—it acts as a filling if the paper is at all porous, especially that part of the edge where the book is backed and is taking none of the pressure; the red colour also improves the appearance of the gold. When this paste is dry the edge is brushed vigorously with a dry nail brush until it has a burnished appearance all over; a result that may be assisted by previously sprinkling a little powdered black lead on the brush. At this stage the edge is ready to receive the size and the gold, and the student is warned that if it is but touched with the hand enough grease will be imparted to it to prevent the gold adhering.

No time must be lost between sizing the edge and laying on the gold; therefore, everything must be in readiness. A sheet of gold is taken from the book and cut into pieces half-an-inch wider than the edge. Some pieces of stiff rough-surfaced paper are taken which, if rubbed against the hair, sufficient grease will be imparted to enable them to pick up the gold. Enough gold is transferred to these papers to cover the edge of one book. As quickly and as straightforward as possible the size is flooded over and the gold transferred from the paper on to it.

Burnishing. On a dry day one hour is sufficient time to allow between laying on the gold and burnishing, but in wet weather several hours will be required unless it is dried off by artificial heat. If it is done too soon the burnisher will stick and the edge will be spoilt, but if it has been allowed to become too dry the gold will not come up so bright. The first burnishing is done lightly through paper, then a piece of soft leather prepared with beeswax is lightly rubbed over the gold.

The flat burnisher is used for flat edges, lightly at first, then gradually increasing until the operator is exerting all his strength.

The resulting edge should have the appearance of a solid block of gold free from marks of any description, but the process, being a complicated one, gives the beginner so many opportunities to go wrong that it is very unlikely that he will obtain a perfect edge within the first attempt. Below are the more frequent faults and their remedies.

Gold does not stick. If the gold comes away in well-defined patches it is due to faulty laying on; the leaf, becoming doubled up, has not come into contact with the book in places. The remedy is to lightly burnish through paper fifteen minutes after gilding while the size is damp enough to fix the gold, but not enough to be forced through. If the gold comes off in small spots it is probably

due to the red chalk being too coarse or there is too much left on the edge. Weak glair will cause the gold to appear "sandy"; but if too strong the leaves will stick.

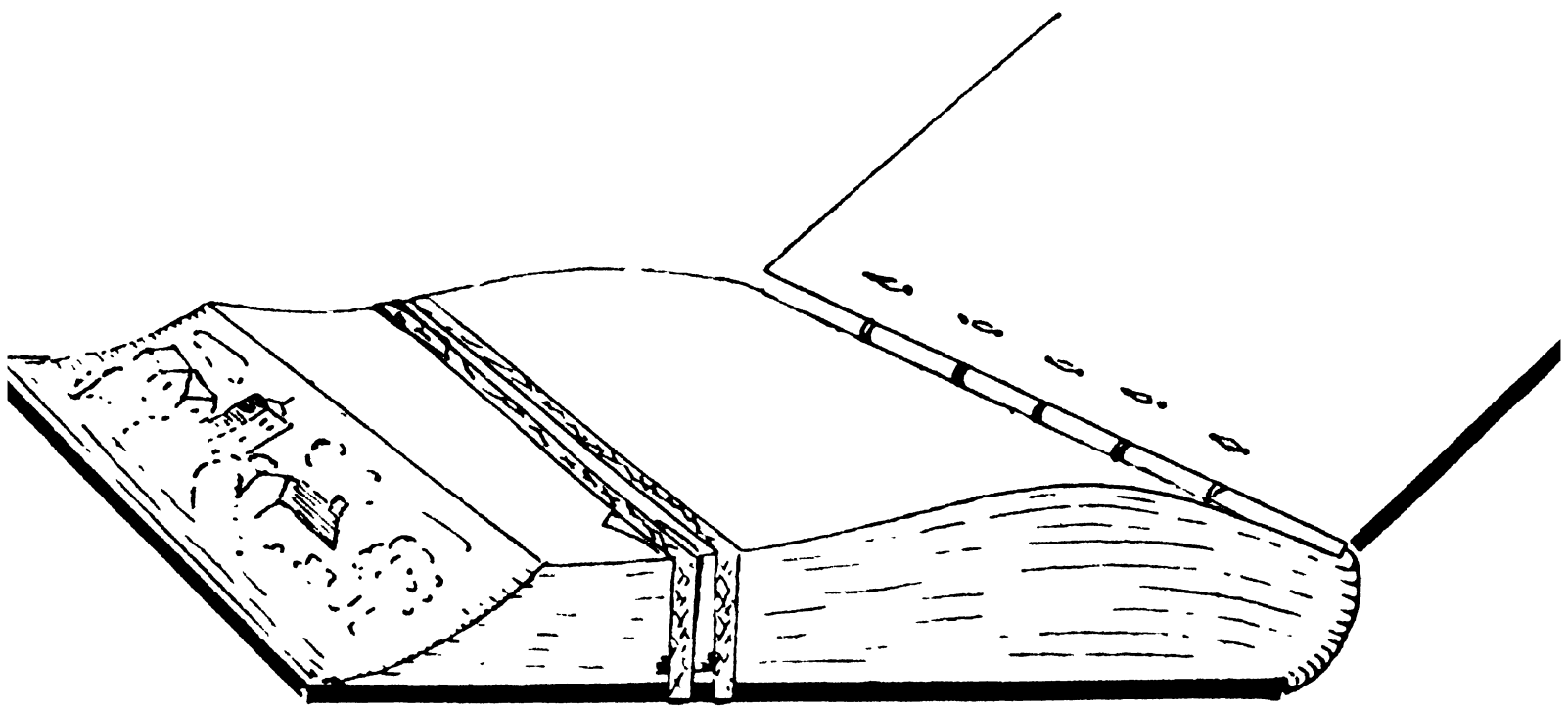
Faults with the burnish. Patches upon the edge that refuse to burnish are caused by glair. If the edge is touched at all while the size is still wet, the moisture will be forced through the gold and that place will refuse to burnish; splashes of glair have the same effect. Do not always blame the burnisher for scratches across the edge, they are probably caused by grit from the cutting boards and the remedy is to rub the beeswax leather over them. The beginner will have difficulty in obtaining a uniform burnish over the whole edge and this can only come with practice; an effort should always be made to work the burnisher from one end of the edge to the other without a pause. If the size is at all wet the gold will be rubbed off, but if the edge is too dry the same degree of burnish will not be obtained as when the preparation is in the right condition. Other faults occur upon the edge not being scraped and sandpapered properly; at the same time it is quite possible to take too much off and put the book out of square.

GILDING IN THE ROUND, ETC.

The above remarks apply to gilding the flat ends of a book, but when the fore-edge has to be dealt with it may be either knocked-up square and gilded as described or it may be gilded in the round. This latter method differs in its details and is more difficult. Its advantages are by some considered doubtful, for though the edge is smooth and more solid it is rather unnatural. For the scraping, a special set of rounded steels are required to fit the different thicknesses. The laying of the gold gives trouble, for instead of settling down into the hollow it breaks across it. One remedy is to use a piece of gauze instead of paper, for if the gold is picked up by this and held in position over the edge, a sharp breath through it will release the leaf which falls loosely upon the size. Another difficulty with a rounded fore-edge is incurred by the size instead of distributing itself over the edge forms a pool at the bottom of the hollow, and this must be run off after the gold is in position by turning the press upon its side. For the burnishing, the flat stone may be used where the round is not very great, otherwise it will be necessary to use the tooth shape, working along the edge instead of across it.

Colour under the gold. Although the red chalk used in plain gilding affects the colour of the gold a little, it is not sufficient to produce the appearance that is often seen connected with the edges

of Church books. To obtain this effect, the colour must penetrate into the paper a little, therefore, a liquid stain is used and when applying, the press should be released a little for the time being. The time to apply the colour is immediately after the edge has been sandpapered, and a vermilion red is the shade generally used, but other colours may be tried.



FORE-EDGE PAINTING.

The painted edge. A development of the "colour under gold" effect is to paint a picture on the edge before gilding. This picture is not seen when the book is shut, but as soon as one attempts to open it the fraying of the leaves brings it to view; for this reason the fore-edge only is suitable, which must not be too round. After the edge has been smoothed down, the book is taken out of the press and tied up as shown above, while being painted. After releasing, the gilding may proceed, but no red chalk or blacklead must be used; a preliminary burnish will help to close the pores and an extra coat of glair allowed to dry on will help.

Rough gilt edges. To gild the edges of a book that has been cut rough is somewhat troublesome, but when well done and upon a hand-made paper is very effective. The size would simply soak into the paper if any attempt was made to gild in the ordinary manner, and the only thing to do is to interleave with thick paper until the edge becomes fairly solid. For very rough edges, such as are produced when the sections are merely trimmed to size in the board-chopping machine, the interleaving and the gilding of the fore-edge and tail may also be done before the book is sewn, the head being cut and gilded in the usual manner.

Tooled edges are dealt with under "Finishing."

Antique gold edges are sometimes required and if the student will examine a genuine old gilt edge he will find it rather dull but smooth. If a new edge is left unburnished it gives something of the effect, or better still burnish and then give it a wash over with water with a soft pencil brush. It is a common mistake to use a deep red gold to give an antique appearance, old gold is always a good yellow colour.

Sprinkled edges. If a large brush containing colour is hit against a heavy stick, or if a flat brush is rubbed against a sieve, the liquid flies off in a more or less fine spray, which, if directed towards the edges of books, forms the familiar sprinkled edge. Any good water colour may be used, which should be selected to match the cover, venetian red being that in common use. Sprinkled edges should be burnished, the method being the same as that used for finishing gilt edges.

Coloured edges. Water colours may be applied to the edges of books with a fine sponge with little fear of the liquid penetrating the paper unless it is exceptionally porous. The book may be placed against the edge of a bench with a weighted board on the top. Useful colours are golden yellow (picric acid), dark green or a quiet blue. Coloured edges should be burnished. There is a piece of apparatus used by signwriters, etc., whereby colour is ejected in a fine spray from the end of a flexible tube by means of compressed air. This may be used for producing sprinkled or coloured edges in a very quick and ready manner where the quantity of work is large.

MARBLING.

This operation consists in decorating the edges of books or flat papers in a special manner and derives its name from the fact that some of the patterns produced resemble marble. The process consists in floating certain pigment colours upon the surface of a liquid, and, by stirring or combing the liquid, forming patterns which are afterwards transferred to the papers or the edges of the book by dipping them into it. The liquid is a form of gum and the pigments are ground in water, but it is the addition of ox-gall which causes the colours to float on the surface and to spread in the remarkable manner they do. Much of the success of the process depends on the fact that the colours do not mix together upon the liquid being disturbed, but are broken up into an endless variety of shapes and patterns.

There are several processes which differ in details, the one about to be described being the simplest, as the colours may be obtained ready prepared.

The size, mucilage, or gum is prepared from carrageen moss, an Irish seaweed. Five ounces are taken and added to six quarts of rain water, to which a preservative, such as a few drops of formaldehyde, may be placed. This mixture is brought to the boil in about one hour and then stirred for three minutes, after which three quarts of cold water are added. It is allowed to stand for twenty-four hours and then strained through linen twice. The bath itself should consist of a large oblong enamel trough.

The prepared colours and preserved ox-gall may be obtained from most bookbinders' material dealers. They are shaken and a little of each placed into small pots at the back of the trough. The ox-gall is placed into a dropping bottle, whereby a few drops may be added to each colour until it is found that when a single drop is allowed to fall on the bath it spreads out to about two inches. The gum is cleared every time it is required for a pattern by skimming the surface with a strip of paper.

The more familiar patterns are produced as follows:—

Dutch. The colours are applied to the bath in strips by means of a stick or pencil. A wide comb, consisting of fine needles about three-eighths of an inch apart, is taken and applied across the strips, forming the familiar coarse comb patterns of this marble.

Nonpareil. Drops of colours are distributed evenly over the surface of the bath, which are then broken into fine strips by means of moving a stick backwards and forwards over the whole surface. The whole is then combed across the strips with a finer comb.

Shell. A coarse brush resembling a miniature birch broom is used to sprinkle small drops of one or more colours over the surface of the bath; this may be done by knocking the handle against a wooden pin while held over the size, whereby the colours leave in a coarse spray. If now the gall water is taken and sprinkled in a similar manner, the spreading power of this substance being much greater than that of the colours, the latter are forced into veins, resembling those to be seen in marble itself; the gall being colourless will form a white ground to the marble, but it may be tinted, forming a light colour to the whole of the pattern.

In order to transfer the pattern to the sheet of paper, or the edges of a book as the case may be, these require to be sponged over with a strong solution of alum in water and allowed to dry; for the colours will not take well otherwise. In the case of books these are done one edge at a time, although a batch of small books may

be placed one upon the other and treated as one. A pair of light wooden boards are placed flush one each side of the edges to be marbled and the book pressed firmly between the two hands. This edge is now dipped into the trough to a depth of about a quarter of an inch upon the ready-prepared pattern and, without delay, water is allowed to run over it for a few seconds from a spouted utensil resembling a teapot or from a short length of hose; marbling must be carried out near a sink with a supply of water. The pattern can be transferred from the bath once only, although if the books are small the unused portion may be used for the other edges, otherwise it is necessary to skim the surface with the strip of paper and make a fresh one. The treatment of flat paper is similar to that of edges, but rather more difficult; a large surface of uniform pattern is not easy to obtain and in laying the paper on the surface of the bath, air bells are liable to occur.

REGISTERS.

A register in its simplest form is a narrow ribbon attached to the head of a book for the purpose of a book-mark. It may be attached at this stage of the binding by gluing it to the back and bringing it down between the leaves, the end being brought up again at another page, where it may remain during the progress of the binding.

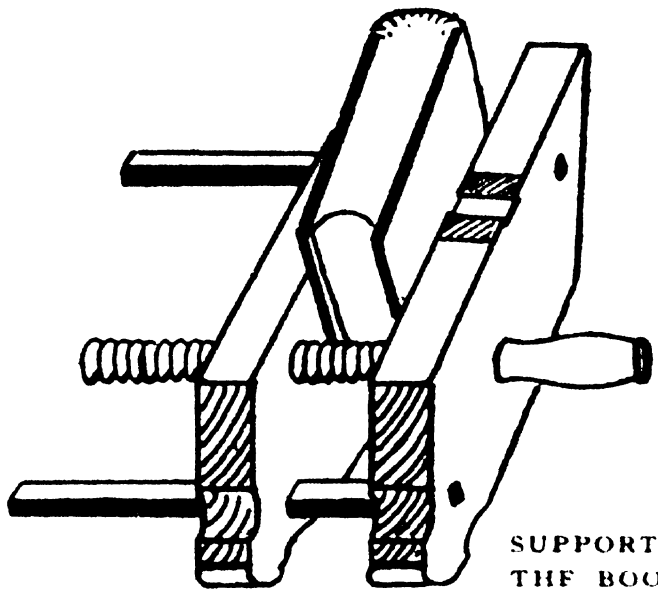
HEAD BANDS.

The head band is that piece of worked silk that can be seen on most leather-bound books at the extreme head and tail. Incidentally, it is used by the thoughtless in removing a book from its shelf, therefore it should be strongly attached. Originally head bands were always worked by hand directly on to the sections, but now they can be obtained ready worked for use on the cheaper class of bindings.

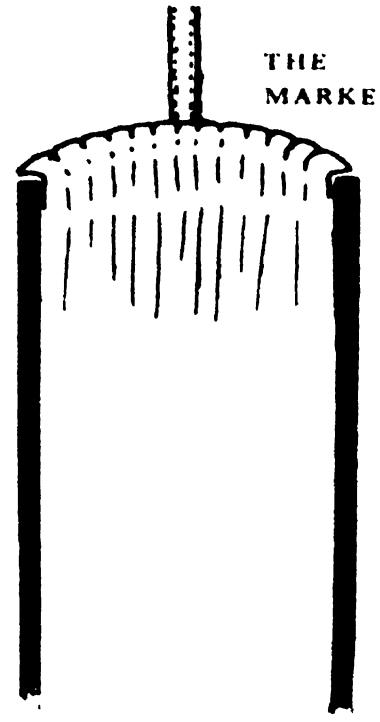
The following is a description of forming the hand-worked head band. The width of the band must be a trifle less than the squares of the book and the body upon which the silks are worked may consist of catgut or a piece of fine quality string. The silk thread should not be too fine, that used in general embroidery being excellent for the purpose.

The book is clamped in a light press with the boards pulled down flush. A needle length of one of the colours is taken, threaded, and the other colour is tied to the end—in the diagrams the two colours are represented by solid and dotted lines. Starting from the left-hand side of the book, and passing through the top

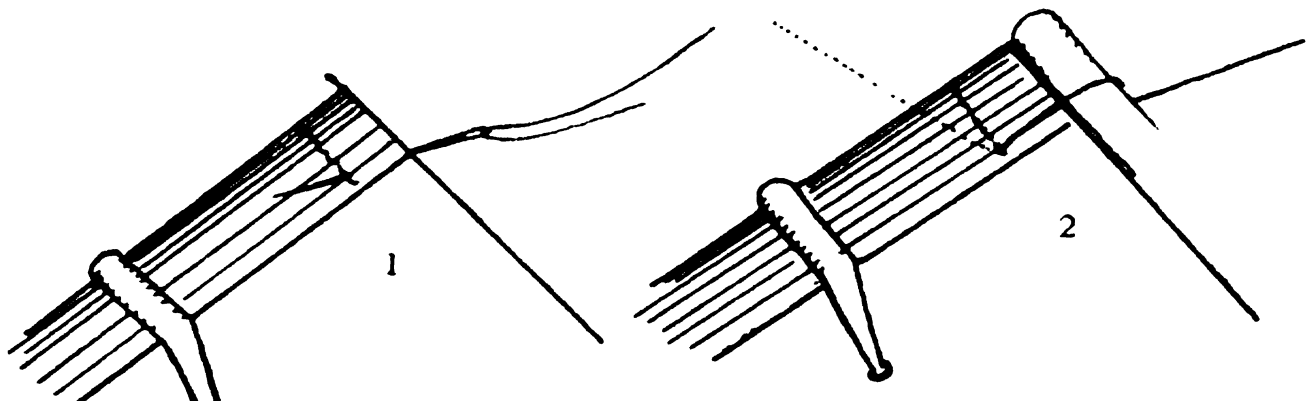
HEADBANDS AND MARKERS.



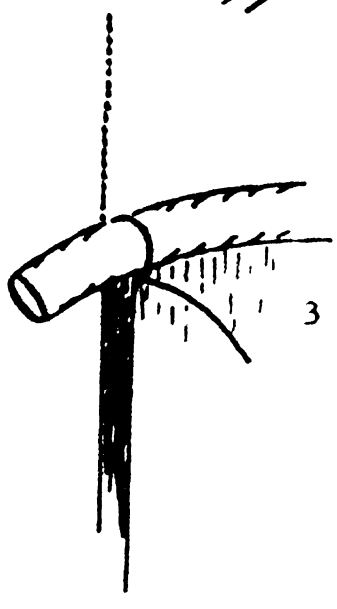
SUPPORTING THE BOOK

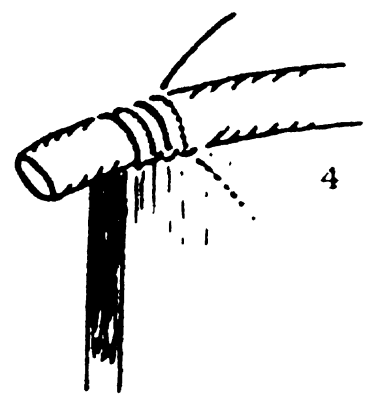


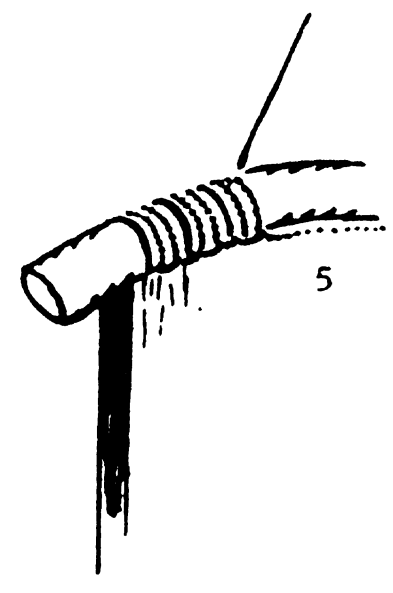
THE MARKER

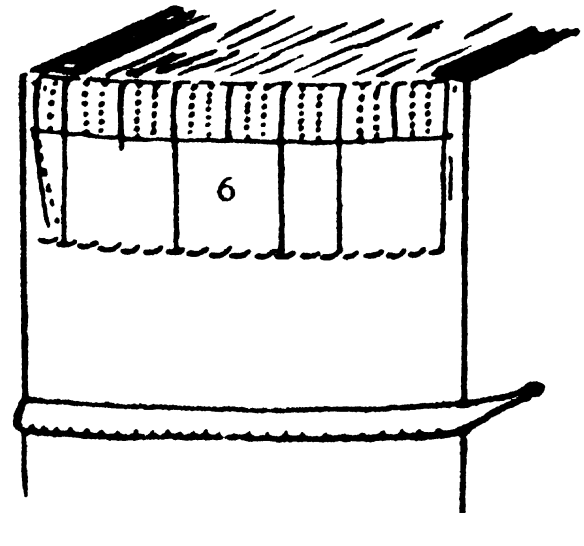


THE HAND-WORKED HEADBAND.









1. FIRST OPERATION.
2. LOOP HOLDING CAT-GUT IN POSITION. THE DIFFERENT COLOURED SILKS ARE REPRESENTED BY SOLID AND DOTTED LINES.
3. FRONT VIEW OF 2
4. FOUR STITCHES MADE.
5. USING TWO OF THE LIGHT COLOUR TO ONE OF THE DARK.
6. BACK OF BOOK, SHOWING HOW HEAD-BAND IS SECURED

round the kettle stitch, a loop is formed which holds the catgut in position, and leaves a length of each coloured silk, one of which holds the needle.

The silks are to be worked round the catgut, alternately crossing at the bottom of each turn, and the head band should be secured to the book at every six turns by passing the needle round the kettle stitch. Upon reaching the end they may be cut off, leaving an inch or so to be pasted to the back sections in order to prevent the work becoming undone. The catgut is then cut off with a sharp knife as close as possible to the silk. Instead of working the colours alternately they may be arranged two and one, giving a greater variety of pattern. Machine-made head bands are sold by the yard, which need to be cut to the width of the book in hand and glued to the back.

CAPPING THE EDGES.

At this stage the edges of books require some form of paper cap as a protection during the operations which follow. The simplest cap, and one that is quite suitable for an edge that is gilt on the top only, is a band of paper enclosing the book and the endpapers, but leaving the boards outside. As this form of cap leaves the fore-edge exposed, a more complete protection is required where the edges are gilt all round, this should take the form of an envelope which may be slipped off as required.

BACK LININGS.

A "tight" or "fixed" back is where the material used for covering a book is tight against the back sections; a "hollow" back has the cover separated from the sections by specially prepared linings.

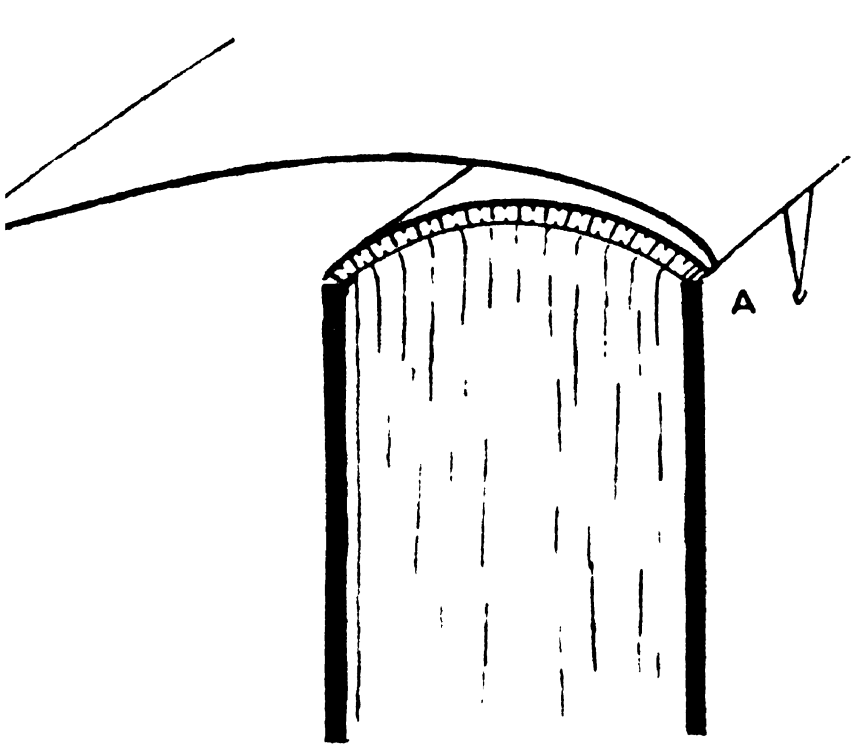
A flexibly-sewn book with its raised cords must have a tight back.

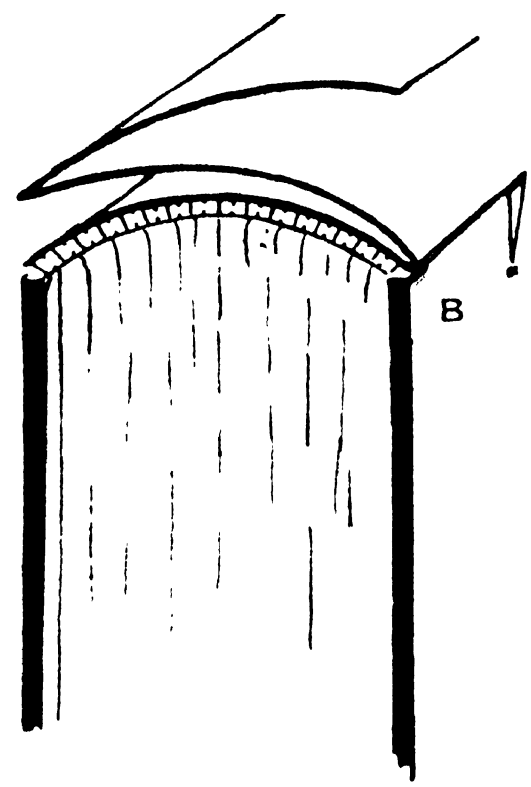
A library-style binding should have a tight back on account of its strength.

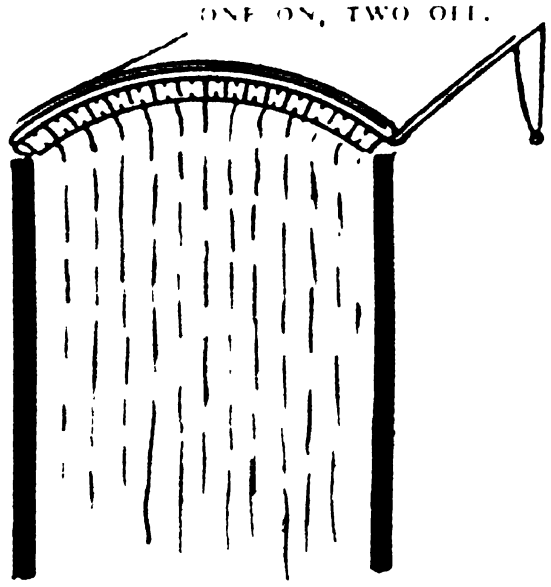
A sawn-in sewn book may have either. Books difficult to open on account of the stiffness of the paper should have hollow backs. Similarly, books that are to be covered in roan, calf or vellum are best with hollow backs. On the other hand, morocco, pigskin and leathers of this description may be pasted direct to the back sections.

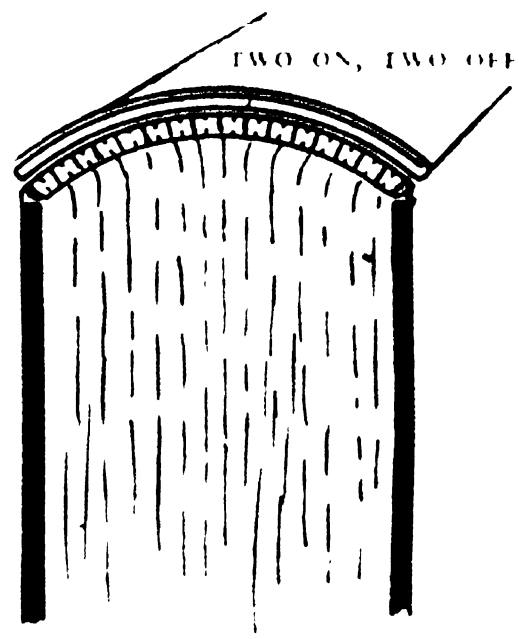
The head bands. These require to be strengthened, which may be done by gluing a piece of linen backed by a piece of strong brown paper to the back sections. This may require to be sandpapered smooth in the case of tight-back books, in which this class of work will require no further linings unless the volumes are extra heavy.

FORMING THE HOLLOW BACK.

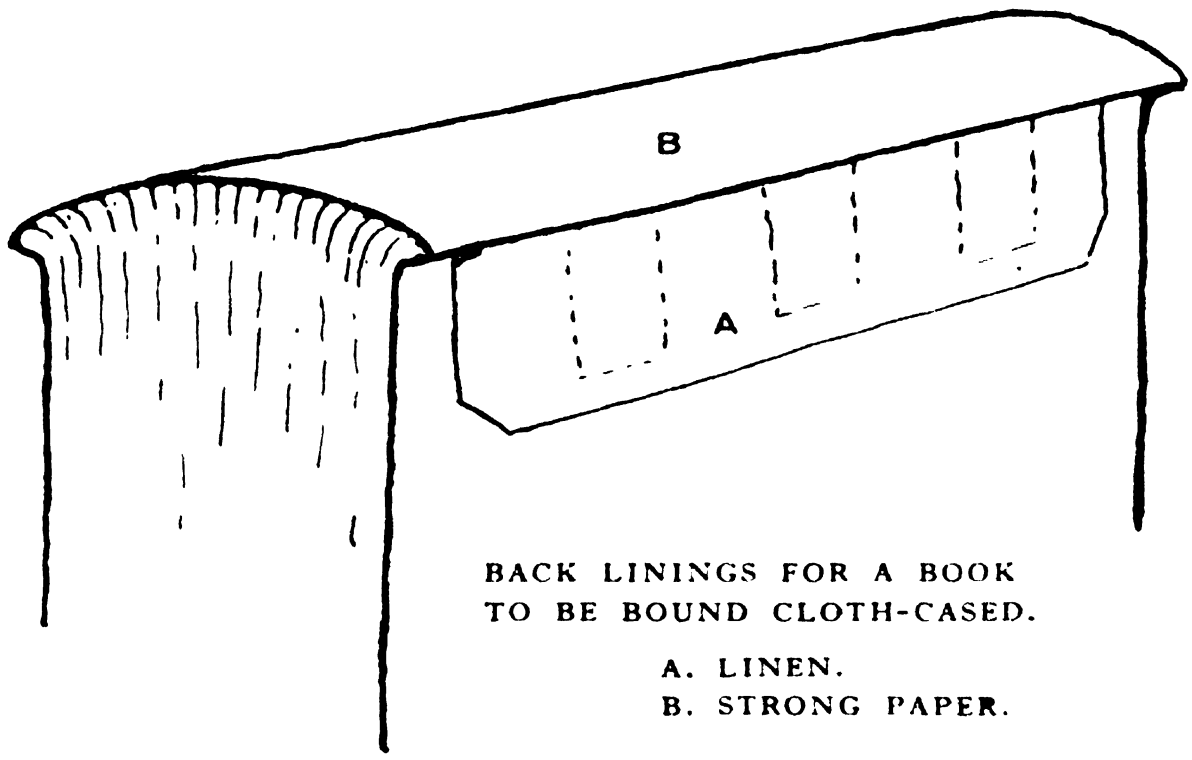








Hollow backs are built up of a carefully selected strong brown paper, and the method is as follows:—A fairly long strip of the paper is taken, the width being a little more than the length of the book. The work is held, back uppermost in a press, and the back sections are glued, care being taken to avoid the boards and slips. The strip of paper is laid to one joint, pressed to the back and folded over at the other joint, taken over to the first joint and again folded. The lining paper is cut through the last fold with a knife and pulled from off the glued back, when it will be found that one is able to make the folded hollow as shown, using the glue already there. The back of the book may be glued again and the hollow transferred to it, being well rubbed home with the bone folder. If it is considered that one lining of paper is insufficient, an extra one may be added before the hollow is made.



BACK LININGS FOR A BOOK
TO BE BOUND CLOTH-CASED.

A. LINEN.
B. STRONG PAPER.

Cloth books. A cloth book requires no made hollow, for this is formed by the case. The backs, however, require lining and for additional strength to the joint a muslin flange is made to overlap the ends. The back is glued, the piece of coarse muslin is placed into position with about an inch overlap on to each endpaper, and one or more paper linings are added, each being cut off flush with the joint.

PREPARATION FOR COVERING.

There are one or two details to be considered before the book is finally ready to receive its cover. In the first place any lining paper that happens to overlap the head bands and boards must be cleared away and any roughness or unevenness sandpapered down.

The raised bands of a flexibly-sewn book must be clean and sharp, and if you do not consider them high enough build them up by gluing a narrow strip of leather on to each one. In the case of a sawn-in book, if raised bands are required, cut up some strips of thick leather about one-eighth inch wide, mark up the back of the book for five bands (in a similar manner to marking up for sewing, in fact, the positions should coincide with the slips), and glue the strips across the back, cutting them off flush with the boards. An easy way to make them adhere is to glue the back all over and then placing them in position, but this method will not do for books that are to be covered in calf, as glue will work through and stain this leather; the bands themselves must be glued.

For library-style bindings very little is to be done beyond the trimming up; the tapes will show through the cover, but this is no objection, in fact, you can build them up a little, when they will show as broad flat bands across the back of the finished book.

The boards require some attention. The inside corners are to be cut as shown on page 75, also any burr that has formed on the outside edges must be knocked out by laying them on the iron and lightly hammering them.

COVERING MATERIALS FOR BOOKS.

Leather is the best material for covering books, for it is durable, pliable and pleasant to handle. Although there are a number of excellent substitutes for leather, in every case one or more of these qualities are lacking. It must be confessed that leathers on the whole are not so durable nowadays as those produced by the older methods. By durability here is meant the power of the material to resist the effects of the atmosphere, etc., over a period of time, as much as the effects of wear and tear. The manufacturer is not altogether responsible for this state of affairs, for in many cases it is the unreasonable demands of the consumer. The enormous demand and the call for cheapness, for bright colours and for flawless skins have brought about methods of manufacture whereby the durability of the leather in general has suffered. In the first place instead of tanning the skins soon after the animal is slaughtered circumstances demand that they shall be preserved until they can be transported to the tannery, which may be the other side of the world. Again a process of dehairing the skins which consisted in steeping them in a weak lime solution over a period of several weeks has been reduced to half that time by using a stronger liquor, but only at the expense of durability. The next operation consists in allowing the raw hides to remain in a fermenting

liquor in order to raise or swell the pores, but the substitution of mineral for organic matter, although apparently more effective, is harmful.

Of the actual tanning materials sumach is considered the best for the light bookbinding leathers. Great changes have taken place in the dye industry during the last generation, particularly with regard to the introduction of aniline dyes in place of the older pigments, whereby a far wider range of shades and colours is now possible.

Dyed materials require a mordant to fix the colour, and where a very light shade is wanted it is necessary to bleach white beforehand. Mordants consist of acid substances which, if confined to the organic variety, are harmless and, whereas certain bleaching processes do but little harm, there are others which are usually quicker in action of which the same cannot be said. Currying is an operation in the manufacture of leather which concerns the finish and grain. Albumen is used as a dressing in the cheaper kinds, but to a less extent in moroccos, etc., for in these latter the natural qualities are preserved as much as possible.

Leather is sold in skins and is priced per square foot. The area of the skin includes all its irregularities, but excludes holes and is measured by a somewhat elaborate piece of apparatus. The prices per square foot range from 7d. in the case of skivers to 3s. 6d. for high-class leathers, and in addition to the different classes of skins they are graded according to flaws and blemishes into firsts, seconds and thirds.

Below are a few general observations upon the various leathers and other covering materials used in bookbinding.

Morocco is a goat skin. The qualities of this leather vary considerably with the nature of the animal, for those from a wild goat from South Africa produce heavy skins with a very bold grain, known as levant morocco, whereas those from the domestic goat give the more familiar hard grain or pinhead morocco. Perhaps the best of leathers for bookbinding, they are strong and durable and capable of a fine polish without artificial dressings.

Niger. This leather comes from the country of Nigeria, where it is manufactured by the natives. Using the more primitive methods, they might be considered free from the faults levelled at modern tanneries, and experience tends to prove this to be the case. The range of colours is limited to a fine brick red and a green.

Oasis. These leathers appear to have some relation to niger, but are softer and can be obtained in a wider range of colours. They are manufactured in this country, are inexpensive and very useful for small books.

Seal gives a beautifully grained leather which is suitable for bookbinding, but the supply is limited.

Pigskin. The skin of the hog is strong, tough and very durable. It is not soft enough for small work, but for large works of reference and for account books is very useful.

Vellum. This material is not leather, for the skin has not been tanned in the proper sense, but prepared by other methods. Vellum is a calf skin and is the strongest and most durable of all materials used in covering. It is hard and cannot be worked like leather and, therefore, is only suitable for books bound in a particular way.

Parchment or Forels. These are split sheep skins prepared in a similar manner to vellum. Although they resemble this material in appearance, they have but little strength and wearing qualities.

Calf. Smooth calf is a very popular leather for letterpress bindings. It is not as strong and durable as morocco and should not be used for large books.

Rough calf. Dressed on the rough side of the skin it is heavier than the above and is used extensively for account books.

Hides. Cowhides produce very large and heavy skins, and although not suitable for small binding work, for large books and for stationery bindings they are very suitable. The once popular "russia" was a hide and is now produced in this country under the name of "Anglos," which has all the qualities of the former with the exception of the characteristic odour.

Basils. We now come to the sheep skins, a useful series of leathers of which there is a very large supply and demand. Basils are oak bark tanned, usually of a dark red colour, having a glazed surface. They are extensively used for the cheaper class of account books.

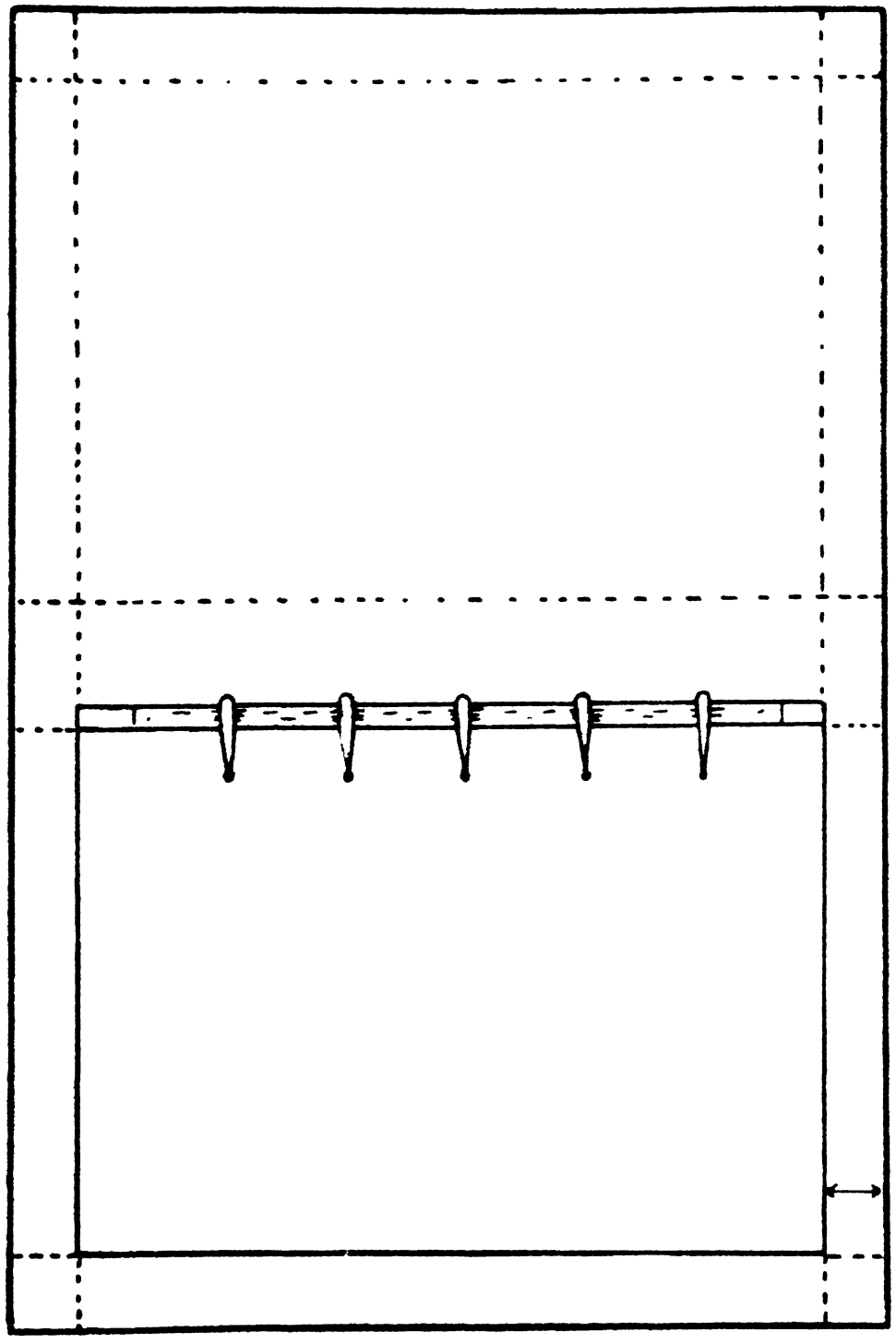
Roans. A term which includes a number of varieties of sheep skins usually softer than basils. They are used as a substitute for morocco where this leather is too expensive, sometimes being artificially grained to effect an imitation.

Persian. This term is sometimes applied to sheep skins that have been dressed to imitate morocco; others have used it for an inferior variety of goat skin from the East.

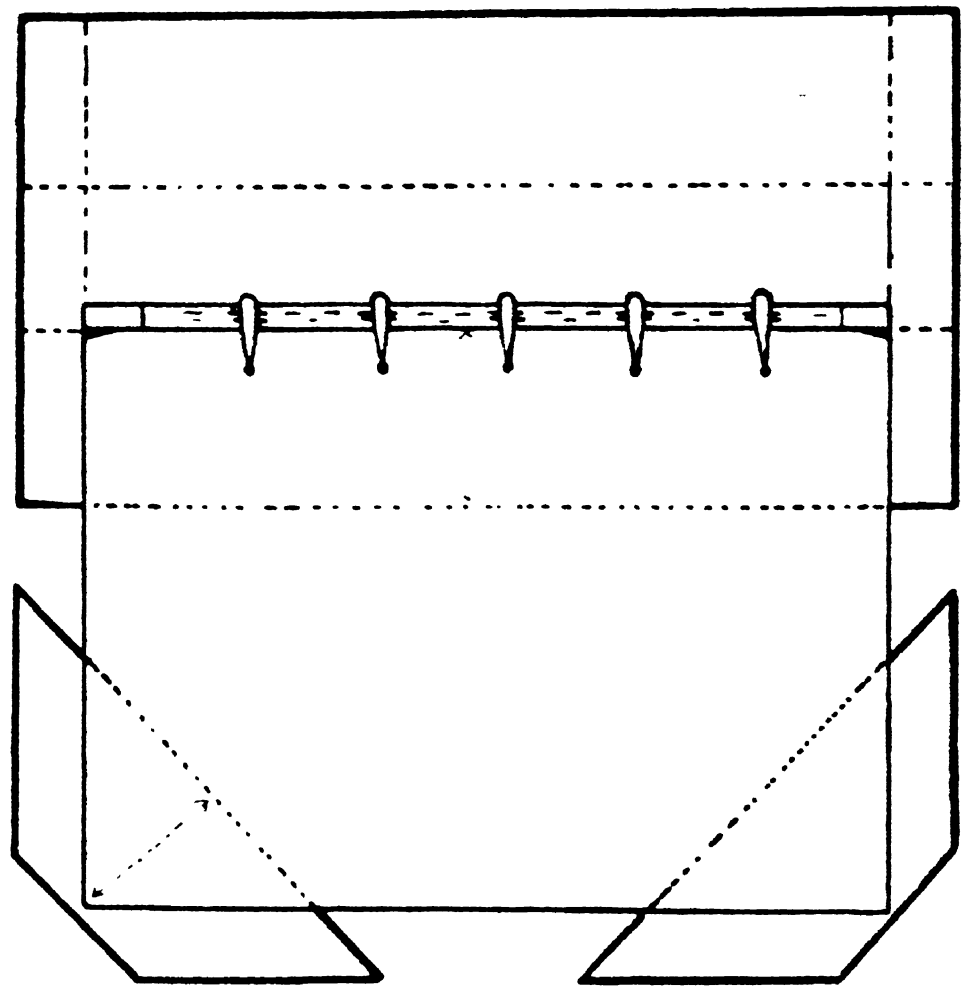
Skivers. Under this heading may be placed all forms of sheep skins that have been split, whereby two skins of this leather are produced from one. Naturally skivers have but little strength and should be avoided for any work of permanent value.

Cloths. Where cloth is used as a covering material the style of binding known as casing should be employed, as the nature of the

CUTTING OUT AND MARKING UP THE LEATHER.



FULL BINDING.



HALF BINDING

material is against its being manipulated like softer leathers. Other than this the better quality book cloths are fairly strong and durable.

Leather cloths. These materials attempt to replace leathers by endeavouring to imitate the appearance and grain. They vary in quality, some of them being very strong and durable; they, however, have not the feel and cannot be worked like leather.

Buckrams. Linen buckrams are very strong and are extensively used in library letterpress work and for account books.

Bookbinders' cloths. The cheap forms of these have but little strength and wear. They are extensively used for cheap bindings, and for the sides of half-leather work.

Papers. Marble papers are also used for the sides of half-bindings and if of good quality and colour are better than cloth. Papers usually have a better feel than the hard cloths and are preferable where strength is not important.

CUTTING OUT THE COVERING MATERIALS.

Books are said to be "full" or "whole" bound when the leather completely covers the books. A "half" binding has the back portion and the corners in leather, whereas a "quarter" binding has the back only so covered. Whole leather bindings become more expensive to produce, not only on account of the larger area of leather used, but because of the difficulty in obtaining large flawless covers and the greater amount of waste from the skin.

A paper or card template of the size of the cover required is the best way to plan out the cover from the skin. The "turn in" of the leather should not be less than three-quarters of an inch, with an average book, but may be greater with larger books. The proportions of the sides and corners in the case of half-binding are given on the diagram. In cutting straight grain leathers an effort must be made to keep this grain parallel with the book and not allow it to be on the slant. The best covers are obtained from the centre of the skin, while the pieces may be used for the corners of half bindings. A pointed knife and rule, working on a piece of straw-board, is the best method of cutting the leather.

Cloth is sold in rolls about 38 in. wide, each containing 36 yards. It is best for the grain of the cloth to run parallel with the back of the book, although the difference is slight. For cutting large quantities of cloth it may be wound round with a card gauge, creased and cut through with a knife, the strips being cut up under the guillotine.

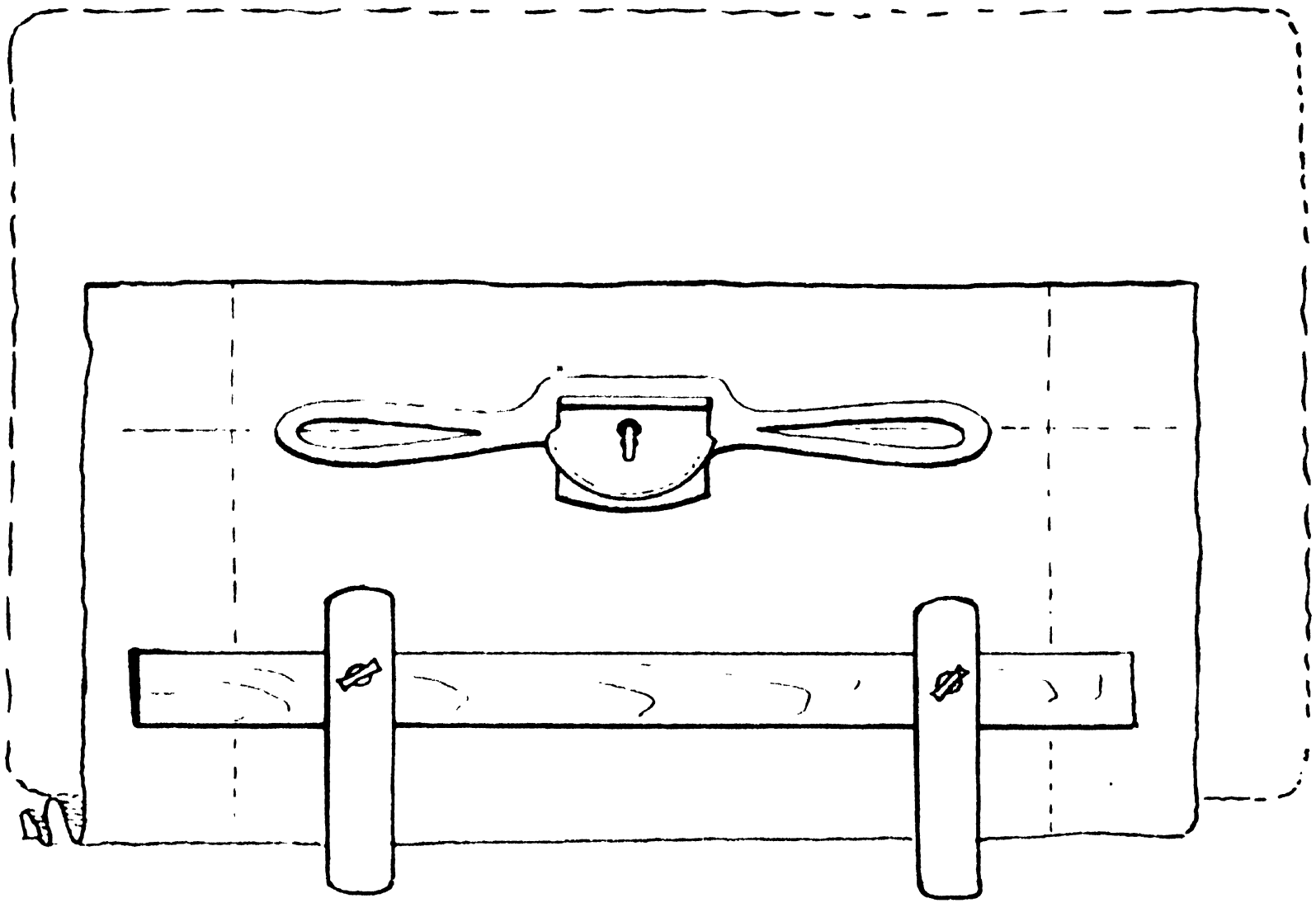
Cloth-cutting machines are in use and the makers claim that they pay for themselves in the material they save over the more wasteful hand method.

PARING LEATHER.

A certain amount of paring or shaving away the underside of the leather cover is generally necessary in order to obtain neatness, but it should be remembered that this only is done at the expense of the strength of the material.

Where a general reduction in the thickness of the leather cover is required, an ordinary carpenter's spokeshave may be used, while for reducing the edges or for small areas the paring knife is best.

A lithographic stone forms an excellent slab upon which leather may be pared, in fact, its surface is admirably suited for a number of leatherwork operations—its polished surface does not injure the most delicate material. In the spokeshave as used for woodwork the distance between the knife and the iron base is too narrow for leather shavings and therefore requires to be widened with a flat file. The leather requires to be clamped to the stone and to protect the cover from damage a piece of wood is inserted between it and the clamp. The strokes of the spokeshave are taken in a direct



USE OF SPOKESHAVE FOR PARING LEATHER.

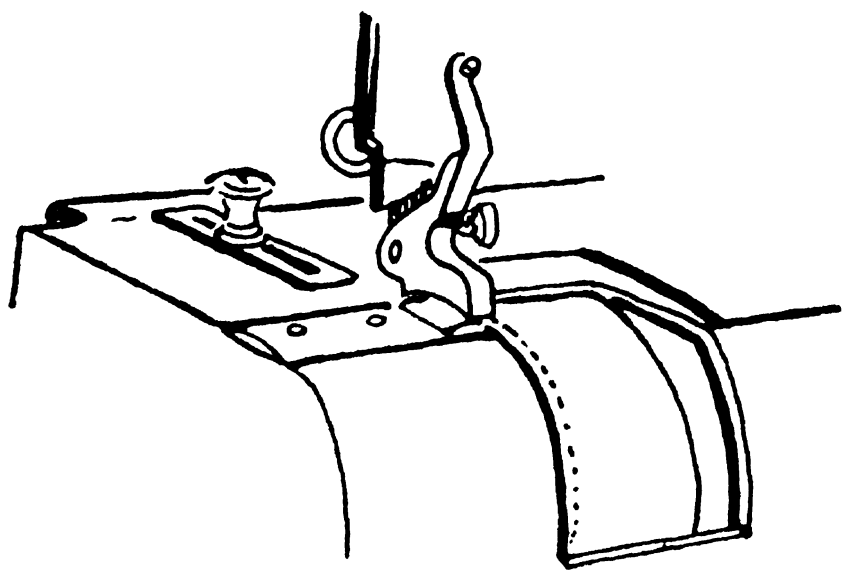
line away from the clamped portion and the knife requires to be kept particularly sharp. Any leather parings that find their way underneath the cover will cause a hole to form if the knife runs over it.

The secret of successful paring with the knife is to keep the edge in condition. No clamps are required, for it will suffice to hold the cover in position against the edge of the stone with the left-hand thumb.

For whole bindings where the leather requires to be reduced at the turn in, the cover must be carefully marked up to the size of the book to assure that the reduction is effected at the right places. The diagrams attempt to illustrate where the reduction should occur; the plain portions should be levelled only, the shaded portions may be reduced so that it may be turned over the board readily, whereas the black places may be reduced as much as possible.

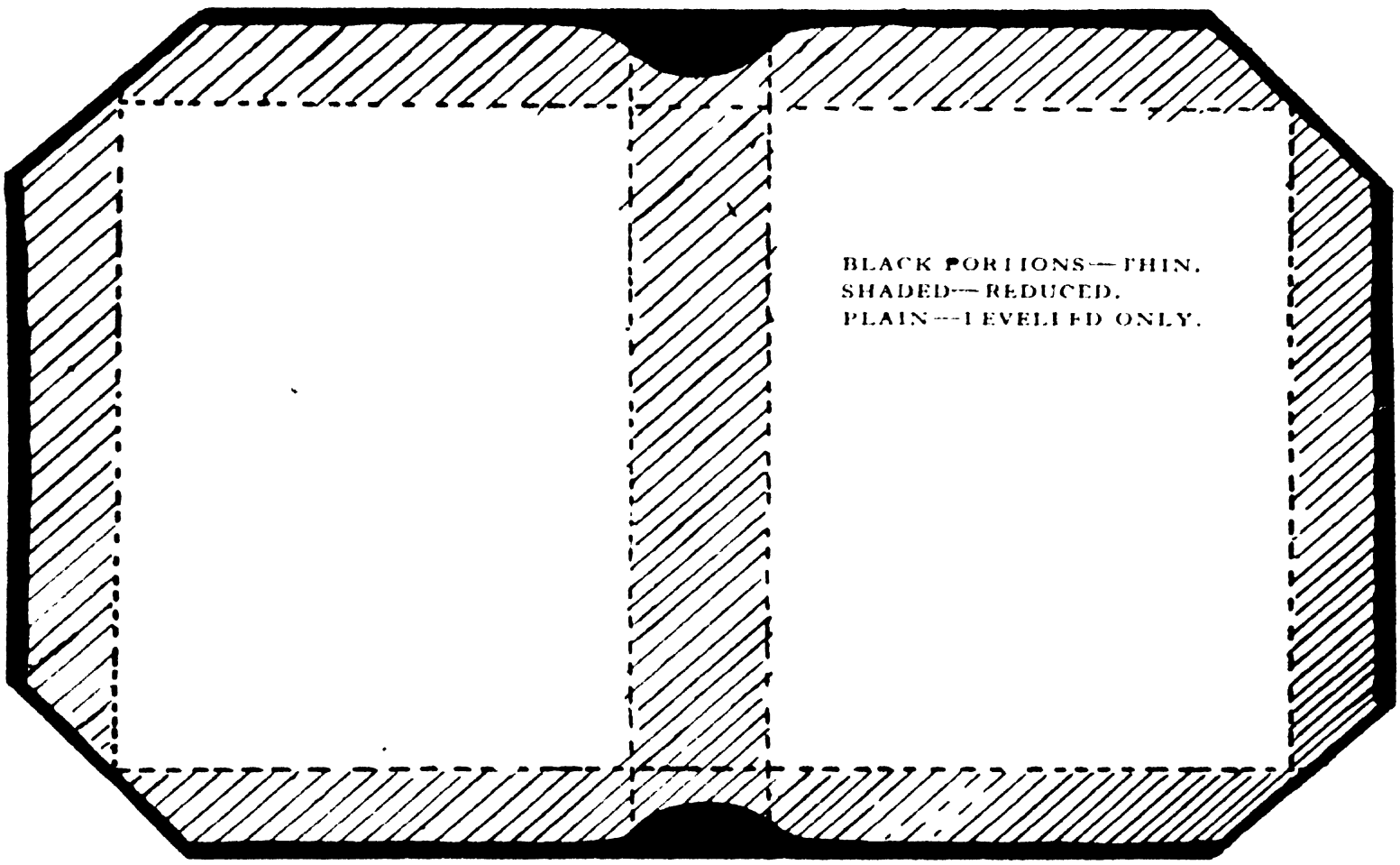
Sheep skins require to be edged round only, as it is hardly likely that they will be too thick and they are usually too soft to be shaved effectively.

Paring machines. Paring, other than a reduction round the edges, requires time and care, and when slips occur the cover is either spoilt or marred. The leather dresser uses a shaving machine whereby he will reduce the thickness of the whole skin to his customers' requirements. For the workshop there is the "Fortuna" paring machine, which will effectively undertake the work of the hand knife, although some skill is required to use it. It uses a knife in the form of a rotating cylinder, and while one side is cutting the leather the other is in contact with a rotating emery wheel, whereby a constant keen edge is maintained.

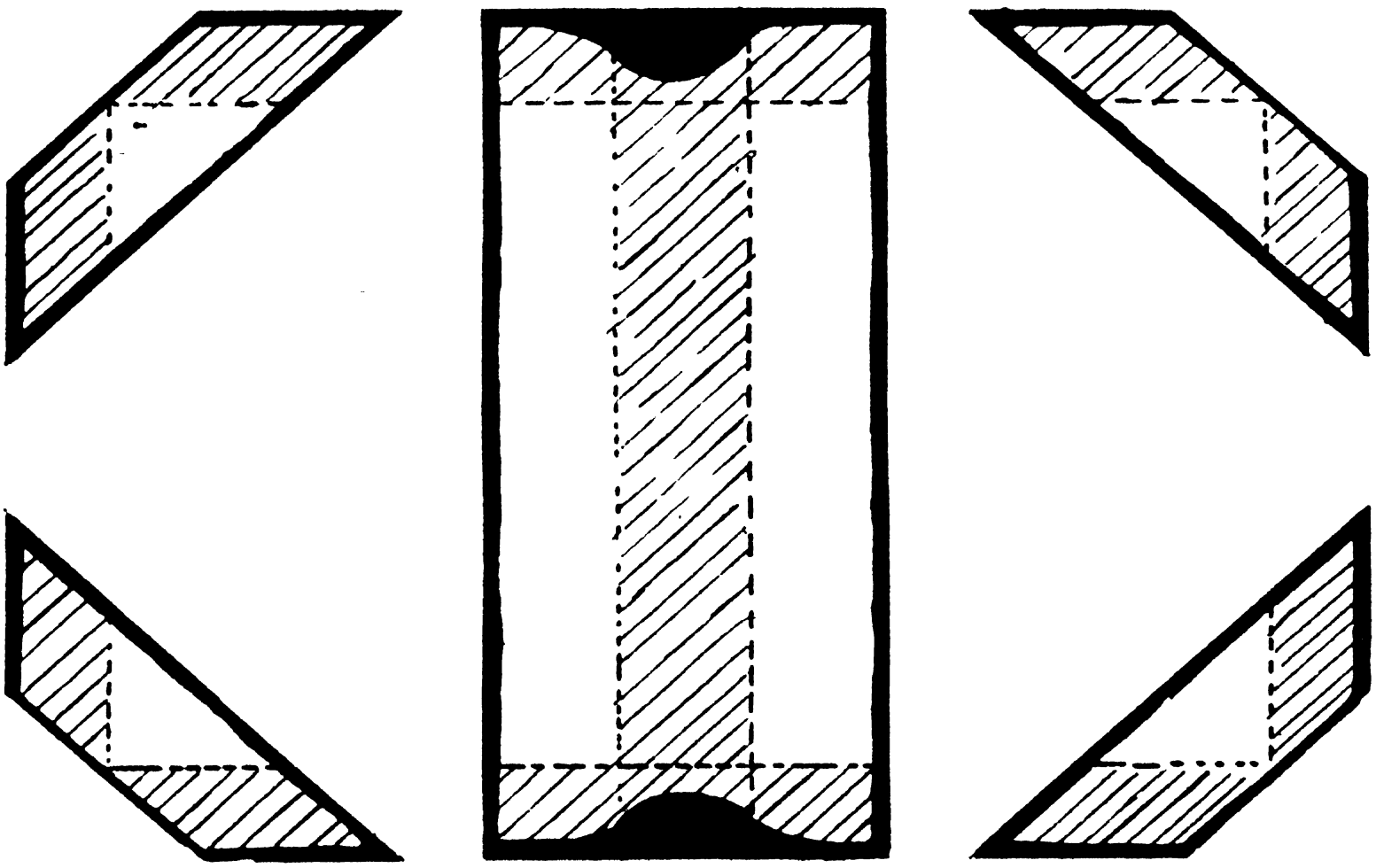


LEATHER PARING MACHINE ACTION.

PARING THE LEATHER.



FULL BINDING.



HALF BINDING.

GLUE AND PASTE.

Where the bookbinder requires a quick-drying adhesive he uses glue, otherwise paste is used. A paste may be made from flour as follows:—Two pounds of flour and one ounce of powdered alum are placed in a large zinc pail and sufficient water added to form a stiff mixture. This is beaten until all lumps are broken up. Four pints of water, brought to the boil in a kettle, is then added slowly to the flour, the mixture being kept continually on the stir by means of a stick. At a certain stage in the operation the whole will become very thick, but stirring must be continued or the paste will be spoilt. Iron containers must not be used for bookbinder's paste, or leather will be stained. Prepared paste and powders that require mixing with cold water can be obtained which, although not better than flour, are sometimes very convenient.

Glue for bookbinder's use should be of fine quality, for he has occasion to use it much thinner than usual and any impurities will show through the papers. Glue must be soaked for several hours before it is heated or it will refuse to melt, although when obtained in powder form this precaution is not necessary. Both glue and brushes deteriorate with prolonged boiling, and in the latter the pieces of hair break off on to the work, which can be seen through the material. So-called cold glues are in effect and action between paste and ordinary glue.

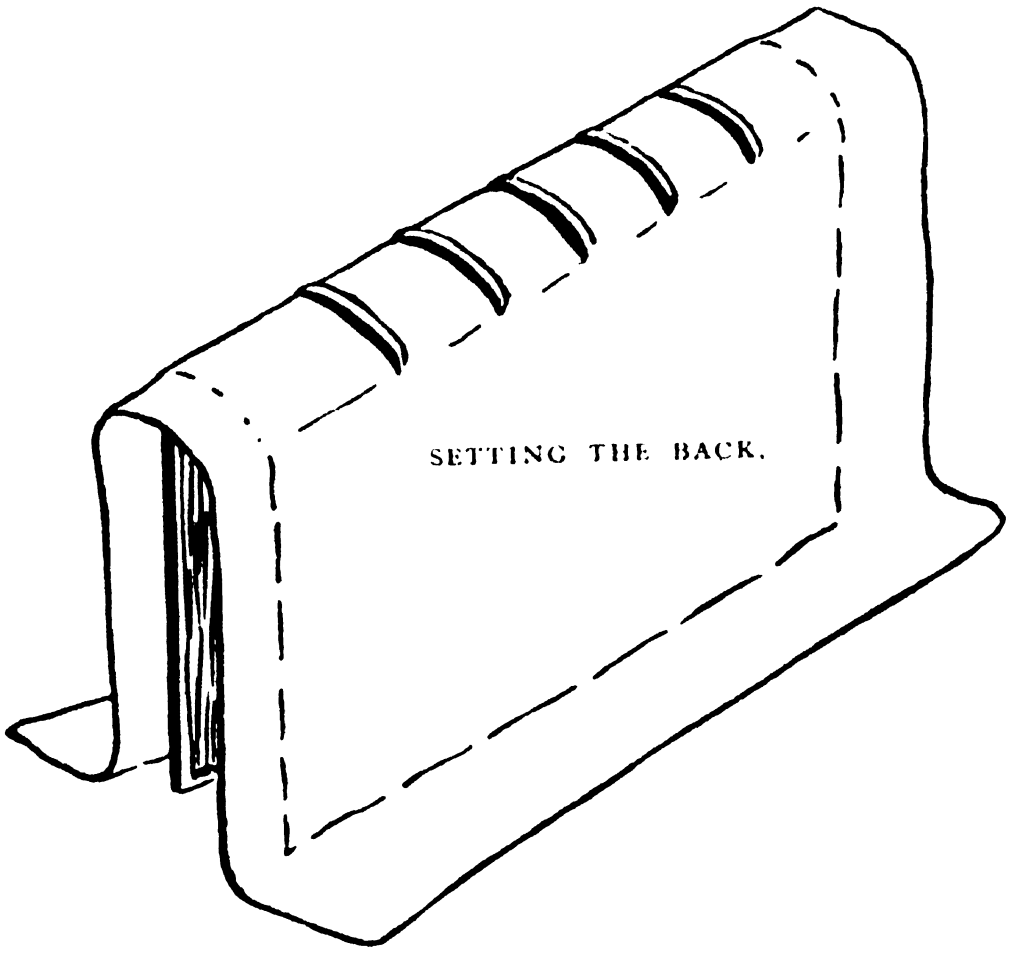
On account of its slower drying and being less likely to stain, paste is used for covering in leather and for paper work such as the endpapers. Glue must be used wherever the moisture is likely to prove injurious, such as for cloth, for surfaced leathers, and for back linings.

Where large quantities of glued paper or cloth are required, for such operations as case making, the gluing machine is of great value, for, by its means, the work is supplied with a uniform layer of glue (or paste as required) and by means of a travelling band may be taken direct to the workman requiring it. One operation of the machine may supply a number of case makers with glued material.

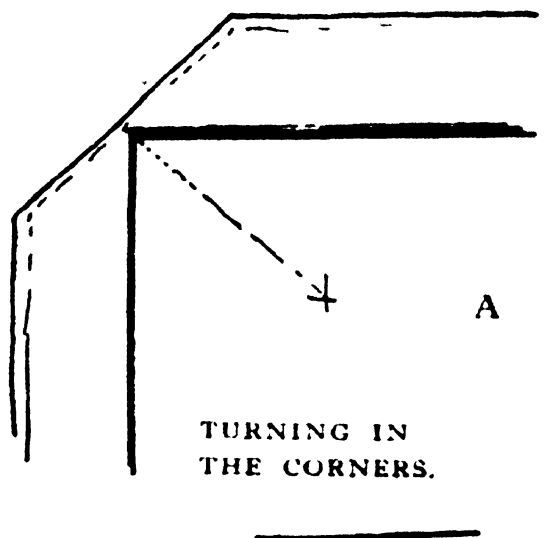
COVERING.

An attempt will here be made to fully describe the actual covering operations for the following styles:—The full leather binding, half-leather work, and a cloth-cased book. The tools required are the bone folder, leather knife, dividers, band nippers, band stick consisting of a strip of boxwood, and a pair of shears. The actual work is carried out on a large lithographic stone. The details are

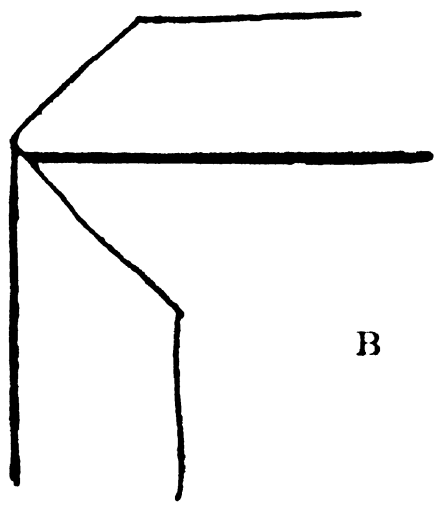
COVERING.

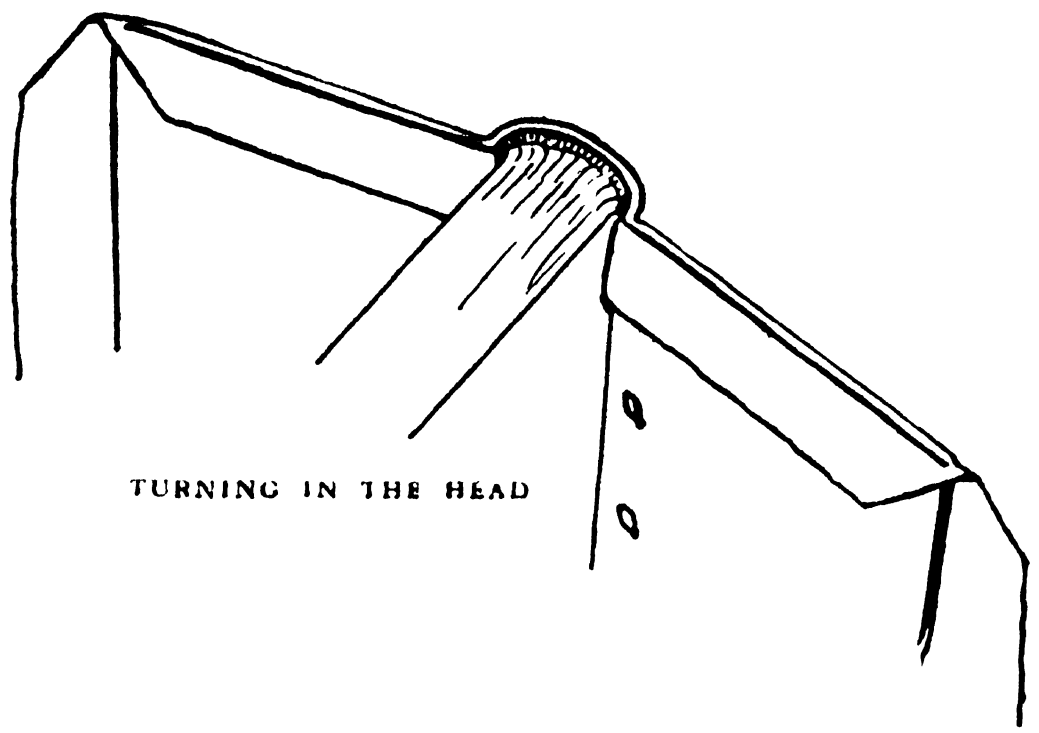


SETTING THE BACK.

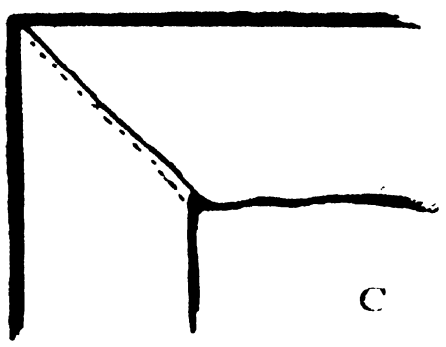


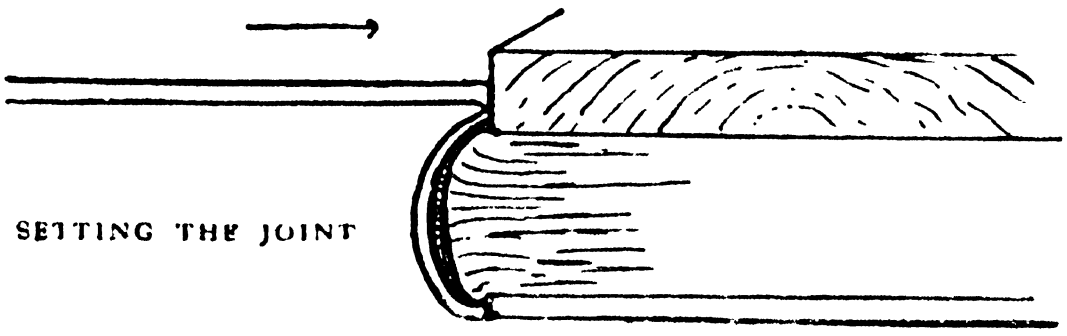
TURNING IN
THE CORNERS.





TURNING IN THE HEAD





SETTING THE JOINT

described in the exact order as they should be carried out when covering.

The full leather binding. Examine the book to assure that there is nothing to cause a mark through the leather, such as dried glue or an unevenness in the board. Paste is to be placed under the slips which require to be rubbed into the board.

The leather is well brushed over with thick paste and a little on the back of the book is necessary. Lay the book in the exact position upon the leather, selecting the best side for the front, and draw over to the other board.

The back is the first to receive attention, to assure there is sufficient to take the raised bands, using the band nippers. This will cause the grain on the side to become distorted, which may be adjusted by lifting up the leather. The cover must not be stretched over the side or it will warp the board as it dries, but on the contrary the grain must be worked up.

The corners of the leather have now to be cut. A piece has to be cut off at an angle of 45 degrees a little distance from the extreme corner of the board. If the shears are used the blunt edge of the leather must be thinned down with a paring knife.

The leather is now turned in at the head bands and while one is being done a piece of paper must be used to protect the other from the pasted leather. A little experience is necessary to know how much leather for head setting.

Following this the cover is turned in along the length of the boards, the folder being used to assure neatness. The fore-edges of the boards are now turned in and the corners adjusted.

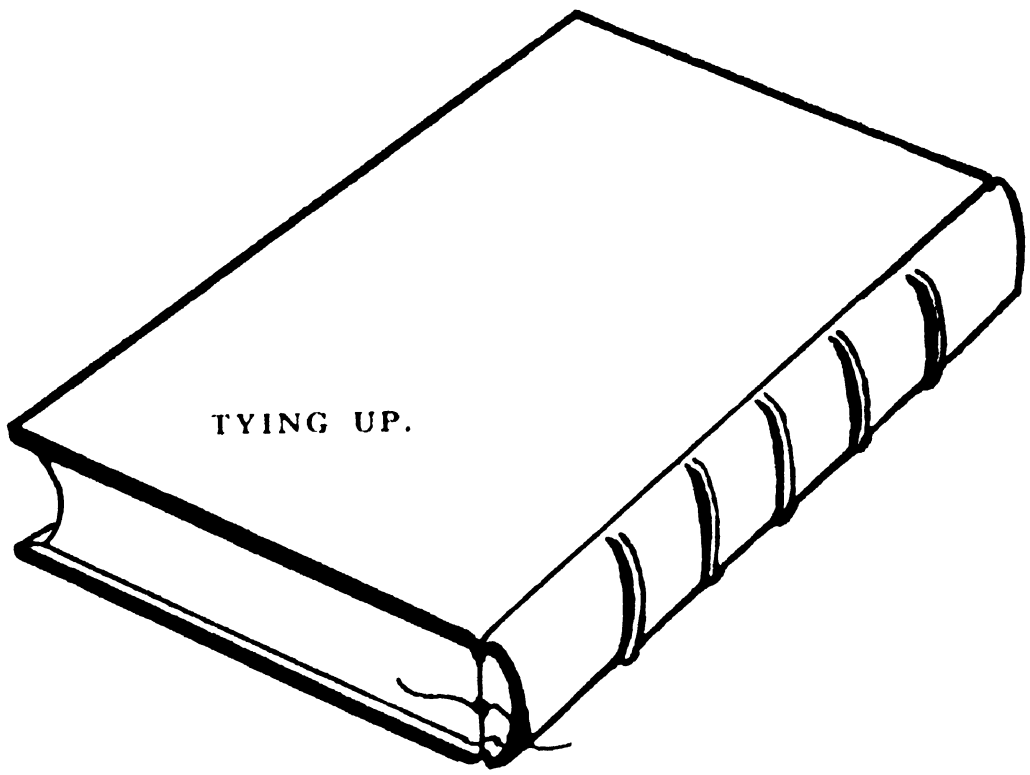
An important detail at this stage is the setting of the joint which is to assure that there is sufficient play in leather to allow the board to open freely. It consists in opening the board and forcing it back well into its joint.

During this time the leather being well wet is liable to stain, therefore, all tools must be clean and the book not removed from the clean surface of the stone. To prevent the damp from the turned in portion of the leather affecting the endpapers a thin piece of card should be inserted.

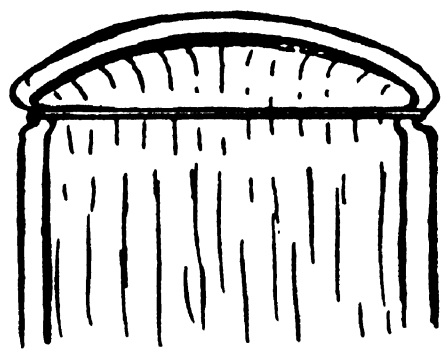
Tying up consists in tying a piece of sewing thread tightly round the joints of the book as illustrated, and its purpose is to hold the cover into position while the head is being set.

Setting the head bands now occurs, for which the pointed end of the folding stick is used. Its object is to set the leather neatly over the head band, and to assure that this portion of the book is neat in appearance and square with the back.

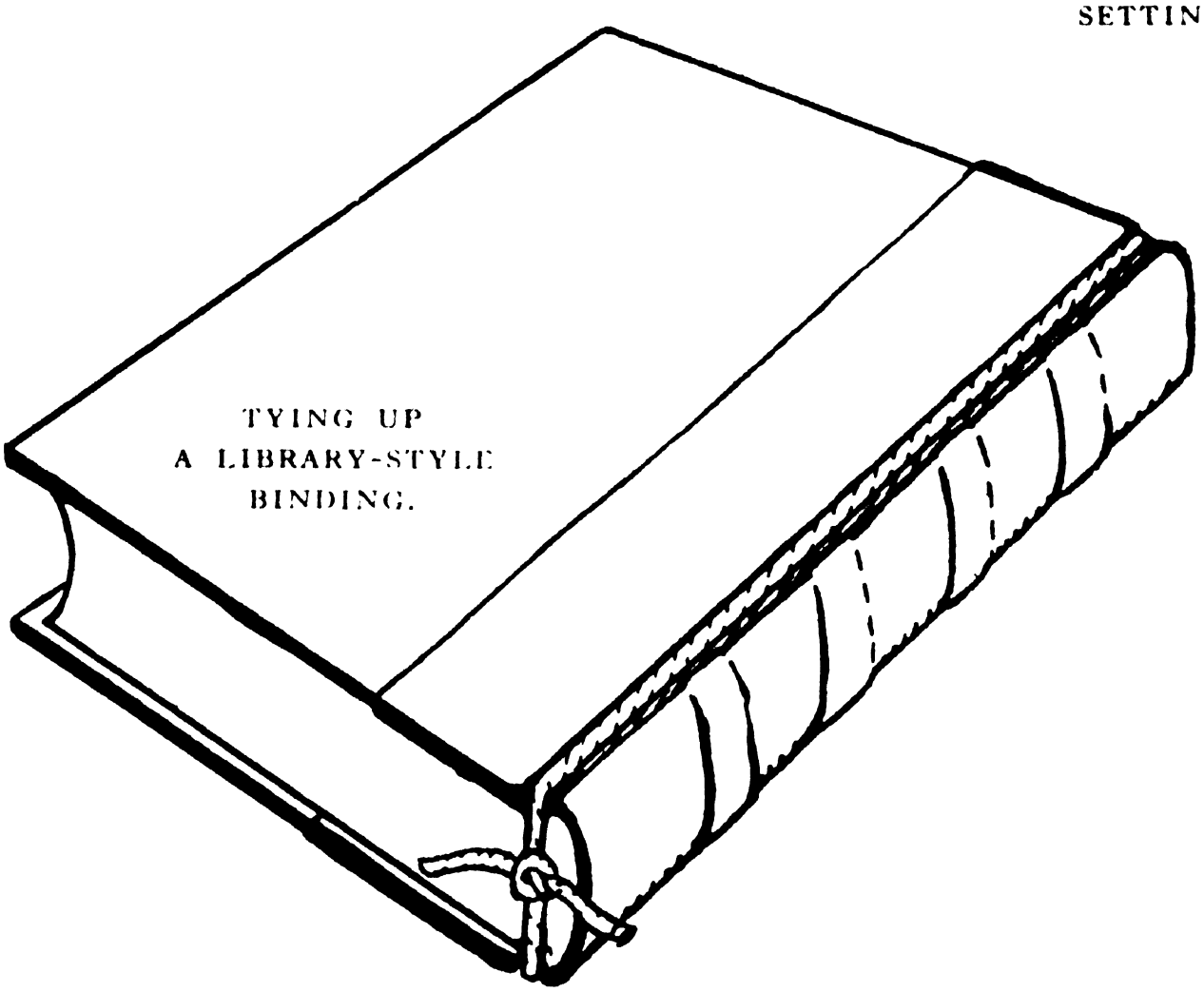
COVERING.



TYING UP.



SETTING THE HEAD



TYING UP
A LIBRARY-STYLE
BINDING.

Setting the back consists in moulding the back to a good shape, and in nipping up the bands occasionally, and at the same time the squares are adjusted.

The book is now allowed to dry over several hours, precautions being taken to assure that it is undisturbed during the period, for whatever shape it dries it will remain. Placed on its side between clean paper with a light wooden board on top is best.

Half-leather bindings. Most of the instructions for covering half-bindings are included in the above description. The treatment of the back, the setting of the head and the turning in of the corners are the same. The corner pieces may be treated as a separate operation and left until after the back has been covered and dried.

Library bindings. Owing to the absence of head bands and raised bands across the back of the book, the operation of covering a book in library style is comparatively simple, and a beginner is advised to attempt this in his first experiments. In place of the silk-worked head band a short piece of string is inserted in the head and tail at the time the leather is turned in, which forms a definite thickening at these places. String is used for tying up, as thereby the leather is forced into the rather wide groove formed by the gap between the joint and the board.

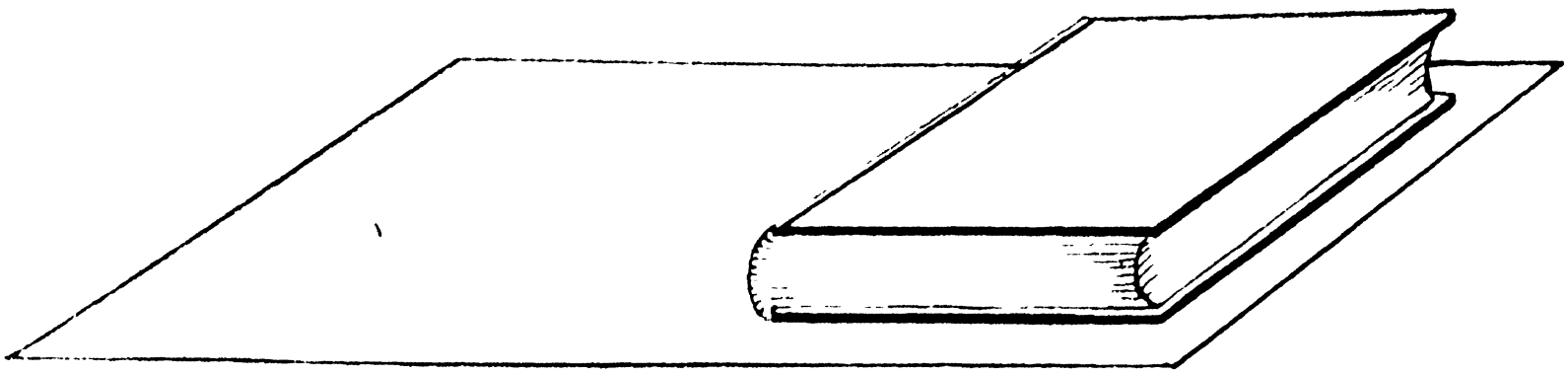
Covering in calf calls for a few comments. It is a porous leather and light colours are liable to stain. The folding stick must be used with care, for the delicate surface readily marks and any rubbing down should be done through papers. The band nippers will probably cause a slight stain, but this is usually covered by the subsequent tooling of the back.

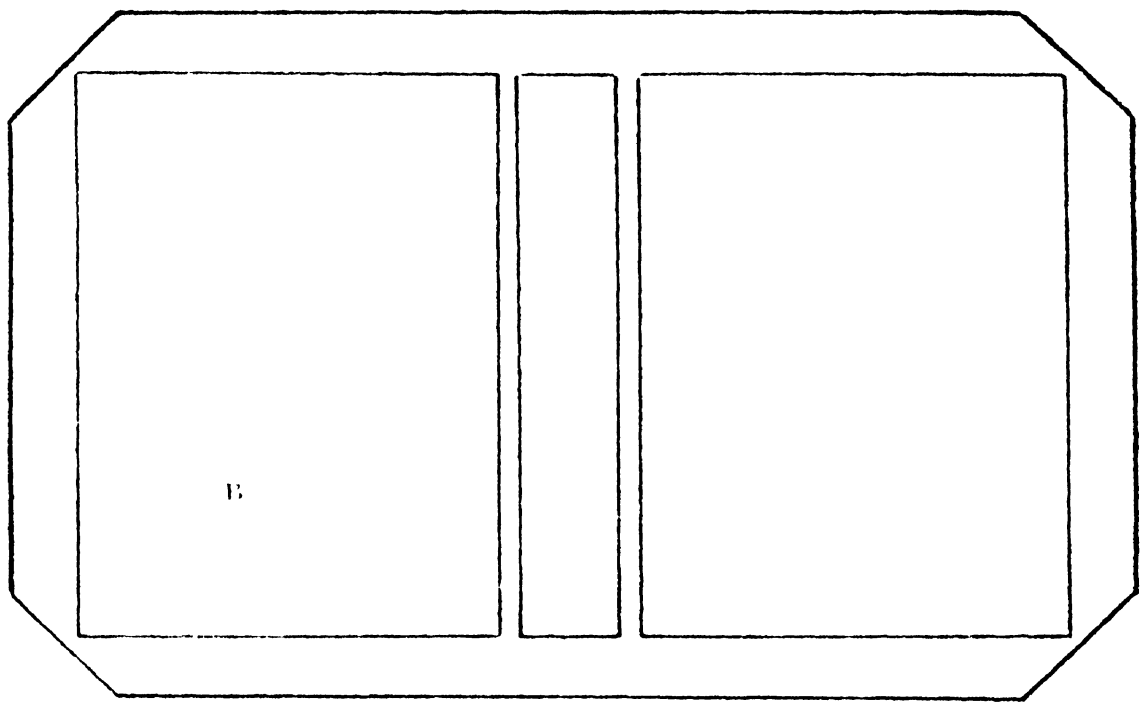
Sheep skins. It is better to avoid raised bands with these leathers unless they are very shallow, for the prepared surface will not bear being stretched over them. Hollow backs should be employed. For the cheapest varieties glue should be used instead of paste, or what grain they have will disappear.

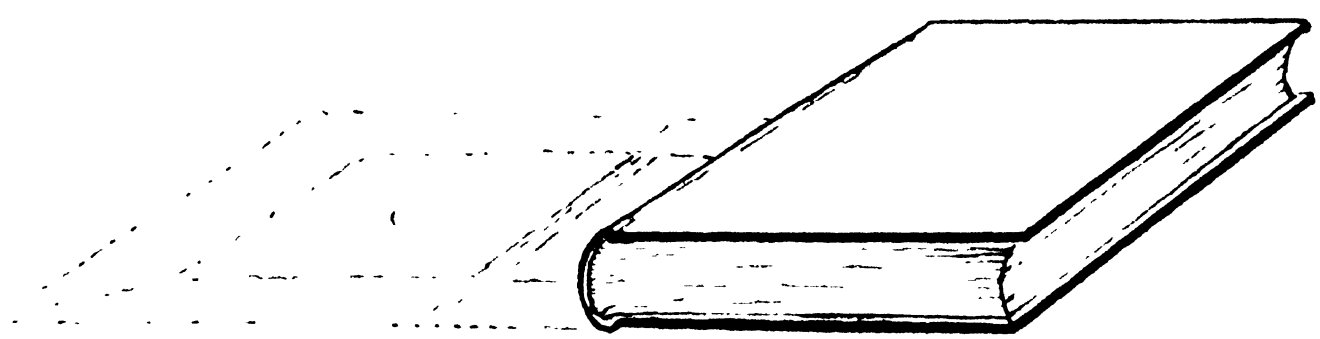
Buckrams and leather cloths may be treated like leather, but hollow backs should be employed and bands avoided. If the preparation on the underside has a greasy feel it had better be slightly sandpapered or it will not stick.

Cloth. Here a different principle is employed for bookbinding which is known as "casing." It is comparatively simple and is used for cheap productions, but forms a very important branch of the industry. The book for casing should be cut, rounded, and backed; the boards are cut to size, but not attached. The backs of the sections are lined as previously stated, but the hollow in this

COVERING A CLOTH (CASED) BOOK.







A. POSITION OF BOOK UPON THE GLUED CLOTH.

B. BOARDS IN POSITION, BOOK REMOVED, HOLLOW IN POSITION, CORNERS CUT.

C. CLOTH TURNED IN AND CASE FITTED TO BOOK.

case consists of a separate piece of the lining paper cut the exact width of the back and in length equal to that of the boards. The cloth cover is cut to size and the case is ready to be made.

Case making. The cloth is glued with very thin, clear glue. The boards are placed into their exact positions on the book. The book is placed upon the prepared cloth so that when it is drawn over to the top board there is an equal turn-in all round. The book itself may now be removed from the boards which are glued to the cloth, and the paper "hollow" is laid between them. In this position the material is turned in all round without delay and the whole rubbed down with the folder and the case is complete, then the book may be placed back into it ready for the next operation.

The above method of case making is used where the work is of a miscellaneous character or for single volumes. For large quantities of books of the same size it is not necessary to use the books after the first one has been made. A card template is cut to the exact width of the hollow of the pattern case which is used to determine the position of the boards for the rest, while the books themselves may be proceeding in another part of the shop.

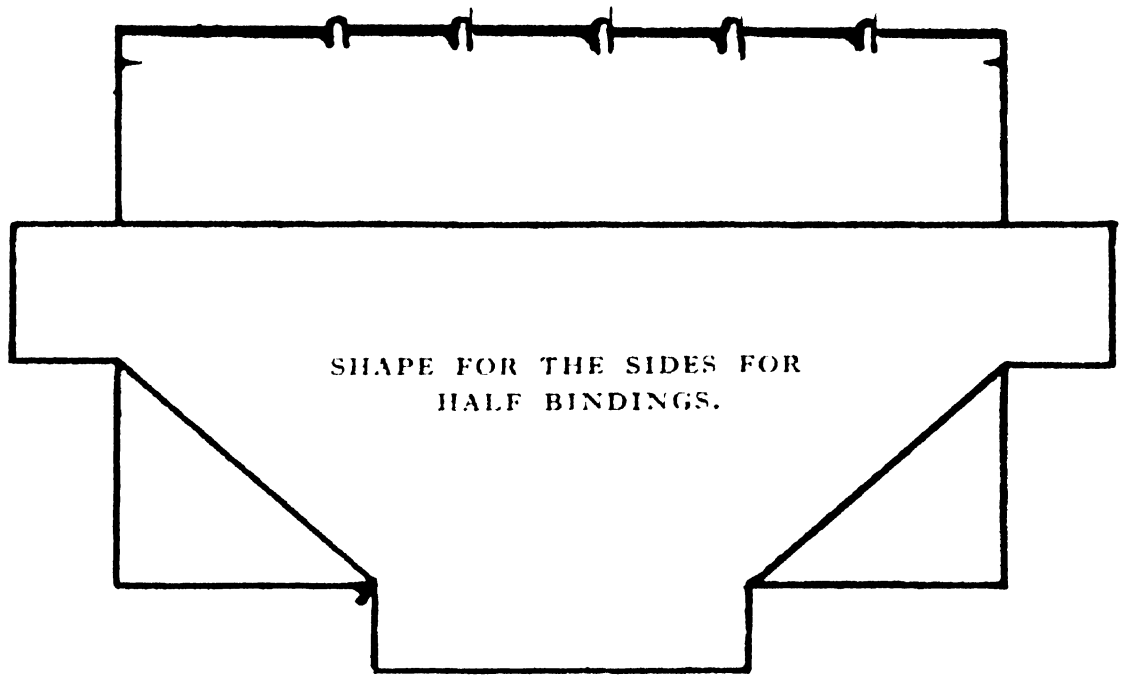
Case-making machines. The enormous demand for cheap cloth bindings has called for machinery for case making. Their output is about 500 cases per hour, which is four times the output of three people making cases by hand. In one machine the operator has to feed the machine with cloth, after which the gluing, placing of the boards and the hollow, the turning in of the material, etc., are automatic.

OPENING UP.

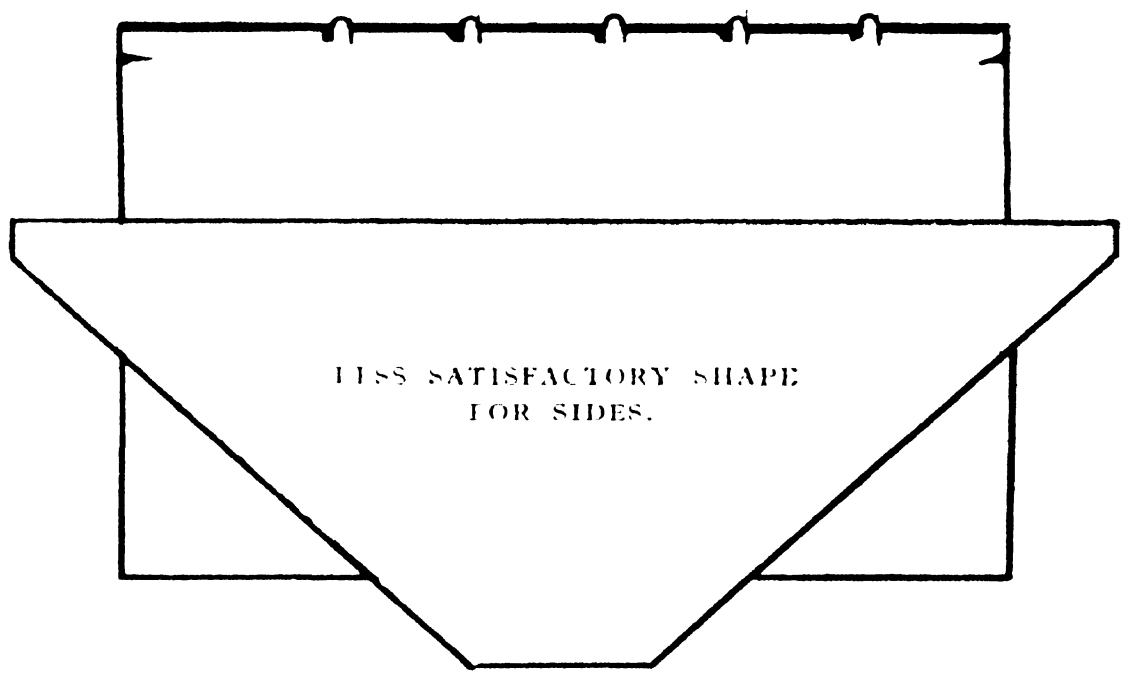
All bound books should remain under a light pressure for about twelve hours after covering, in order to allow them to set. After this period the paste has dried sufficiently for the books to be "opened up." A book should never be opened up for the first time at random or the back may be permanently broken. The strings used for tying up have to be cut, after which the boards may be opened back one at a time, which will ease the joints. The leaves of the book may now be opened, taking a few at a time from the front, afterwards treating the end in a similar manner, until the centre is reached, whereby the opening is done a little from each end.

SIDING AND PASTING DOWN.

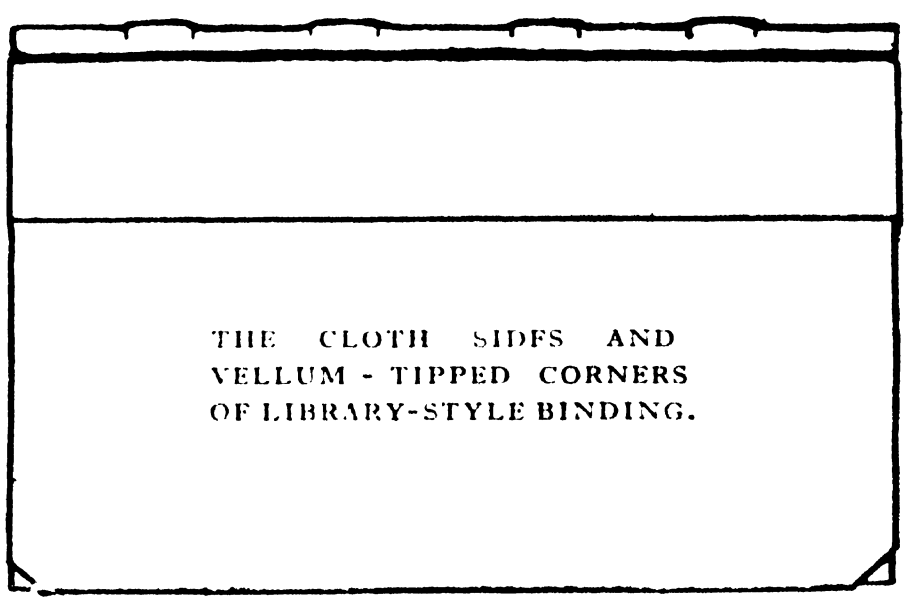
The operation under this heading consists of placing the sides to half-bindings, and to the pasting down of the endpapers of both full and half-bound books. This work may be postponed until after the tooling has been done, if desired.



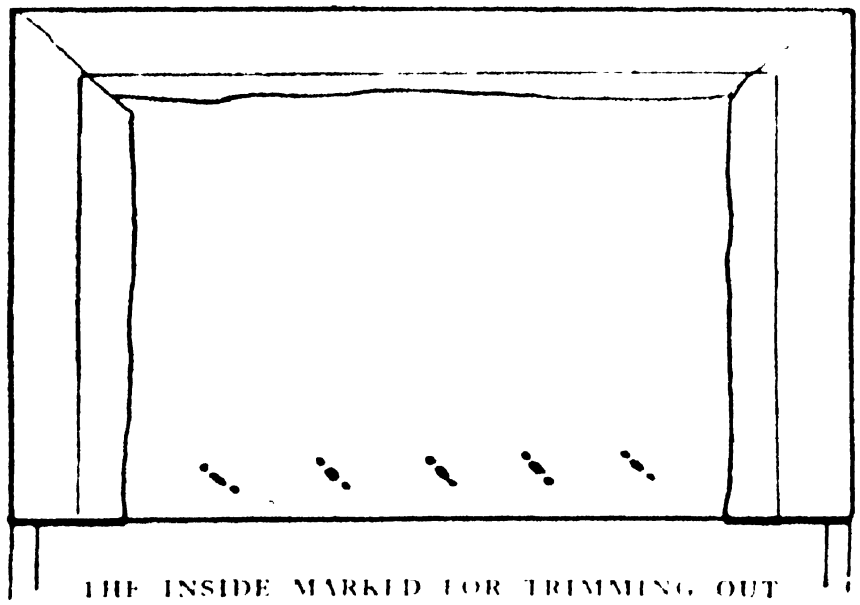
SHAPE FOR THE SIDES FOR
HALF BINDINGS.



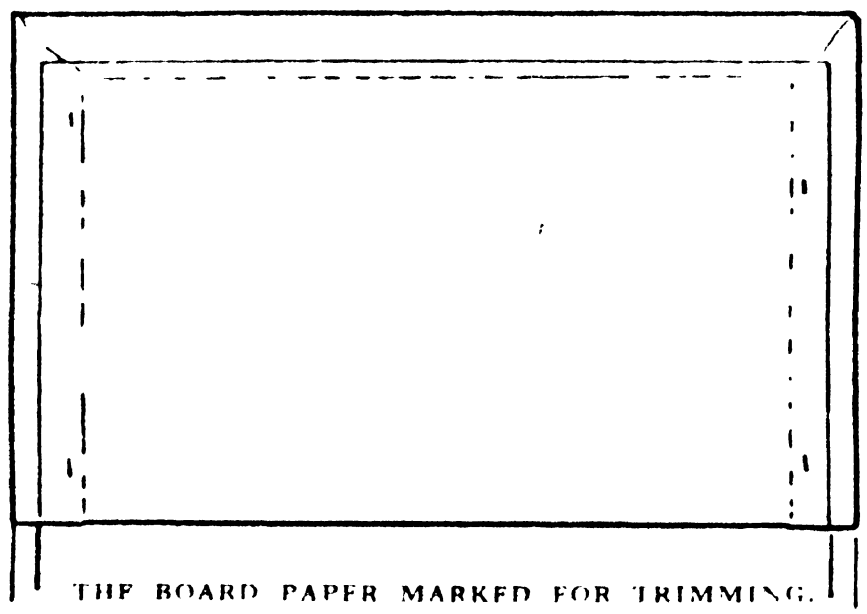
LESS SATISFACTORY SHAPE
FOR SIDES.



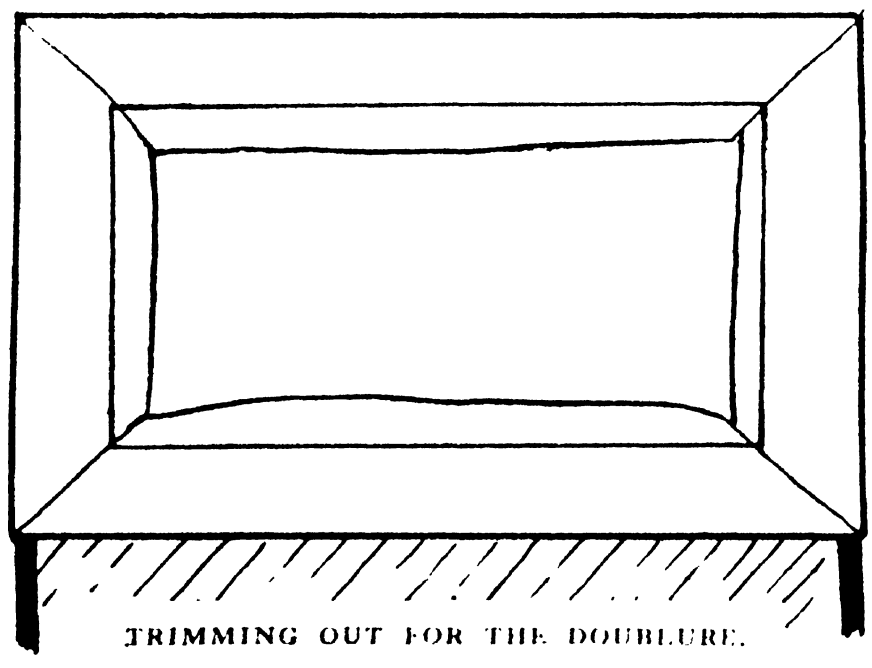
THE CLOTH SIDES AND
VELLUM-TIPPED CORNERS
OF LIBRARY-STYLE BINDING.



THE INSIDE MARKED FOR TRIMMING OUT



THE BOARD PAPER MARKED FOR TRIMMING.



TRIMMING OUT FOR THE DOUBLURE.

Half-bindings. The leather is thicker than the cloth or paper used for sides, therefore, a ridge will be formed unless the rest of the board is built up or "filled in." Should the leather be unevenly proportioned it will be necessary to compass them and trim away the unwanted portions with a knife and rule. The filling in may consist of pieces of thick paper cut to the exact shape of the space between the back and corners and carefully glued into position; paste should not be used, for it causes the board to warp outwards.

The sides are cut to size so that they just overlap the leather and have the usual turn-in of about one inch. Two methods of cutting the sides are given in the figures. Thin, clean glue should be used to attach them and the folder used, through paper, in order to assure that they stick well and are free from air bells, etc.

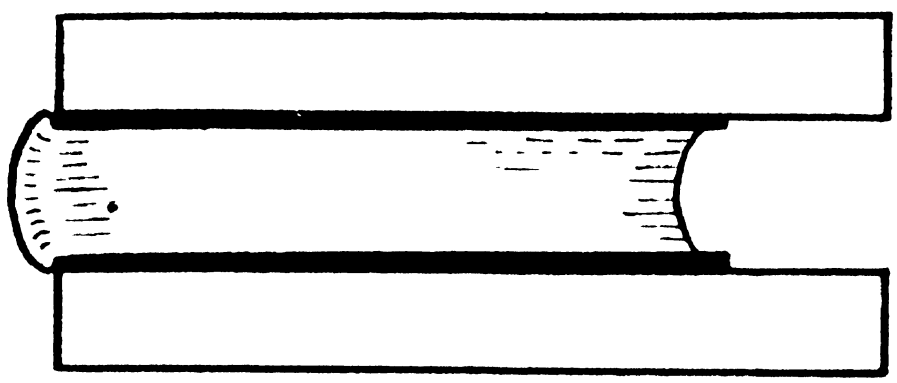
An examination of the insides of the boards of a binding at this stage will show them very uneven and untidy. The turn-in of the material requires to be trimmed out to a level width of half an inch, or more if there is sufficient. The compasses should be used and when the surplus cloth or leather has been cut through with a knife and rule it will be found to come away from the board quite easily. Again a ridge will be formed, which should be filled in with thick paper as in the case of the sides of the half-bindings. The first sheet of the endpapers is the waste or protecting sheet and requires to be torn out at this stage. The joint must be cleared of any pieces of hard glue or paste, or anything that is likely to break through the board paper. It will be found on trying the board paper, that the distance of the fore-edge is greater than that of the head and tail on account of a certain portion being taken up by the joint; these are evened out by compassing them equal and cutting away the excess, whereby the inside exposed portion of the leather will be greater than the "squares" of the book.

Leather bindings are "pasted down" open in contrast to cloth cased work. A protective piece of paper is placed under the board papers, which is then pasted, a little being rubbed into the joint with the finger. Without delay it is brought over on to the board and rubbed down with the folder. The joint requires special care, the object being to assure that it sticks well without any looseness while, at the same time, it must not be stretched across. Two hours should be given for the paste to dry before the board is closed and the other side attempted.

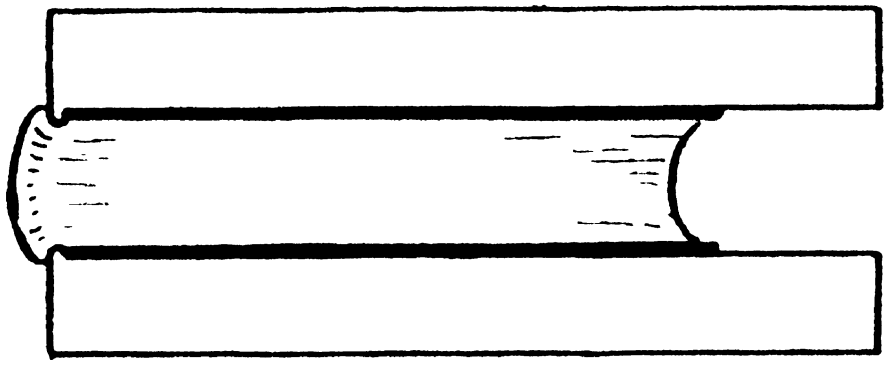
Library bindings. The sides for this work should consist of strong cloth. They may have leather corners or not, as desired. As it is important that the corners should be strong, little tips of vellum have been used. It is the opinion of the writer that

rounded corners are suited to this class of work, being more durable. The treatment of the endpapers is similar to that of leather bindings, although any extensive filling in is not necessary.

Cloth book. The equivalent operation to pasting down the endpapers in the case of cloth work is known as "casing in." The hollows of the cases are flat and require to be rounded to the shape



POSITION WHEN PRESSING A CLOTH BINDING.



SPECIAL BOARDS ARE USED WHEN PRESSING BOOKS HAVING A FRENCH GROOVE.

of the book. This may be done by working them over a thin rod. By means of a slight edging of glue along the joint it is possible to temporarily attach the book into the case in order to adjust the squares. The endpapers, including the piece of muslin or linen and the tapes are glued, the book is shut, and without opening it is placed in the press with the press boards placed as shown in the figure, and the weight applied without delay. As this is usually the only pressing a cloth book receives it should be allowed to remain for several hours, and the forwarding is completed.

Leather joints. The leather joints and the turn-in at the inside corners require to be mitred to correspond to those of the fore-edge. Should there be any danger of the slips showing through the joint or if the leather is thinner than the rest of the turn-in, the board

must be lined with paper. When the joints are pasted down the result should be a frame of leather round the inside board enclosing a panel which may be filled in with silk and is known as the doublure.

Silks. The cut edges of silk are always ready to fray even though the material may be lined with paper, and, to avoid this, it is usual to make them up in the form of a pad. A stiffener of paper is cut to the size of the board panel, or the flyleaf as the case may be; the silk is cut to size, allowing a quarter of an inch turn-in all round. After being ironed the silk is laid flat and the paper placed into position upon it, when a little glue round the edges will allow the turn-in to be made. This should result in a loose silk pad which may be glued into position on the book.

SECTION II.

STATIONERY BINDING.

SECTION II.

VELLUM OR STATIONERY BINDING.

THE principles involved in the binding of books that have to be written in are so different from those of letterpress work, that it has been decided to go through the whole process again in order to avoid the confusion that would otherwise ensue. The work includes the production of books mentioned in the last four divisions of the trade, i.e., account books, manifold books, exercise and note books, and general office stationery. The term vellum binding came to be used because at one time the sections were always sewn on strips of vellum, but, as this material has been replaced by strong webbing, stationery binding is a much better and more comprehensive term. Its importance as a trade is about equal to that of the letterpress branch; the work is generally heavier and even more varied.

THE PAPER.

The stationery binder is even more concerned with the paper than is the case in letterpress work, for its writing qualities are of more concern than those required for printing. Papers generally are divided into "printings" and "writings," and it is with the latter that we are here concerned. A classification may be made as follows:—

Ledger papers (hand made). The demand for these papers is the main support of the hand-made paper industry, for the production of high-class account books is a large one.

Ledgers (machine made) vary widely in quality. They should be strong, heavily tub-sized, and have a good writing surface; usually blue or "azure" laid.

Writings. A wide class of papers usually white or cream laid, used for note books, cheap account books, exercise books, etc.

Banks. These consist of a series of thin, strong, heavily-sized papers. They are used for letter headings, typewriting and general manifold work which requires a thin paper.

THE SIZES AND SUB-DIVISIONS OF WRITING PAPERS.

Although the same names are given to the writing paper sizes as to those for printing, the actual dimensions differ and usually run smaller. The folding is different, and, in order to supply the demand for long books, a series of sub-divisions cut down the long way of the paper is introduced.

The broad folios. These give a series of full size account books, the foolscap folio being the most used.

The broad quartos form a series of small, square account books, such as minute or exercise books.

The long quartos form a series of long books useful for the shop counter, or wherever a series of minor transactions have to be recorded.

Broad octavos. Rent books, note books, are usually formed from these sizes, particularly foolscap.

Long octavos form long pocket note books.

MACHINE RULING.

An account-book binder is not expected to undertake his own ruling, for it is a separate trade, but he has to prepare the paper, therefore, should understand the process.

Pen machine and disc machine. There are two distinct machines in use for ruling paper. One makes use of a series of pens fixed into one or two brackets which are kept supplied by means of ink-soaked wads. Each series of pens can be arranged to rule along the whole length of the sheet, or they may be lowered automatically at any required position on the sheet by means of adjustable cams. One or two coloured inks may be used on pens in the same series, provided they do not come too close together. The other machine makes use of metal discs arranged upon spindles in place of pens, and is more modern. One or more spindles can be brought into use for one set of lines, a separate one being required for each colour as well as for every stop on the paper.

Machines compared. Although the disc machine is of a more recent invention, the pens have their advantages for certain work; the deciding factors being: (1) the situation of the stopped lines; (2) the position of the different colours; (3) the "run" or the number of sheets required to be ruled to the same pattern; (4) the paper.

SIZES AND SUB-DIVISIONS OF WRITING PAPERS.

Size.		Folio.	Long Folio.	4to.	Long 4to.
Foolscap	16½ × 13¼	13¼ × 8¼	16½ × 6¾	8¼ × 6¾	13¼ × 4⅛
Foolscap and one-half	24½ × 13¼	13¼ × 12¼	—	—	13¼ × 6⅛
Foolscap and one-third	22 × 13¼	13¼ × 11	—	—	13¼ × 5½
Demy	20 × 15½	15½ × 10	20 × 7¾	10 × 7¾	15½ × 5
Large Post	21 × 16½	16½ × 10½	21 × 8¼	10½ × 8¼	16½ × 5¼
Medium	22 × 17½	17½ × 11	22 × 8¾	11 × 8¾	17½ × 5½
Royal	24 × 19	19 × 12	24 × 9½	12 × 9½	19 × 6
Super Royal ...	27 × 19	19 × 13½	27 × 9½	13½ × 9½	19 × 6¾
Imperial	30 × 22	22 × 15	—	15 × 11	22 × 7½

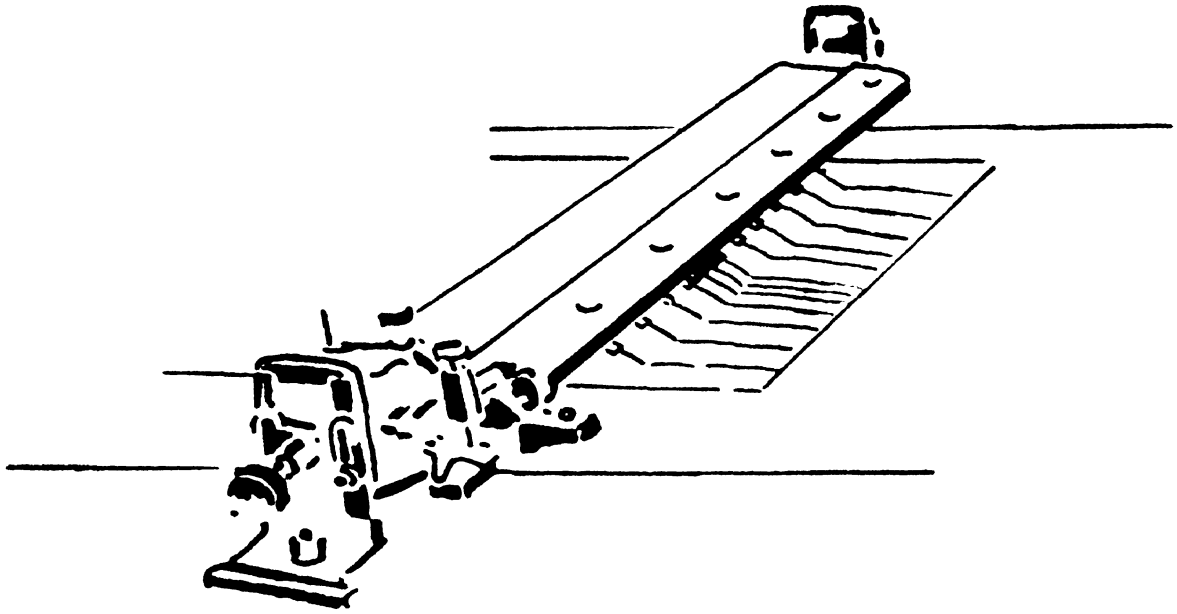
Size.		6mo.	Long 6mo.	8vo.	Long 8vo.
Foolscap	16½ × 13¼	6⅝ × 5½	4⅜ × 8¼	6⅝ × 4¼	8¼ × 3⅜
Demy	20 × 15½	7¾ × 6⅝	5⅛ × 10	7¾ × 5	10 × 3⅞
Large Post	21 × 16½	8¼ × 7	5½ × 10½	8¼ × 5¼	10½ × 4⅛
Medium	22 × 17½	8¾ × 7¼	5¾ × 11	8¾ × 5½	11 × 4⅜
Royal	24 × 19	9½ × 8	6 5/16 × 12	9½ × 6	12 × 4¾
Super Royal ...	27 × 19	9½ × 9	6 5/16 × 13½	9½ × 6¾	13½ × 4¾
Imperial	30 × 22	11 × 10	7 5/16 × 15	11 × 7½	15 × 5½

SIZES OF WRITING PAPERS.

Pott	15 × 12½	Sheet and half F'cap	24½ × 13¼	Super Royal ...	27 × 19¼
Foolscap ...	16½ × 13¼	Copy	20 × 16½	Elephant ...	28 × 23
Pinched Post ...	18½ × 14¾	Large Post ...	21 × 16½	Imperial ...	30 × 22
Post	19 × 15¼	Medium	22 × 17½	Atlas	34 × 26
Demy	20 × 15½	Royal	24 × 19		

(1) For every stop in the ruled lines the disc machine would require a separate spindle, whereas a complicated set of stopped headlines can be set up in one bracket of the pen machine.
(2) A separate spindle is required for every colour in the disc machine, whereas different coloured pens may be arranged in the same bracket.
(3) The output of the disc machine varies between five and seven reams of paper per hour both sides which, compared with the pen machine's two to three, is an important consideration. The disc machine gives more than double the output, therefore, even when two separate workings would be required, as compared with one on the pen machine, the former would undertake a long run in less time.
(4) The line made by the pen machine is a little more certain when hard-sized hand-made papers are used, owing to the flexibility of the pen as compared with the hard metal disc.

From these remarks it will be seen that the pen machine is the one to use for jobbing work, whereas the disc machine is by far the best for long runs.

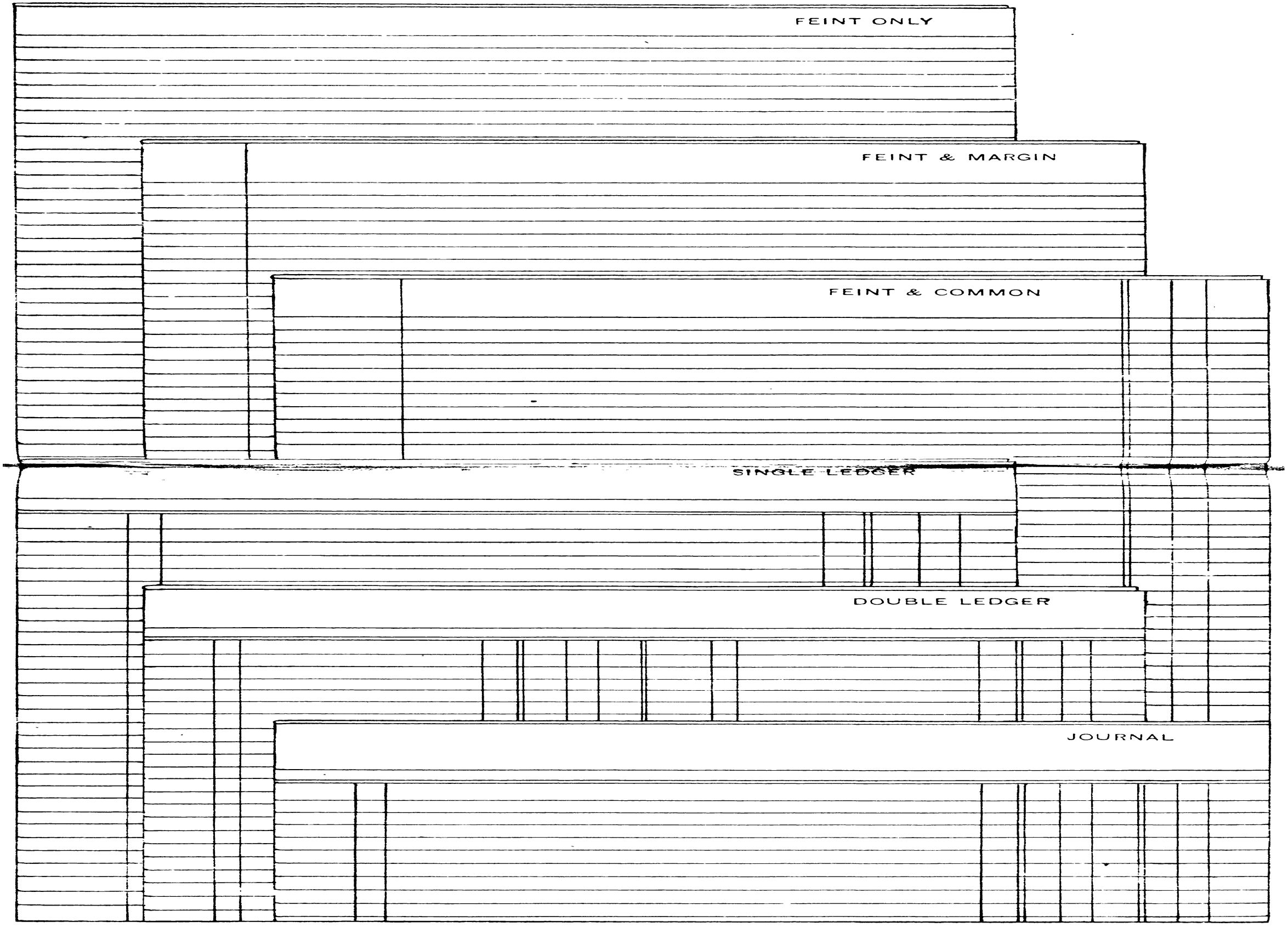


PEN RULING MACHINE ACTION.

RULINGS.

Below will be found a list of standard rulings, together with a short description and uses.

Feint only. This is the term that is given to the light blue writing lines that run across the pages of account books, etc. The word "only" is always used where no other lines but these are required. The width of the lines varies according to the size and requirements of the book, similarly with the depth of the colour.


FEINT ONLY
FEINT & MARGIN
FEINT & COMMON
SINGLE LEDGER
DOUBLE LEDGER
JOURNAL

Where white paper is used these lines should be very faint indeed, otherwise they become very unsightly. Special terms, such as double small, round hand or text, are used where the feints are arranged for writing between the lines. Exercise books and some letter papers are ruled feint only.

Feint and margin consist of the usual feint lines with a red or blue margin line about one inch from the left-hand edge of the page. Manuscript books and minute books are ruled in this manner.

Feint and common. This ruling consists of the usual feint lines together with the following down lines in red, one to form a date column on the left, and three on the right for £ s. d. This ruling is used for books, etc., that consist of general petty cash entries, such as are used by collectors, tradesmen, etc. A common mistake with this pattern is to make the pence column too narrow, forgetting that the binder must cut some off in trimming.

Variation of the feint and common ruling is the double or treble cash with its two or three £ s. d. columns for detailed entries, discounts, etc.

The single ledger. In the rulings described above, the down lines run right through the paper, but, with the ledger, and some of the patterns that follow, each page of the book is given to a separate series of business transactions which require to be headed or titled, therefore, the down lines are stopped at a convenient distance from the top by means of a horizontal double red line. Other than this, the single ledger ruling consists of the usual feint and cash lines, together with a narrow column to the left of the £. This is called the folio, and is used to denote the number of the page from which the particular entry has been extracted. Sometimes the date column is made double, separating the month from the days.

In the case of a single ledger one page is used for *debit entries* and the opposite page for *credit.*

The double ledger has both debit and credit entries on one page, or this may be doubled again where a number of small items are recorded. The cash columns of the ledger are sometimes doubled for recording discounts.

The journal is similar to the ledger with double-cash columns. It may be single or double according to whether the debit and credit are on two pages or one.

GENERAL REMARKS.

It is important that ruling should register well, especially when a printed heading is required. The head and the off-side are used by both printer and ruler, but as the work is nearly always both

sides, therefore, both side edges are used as lays. It is, therefore, necessary that the head and side edges are squared before commencing ruling. No attempt is made to preserve the deckled edges of hand-made papers in account-book work.

Manifolding. The manifold book forms an important branch of vellum binding and where ruled sheets are used it is very important that the register is perfect. It is best to rule the feint lines on the original only, as it is almost impossible to keep them exactly one above the other, especially if a different paper is used for the duplicate.

Memo. books. Small account books may be ruled two or three on a sheet. Foolscap octavo memorandum books would be ruled up on the full sheet as follows. Two sets of the feint lines only would be ruled along the length of the paper, and the four pages of down lines across the short way, both sides. After ruling, the paper is cut in half and issued to the binder, who will fold them the long way, sew them and perhaps bind them two books on, making them into single volumes when the time comes for trimming up. In a similar manner 12mo books would make up three on.

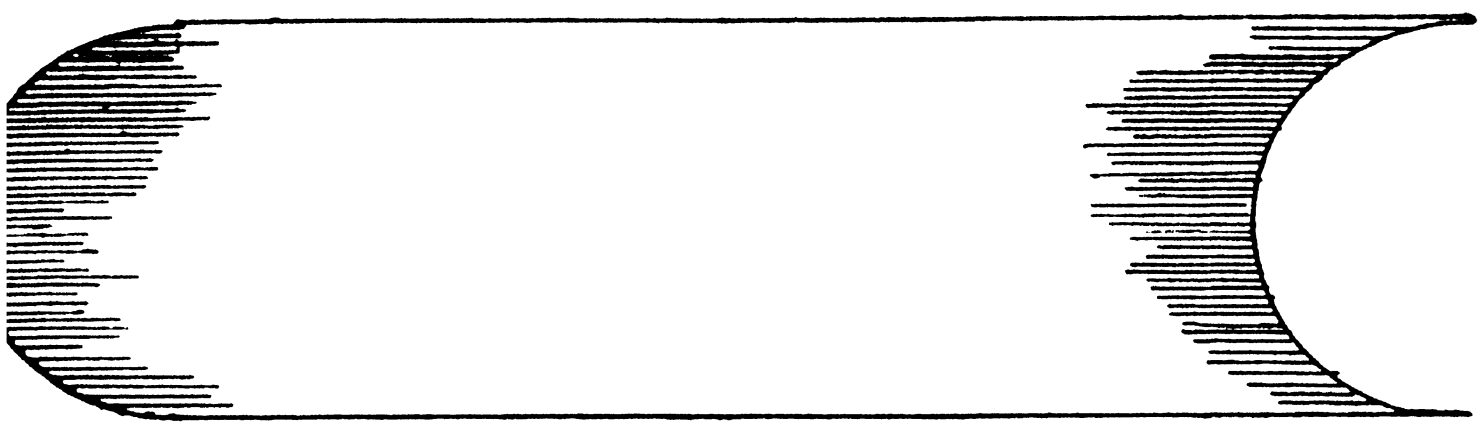
SECTION FOLDING.

Account books are made up by quires (24 sheets), therefore, a ten-quire demy folio will contain half a ream of ledger paper, making 480 leaves or 960 pages. In the case of important work the sheets are overlooked at this stage and all imperfect sheets made good or removed; for hand-made papers, on account of the slight difference in colour that exists between the two sides, it is necessary to "face" them, whereby the light sides come together.

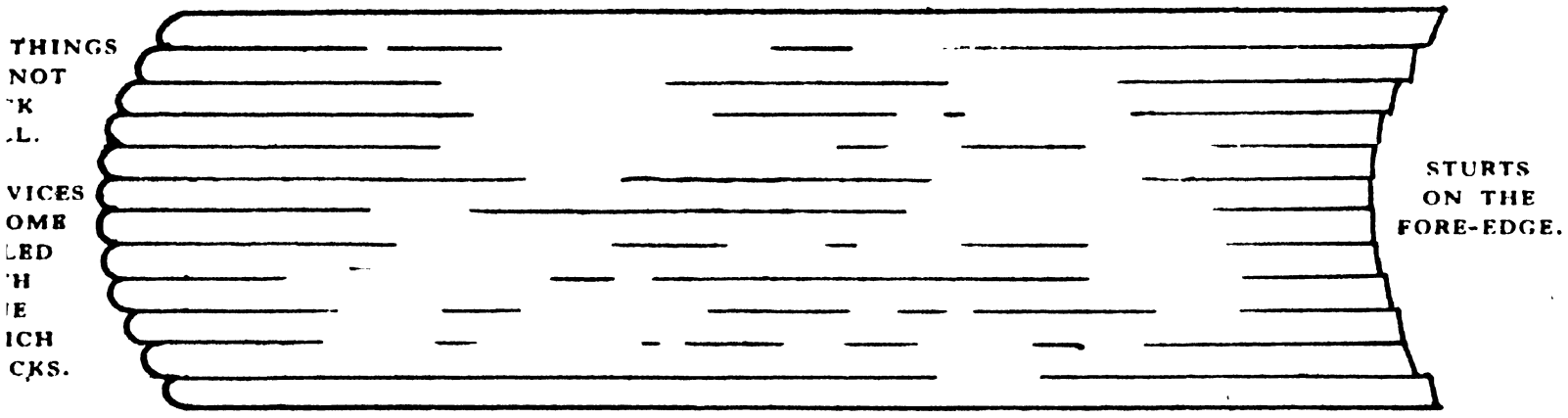
The number of sheets that are taken to form a section is an important consideration, for upon it depends the success of the binding; the governing factors being the size of the book and the thickness of the paper. Four sheets may be taken as a minimum number to a section to be used for hand-made paper; five or six may be used for machine-made papers, unless the books are extra thin or small in size; eight should only be used in the case of very cheap books using writing paper of exercise book quality. The remarks passed in the letterpress section dealing with excess of swelling in the backs of books due to extra thin sections also apply here; on the other hand, thick sections overload the sewing, resulting in a less durable binding.

The folding is not done by single sheets, but by their respective sections. The lay edge or the knock-up edge is the head. It will be found that the sheets will not lie very flat after folding, but

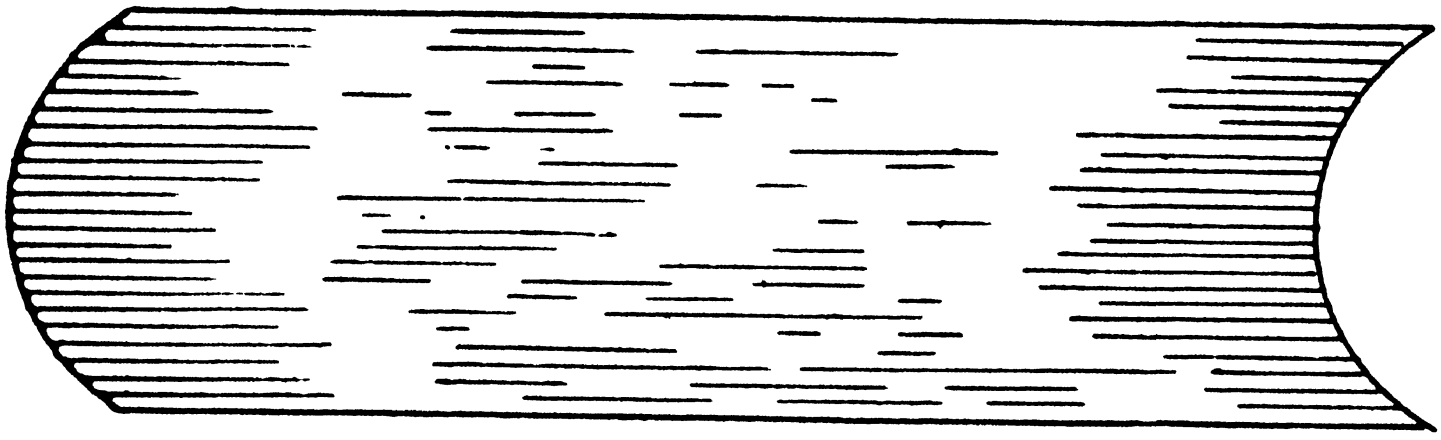
THE THICKNESS OF THE SECTIONS OF AN ACCOUNT BOOK.



SECTIONS TOO THIN—TOO MUCH "ROUND."



SECTIONS TOO THICK—INSUFFICIENT "ROUND" AND WEAK SEWING.



CORRECT SECTIONS GIVE CORRECT "ROUND" OF ⅓RD CIRCLE.

this can be remedied by carefully stacking them so that their own weight presses them down. The books may be counted off, and all waste leaves placed outside as they may be used for making up the endpapers.

A comparatively simple machine for section folding is available where the quantity is large.

PERFORATING.

Invoices, cheques, receipts, etc., that are bound into book form and require to be torn out as occasion arrives, must have the paper prepared, whereby it is weaker where it is required to be torn. The operation is comparatively simple and is known as perforating. The machines in use are of two general forms, the round-hole perforator, and the faster rotary machine usually forming a slot hole.

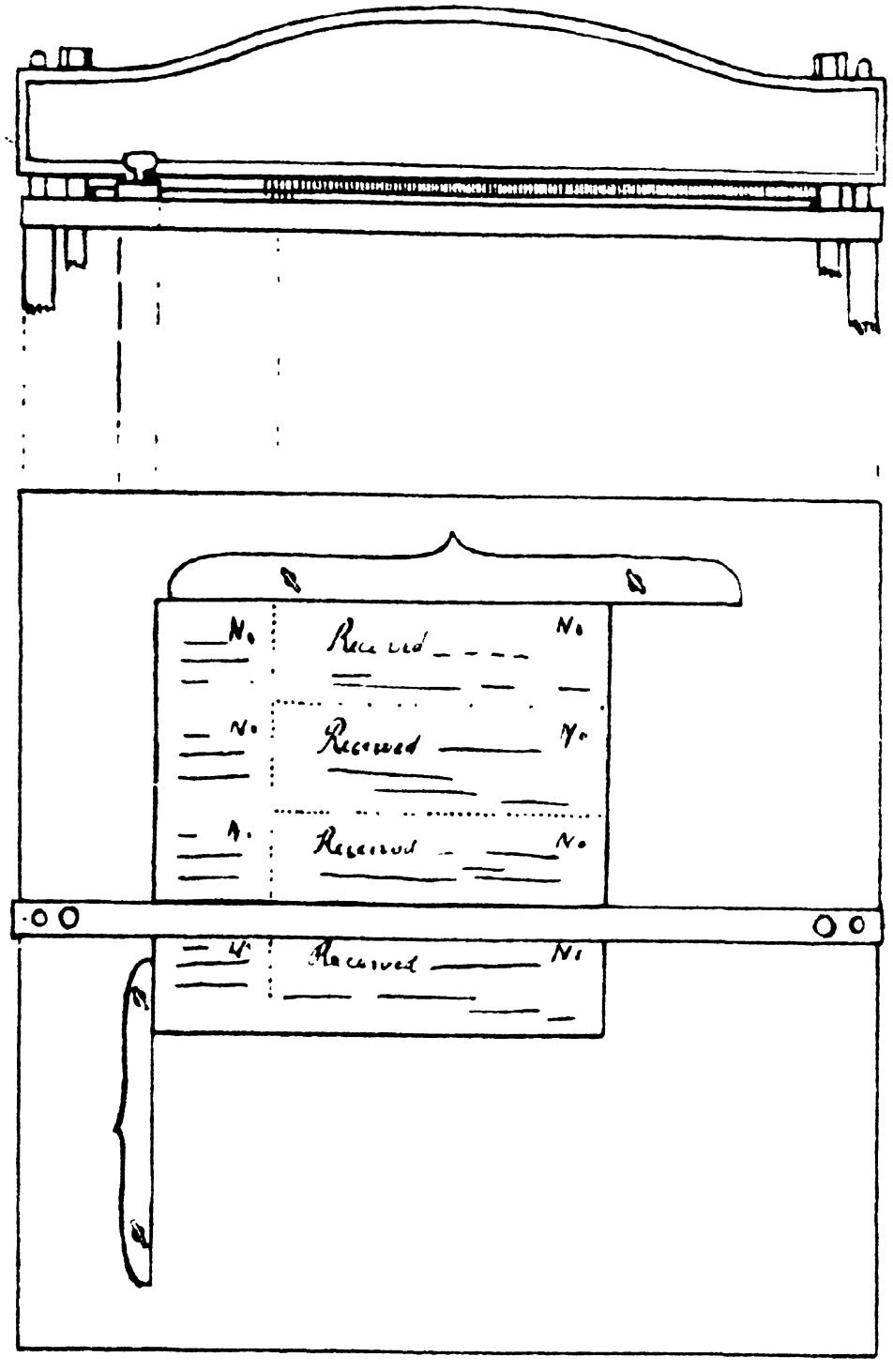
The first-named perforator consists of an iron bracket about three feet long, containing a series of metal pins. This is given an up and down motion, whereby the pins work in and out of a corresponding series of holes in the plate, which is fitted with back and side gauges. More than one sheet of paper may be placed under the pins at the same time, but the number is limited to four or five, and, as time is required to separate them afterwards, the advantage is sometimes doubtful. The pins do not extend along the whole length of the bracket, whereby cross-cut perforations may stop where required.

The rotary machine contains the pins in the form of spindles which rotate against another spindle containing corresponding slots. More than one set of pins may be worked on the same shaft, and where the perforation is required to stop on the sheet a gate is fitted and cams arranged to lift the pins. The motion being continuous the machine is faster and, as the finished sheets are automatically discharged, the operator can give all attention to the feeding. The quality of the work, however, is inferior on account of the slot in place of the clear round hole of the slower bracket arrangement.

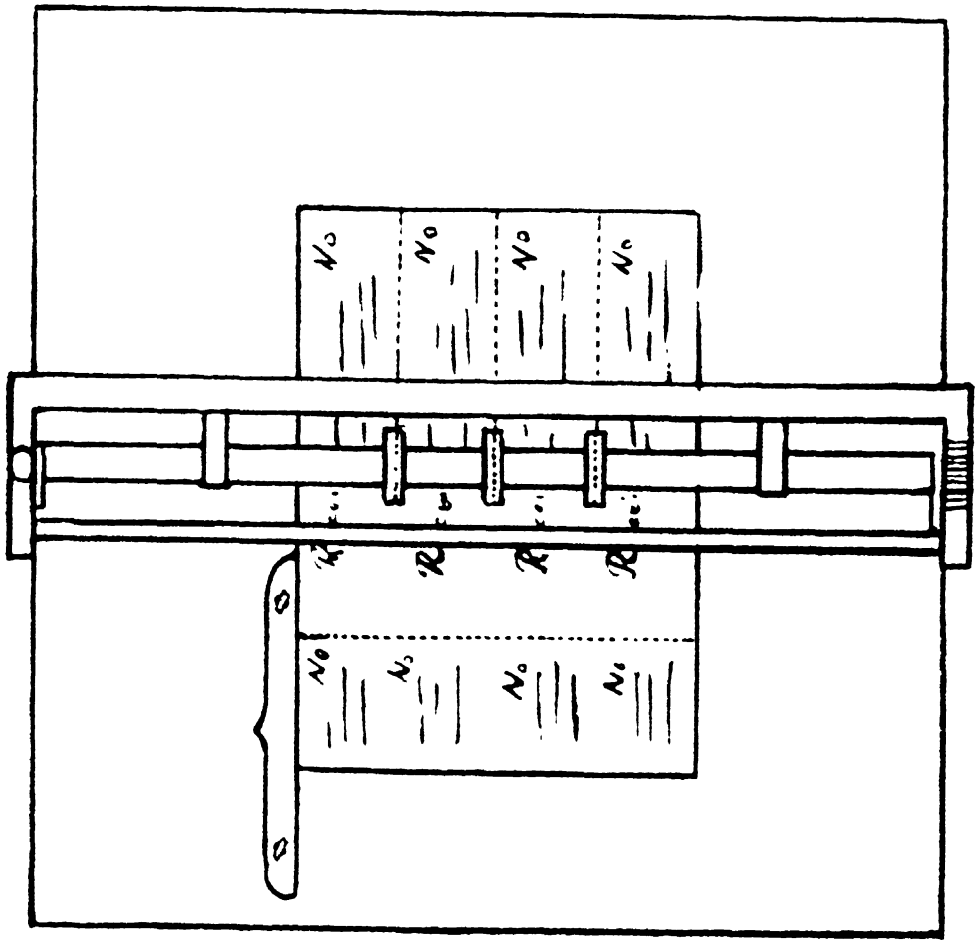
Postage stamps call for a special design in perforating machines. It employs a set of pins arranged as shown in the diagram, whereby when the sheet is once fed into the machine, it is moved along automatically the exact width of a stamp until completed. It is more accurate than rotary perforating and produces a round hole.

Manifolds have sometimes the original and the duplicate of the same paper, whereby the printing occurs on the first and third pages; or on the first only when the other is blank. In this case

PERFORATING MACHINES.



PIN PERFORATING MACHINE.



ROTARY PERFORATING MACHINE.

the perforating occurs before folding and the interleaving arranged by alternating before making up the sections. Where the duplicates are of a different paper the printed sheets are folded, perforated, and then interleaved into sections, when it will be found that a paste-in single leaf is required in the centre of each section.

Ruling machines may be obtained with perforating apparatus attached, whereby one lay will suffice for the two operations.

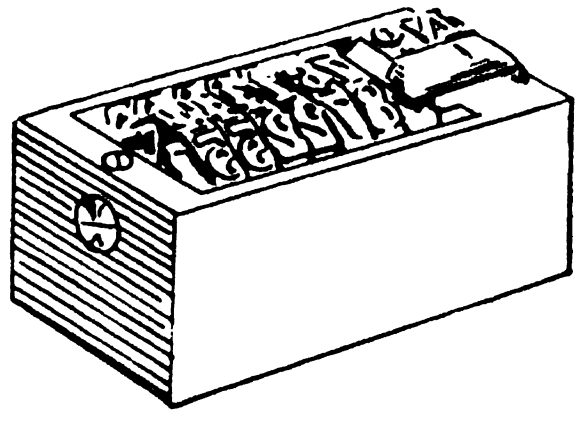
NUMBERING.

Account books require to be paged whenever there is an index, and counterfoil books must have their originals and duplicates numbered. A small machine is used to impress these numbers, which, after recording once, or at every other impression as occasion requires, automatically advances a figure.

Account books are best numbered after they are sewn and the edges trimmed. Where every page contains a separate record, such as the double ledger, they are numbered consecutively throughout, and the book is said to be *paged*, but where the whole opening is used for an entry, as in the case of the single ledger, the two facing pages are numbered as one and the book is said to be *folioed*.

Duplicate or manifold books. The machine is able to number the pages of bound books only where the figures occur in the top corner of the leaves and, where this can be arranged, it is perhaps the easiest method; failing this the numbering must take place before sewing. Folded sections are troublesome, as they have to be separated and placed in order again by the operator, which is the reason why books of single leaves are popular with this class of work in spite of the difficulties of sewing. By a simple adjustment of the machine the numbers may occur in duplicate or triplicate as required. Where the books form a sequence, the numbers of the invoices, etc., may run on, as most machines will number up to six figures.

Type-high numbering machines consist of a small piece of apparatus which may be set up with the printing type and the sheets numbered while being printed. By making the word No. a little higher than the rest it is forced down at the time of the impression, whereby the change in the number is effected.



TYPE-HIGH NUMBERING MACHINE

ACCOUNT BOOK ENDPAPERS.

A special type of "made" endpaper is used for heavy account books. It is made up of the same paper as used in the book, the joint being of strong cloth or leather, and is sewn on.

The material required for each pair of endpapers is as follows:— Two folded sheets of clean, plain paper similar to that used in the book itself; two sheets of paper which may consist of the ruler's waste sheets; two strips of leather or strong cloth for the joints, two inches wide and a little longer than the book itself; four pieces of marbled paper the size of sheet when folded.

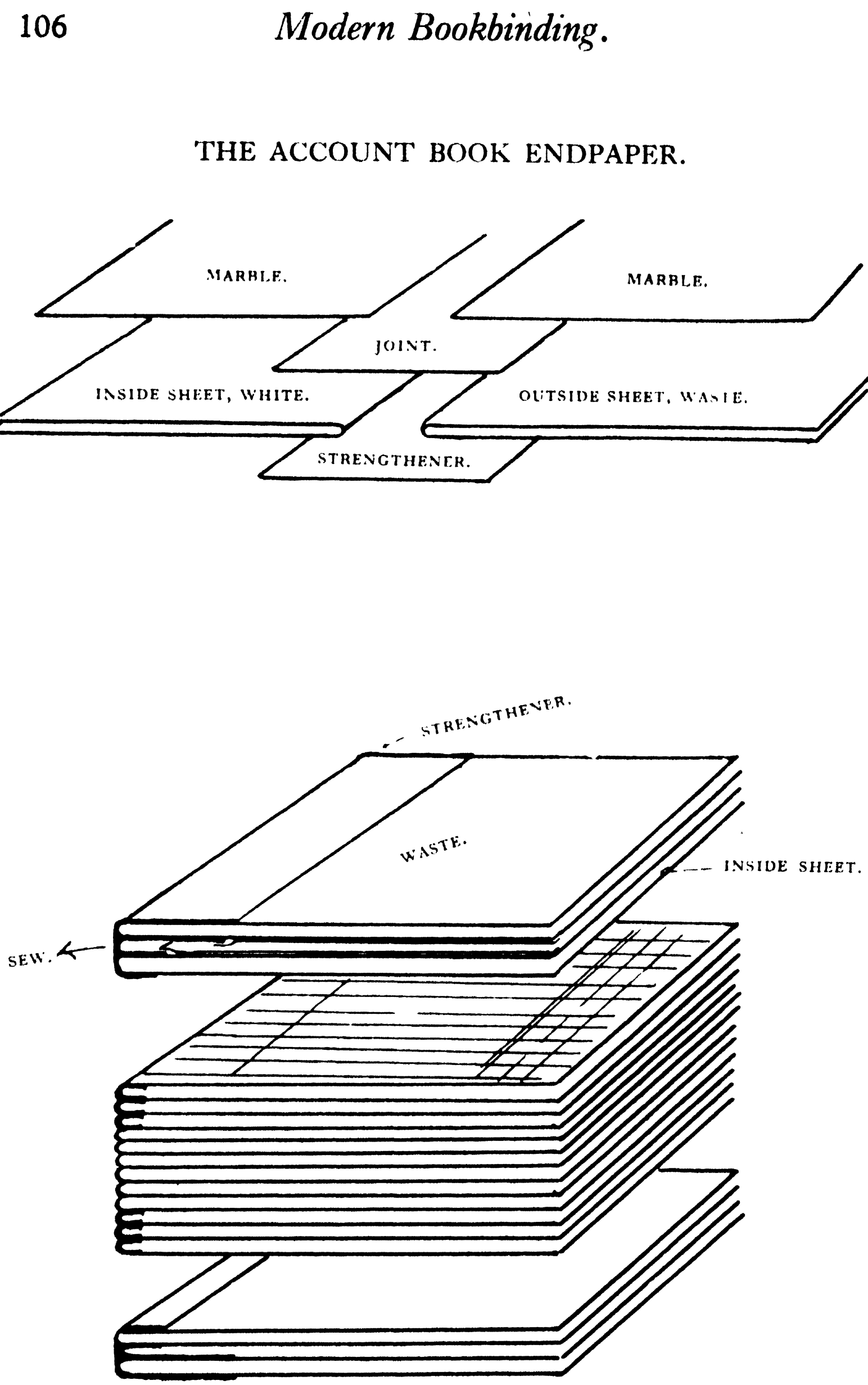
The ends are made up in pairs and all material is laid to one edge, which is the head. The joint pieces are glued, one of the waste sheets is taken and laid along the glued joint, covering two-thirds its width, the blank sheet laid over the other third and the folder used to assure that they stick well. The other endpaper is treated in a similar manner, or if more than one pair be required the whole is brought to this stage. The insides of the endpapers are now lined with marble paper, which should just cover the edge of the cloth or leather joint; thin glue should be used for this purpose. The ends have now to be folded and strengthened. A strip of linen is glued over the outside fold and, as it is not seen in the finished book, the colour is not important, provided it is not too dark. Just as the inside joint is wider one side than the other, this strengthener should be the same, the narrow portions are placed nearest the book.

Other forms of endpapers or linings. The varieties of styles occurring in the cheaper forms of bindings in this branch of the trade are very numerous. The more general styles will be mentioned here, many of which are put on after the book is sewn.

A plain white end is used for ruled paper books in cheap bindings. Flush bindings may have the folded sheet pasted to the first leaf of the book, this should be pasted all over, not edged, as ruled books usually start page one on the left-hand side. Books with "squares" on where the material is turned in require an extra waste single leaf added to the outside of the endpaper. Marbled paper ends sometimes are used without a cloth joint and, as this paper is not strong enough by itself, it is used to line the whole of the inside opening after the book is sewn.

Manifold books employ a carbon paper to effect the extra copy which is of a greasy nature and ready to stain. On account of this it is usual to make the back endpaper of such books of a grease-proof paper. The ends for this work may be edged on, or better, a pair of single leaves sewn round the first and last sections.

THE ACCOUNT BOOK ENDPAPER.



TAPING.

This is an operation whereby extra strength is given to important account books. Bindings of this class have to withstand daily wear and tear over a period of many months, and the object here is to reinforce those sections, such as those that occur at the beginning and at the end of the book, which from experience have been found to give way under strain.

The number of sections affected depends upon the size of the book, usually six at each end, and the operation consists in pasting strips of good quality white linen down the folds of certain leaves. As an example, a ten-quire demy book may be treated as follows:— Twelve sections will be taped and for this purpose ten lengths of linen half-an-inch wide, and two lengths one inch wide, will be required to be cut and laid down upon a pasted slab. The first section of the book will be taped on the *outside* by means of one of the wide strips, but three-quarters of the width should occur on the leaf that faces the cover of the book, leaving but a quarter of an inch for the other side. As linen will not stick to linen very well, the second section is taped up inside the fold of the outside sheet by means of one of the narrow strips, and the third section outside the fold and so on until six are completed. The back of the book is treated in a similar manner, in this case the wide strip occurs on the extreme outside.

The number of sections that it is advisable to tape must be governed by the quality of the binding, but at the same time it must be remembered that the swelling in the back is increasing, and that after a certain number the advantages are doubtful.

PRESSING.

To assure the tightness of the sewing, the sections of best account books receive a thorough pressing at this stage. The "made" endpapers should be included in with the book and precautions taken that the whole is well knocked up and square, for should a section become displaced it will always tend to slip back in spite of the sewing. Any printing must be dry or it will set-off, and ink dries very slowly on hard-sized ledger papers. The pressing should extend over twelve hours.

SEWING.

Sewing has already been described, therefore, it is only necessary here to mention those styles that apply to this branch of the trade. Account book sewing is a very important operation, for the books

are large and durability is of the utmost importance. The materials should be of the best and selected with care.

The thread should be strong, bearing in mind the excess of swelling if too thick.

The tapes must be free from stretch. Vellum was used at one time, but the linen webbings now sold are better, as the glue adheres to them better and they are not so hard as to cut the thread. The sewing itself resembles the library style sewing previously described, except that the kettle stitch is not sewn in and is made stronger. Instead of merely catching up the thread to the previous section, a loop is made at the commencement of the sewing and the threads securely tied to this, as illustrated. Attempts are sometimes made to increase the strength by sewing through the tapes instead of taking the needle round them, but the advantage is doubtful, for in this case it is not possible to pull the slips tight after any reduction in the swelling by hammering. A frame is not used with these sewings, as the stiff tapes do not require support, and their position on the back is not important, provided they are fairly equally distributed along the back. An even tension of the thread throughout is very important.

Machines of the heavier type are used for the cheaper styles of account books only, for they are unable to sew tight enough for heavy work.

Manifold books, etc. It has been mentioned that where these can be made up of single leaves, certain operations, such as perforating, numbering, etc., and the assurance of correct register, are much simplified. The sewing of single leaves, however, presents difficulties. They may be oversewn, or if a good inch margin is allowed in the back at the time of printing and the thickness of the book does not exceed one inch, they may be stabbed or wire stitched through the side. Some wire-stitching machines will penetrate an inch of paper, but failing this, holes are stabbed through the side by means of a bodkin or a stabbing machine and the book sewn through with thread.

ACCOUNT BOOK FORWARDING.

The qualities and styles of bindings in the stationery trade are quite as numerous as those in the letterpress branch. Below will be found a few definite specifications which may be used as a guide and which will be adhered to in describing the various operations to follow.

Extra account books. Hand-made paper, at least six sections taped at each end, sewn on four stout webbing tapes by hand, made

endpapers with a leather joint, marbled edges, lined over the whole back with calf or hide, hollow made of millboard drawn on, split boards best black millboard, covered calf or hide, bands and laces optional.

Half extra account books. Machine-made paper, tub-sized, four sections taped at each end, made ends, cloth joints, sewn on three webbing slips, marbled edges, back lined bands of calf or hide, hollow back half millboard and machine board drawn on, split boards half best black and machine, covered calf or good basil.

Cheap account books. Medium writing paper, sewn two tapes on stiff linen, ends lined marble with a cloth joint, top marbled edges, backs lined bands of basil, machine board no split, strawboard hollow, covered basil or buckram.

Quarter squares. Sewn two tapes, sprinkled edges, strawboards with squares, covered quarter leather or buckram, tight back, paper sides turned in.

Flush books. Sewn two tapes, strawboards, leather or buckram back, paper sides, cut flush, sprinkled edges.

In describing the various operations that are necessary to bind books in the above styles it is the first two, namely, "extra" and "half extra" account books, to which the descriptions will mainly apply, but where these are modified in the cheaper styles the fact will be mentioned towards the end of each section.

PASTING UP.

This operation is similar to that of letterpress work, the first and last sections being pasted along the back. The paste must not exceed an eighth of an inch. Sometimes a strip of linen down the back of the junction of the sections is employed, but this is inclined to cause starts when rounding.

The swelling may be reduced a little at this stage. It is important that the fore-edge is gripped tight to prevent the sections becoming displaced, and for this purpose the nipping press or the hand clamp of a guillotine is useful for large books. The back is hammered sufficient to close the sections a little, but not enough to cause the threads to cut through the paper.

GLUING UP.

A very important operation and only the finest glue should be used, even to the extent of using pure gelatine, of which glue is an impure form. The back and head of the book must be knocked

up perfectly square and thin glue applied with a short-haired brush. Avoid gluing the tapes at this stage, for a reason to be explained later, and confine the operation to the kettle stitches and spaces between the exposed threads. These remarks apply to extra and half extra account books only, other work may be glued along the length of the back in the usual manner.

TRIMMING THE FORE-EDGE.

The guillotine is universally used for trimming and cutting in stationery binding. The fore-edges are trimmed before any attempt is made to round the backs, to avoid any risk of cutting away the pence column of the ruling. The operation is very simple. One cannot be far wrong in trimming as little off as possible, but where the customer has given a special size for the book, keep within it, as he is probably governed by the dimensions of his safe.

ROUNDING.

This operation is much the same as described for letterpress work, a little more energy being required on account of the thicker sections and heavier books. Stationery binders are not concerned with the operation of "backing."

STIFF LEAVES.

A stiff leaf occurs where two leaves of an account book are pasted together. The outside ruled leaves and the blanks of the endpapers are always treated in this manner, also wherever the rulings change such as the junction between the index and page one of the book. It occurs at this stage, for now the book is rounded it may be pressed solid. Thin glue is best, for paste is inclined to cause the ruling to set off. The operation simply consists in gluing the leaves all over and closing the book and pressing flat with the tapes thrown out.

With extra thick books it may be that the rounding has not been sufficient to allow a solid pressing, when it will be necessary to place a few thin boards next the stiff leaves at the time of pressing.

Projections. The pressing may be continued for several hours with advantage. On taking out it will be noticed that the dampness has caused the paper to stretch, whereby the stiff leaves project beyond the fore-edge. These require trimming down with a knife and rule.

The tapes will be found to have buckled on account of the reduction in the thickness of the book, but if precautions were taken

not to allow them to be glued at the time of gluing up it will be a simple matter to pull them tight again.

TRIMMING THE EDGES.

Extra account books have the head and tail trimmed at this stage. It has already been stated that the guillotine demands that the work to be cut or trimmed shall be solid beneath the knife. Now the portion that overhangs the round fore-edge of the book will break away unless special precautions are taken, therefore, (1) incline the book towards the diagonal direction of the knife; (2) support the round of the back by means of pieces of strawboard, so that wherever possible the knife is cutting against something; (3) make sure that the edge has not been drawn away from the gauge.

Cheap account books may be trimmed on all three edges before rounding, in which case it is necessary to pack up the swelling by means of a pad or strawboard when cutting head and tail.

Flush books are not trimmed at this stage of the binding.

EDGE DECORATION.

Marbling. This form of edge decoration, although at one time extensively used for letterpress binding, is now almost exclusive to stationery work. The pattern known as *large Dutch* is seldom used for anything but account books, while *Spanish* marble is employed for cheaper bindings. The smaller patterns, such as *nonpareil* and *shell*, are used for small work generally. It has become a common practice to identify the different rulings by means of the colour of the edges, although no strict rule can be given. Blue edges may indicate a feint-only ruling, red edges a feint and cash, large Dutch for double cash, etc. Where convenient it is an advantage to marble the fore-edge of extra account books before the heads and tails are trimmed.

Sprinkled and coloured edges are used for the cheaper bindings especially where the quality of the work will not keep a marbling plant employed.

An improvement upon beating the colour out of the brush by means of an iron pin is the aerograph brush, for it is cleaner and quicker and is quite convenient for solid colour as well as sprinkle. Almost any water stain will take to the edges of books, ruling inks being very convenient for this class of work; spirit stains must be avoided, as they penetrate too far into the paper.

Gilt edges are generally too expensive for stationery binding except for small pocket books; plain edges are quite common except for ruled books, for here the ends of the lines show on the edges.

ACCOUNT BOOK BOARDS.

The method of attaching the boards of account books is similar to that already described for library binding in the letterpress section, whereby a split is used to secure the slips. For heavy books the selection of the boards is important, best millboards being used for everything but the cheapest work. As a guide for the thickness of the boards, for various sizes of books the following table may be used:—

Size of Book.	Thickness of Book.	Thickness of Boards.	Squares.
Foolscap Folio ...	3 quires ...	S.W.G. 8 ...	$\frac{1}{4}$ inch
Medium ,, ...	3 ,, ...	,, 7 ...	$\frac{3}{8}$,,
Sup. Royal ,, ...	3 ,, ...	,, 6 ...	$\frac{7}{16}$,,
Foolscap ,, ...	6 ,, ...	,, 5 ...	$\frac{1}{4}$,,
Medium ,, ...	6 ,, ...	,, 4 ...	$\frac{7}{16}$,,
Sup. Royal ,, ...	6 ,, ...	,, 5 ...	$\frac{3}{8}$,,
Foolscap ,, ...	10 ,, ...	,, 4 ...	$\frac{1}{4}$,,
Medium ,, ...	10 ,, ...	,, 2 ...	$\frac{7}{16}$,,
Sup. Royal ,, ...	10 ,, ...	,, 3 ...	$\frac{3}{8}$,,

In each case the split should consist of a millboard of about S.W.G. 20. The outside board, where it is necessary to add one, should also consist of thin millboard. The middle board may consist of a machine quality, according to the style of the binding, bearing in mind that black millboards, when at all thick, become very heavy.

The cutting of the thick boards offers certain difficulties, for while it is possible to trim round the edges of boards up to almost any thickness by means of a guillotine, a quarter of an inch is the limit when it is required to cut them into smaller sizes. The remedy is to reduce the thinner boards to within a quarter of an inch before they are glued together or "made," after which they may be trimmed round by means of the guillotine which, under these conditions, will produce a clean, square edge.

It is important to control the warping of thick boards, for should they begin to curl in the wrong direction it is difficult to get them back again. Glue should be used for making up boards, for the moisture in paste takes a considerable time to dry out. A thin board will always pull a thick one round, therefore, the thin split usually has the effect of causing a slight curl towards the book, which is what is desired; but should this fail, a linen or strong paper on the insides, using paste, should be tried.

BACK LININGS.

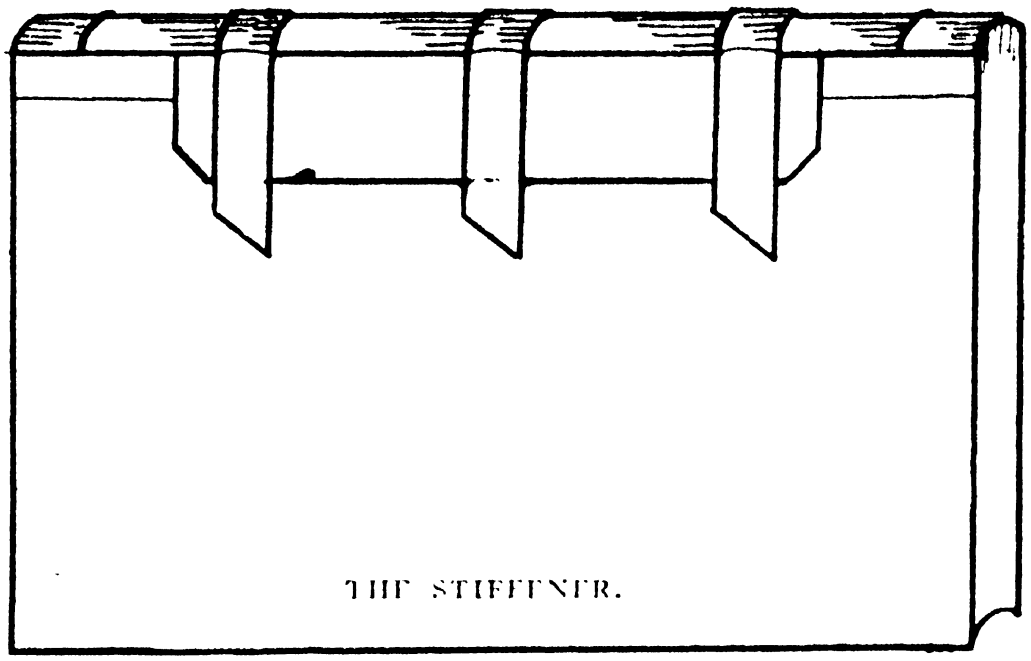
The back linings for this class of work should consist of strong but pliable leather. The first operation consists in gluing a piece of thin board, shaped as the illustration, under the slips; this board is known as a *stiffener*, and its purpose will be explained when dealing with the spring back. A piece of calf skin extending over the whole back and for two inches over the side is the best lining, but tor half-extra bindings it is usual to employ pieces. It is a mistake to confine the linings, or "clothings" as they are termed, to the space between the slips only, for it is important that the exposed threads are firmly secured, but if the leather is thick this portion may be pared down. Glue of medium strength should be brushed over the back sections of the book, but the leather should be pasted to keep it pliable. The linings require to be well rubbed down with the folder and allowed to dry undisturbed.

Tight back bindings are not lined at this stage.

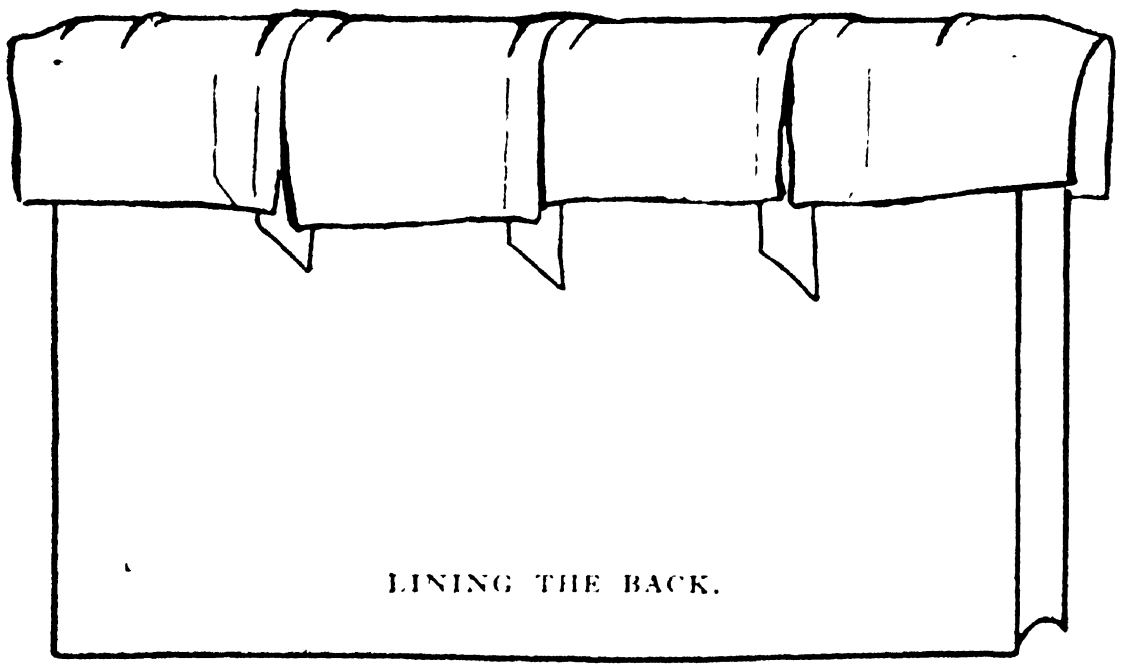
Trimming up ready for the boards is a minor operation which occurs after the linings are dry. *Firstly*, the leather that overlaps the edges is cut off flush. *Secondly*, the waste sheet of the endpaper, which now contains the stiffener, slips and leathers, is cut off within three inches or less from the back, whereby it becomes a flange ready to be set into the split of the boards. *Thirdly*, at about two inches from each end these flanges are cut through to the back edge; this is to allow these portions to be left out of the split to enable the covering material to be turned in. *Fourthly*, the extreme ends of the flanges are cut short from the edges of the book to prevent their being seen when the endpapers are pasted down.

TACKETING.

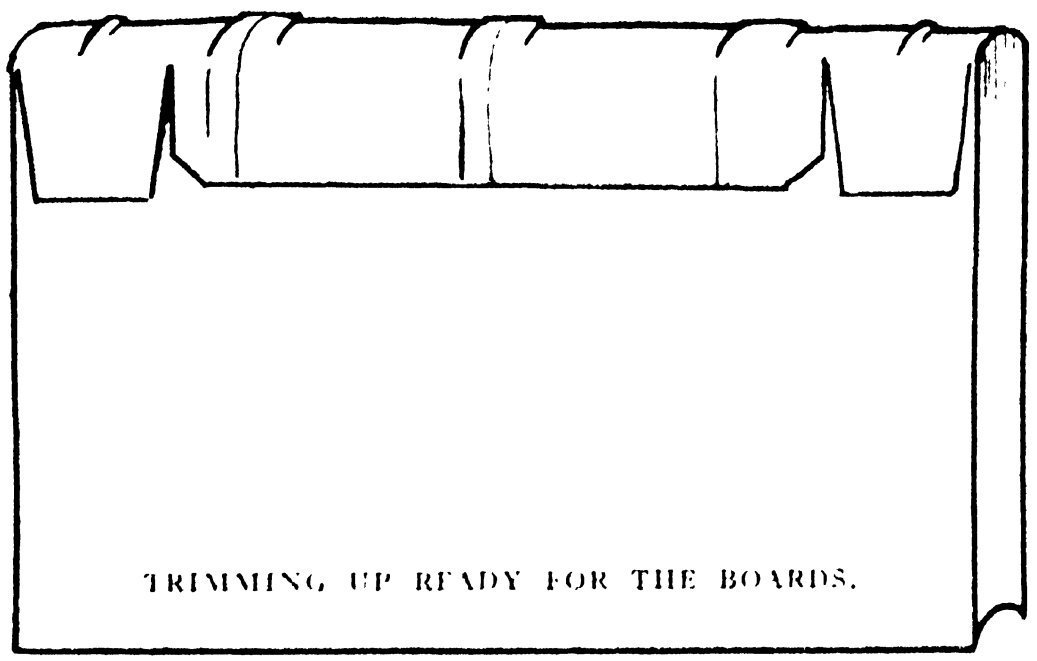
This is a method of increasing the strength of the sewing of heavy account books by means of auxiliary stitches of catgut extending through the clothings or back linings. Books for tacketing must be lined over the back in one piece. Each tacket stitch is complete in itself and the number employed is left to the discretion of the binder, who should aim at an equal distribution between the sections and the webbings. Imagine that a book has three webbings and that it has been decided to tacket every other section; in which case a number of lengths of catgut will be required equal to half the total sections, the length of each being about four inches. The sections are opened at the centre and pierced with a fine bodkin at each side of one of the tapes, and a stitch threaded through from the inside, leaving the ends equally projecting on the outside. The next section tacketed will employ



THE STIFFENER.



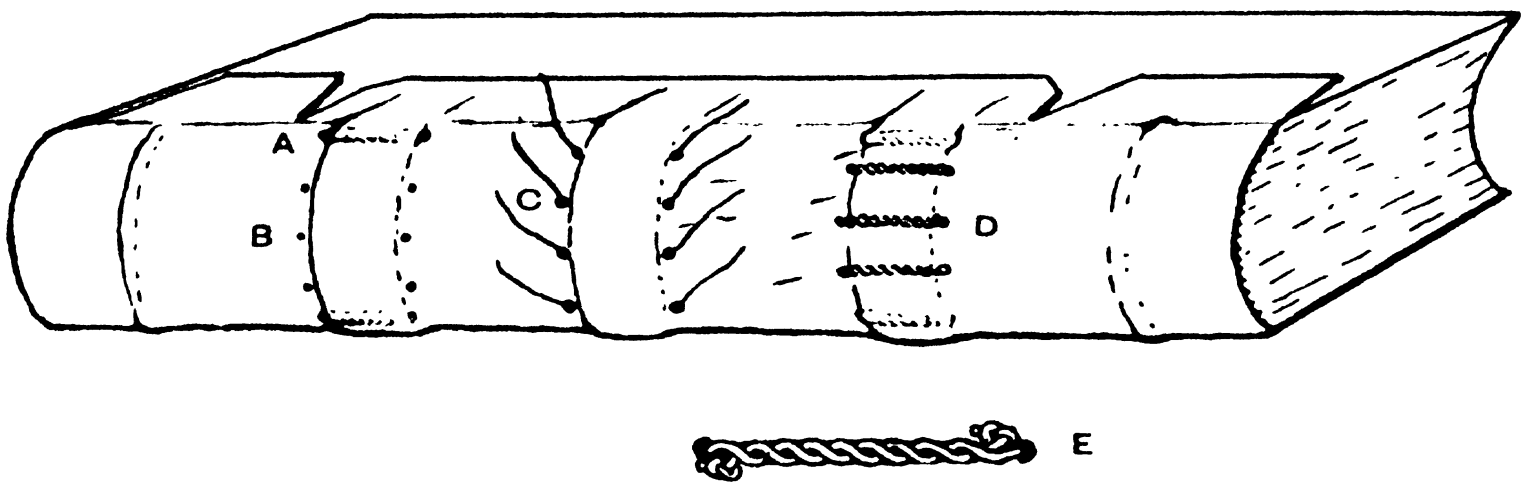
LINING THE BACK.



TRIMMING UP READY FOR THE BOARDS.

another webbing in order to distribute the stitches. The loose ends on the outside are now twisted together as shown, whereby a knot will prevent them becoming undone, and allow the ends to be cut off close. As there is a danger of the tackets on the first and last sections of the book getting in the way of the hollow back

TACKETING.



A. TACKETS UNDER THE LEATHER.
B. HOLES PIERCED FOR OUTSIDE TACKETS.
C. CATGUT LACED THROUGH.
D. TACKETS COMPLETED, THREE OUTSIDE AND TWO UNDER THE LEATHER.
E. ENLARGED DRAWING OF TACKET STITCH.

it is advisable to work these *before the back is lined with leather.* Tacketing is not absolutely necessary, but it affords additional strength for important books and is usually associated with *banded* work.

THE SPRING BACK.

The hollow back of an account book is very different from anything yet described in our letterpress section. It is called a spring back because it grips the back of the book like a spring and must be levered off every time the boards are opened, which is the purpose of the *stiffener* previously described. After it has left the back, however, the effect of the spring is to force the sections up, whereby a well-bound book of this type opens remarkably flat in spite of its heavy linings.

The hollow is made up of a number of thin boards glued together, made round by means of a roller while still pliable, and allowed to dry. Strawboards, although easy to work, are too brittle for use; a good quality thin machine board is perhaps the best, for the best black varieties are inclined to be too hard, except for large books where the curvature is not great. For the substance of the hollow two thin boards will be required for a three-quire book, but as many

as five are necessary for a ten-quire royal folio. They should be cut about two inches longer than the boards of the book, but the width requires considerable judgment and experience. By means of a strip of paper measure the distance round the back of the book extending over the joint three-eighths of an inch each side. This forms an average width for a medium size book, but allowance must be made for any tackets, etc. The component strips are not all cut the same width, the inside pieces being about a sixteenth of an inch smaller. For thin books, where two thicknesses of board would make the back too heavy, one piece is used to which a wrapper of paper is glued, completely enclosing it.

The roller is made of wood, to which is attached a yard or so of strong brown paper. The workshop should possess a number of sizes to suit various backs, and the one selected is required to be not quite so wide as the thickness of the book.

Strong glue, freely supplied, should be used to join the thin boards together and then, in order to soften them, they are held in a gas flame for a few seconds. The back is now gradually wound between the paper of the roller by easing it first one side and then the other until it is tightly enclosed between them and allowed to remain for a few minutes. Before it is allowed to dry hard it is taken out and the edges rubbed over by means of a folder until it acquires the shape shown in the illustration, after which it is allowed to dry firm on a flat board with boards to retain its shape.

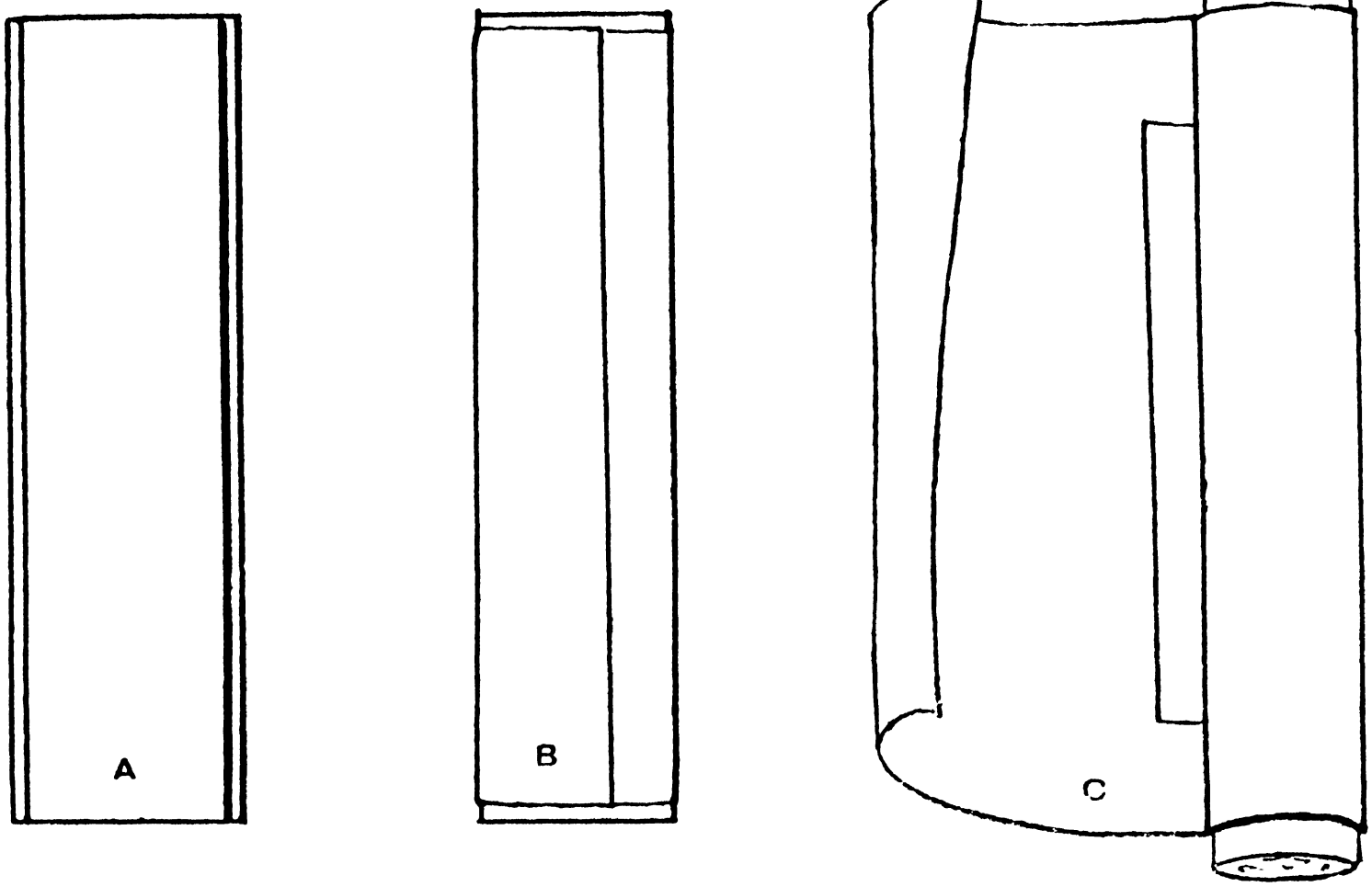
Attaching the spring back. When hard dry, the spring back should grip the book firmly without any danger of it breaking; if too loose or too tight another must be made. The strengthener consists of a piece of strong linen glued to the inside of the hollow, leaving a flange projecting at each side. When this is dry the back may be placed into position on the book, whereby it is made secure by gluing these flanges on to the side, and, while this is being done, make sure that it is square by measuring the distance from the fore-edge, and make them equal on both sides and top and bottom.

CUTTING AND ATTACHING THE BOARDS.

Extra account books, the boards of which are already prepared, now require to be trimmed round and cut to size.

The squares, as the portions of the board that overlap the edges of the book are called, require a little consideration. On referring back to the chapter on boards, a table giving the sizes of the squares for various sizes is given, these, however, refer to the head and tail of the book, for it is usual to make the fore-edge a little wider.

THE SPRING BACK.



A. THE BACK CONSISTING OF TWO OR MORE PIECES OF THIN BOARD GLUED TOGETHER.

B. A BACK CONSISTING OF ONE BOARD WITH A PAPER WRAPPER.

C. ROLLING THE BACK.

D. SECTION OF BACK ON LEAVING THE ROLLER.

E. SECTION OF BACK AFTER EDGES HAVE BEEN TURNED OVER.

F. THE BACK WHILE DRYING.

G. THE STRENGTHENER.

H. ATTACHING THE BACK,

The groove, i.e., the distance between the edge of the spring back and the edge of the board, also requires careful consideration, for if it is too small the board will not open properly, while if too large a strain is thrown upon the first section. *Make the groove at least as wide as the boards are thick* is a rule that can be used as a guide, allowing extra where the leather is thick and for "banded" work.

When squared and cut to size, the boards require to have the back corners rounded off as illustrated, and they are ready for attachment. The stiffener, the tapes, etc., which are now firmly glued together, forming a flange, have now to be placed into the split of the board which has been glued to receive them. The two smaller flanges at each end are left outside the split in order to allow the covering material to be turned in at the head and tail. With both boards glued into position, the squares are carefully adjusted, after which a piece of thin strawboard is inserted between them and the endpapers as a protection, and the book is pressed without delay. There is a slight danger of the boards slipping under the pressure to be looked for, otherwise the book may remain in the press several hours.

Cheap account books with squares have the boards cut to size and pasted to the waste sheet of the endpapers at this stage, back linings are not required where the cover is glued direct to it. A groove three-eighths to half-inch from the back is usual.

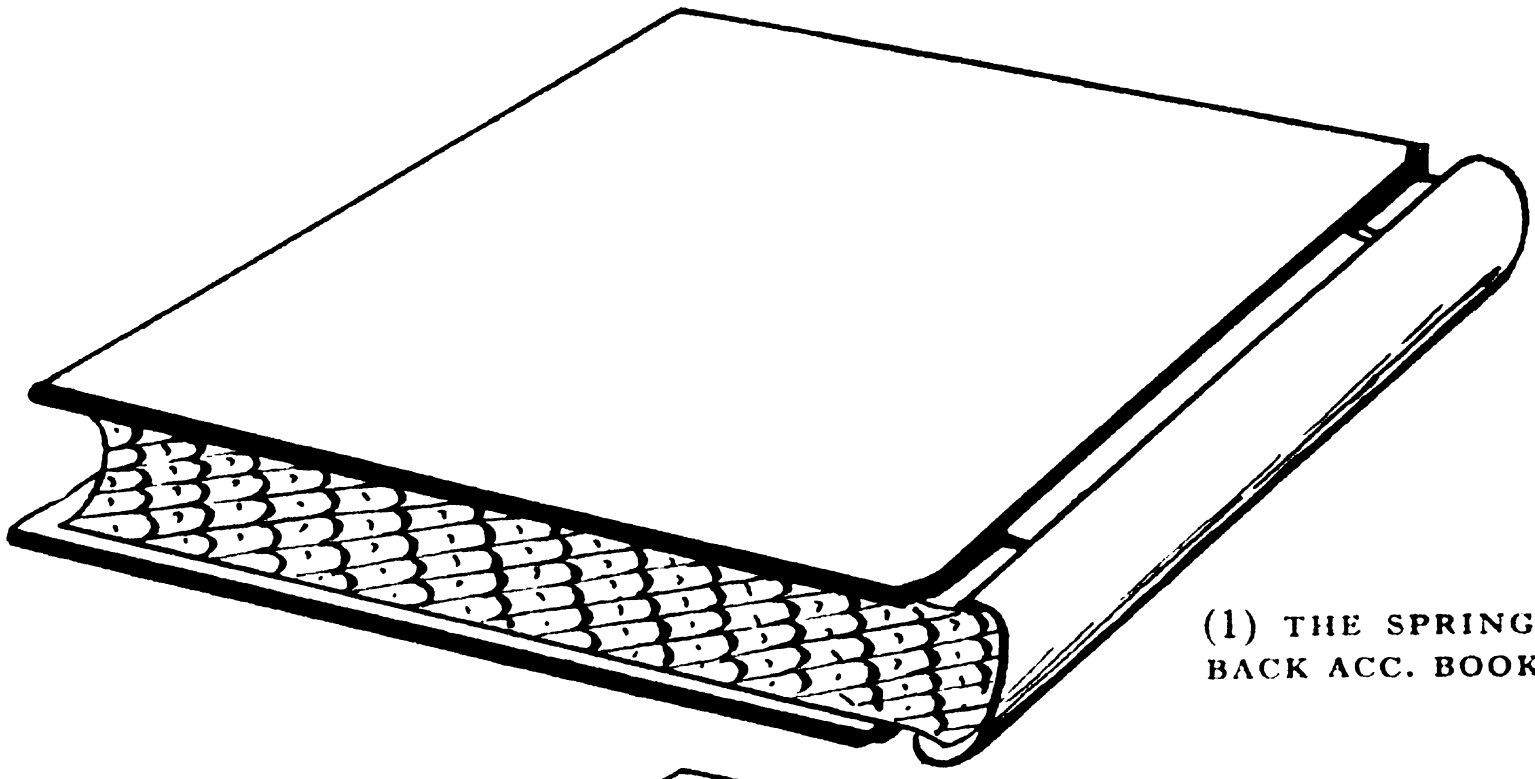
Flush books may be divided into two classes: *Flush and flush turned-in*. For the former the boards may be pasted direct to the endpaper, but for the latter, as the covering material has to be turned in, some form of temporary attachment for the boards must be arranged, either by means of a waste sheet to the endpapers or by tipping them to the slips only.

COVERING MATERIALS FOR STATIONERY WORK.

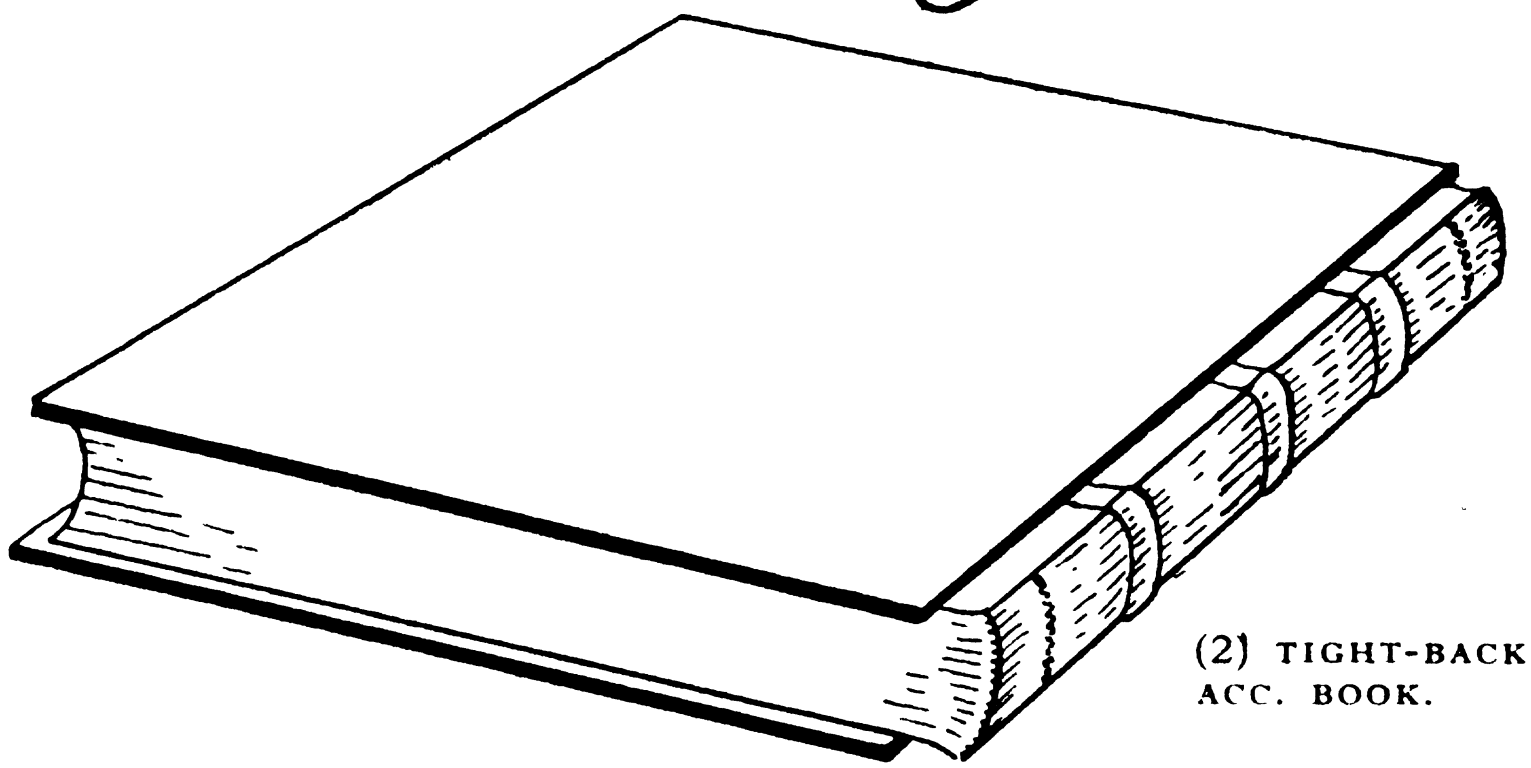
Hides, being very strong and durable and the skins having a very large area, are ideal for large "extra" account books. A dark red variety under the name of "Anglos" now replaces the one-time popular "russia" leather, and is quite as durable.

Rough calf consists of smaller calf skins than hides, and these are dressed on the rough side; they are, however, much heavier than the smooth calf of the letterpress binder. The use of the rough side is not an advantage from a point of durability, as the air is allowed to penetrate into the skins, but they are very pliable and strong.

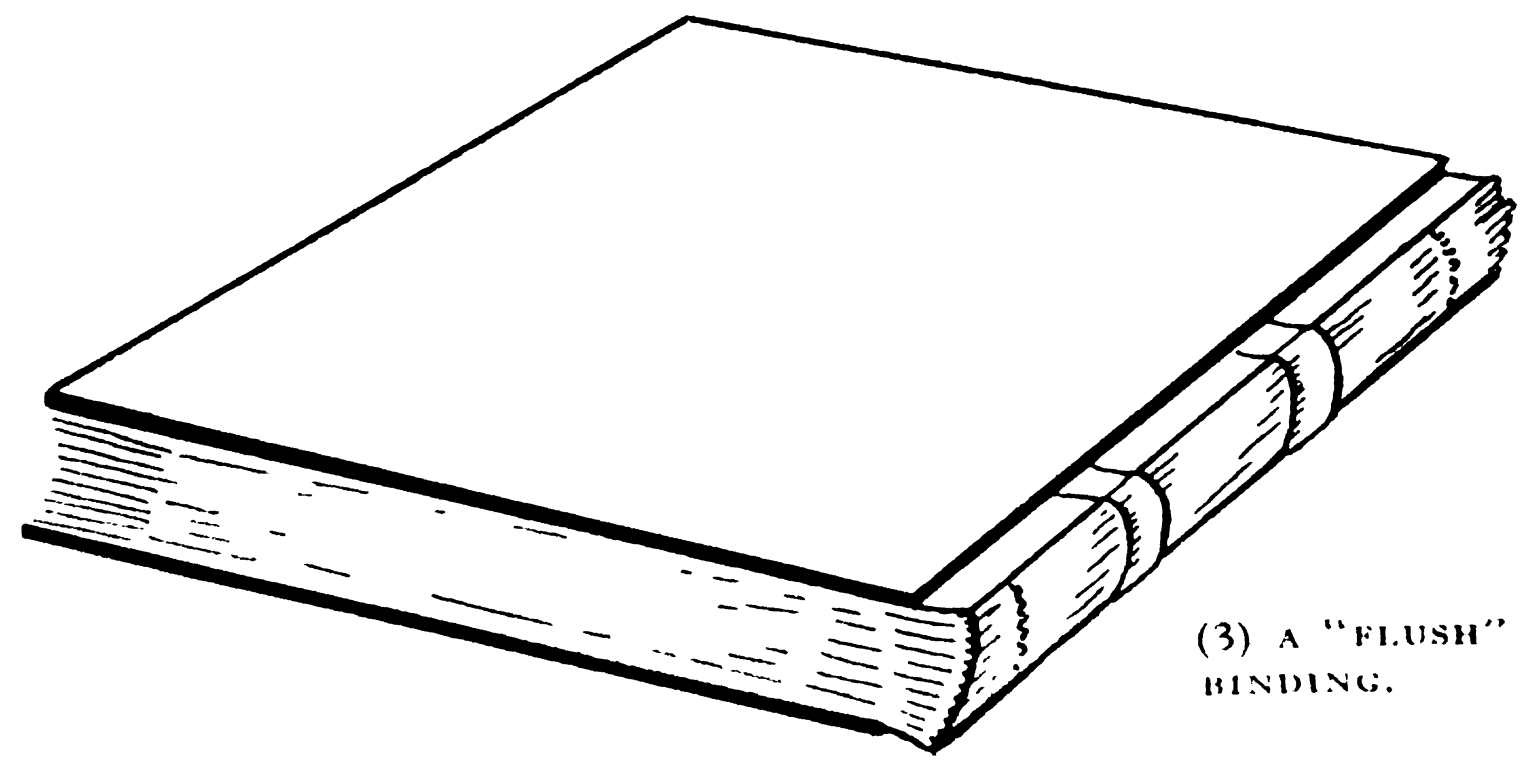
ATTACHING THE BOARDS.



(1) THE SPRING-BACK ACC. BOOK.



(2) TIGHT-BACK ACC. BOOK.



(3) A "FLUSH" BINDING.

Pigskin is another excellent covering material for account books. Although not so pliable as calf, it is close in texture, durable and very strong, provided they have not been shaved down too much. The skins are very large, which is another advantage for this class of work.

Basil is a sheepskin tanned with oak bark. The quality varies considerably, the best of them forming a very useful economical leather for medium-sized account books. Usually dark red in colour, but black and green basils may be obtained; they have a characteristic smooth, glazed surface.

Rough sheep are undyed sheepskins, dressed on the rough side where at first glance they resemble calf. They are, however, very loose in texture and readily fade.

Skivers are split sheepskins. They are suitable for cheap small work only.

Vellum, although difficult to work, is admirably suited to large account books, being the hardest wearing material the bookbinder possesses.

Forrils are split sheepskins dressed in a similar manner to vellums. They are not strong and have a greasy nature which makes them difficult to stick.

Leather cloths form good substitutes for leathers upon occasions, being strong and durable if not so pliable as the latter.

Cloth. Usual quality bookbinders' cloth is not strong enough to use as a covering material except for very light work, and for the sides of half-bindings.

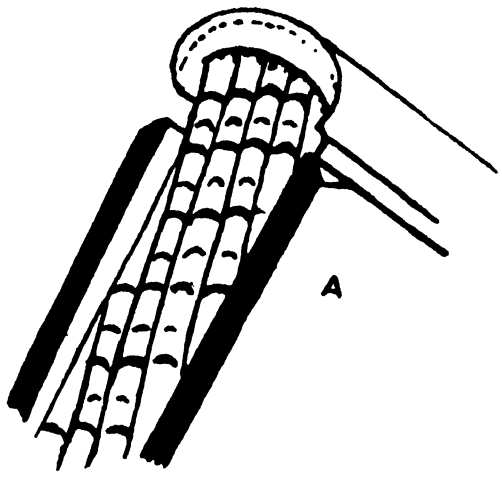
Marble paper is extensively used for the sides of flush bindings.

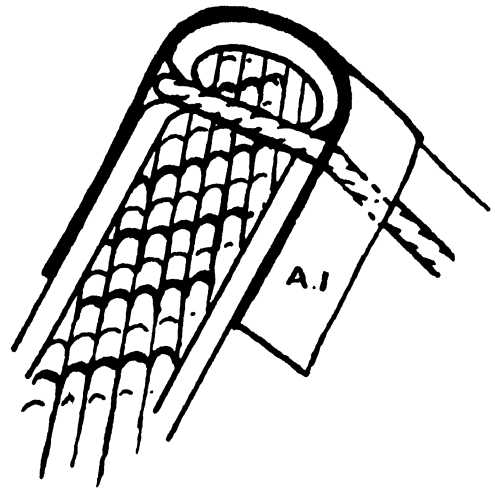
COVERING STATIONERY BINDINGS.

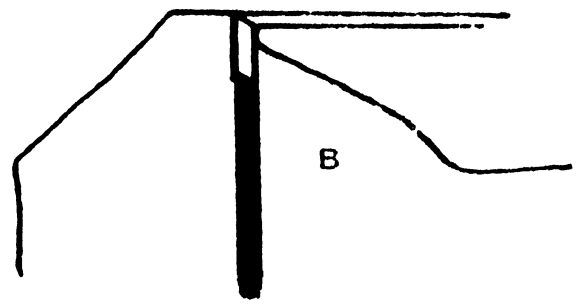
This work, as in the case of letterpress, may be full, half, or quarter bound, according as the leather wholly covers the book, or back and corners only, or back only. Extra account books are either full or half bound; cheap account books are either half or quarter bound; flush books are always quarter bound.

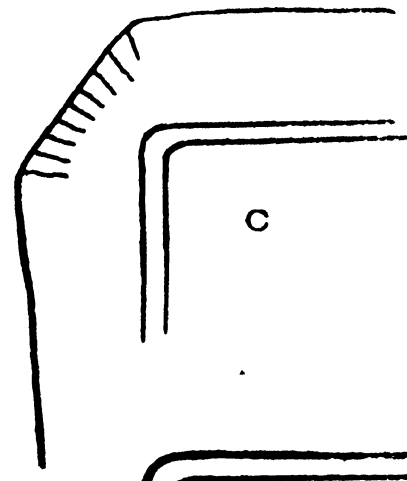
Cutting out and paring. This subject has been dealt with in the letterpress section, therefore, it is sufficient to say here that very little paring is done in this class of work, as every ounce of strength in the leather is required. Backs and corners are pared round the edges only, either by hand or machine.

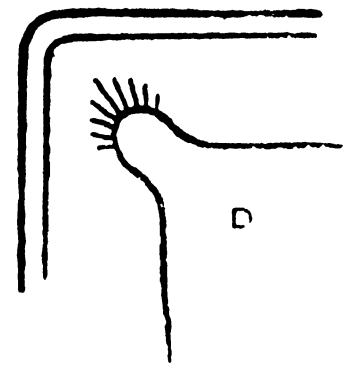
DETAILS IN COVERING ACCOUNT BOOKS.

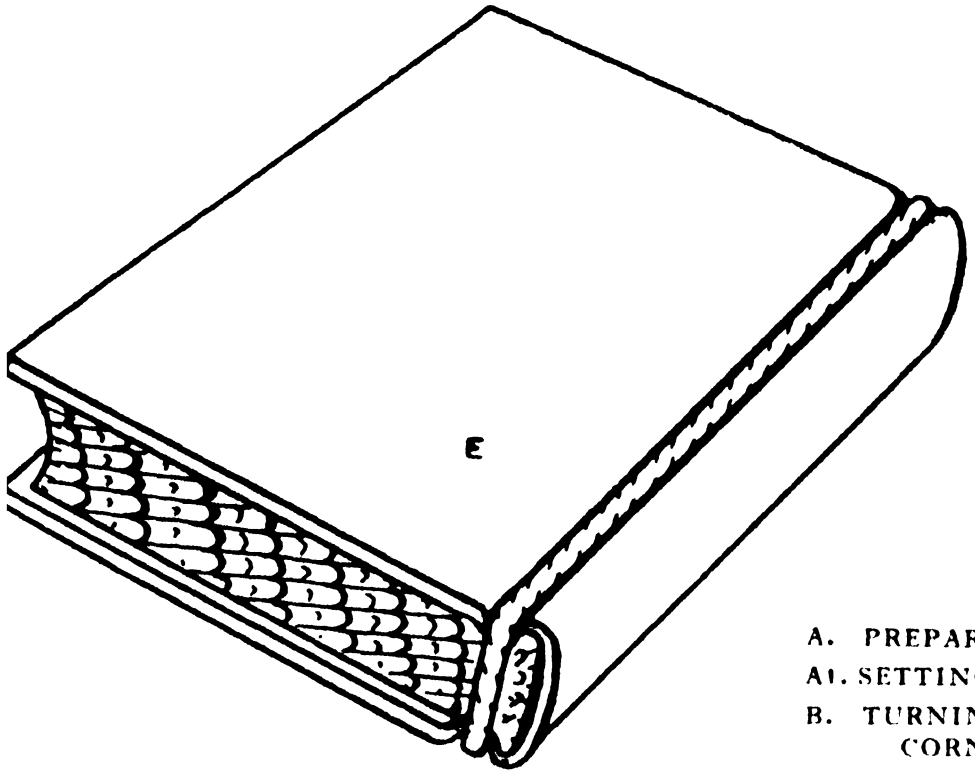












A. PREPARING THE HEAD.

A1. SETTING THE HEAD AFTER COVERING.

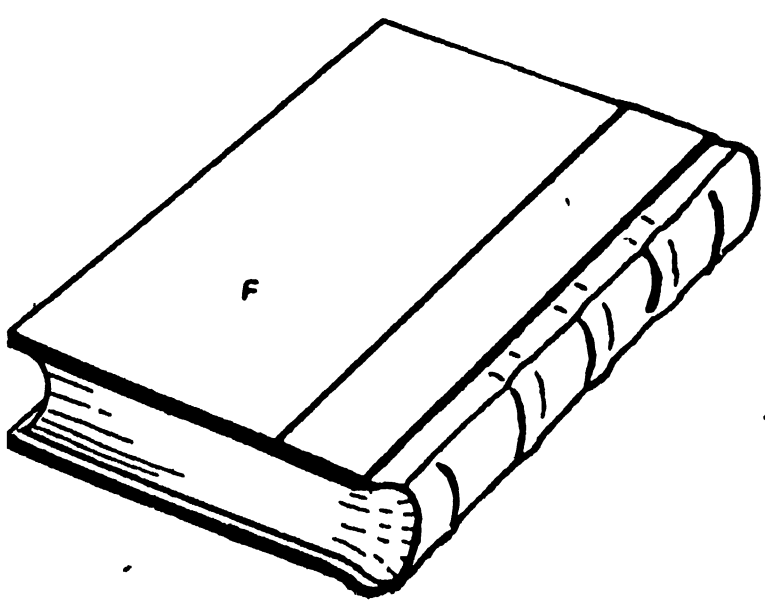
B. TURNING IN THICK MATERIAL. SQUARE CORNERS.

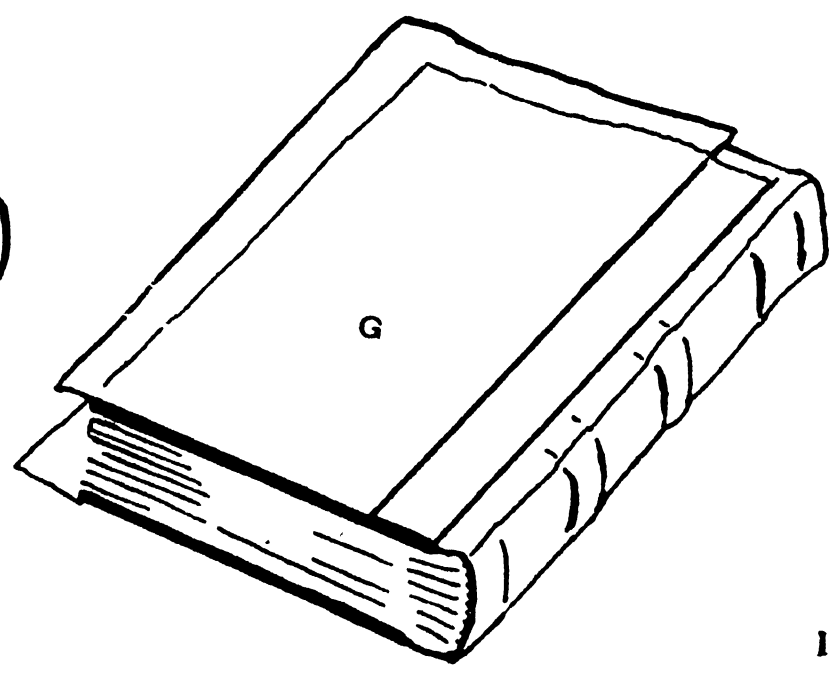
C-D. ROUND CORNERS.

E. TYING UP AFTER COVERING.

F. A QUARTER BOUND BOOK. TIGHT BACK SQUARES.

G. A QUARTER BOUND BOOK. TIGHT BACK, FLUSH (BEFORE CUTTING).





Preparing the book. An examination of a bound ledger will show that the extreme head and tail have been thickened up and moulded to a definite shape. This is done by wetting these portions of the spring back, whereby they may be worked up soft, afterwards being worked into shape under the covering material. They must first be cut down to be nearly level with the boards before being wetted. The back corners of the boards require to be rounded off as shown and the book is ready for covering.

Covering in full leather. The cover and the back of the book must be well pasted, including the softened head caps. The cover is placed on to the book with an equal turn-in all round. The leather is now well forced down along the grooves by means of the folding stick. The turn-in at the head and tail is next to receive attention, for which purpose, in the case of heavy books, the coverer will need some assistance. The leather is to be drawn lightly over the edges of the boards and forced into the hollow of the back. The *corners and fore-edge* turn-in follow. The corners are important, as it is necessary to retain the full thickness of the leather. Two methods are shown, one of which retains the square corner, the other uses a slightly rounded shape, which wears better. As soon as the turn-in of the leather is completed a piece of thin strawboard should be placed inside each board to protect the endpapers from damp.

Tying and setting the head. The string used should be thick enough to completely fill the grooves and for large books smooth rope is necessary. The final shape of the cap is obtained by working the softened board and leather with a folder; a wide strip of vellum placed round the back of the book will form a support during this operation, and at the same time enable the head to be set square. After making sure that the leather is sticking over the back and sides the covering is completed and the book should remain under a weight on a clean bench for twelve hours.

Covering in vellum. Upon handling a piece of vellum for the first time one wonders how it is possible to employ this stiff material for covering books. It becomes pliable when moist and the object is to arrange the work so that it is in the right state when being worked. Vellum is somewhat transparent, therefore, requires to be lined on the underside with clean, opaque paper such as cartridge paper. To prevent creases when lining, both vellum and paper are pasted, whereby both are allowed to stretch before being placed together. After being rubbed down they are placed between clean boards to set. The covering of the book takes place within three or four hours after lining and while the cover is still pliable, the operation being very much the same as for leather.

This material readily stretches when damp, but, as it shrinks as it dries, the coverer should make allowances and work it well into the groove and give plenty to the corners, etc.

For half-bindings. The remarks passed upon a full cover will also apply to a back piece only. The corners may be placed on the book after the back has dried and the string removed.

For tight-back bindings use paste for the leather, but give the backs a coat of glue and when covering see that they stick well.

Flush books may have the leather turned in, in which case the edges are trimmed before covering, otherwise a strip of leather is placed down the back before cutting.

SIDING AND GLUING DOWN.

The cloth used for the sides of half-bound account books should be of good quality, for they have to withstand considerable wear. The instructions given in the letterpress section on this operation will also apply here. Cheap account books may have cloth or strong paper sides, but flush books should have paper, for cloth does not stick tight enough to be used without being turned in.

GLUING DOWN.

Where the leather is thick the insides of the boards require to be trimmed out and filled in with a thin card, which also serves the purpose of drawing the boards round, if necessary. After this is done the board papers are glued and the book closed. A piece of thin card is inserted between the marble papers to serve as a protector and the book is pressed sometimes with a brass rod inserted in the groove to set this portion of the binding at the same time. The endpapers of account books are never glued down with the boards open as in the case of letterpress leather bindings.

BANDED AND LACED WORK.

That account books are required to be exceptionally strong and durable has been stated in this work many times. This chapter proposes to describe a few methods whereby exceptional wearing qualities have been attempted.

If a few books that have had to withstand considerable wear and tear are examined it will be found certain portions of the binding are the first to give way. They are: (1) The first four or five sections; (2) the corners of the boards; (3) the bottom edges of the

boards; (4) the joint or groove; (5) the back linings. Numbers 1 and 5 have already received attention under the operation of *taping* and *tacketing*. The methods about to be described will include those whereby a double covering of leather is given to certain portions of the board.

Under bands. This is the simplest form of banded work and consists in fixing broad strips of leather across the back and on the sides before the book is covered. The size and position of these bands are based upon definite proportions of the side of the book, as shown in the illustration. The length of the board is divided into nineteen divisions, and the width into five divisions, each band is then made three-nineteenths in width and extends across the board to the extent of two-fifths. The grooves of a book that is to have bands are made wider to allow for them, but even then the leather used should not be too thick. The bands are not pared at all, but cut square through, whereby their outline is clearly seen through the cover. They are pasted into position, well forced into the groove with brass rods, and allowed to dry before the full leather cover is put on.

Single bands. These are similar in size and shape to under bands, but are placed on after the book is covered. Red bands of hide placed upon a book covered in rough calf or vellum are usual. The division of the side should be planned out upon a piece of paper the size of the board and the position of the bands marked through it on to the leather. The material for the bands requires to be neatly cut out (allowance being made for the groove) and pasted into position, but as it must be clear that no paste will hold these bands firm enough, they are afterwards laced to the boards. This latter operation will be described after other forms of bands have been explained.

Double bands. These, in addition to affording strength across the back, give an extra thickness of leather along the edges of the boards. It will be seen on referring to the diagram for double bands why the odd number of nineteen parts are used for dividing the board. Extra care is required for planning and cutting out these rather complicated leather bands; paper templates should be employed which may be tried upon the book and, when correct, the leather cut to them. The bands have now to be pasted and attached to the books exactly to the marks upon the cover, but no attempt is made to turn in the leather at this stage, as this is not done until after the lacing.

Double straight bands. These are rather more simple than the ordinary double bands. It will be noticed from the diagram that

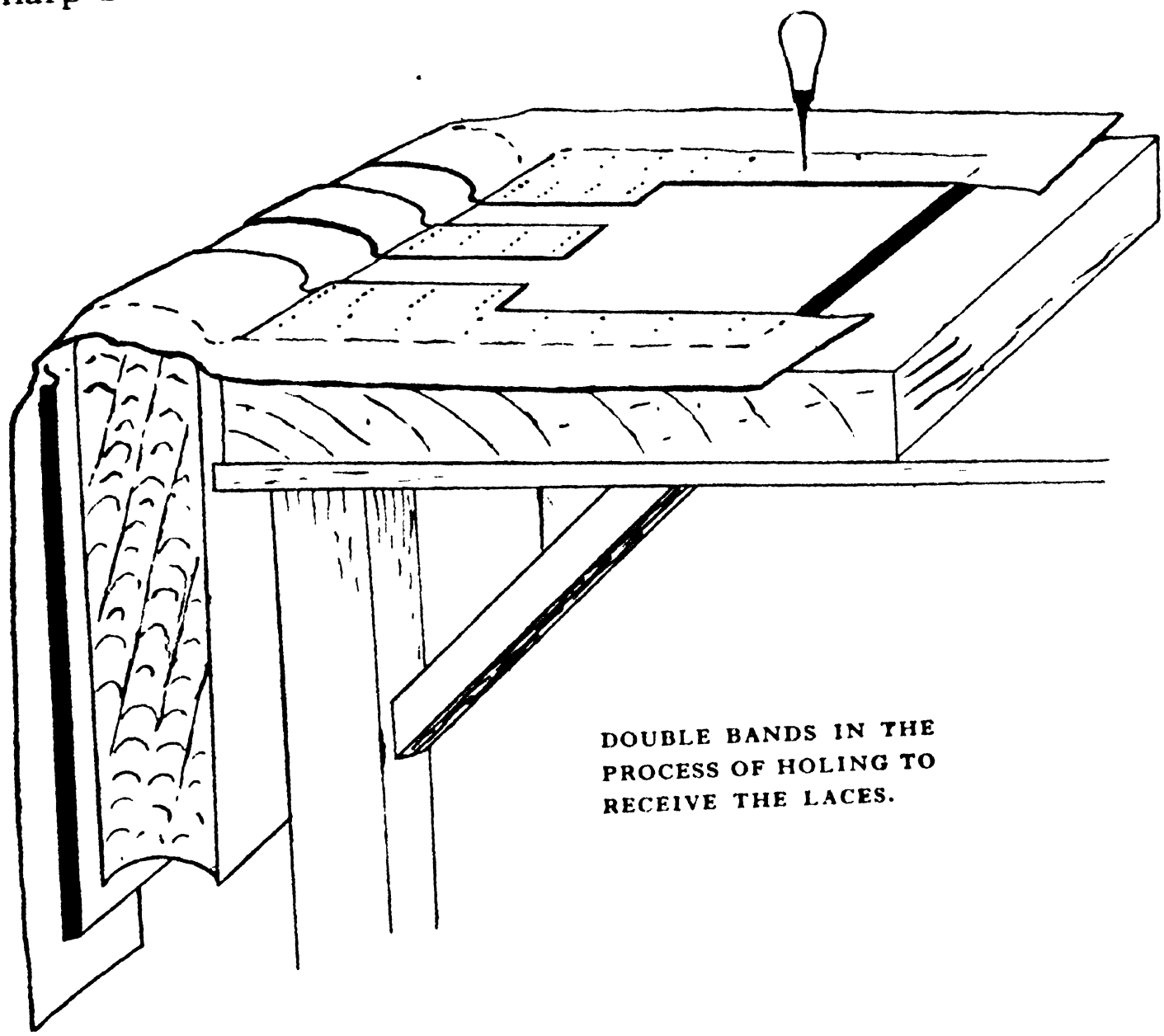
the board is divided out into twenty parts instead of the usual nineteen, allowing four parts each to the bands and spaces. Other than this the method of fixing is the same as for double bands, the leather being turned after the lacing is completed.

Laced corners. Sometimes extra strength is given to the corners only, as shown in the diagram. The method of marking is to set a pair of compasses to one-third the width of the board of the book and describe an arc from the extreme corner. A neat card gauge will be required to cut out the four pieces of leather which must allow for the usual turn-in. When working this gauge it is not sufficient to continue the arc of the circle, as the turn-in portion must be cut straight.

The laces. Under bands do not require lacing, as it is quite obvious that they cannot come away, but those that occur outside the cover are laced to the board by means of narrow strips of vellum, which form more or less ornamental patterns. The standard styles in use will be described here, but with experience they may be varied at the discretion of the craftsman. The laces consist of strips of vellum and, as they are required to be as long as possible, odd pieces will not do; neither will forel or parchment answer the purpose and it is only waste of time to attempt to use them. Take a quarter or half a skin, cut down the long way and line with paper on the rough side, as you would do when about to cover a book with it; allowing it to dry under a weighted board. The guillotine is the best means of cutting the vellum into the necessary strips and if the machine is large enough to do this without folding it so much the better. A convenient method is to attach the vellum to a strip of thin board by gluing the extreme ends, as this is more reliable against the back gauge of the machine. One-eighth of an inch is a good average width for the laces and this is very conveniently managed by drawing the gauge up to this amount at every cut of the knife; great care should be taken in cutting, as the smallest variation in width is at once noticeable in the finished book.

The patterns and gauges. These are thin pieces of millboard, lined with paper in order to make the necessary pencil marks, which are used to mark out the pattern to determine the position of the holes in the cover. One piece will be required for the single bands and one for the double, or the straight double bands, as the case may be, and they are required to be cut to the exact shape of that portion of the band that lies upon the board. Diagrams of all the various shapes of these gauges are given here; a point to remember is that as all laces must be kept within the squares of the book, this amount is to be allowed when constructing the pattern. It will

be seen that the pattern for double bands consists of two pieces, one of which is the same as a single band, the other being made to correspond as near as possible by dividing the length into seven portions. Whatever the size of the book the proportions and number of holes are the same, as by practice these have been found to be the best. The position of the holes should not occur closer to the edge than an eighth of an inch or the leather will break, but at the same time they must be close enough to the edge to hold and prevent the bands from peeling up. With the pattern held into the exact position on the book, the leather is marked through with a sharp bodkin.



DOUBLE BANDS IN THE PROCESS OF HOLING TO RECEIVE THE LACES.

Punching the holes through the hard board of the book is a somewhat strenuous operation. The bench must be firm and solid and the board opened out as shown in the diagram, pieces of waste card being placed beneath to take the point of the bodkin. The bodkin itself must be carefully selected to give the correct hole; it will be necessary to grease it with tallow or it will become too hot and will be difficult to extract. When the side of a book has been holed, care must be taken that they are not closed up again, or it will be difficult to force the laces through.

LACING.

To describe this complicated operation in words is rather difficult, but it is hoped that by means of the diagram even a novice will be able to undertake the work after a few experiments. The points to be kept in mind all the time are as follows: (1) The strips must lie vellum side uppermost on the outside of the book; (2) the pattern is to be built up in the simplest and most straightforward manner; (3) single laces only must occur on the outside of the book, although it will be necessary to double them on the inside of the board in places; (4) although the inside laces are not seen it is necessary to keep them as tidy as possible or they will show through the board paper. The laces are pointed at one end to assist in passing them through the holes and a knot is tied in the other to prevent them being pulled through too far. The work starts from the underside of the board through the hole marked A and proceeds in the directions of the small arrows. The numbers indicate the order in which the lacing proceeds, as seen from the outside of the board, and the small separate arrows the course the lace takes on the inside. The portion of the diagram marked No. 1 shows the lacing half completed; by repeating the process in the reverse direction the operation will finish at Z. Nos. 2 and 3 show the procedure for single bands, when it will be readily seen how the whole is completed by finishing at Z. No. 4, that for the double straight bands, will require a few experiments on the part of the novice, but the whole of the lacing can be completed in a straightforward manner to finish up at Z. No. 5, the corner piece, shows the lacing half completed and by taking the lace back again it will finish at the starting hole.

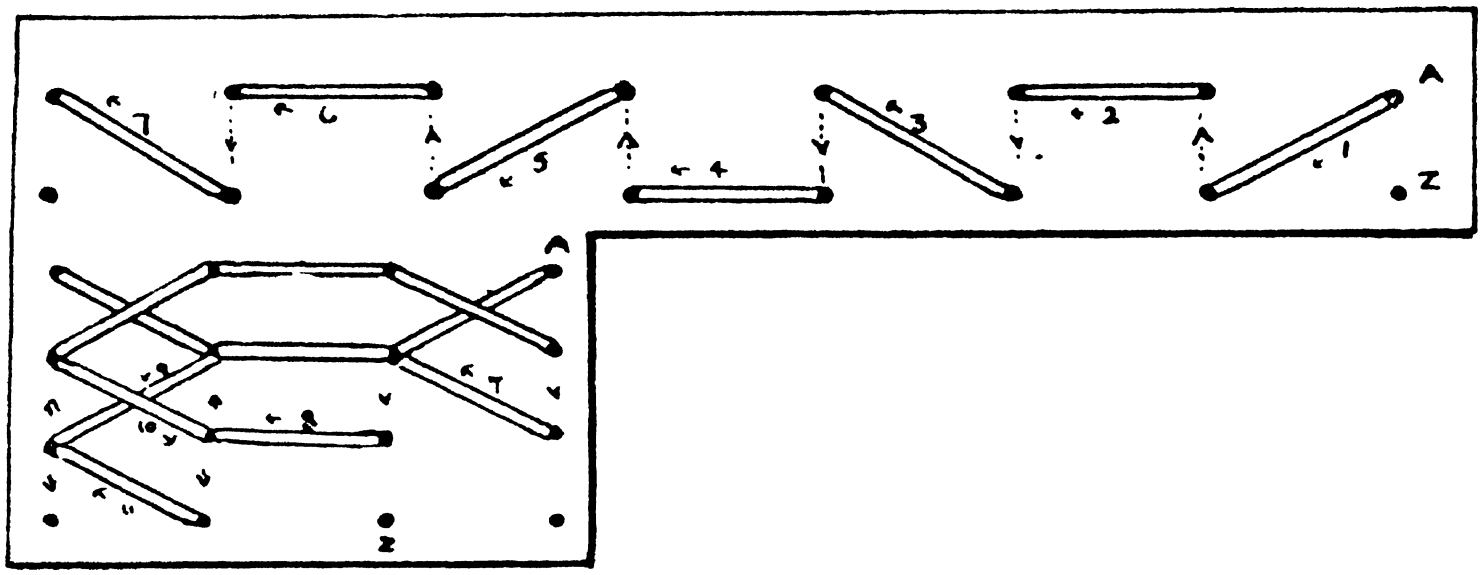
The laces must be pulled tight as the work proceeds and all joins made on the inside of the board. It will be necessary to keep the bodkin handy to open out the holes, as some have as many as three laces passing through them. Any preliminary experiments may be made by means of paper laces and a piece of thin millboard.

The work which follows the completion of the lacing of both sides of the book consists in beating the insides of the boards with a backing hammer in order to close up the holes and to flatten out the knots, etc. It is important that the outside is kept flat upon a solid block during this operation or it will become bruised.

It will be noticed that the laces do not lie very flat at this stage and in order to effect this an effort is to be made to work some thin paste underneath them by means of a thin folder, afterwards washing the whole band over with paste water. Treat one side of the book like this and, after the moisture has dried off sufficient to prevent it sticking, lay this side in the press with a clean board

VELLUM LACING.

1



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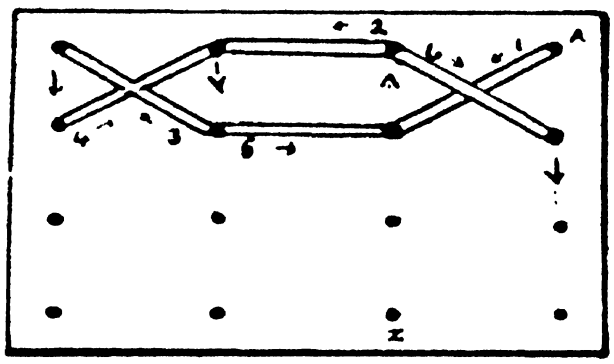
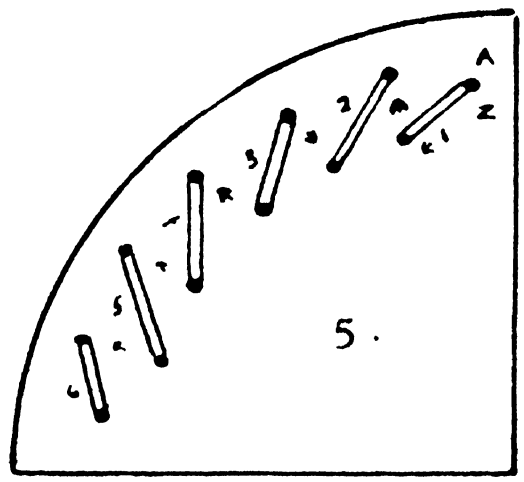
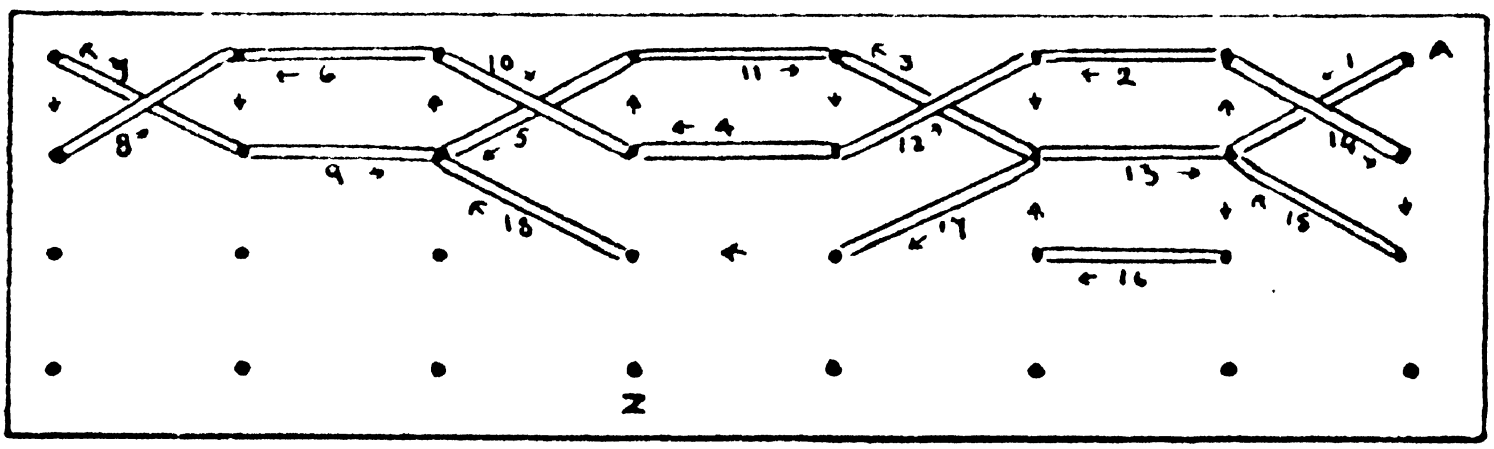




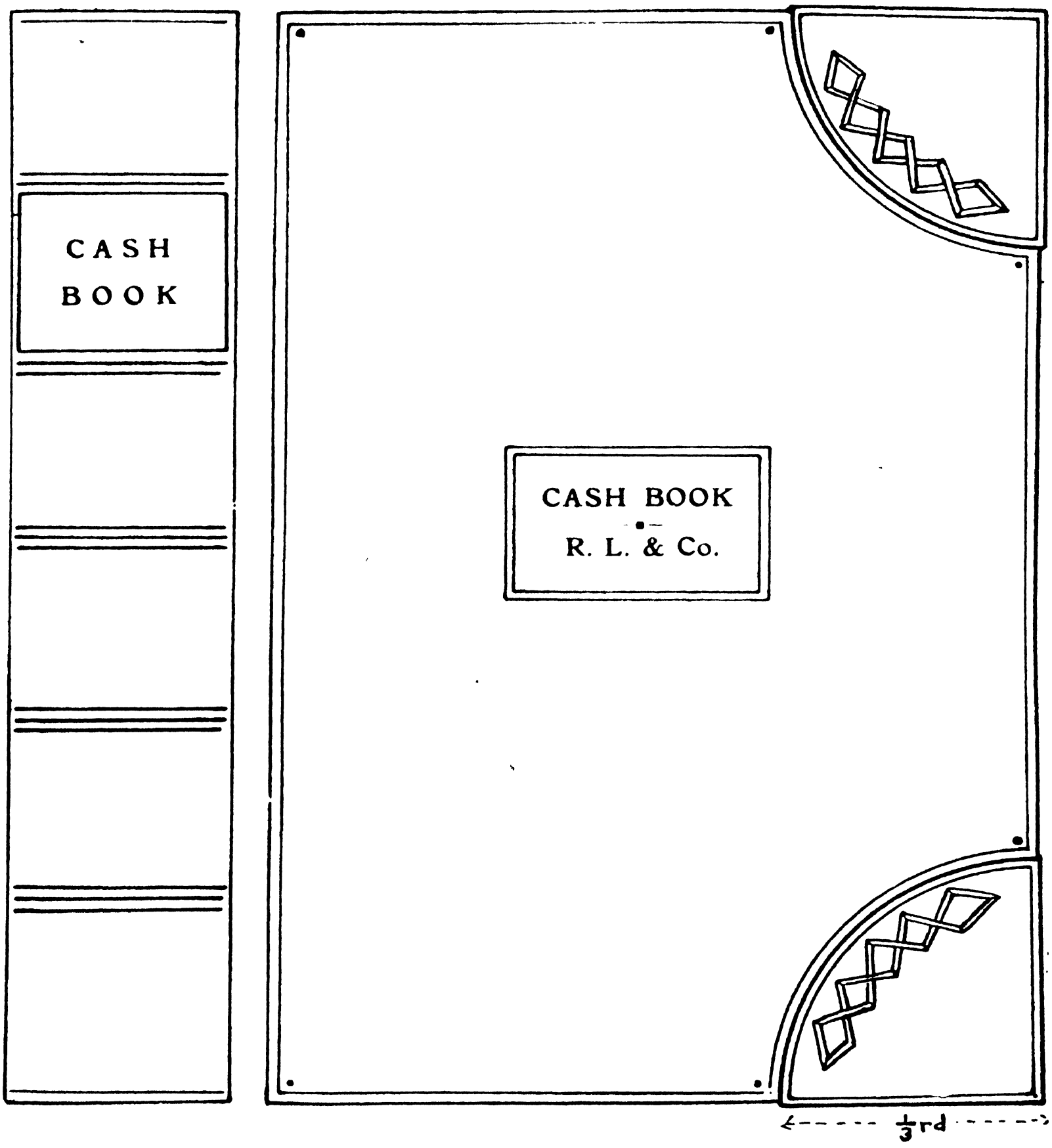
5.

4

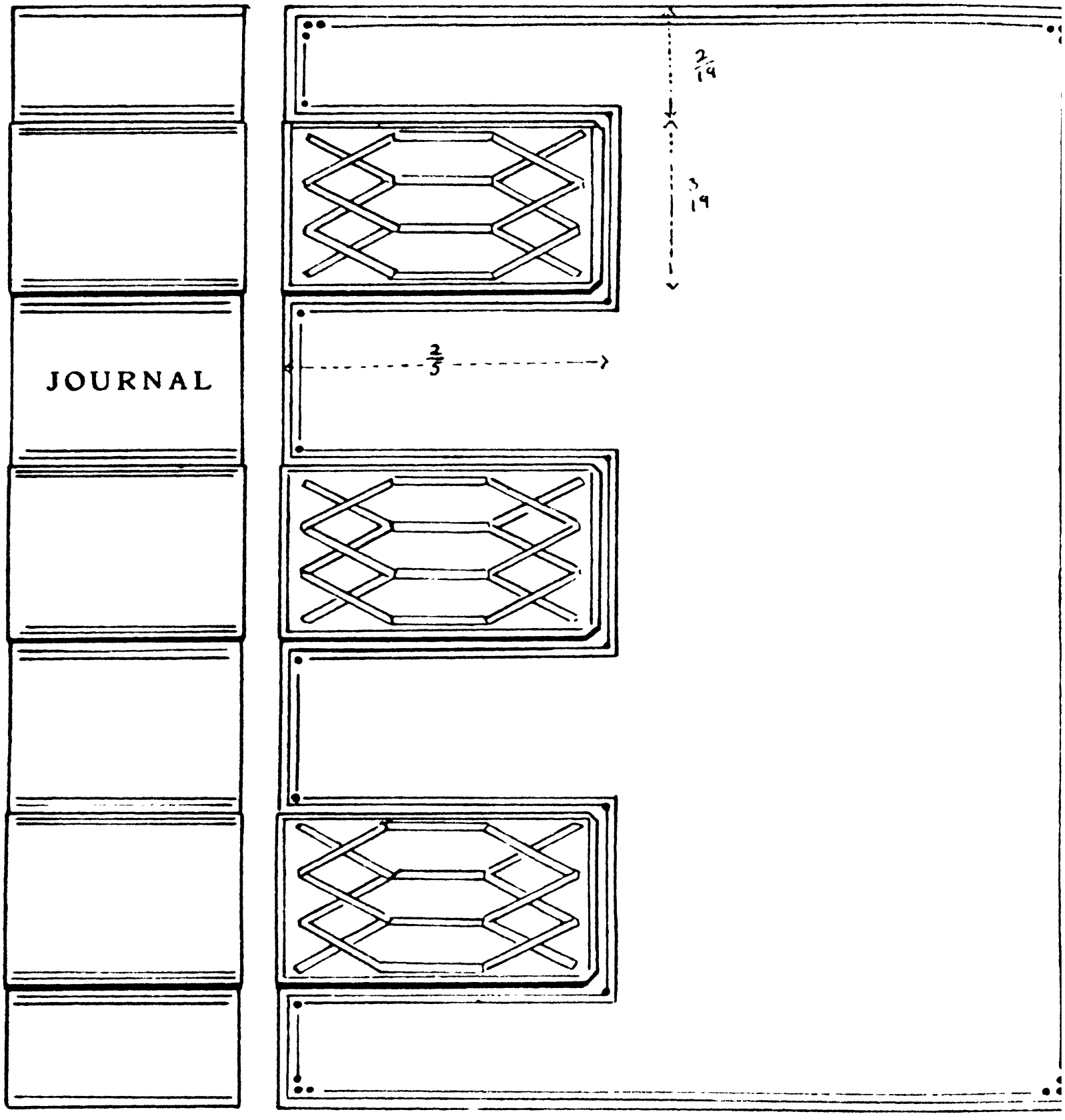


1. EDGE OF DOUBLE BAND PARTLY LACED.
2. SINGLE BAND PARTLY LACED, 1ST STAGE.
3. SECOND STAGE IN THE LACING OF NO. 2.
4. DOUBLE STRAIGHT BAND PARTLY LACED.
5. A CORNER PIECE PARTLY LACED.

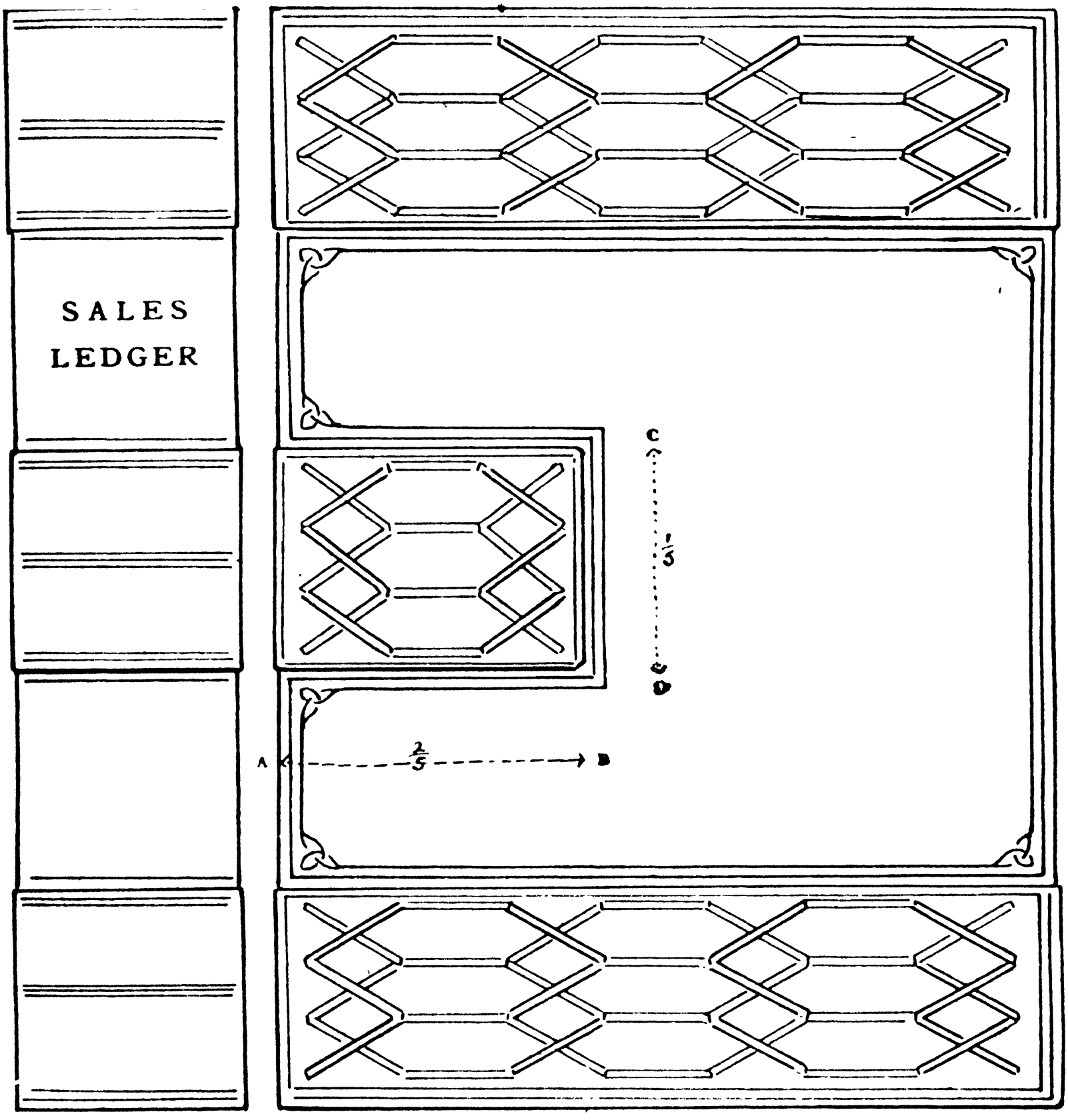
A IS THE STARTING POINT AND Z IS THE FINISHING POINT IN EACH CASE.



ACCOUNT BOOK WITH LEATHER CORNERS, VELLUM LACED.

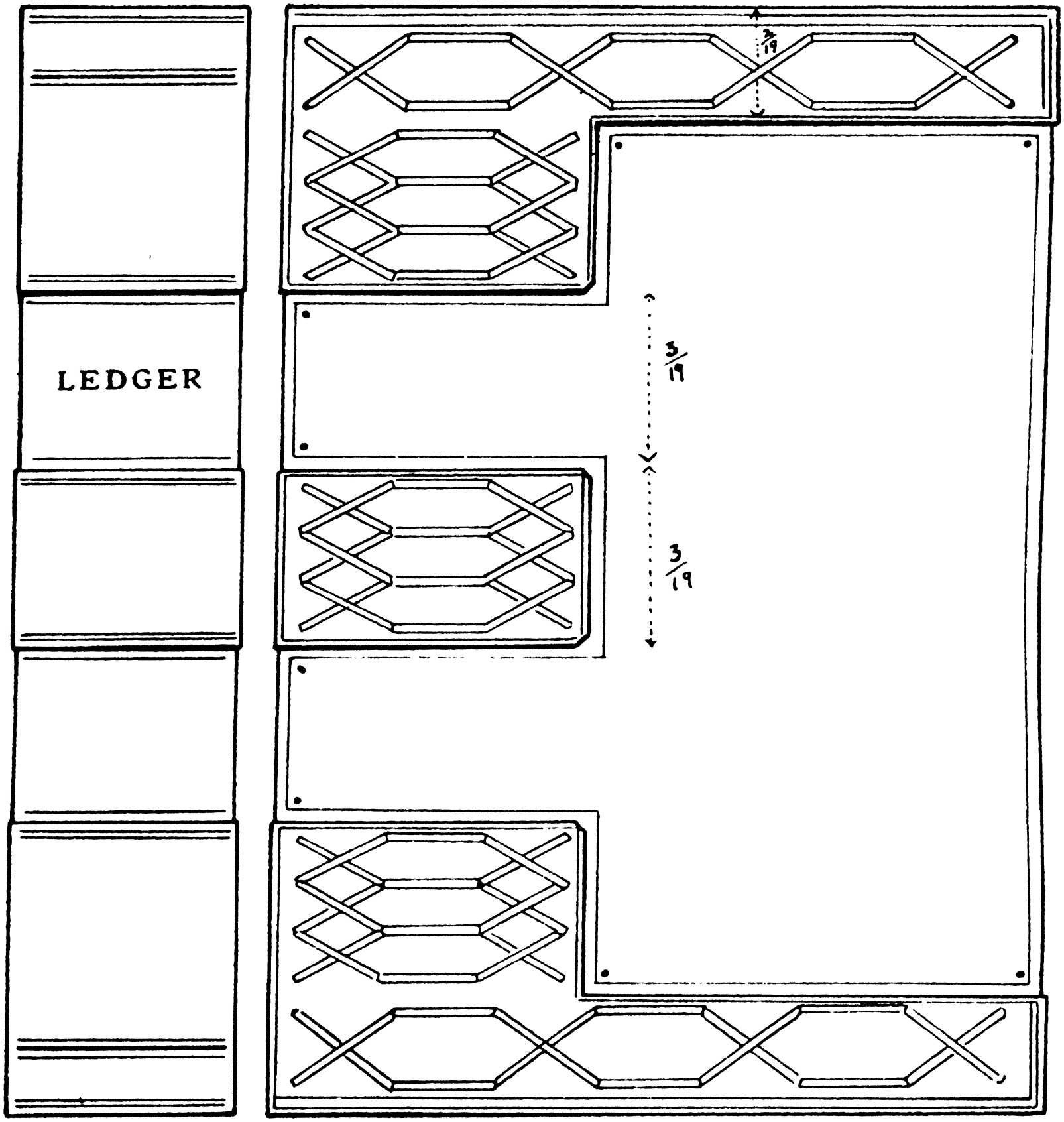


ACCOUNT BOOK WITH SINGLE BANDS, VELLUM LACED.

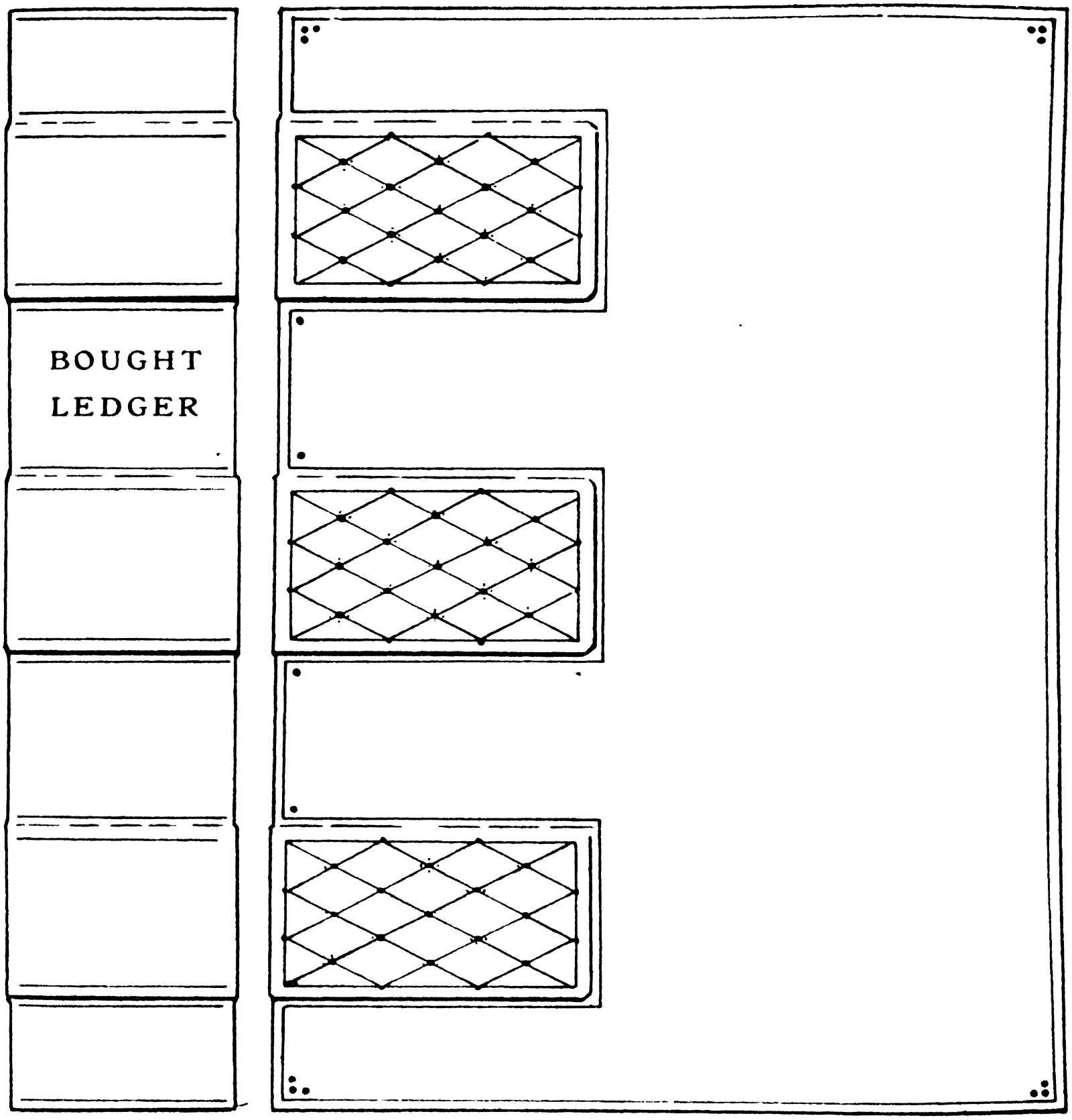


ACCOUNT BOOK WITH DOUBLE STRAIGHT BANDS, VELLUM LACED.

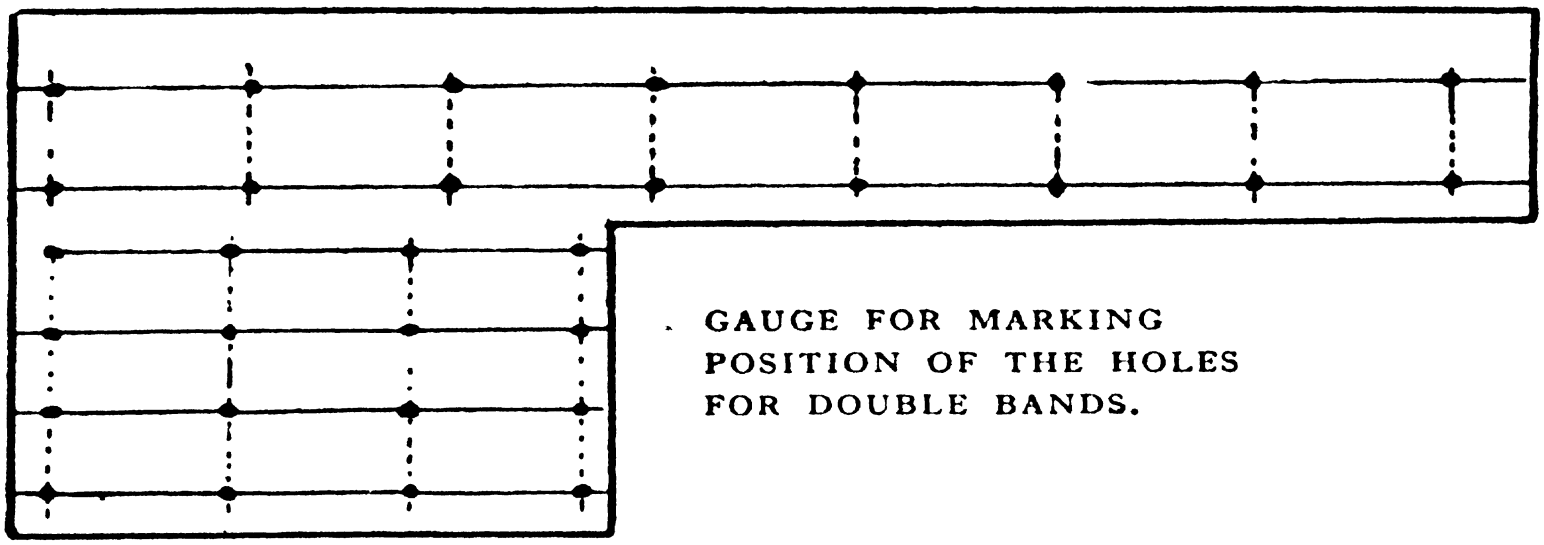
A-B = TWO-FIFTHS OF WIDTH OF BOARD. C-D = ONE-FIFTH OF HEIGHT OF BOARD.



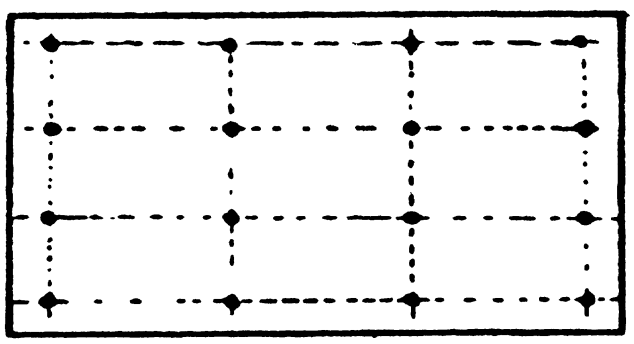
ACCOUNT BOOK WITH DOUBLE BANDS, VELLUM LACED.



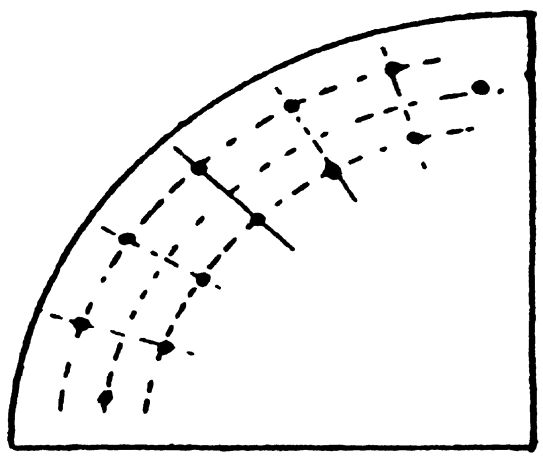
ACCOUNT BOOK WITH LEATHER UNDER BANDS.



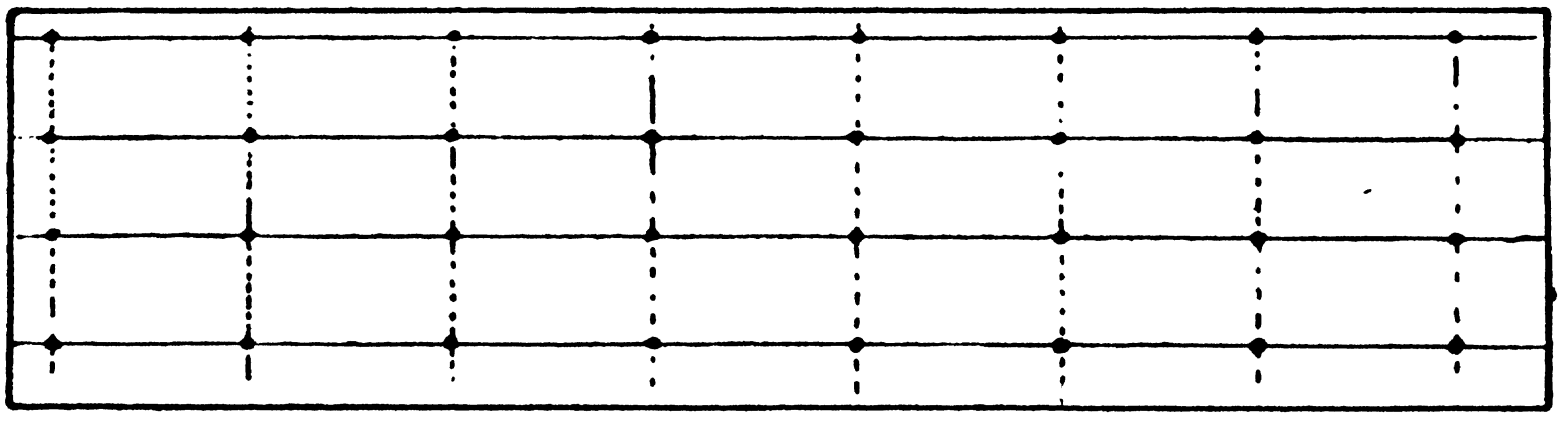
GAUGE FOR MARKING POSITION OF THE HOLES FOR DOUBLE BANDS.



FOR SINGLE BANDS.



GAUGE FOR LACED CORNERS.



GAUGE FOR DOUBLE-STRAIGHT BANDS.

against the laces and apply a good pressure for several hours. This will have the effect of forcing the laces into the leather and generally levelling both sides of the boards. The other side of the book must be dealt with as a separate operation.

It is not until this stage is reached that double and double-straight bands are turned in at the top and bottom edges and the corners. The ends of the spring back are softened with water and paste in order that they may be "set" and the corners of the leather as explained when dealing with covering. The turn-in of the bands is well pasted, which will have the effect of softening them. After they have been turned over and the corners set, the book is tied up again, and the head and tail of the back carefully moulded into shape, as though the book was being covered for the first time.

In spite of the pressing the boards have received, the insides will still be rough enough to show through the endpapers, therefore a "filling in" of thin strawboard will serve the double purpose of levelling the insides and making the laces perfectly secure. It may be necessary to add a second filling, for it will be remembered that the turn-in consists of two thicknesses of leather where the bands occur. The operation of gluing down the endpapers follows as previously described.

LOOSE-LEAF BOOKS.

Loose-leaf books are gradually increasing in popularity. A book with which it is possible to add leaves exactly where they are required has so many advantages in accountants' work that the objections to the system are being over-ruled.

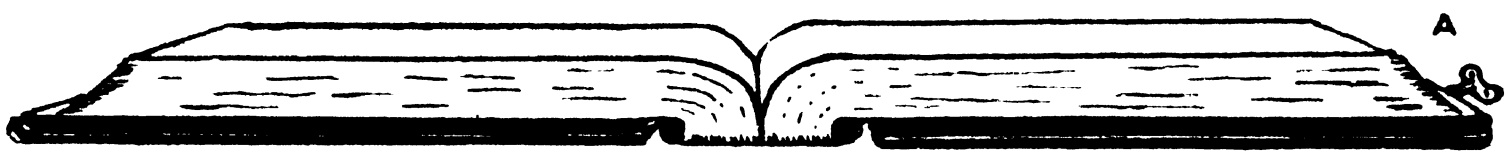
There are many systems of binding the leaves together, most of them being covered by patents. The usual form consists of a pair of boards connected together by a piece of mechanism which forms the back and holds the paper. The mechanism is of metal and is usually opened by means of a key which is sometimes of the ordinary clock variety, but they can be obtained whereby only the key owner can ever disturb the leaves. The metals themselves fall outside the work of the bookbinder, but the boards and the leather cover are usually done by him.

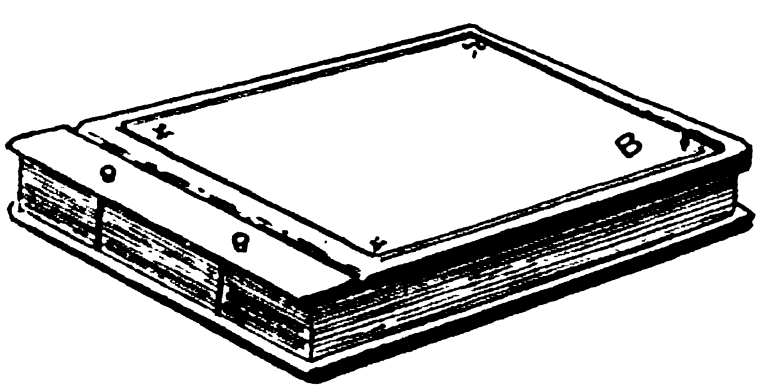
The thong binder. A pair of boards are held together by means of three or more flat thongs, which pass into a piece of mechanism inside the back board. By means of a key into the fore-edge the length of the thongs may be altered whereby the boards may be separated by four or more inches or they may be brought close together. The ruled leaves are slotted to enable them to pass round the thongs, which are then tightened by the key. These binders are strong and simple, and having no back they will hold six leaves as firmly as they will six hundred.

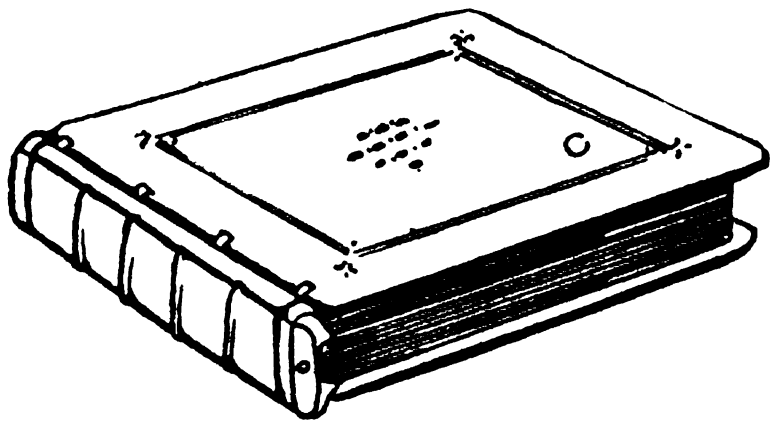
The post binders. These form the basis of a large number of loose-leaf mechanisms. The principle is a series of adjustable metal posts whose length may be varied. The paper is slotted with round or flat slots according to the shape of the posts. Some of these binders are made with a back, giving them the general appearance of a book. They are made in a wide range of qualities, the adjustments being made either by means of a key or by screwing the posts.

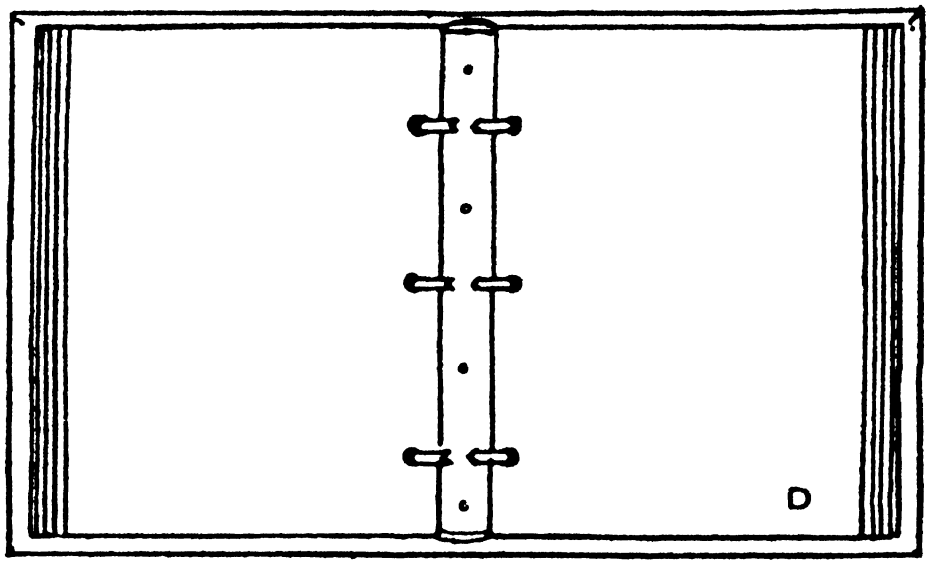
The ring binders. These employ rings which may be opened or closed, the paper being pierced with round holes. They are quick in action and are very useful for notes, but the amount of paper they will hold is limited, and they have not the security of the post or the thong binder.

LOOSE LEAF BINDERS.









A. THE THONG BINDER. B AND C. EXPANDING POST BINDERS.
D. RING BINDER.

The refills for loose-leaf work always consists of single leaves, which after they have been ruled are cut to size and slotted or holed through the back to fit the metal. Round corners have become a general thing with this class of work. For the leaves to be strongly bound together it is impossible for them to open right into the back, therefore, a 1½ in. margin is always allowed, and the books generally kept of wide dimensions. For the same reason thick papers are to be avoided, although sometimes the sheets are run through a simple machine which has the effect of producing slight corrugations down the back, whereby they bend open more readily.

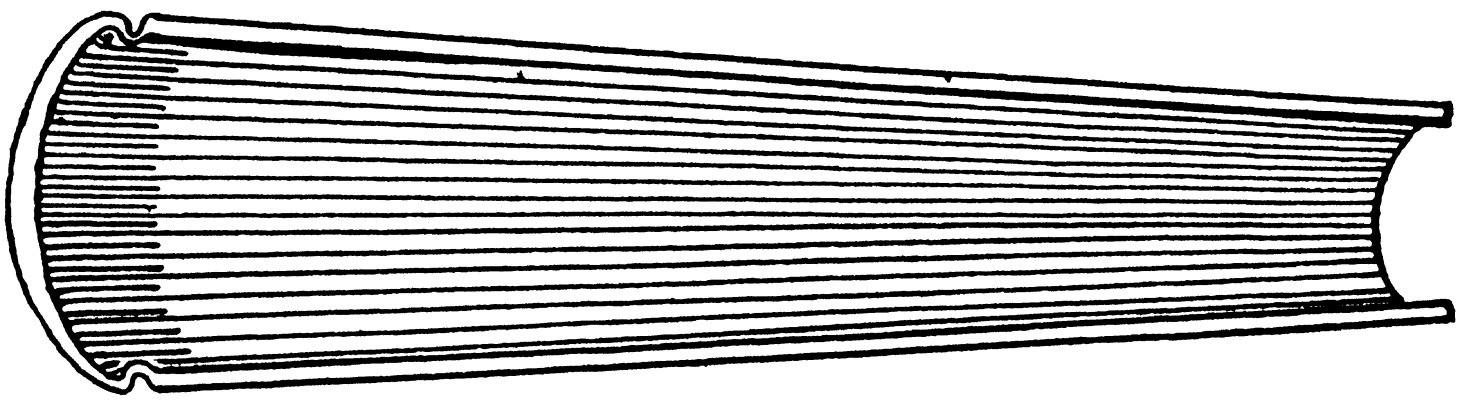
The edges of the paper cannot be marbled, for any alteration of the leaves would break up the pattern; sprinkled or coloured edges may be employed.

The endpapers consist of a stiffened protecting leaf of the same size as the paper of the book, and a separate board paper.

Indexes. It is not possible to number the leaves of these books, therefore, the usual separate index is of little value. Neither is it possible to cut the leaves, therefore, leather tabs are employed which project beyond the edge.

GUARD BOOKS.

Whenever it is required to add matter to a book after it has been bound, provision must be made at the time the sections are made up, in order to give the necessary room at the back. Bindings of this description are called guard books, because narrow folded



A GUARD BOOK.

strips of paper are inserted between the sheets at the back which are called guards. In the case of a photograph album, where one print is to be pasted to each leaf of the book, the sections will be made up with one guard between each, so that when the book is full the boards will be approximately level. If both sides of the

leaves are to be used it will be necessary to insert twice the amount of guards, in order to prevent the fore-edge from becoming wider than the back.

The forwarding of a guard book presents difficulties that are not encountered in ordinary "solid" books, owing to the fact that they cannot be pressed. One method of overcoming them is to pack up the leaves with clean waste paper after sewing, whereby the book becomes solid and the forwarding may proceed in the usual manner. Failing this it becomes necessary to trim the edges before the guards are inserted and the sections sewn. They may be bound hollow or tight backs as in the case of ordinary work, but the boards should be a little heavier than usual, in order to keep the book a good shape. Where gilt edges are required it is necessary to pack the leaves up solid or to gild before sewing.

INDEXES.

Most account books are books of reference, therefore, it is important that the particular entry required should be found with ease and this is the purpose of the index. The book may be indexed throughout, in which case each letter of the alphabet has allotted to it a certain number of leaves, the total being divided in this way:—As certain letters occur more frequently than others, as the initial letters of surnames, the leaves require to be allotted out in their correct proportions, and for this purpose an index scale has been prepared. This scale, which was compiled from certain lists of names in a directory, shows that the letters B, H, S, M, and W, require more than double the number of leaves than most of the other letters. It is usual to reduce the number of divisions to twenty-four by placing I and J together, and by leaving out X, but practices differ, for sometimes Mc is included as a separate letter.

Cutting the index—the scale card. This is a home-made appliance whereby any reasonable length may be readily divided into twenty-four parts. A piece of good white card, size about 20×12 in., carefully squared on the machine, is required. The whole of one edge is divided into twenty-four divisions, but the other edge has the same number of divisions reduced to about a quarter of an inch and placed twelve each side of the centre. The points are then connected by lines as shown and the card lined with parallel lines along its length. By placing any length from 3 in. to 20 in. along one of the lines, the twenty-four divisions may be marked out.

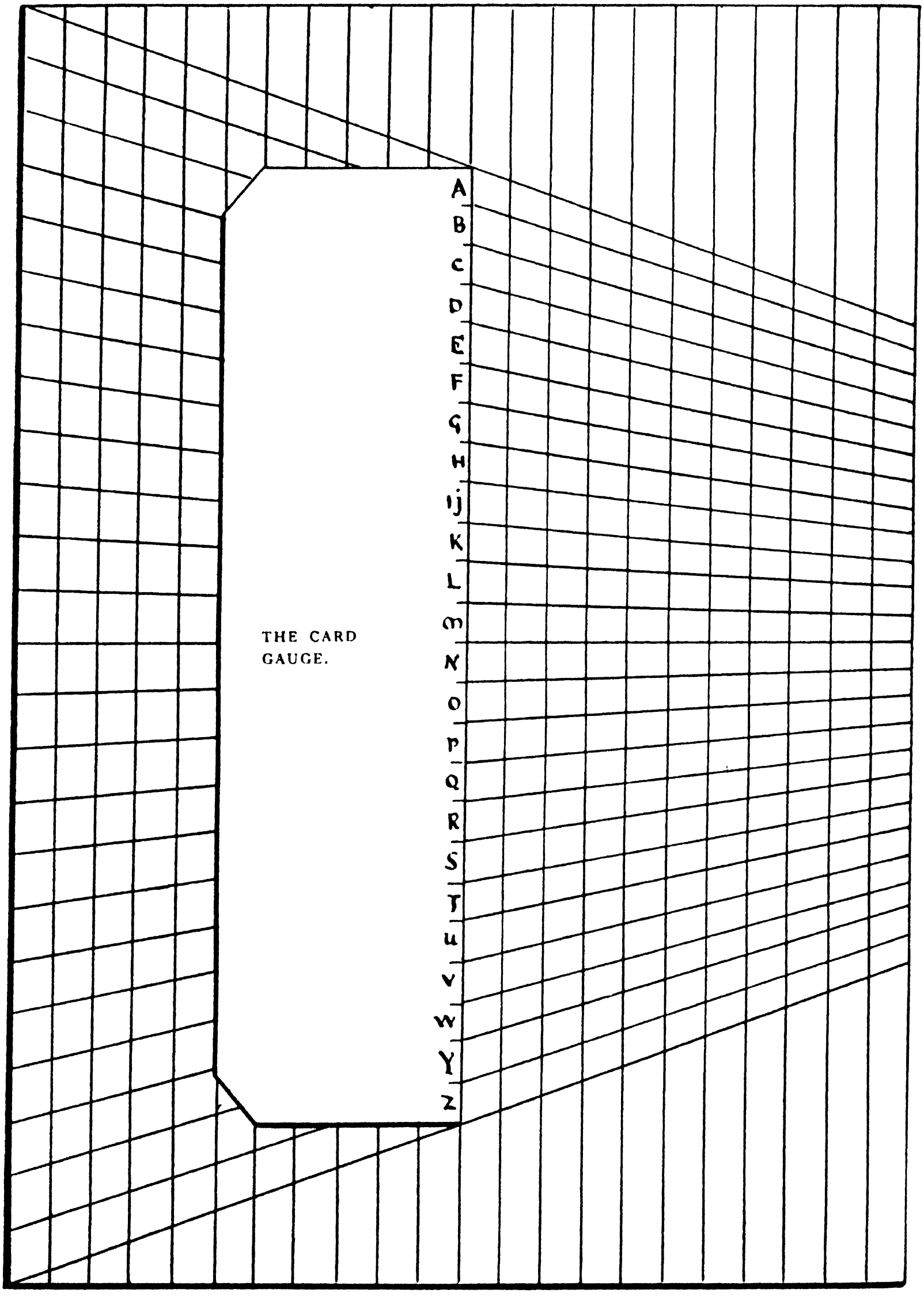
The gauge. This consists of a piece of fairly thin card having a clean cut edge and as long as the leaf of the book to be cut. By placing this to our scale card it may be divided into twenty-four divisions and each marked with the letter of the alphabet. Now count the number of leaves in the book which are required to be indexed,

THE INDEX SCALE.

							One-letter index.		Two-letter index.
A ...	6	5	3	2	1	1	A	1	1
B ...	17	12	10	6	4	2	B	2	
C ...	12	10	8	3	2	1	C	1	1
D ...	7	6	4	3	2	1	D	1	
E ...	5	3	2	1	1	1	E	1	1
F ...	7	5	4	3	2	1	F	1	
G ...	7	5	4	3	2	1	G	1	1
H ...	14	10	7	4	3	2	H	2	
IJ ...	6	5	3	2	1	1	IJ	1	1
K ...	5	3	2	2	1	1	K	1	
L ...	8	6	4	2	2	1	L	1	1
M ...	14	10	6	4	3	2	M	1	
N ...	4	3	2	2	2	1	N	1	1
O ...	2	2	1	1	1	1	O		
P ...	12	10	6	4	3	2	P	1	1
Q ...	1	1	1	1	1	1	Q		
R ...	10	8	6	4	3	2	R	1	1
S ...	16	12	9	6	4	2	S	1	
T ...	8	6	4	3	3	2	T	1	1
U ...	2	2	1	1	1	1	U	1	
V ...	3	2	2	1	1	1	V		1
W ...	12	10	7	5	4	2	W	2	
Y ...	2	2	2	1	1	1	Y	1	1
Z ...	2	2	2	2	2	2	Z	1	
Total	182	140	100	66	50	33		24	12

and allot each letter its number by means of the index scale—they may be marked in pencil on the gauge. Where the exact number of leaves is not given in the scale a compromise must be effected. To use the gauge it is placed into position upon the book to be cut, the number of leaves given to the first letter counted off and a piece of tin inserted upon which the paper is cut with a penknife. Each letter is cut separately until completed.

INDEX SCALE CARD.

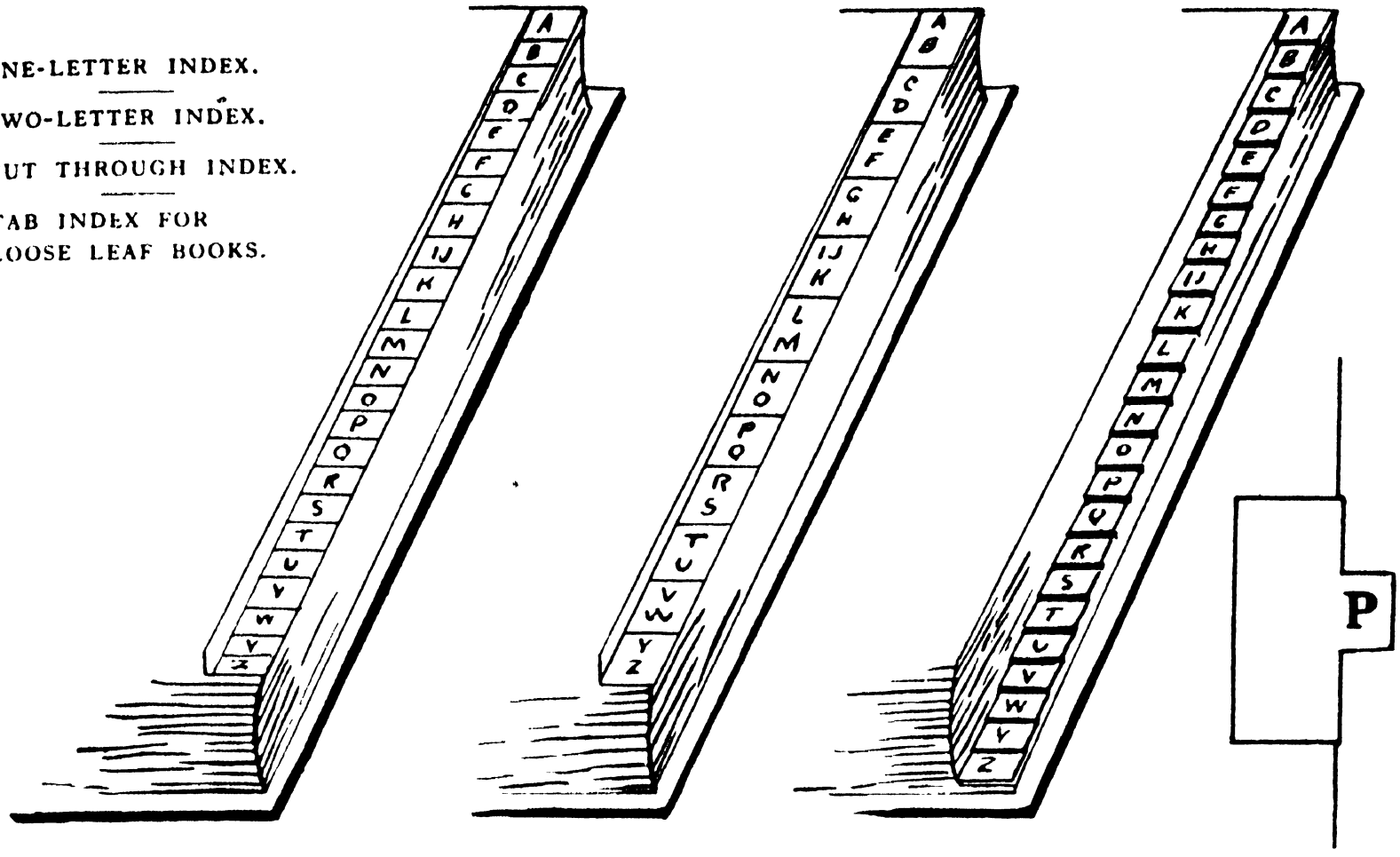


ONE-LETTER INDEX.

TWO-LETTER INDEX.

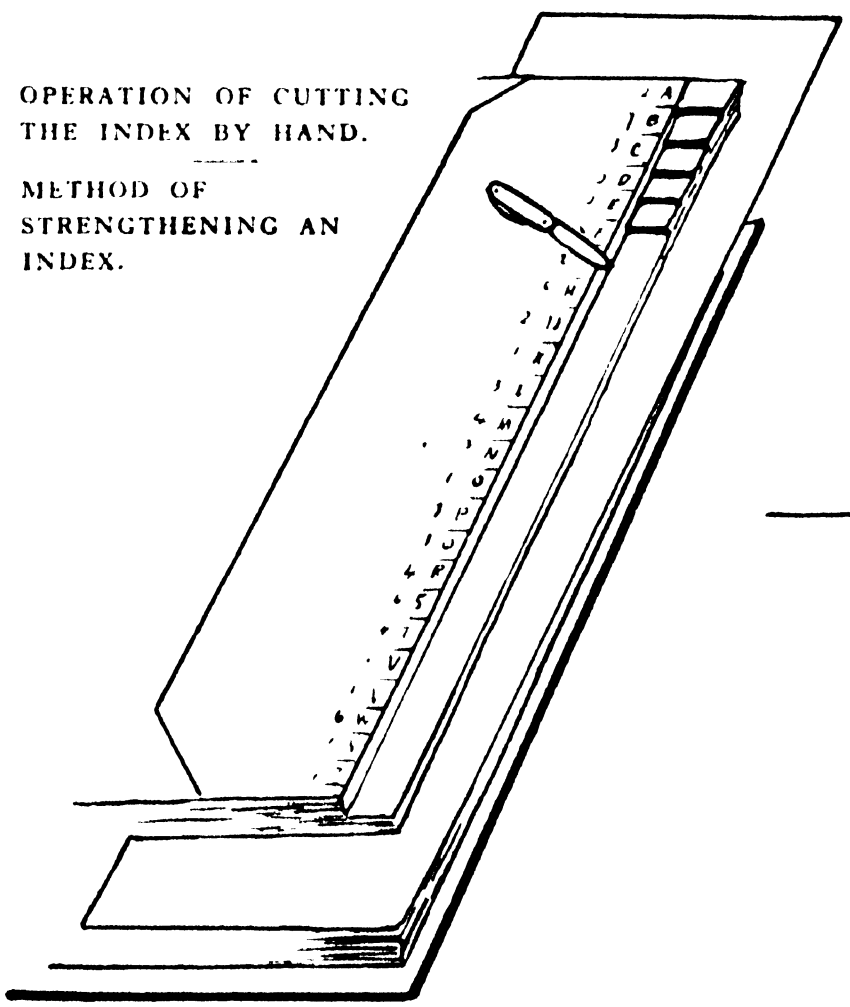
CUT THROUGH INDEX.

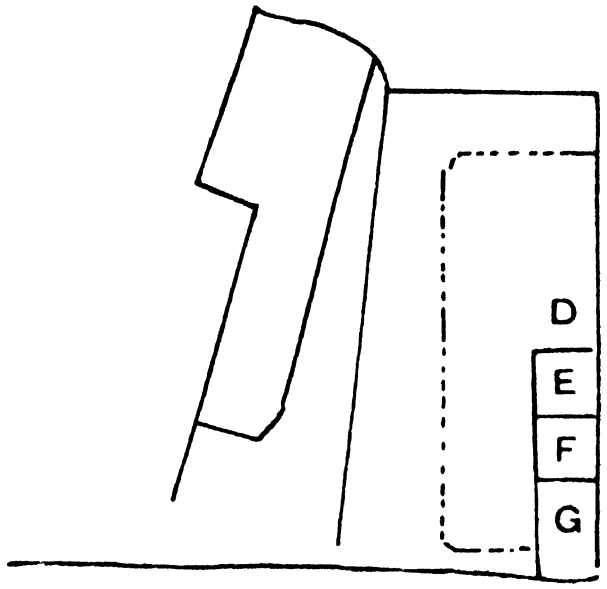
TAB INDEX FOR LOOSE LEAF BOOKS.

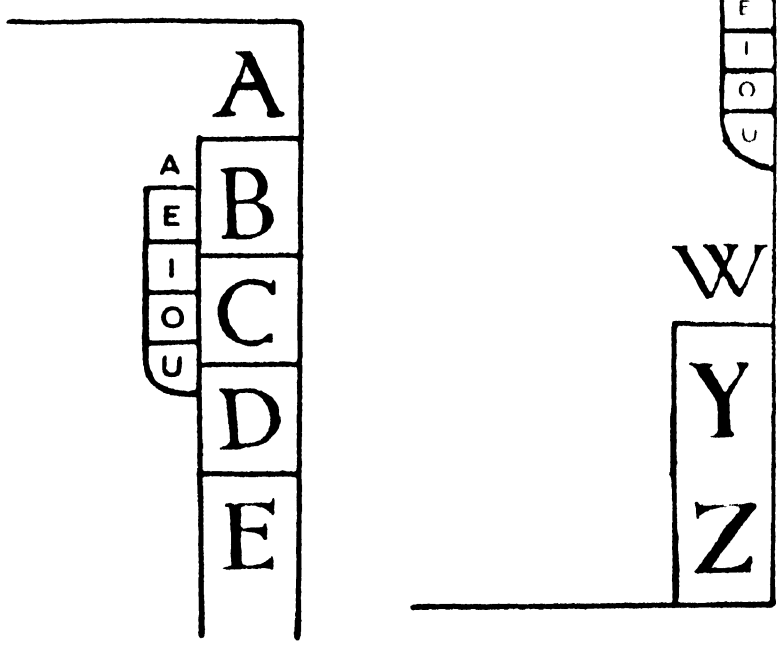


OPERATION OF CUTTING THE INDEX BY HAND.

METHOD OF STRENGTHENING AN INDEX.







THE VOWEL INDEX.

One letter index. Thick books cannot be cut right through, as it weakens the fore-edge, and there are difficulties with the rounded shape; therefore, short indexes are made at the front and references made by numbering the rest of the leaves. The usual allotment in this case is one leaf to a letter, but sometimes one leaf to two letters is considered sufficient.

As indexes become thumbed and worn with use it is often necessary to strengthen them by backing the letter with linen. Such a backing must extend well each side of the letter, or it will be ineffective.

A vowel index has a miniature index cut in each letter of the main one, using the five vowels only.

Lettering the index. For miscellaneous work the handle letters as used for lettering the backs of books will do quite well for this work. It is usual to stamp the letters alternate red and black, and for this purpose quick drying printing ink is conveniently applied by means of a piece of printers' roller. An alphabet arranged on a wheel has been devised for wholesale work, which alternately inks the letters red and black. They are rather expensive and, as it means a different wheel for each size index, it may be necessary to cut the leaves according to the nearest wheel in use.

Machines for index cutting do their work well, and save a considerable amount of labour where any quantity of one size are required to be cut. The same machine will cut books ranging from 3 in. to 20 in.

SECTION III

FINISHING AND DESIGN.

SECTION III.

FINISHING AND DESIGN.

BLIND FINISHING.

FINISHING, as a branch of the bookbinding trade, is of greater importance than its title might lead one to suppose. A journeyman usually confines himself to either forwarding or finishing, although some have a fair knowledge of both. The subject will be dealt with under the following headings:—

(1) Assistant finishing.
(2) Blind ,,
(3) Gold ,,
(4) Lettering.
(5) Blocking.
(6) Extra finishing.
(7) Finishing out.
(8) Design.

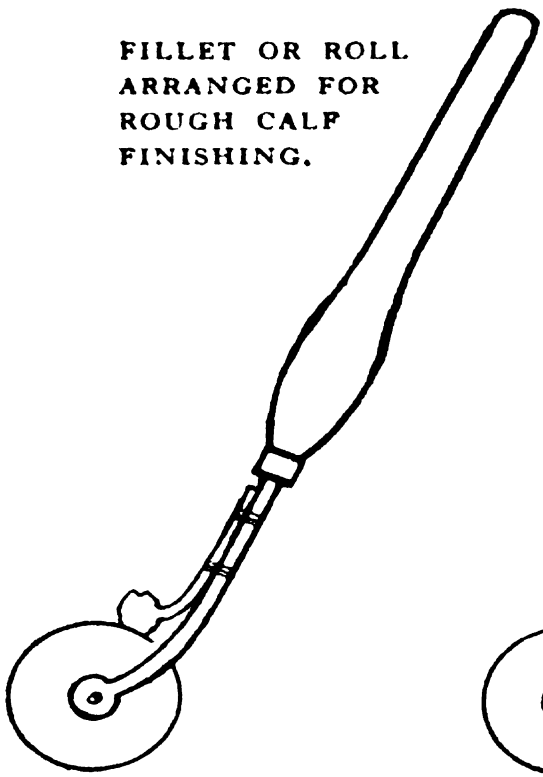
Assistant finishing. The work falling under this heading is described elsewhere. It includes the cloth or paper sides of half-bound letterpress books and the pasting down of the endpapers. It also includes the finishing out of the book, such as the polishing, varnishing and pressing.

Antique or blind finishing. The finisher decorates or letters his books by means of stamps which may take the form of hand tools, pallets, or rolls. As considerable pressure is required, their size is limited unless a machine is used, when the tools are called "blocks" and the operation "blocking." An effect may be obtained by merely heating the tools and making an impression upon the leather, which may be damped to assist the operation. This is called blind tooling and is sometimes used as a preliminary to gold tooling. The account book finisher employs blind tooling a good deal, for it is more suited to this class of work than the lighter gold tooling. Rolls are used on the sides of the full or half bindings and pallets across the backs.

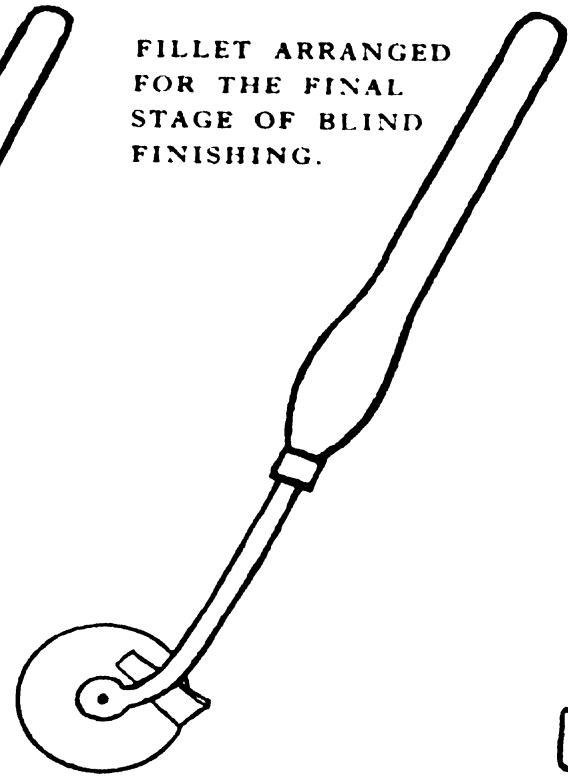
The finishing stove is an arrangement of a bunsen burner used to heat the tools without burning the handles. Other necessary apparatus consists of a finishing press to hold the work, dividers, marking folder, and a cooler consisting of a saucer containing a wet sponge used to cool the tools to the required temperature.

FINISHING TOOLS.

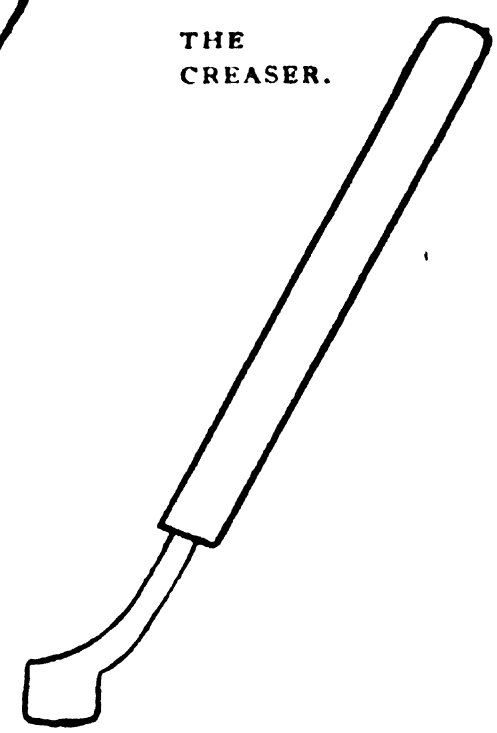
FILLET OR ROLL ARRANGED FOR ROUGH CALF FINISHING.



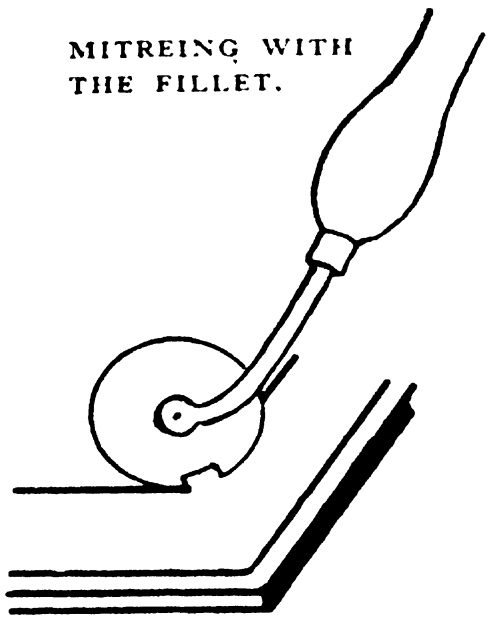
FILLET ARRANGED FOR THE FINAL STAGE OF BLIND FINISHING.



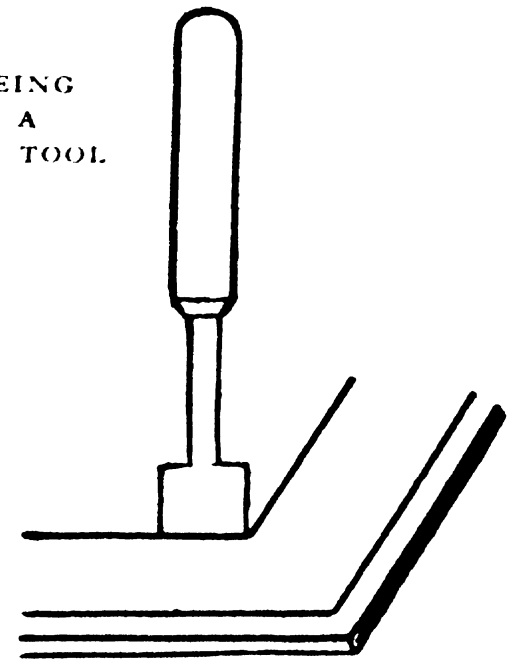
THE CREASER.

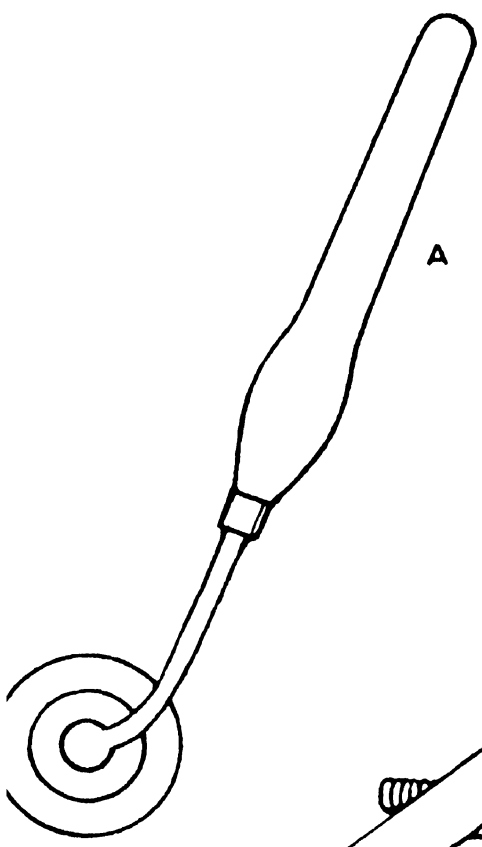


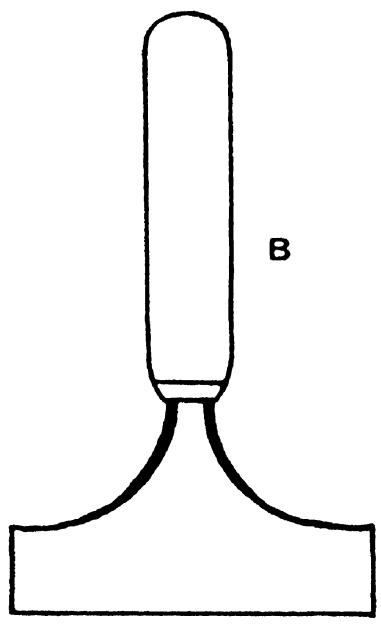
MITREING WITH THE FILLET.

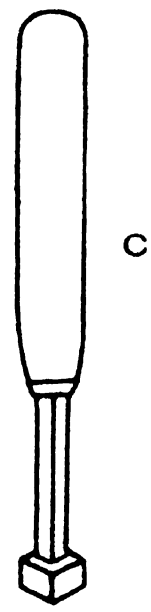


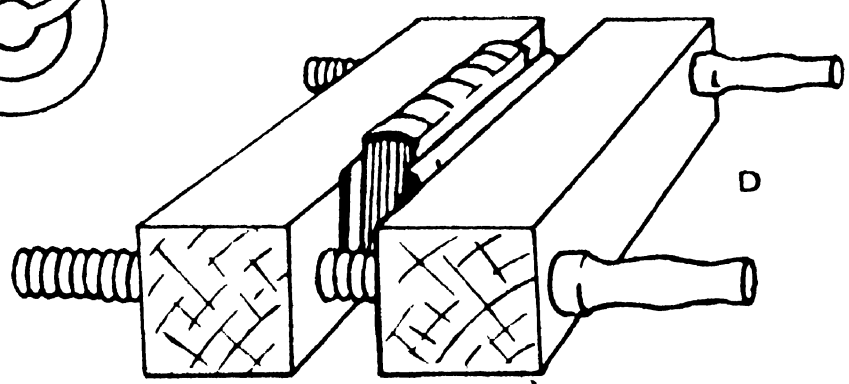
MITREING WITH A HAND TOOL.



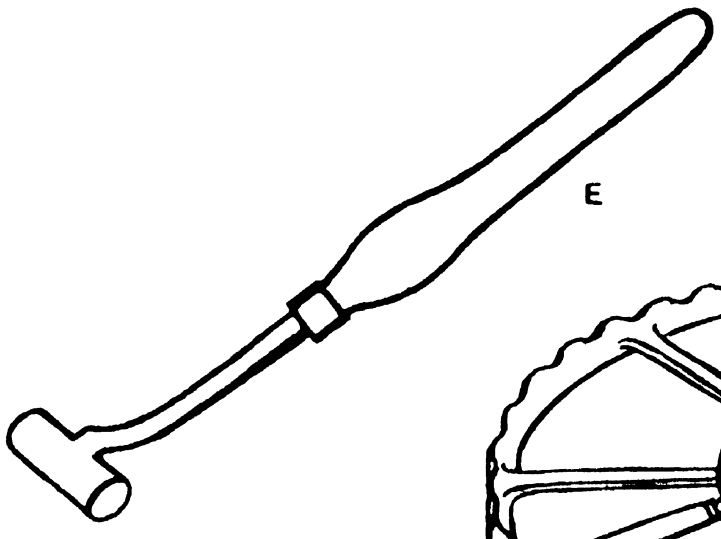


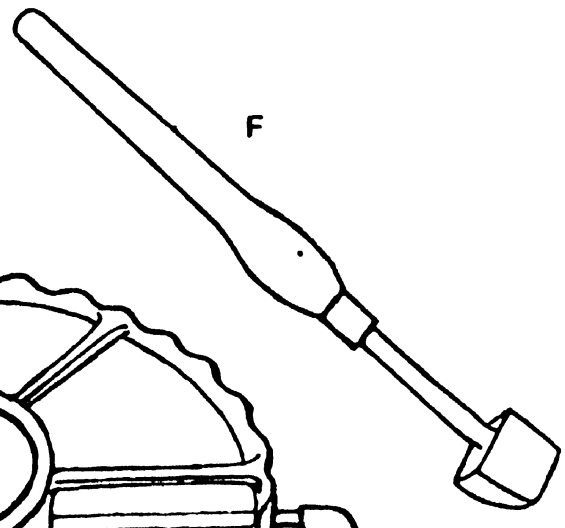


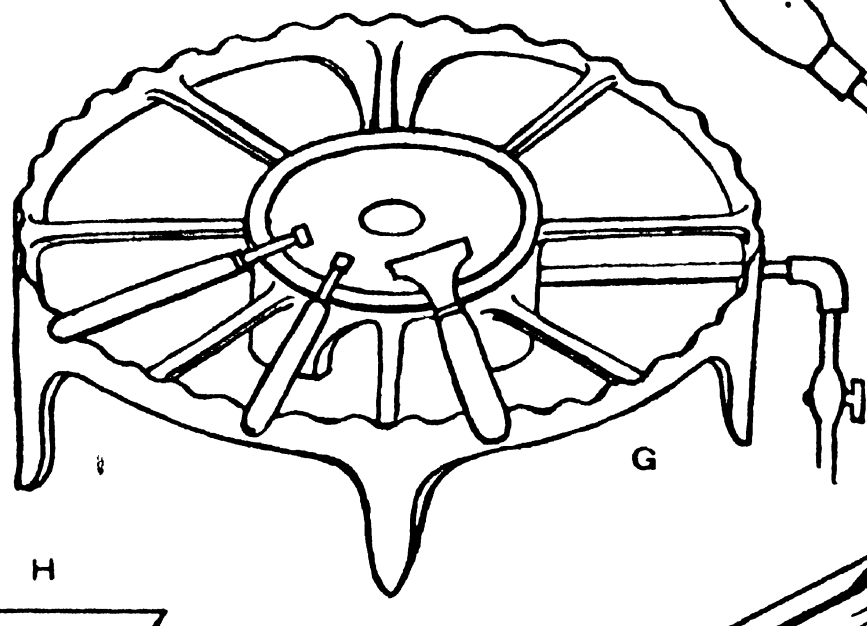


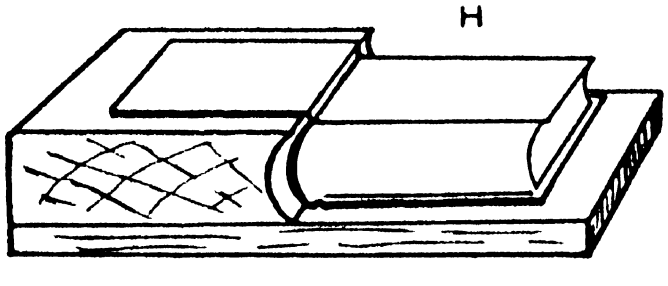


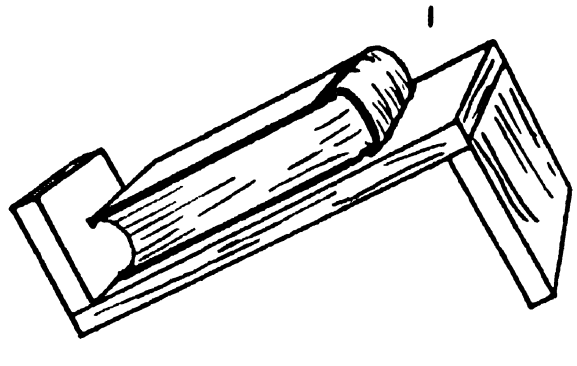
A. THE FILLET.
B. THE PALLET.
C. HAND TOOL.
D. FINISHING PRESS
E. } POLISHING IRONS.
F }
G. THE FINISHING STOVE.
H. THE "INSIDE" BLOCK.
I THE "MITRE" BLOCK.











Morocco, pigskin and the better class of leathers work much about the same. If the leather is first sponged over with vinegar and the tools are used cool, that is well below hissing point, a clean sharp impression will result. Working the tools into the same impression the second time will improve the result by producing a burnish.

Sheepskins usually contain so much dressing that they refuse to take a good colour and it is best to work them dry, when the tools may be a little hotter.

Rough calf. The black tooling associated with this material is produced by quite a different method. The tools are not heated, neither is any attempt made to obtain an impression. Iron stains leather very readily, and if the faces of tools are sponged with strong tincture of iron and worked over the leather, without heating, the effect is of printing in black.

Vellum and Forel. These materials are too hard to blind tool in the usual way, although they gild quite well. There is a method of blacking the tools in a candle flame and working them this way, afterwards fixing the impression by painting them in with varnish, but it is not very satisfactory. Painting the letters and drawing any lines with a ruling pen is perhaps the best.

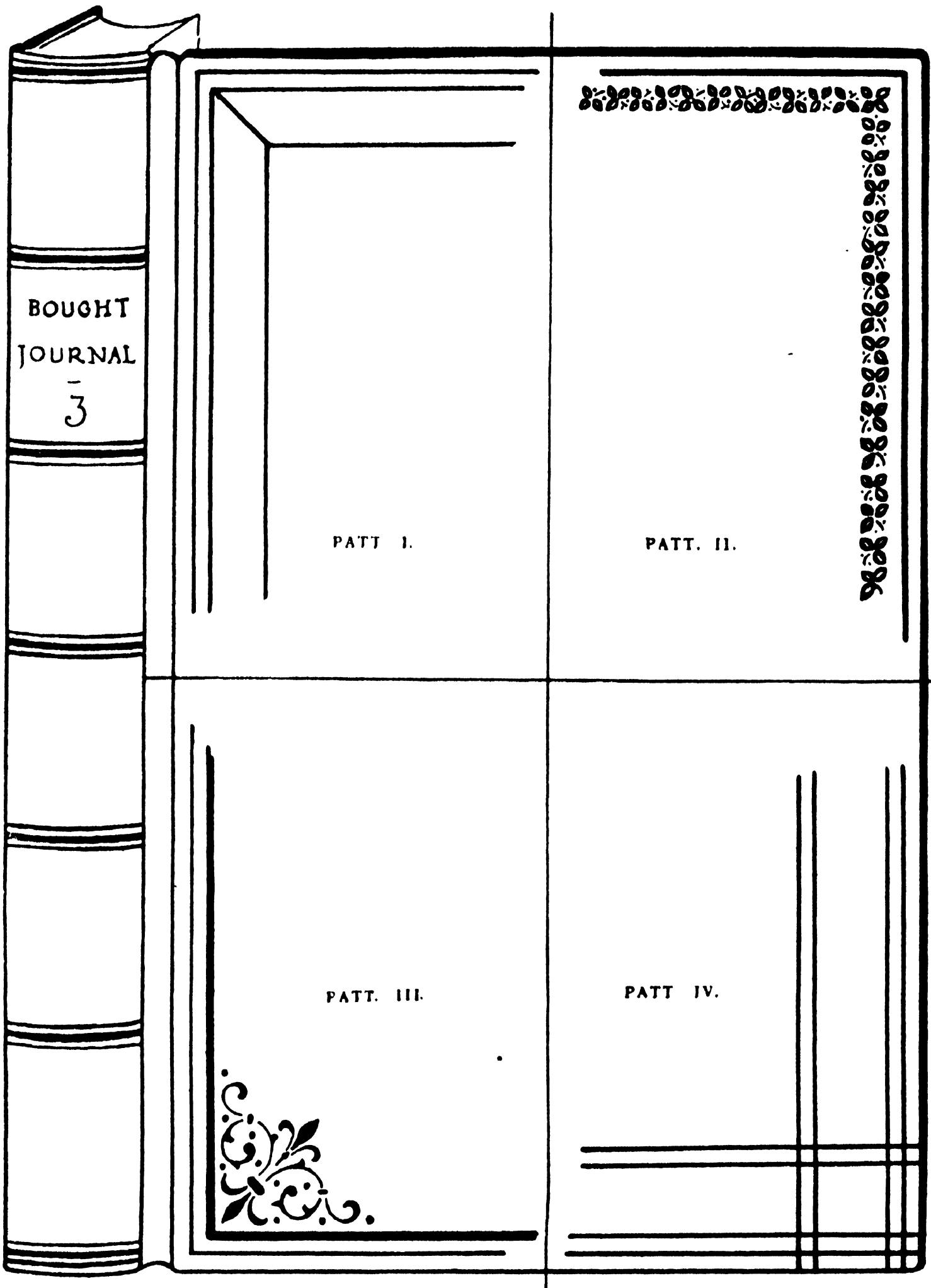
Account books should always be very simply tooled with perhaps the lettering only in gold. A few suggestions for full bindings are given in the illustration. Pattern 1: The pattern is marked on the side of the book by means of the compasses and the marking folder. The only tools used for the blind work are a one-line fillet and a hand tool consisting of a straight piece of line. Pattern 2 is a simple roll border, the tools required are one-line fillet, one-line hand tool, leaf roll and a small four-leaf tool for the corner. Pattern 3: Tools required, broad and narrow fillet with mitre pieces, and corner tool. Pattern 4 requires a two-line fillet only. The lines are not mitred, but run right off the book.

Insides and edges. A roll consisting of a series of bars is often used for the edges of the boards of account books. The bars on the inside should correspond with those on the edges whenever possible.

Half-bindings. Account books require a two-line roll or a small flower roll run against the cloth.

The backs of both full and half-bound account books vary but little. The most useful tool is a long two-line pallet. They are usually marked up in imitation bands and a ready method of obtaining a square guiding mark is by means of a strip of vellum and a marking folder. A pallet made hot is the best means of blinding a two-line across the back, but there is a method whereby two coarse catgut strings are jiggered over the back.

ACCOUNT BOOK FINISHING.



GOLD FINISHING.

Gold finishing is much more complicated than blind work. Its difficulties principally lie in the fact that different materials, or even slight variation in the quality of the same material, require different treatment in order to make the gold adhere properly. Dealing with the various preparations used by the gold finisher, they are as follows:—

The glair. This is a preparation by means of which the gold is made to adhere. Separate the white portions of several eggs and place in a flask, add about half as much vinegar and beat it well. This will cause it to froth, which should be allowed to stand for several hours and then strained. Used in this form it is rather expensive, but it can be made from dried albumen where half an ounce may be added to half a pint of water and, after soaking over night, beaten in the same way. The latter preparation is considered better for calf work.

Paste water is used by finishers to wash up leather, as it acts as a filler if the latter is at all porous. It consists of extremely thin paste.

Size is used by calf finishers whenever the leather is very porous and requires a hard surface. Gelatine makes the best size, which has to be heated like glue, but not in iron containers.

Vinegar is used for washing leathers that do not require a filler, such as certain moroccos. Acetic acid or citric acid are sometimes used in place of vinegar, as they have a slight clearing action upon the colour and are otherwise harmless.

Vaseline is used by finishers to retain the gold leaf to the work while tooling. Olive oil is used by some people, particularly for blocking.

Gold cushion and knife. The book finisher uses the ordinary type of these, but they must be kept in perfect condition as he is often required to cut his gold into very fine strips. The knife must be kept sharp, but without a rough edge, and fine pumice is used on the cushion to keep it clean.

Gold leaf. This wonderful material consists of almost pure gold beaten out extremely thin. It is sold in books of twenty-five leaves, the size being about 3½ in. square. English gold is much dearer than foreign, but should always be used for best work.

Gold leaf will stick to anything upon contact, unless the article is dry, clean and absolutely free from grease. A leaf of gold may be laid out on the cushion by running the knife beneath it and lifting it out, when a sharp breath in the centre of the leaf should lay it perfectly flat. In this condition it may be cut to the desired size and shape.

Recovering waste gold. Only a small proportion of the gold used remains on the book, the rest being cleaned away, but owing to the value of this metal it is worth recovering. Sometimes a specially prepared piece of india-rubber is used, which retains the waste until it becomes full, others wash the surplus gold away with benzine by means of cotton wool, or an oiled rag may be used. Periodically these materials may be taken to a refiner who will pay the value of the gold recovered from them.

GOLD FINISHING ON VARIOUS MATERIALS.

Moroccos. With these leathers the aim of the finisher should be to retain the original surface as much as possible. By making a blind impression of the tools first it is possible to confine the glair, etc., to the actual pattern which is always to be preferred for extra work. The first preparation that morocco should receive should be a wash over with vinegar and the moisture evenly distributed by means of a small hand brush. This has the effect of washing the leather and at the same time giving it a slight dampness which is necessary for gold finishing. When the surface of the leather has dried, the glair may be applied, either painted into the impression or washed over the surface with a sponge, whichever it is decided to do. A second coat is an advantage to the tooling, provided it is painted in. All preparations must dry on the surface before the gold is applied.

Vaseline is generally used to hold the gold on this leather and it may be applied fairly freely with a piece of cotton wool.

The gold must be cut to size and applied to the book by means of a pad of cotton wool. This pad must be fairly firm and in order to pick up the gold it requires to be slightly greased, but the natural grease of the back of the hand is usually sufficient. The gold requires to be pressed on to the leather, but the pad must not be allowed to rub.

A second layer of gold is necessary for the best work, or if the first has broken during laying on.

The tooling. To obtain the maximum brilliancy of gold, the faces of the tools must be kept clean by rubbing them upon a pad of leather occasionally. The tools, when taken from the stove, are too hot and require to be cooled down by a cooler consisting of a pad of wet cotton wool. The temperature should be such that there is no hiss when the metal is moistened, but only just below the hissing point. Hand tools are gripped firmly in the right hand with the thumb on the top of the handle. They are impressed on the gold very firmly and without hesitation, large tools requiring as much pressure as the finisher can apply, but smaller tools less in

proportion. The pressure of the hot tool results in the glair being melted, which causes the gold to adhere, at the same time it becomes moulded to the face of the tool and a brilliant impression should result.

Cleaning off the gold. When all the tools have been impressed much of the surplus gold is removed with a soft rag, a small piece of cotton wool steeped in benzine should remove the rest together with the grease, after which a clean coarse flannel is used to clean out the impression.

Gold finishing on calf. This leather is porous and requires to be filled before the glair will remain on the surface. Paste water well washed in is used first and when this is dry a thin coating of hot size is given. Two coats of glair are given, carefully sponged over so that they do not froth, the first drying before the second is applied. If the preparation is fairly fresh, calf will tool as easily as morocco, but if it has been allowed to dry too long, hotter tools must be used and in a quick and deliberate manner. Calf treated in this way must be polished and varnished.

For sheepskins the preparation is a wash up with paste water and a sponge over with glair. These leathers vary considerably according to the nature of the dressing that has been applied. Only extra heavy tools are previously blinded in.

Imitation leather cloths. These often give trouble to the finisher. A wash over with methylated spirit before the glair is applied will sometimes overcome the trouble.

Cloths. These require a preparation of glair only and applied in such a way that the surface is not disturbed. It is necessary to sponge all over or the glair will show. One layer should be sufficient and the tools used with extra firm pressure.

Gold finishing on velvet, etc. There is a method of gold finishing that does not employ a wet preparation. It uses a special substance known as powder glair or blocking powder, which is finely sprinkled over the surface to be tooled. The gold is cut up into small pieces and is picked up by each tool by slightly greasing the face after it is cooled down and then impressed on to the material, the surplus powder and gold may be brushed away.

COMMON FAULTS IN GILDING.

Gold does not stick. If the preparation is too dry or if the tools are too cold, the gold will be weak. When the leather has been prepared on the same day, the fault is most likely to be the tools, especially if some impressions stick and others do not.

Gold is dull. This is caused by the tools being too hot or the preparation too damp. Not only would the gold be dull, but the outline would be blurred.

Gold sticking where not required. This is probably caused by the preparation being wet at the time the gold was laid on. Sometimes when cooling down the tools a drop of water will remain in a crevice with fatal results when applied to the gold.

LETTERING.

More than half of an average finisher's work consists in lettering the titles on the backs of books; the work, therefore, is of the utmost importance—a book may be complete without decoration whatever, but not without its title.

Two distinct methods are employed, one of which uses separate letters in the form of hand tools which are impressed one at a time, the other uses brass type, the title being set up in a special holder and impressed a whole line at a time. The first method is suited for both backs and sides of books, particularly where there are miscellaneous titles; type is only suited for rounded backs, but it is much quicker where there is a series of books of the same title. The workshop should, therefore, be equipped for both methods.

Hand letters. There should be at least six sizes of these available varying from $\frac{1}{16}$ in. in height to $\frac{1}{4}$ in. The letters may be obtained hand cut or cast, the former usually contain more metal and may be obtained to customer's own design, but the latter are claimed to be of harder metal and are cheaper, but many of them are bad in design. Two designs for hand letters are suggested, the former being the Golden type of William Morris. This makes a particularly good form for bookbinders' use, as the bar serifs help the alignment and withstand the wear to which these tools are subjected; also the difference between the thick and thin strokes is not accentuated.

HAND LETTERING.

The title of a book should be as brief as possible, provided it is complete. The usual position is in the second panel from the top.

The author's name, if short, may be placed in the same panel underneath the title and separated from it by a short line, or it may be placed in the panel immediately beneath it.

The volume number may be placed underneath the author, as there is likely to be more room there than in the title panel.

The size of the letter selected should be such that it will appear comfortable in the panel without crowding. A smaller size letter

may be used for such words as THE, OF, etc., and for the author, but not more than two sizes should be used on one book. The following rules may be used as a guide when planning out a lettering panel: (1) The space at the top of the panel should always be a little less than that at the bottom; (2) the space between two lines of lettering should be a little less than either top or bottom spaces; (3) the distance between two words in the same line should equal one letter; (4) wherever possible the lines should be arranged to assist in the reading of the title; (5) the lettering as a whole should be designed to fit its panel comfortably, whether it be upright or oblong, as shown in the illustration. A rough plan out should be made on a piece of paper.

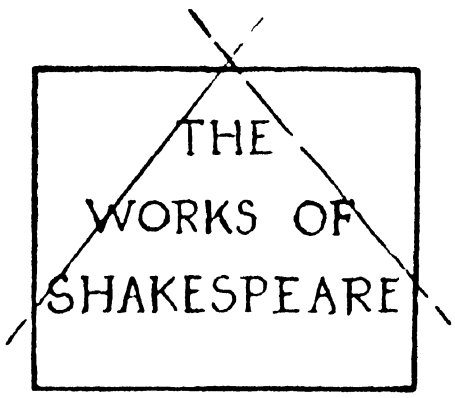
For lettering the back of a book direct on to the gold and using hand letters, the following is the procedure. It will be found that the slightest touch with the point of the dividers on the gold will make a visible mark, and by this means determine the tops of the lines of letters by making a mark on the right-hand side of the panel; now a piece of fine thread held between the two hands if drawn across the gold will make fine lines. Find the centre of these lines and make a mark immediately above them. Upon your dividers find the average distance from centre to centre of two letters when comfortably spaced to form words. Count the number of letters per line, including the space between two words as one letter. Counting from the centre mark on the panel determine the position of each of the letters by a slight mark just above the line.

The hand letters themselves are arranged round the finishing stove in alphabetical order and, to assist in finding them as they are required, the vowels, a, e, i, o, u, are usually marked on the handles. The book is fixed in the finishing press in the position shown, whereby the letters may be impressed immediately beneath the corresponding mark. Extra wide letters as M's and O's and narrow I's must be allowed for by closing up or opening out as the lettering proceeds.

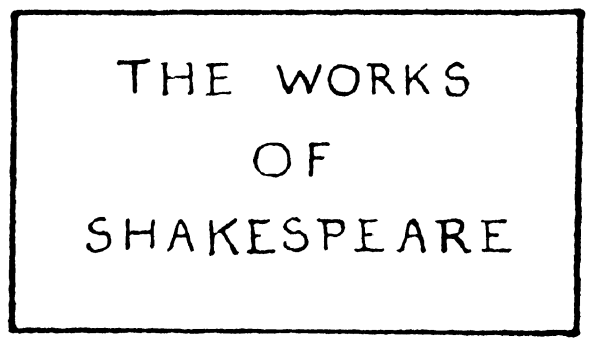
TYPE.

The brass type is obtained in sets of about one hundred, properly proportioned according to the frequency with which certain letters occur over others. They are set up in the type-holder in lines as planned out for the panel, with the tops of the letters towards the flat side. Two or three lines may be set up in one holder, provided they are separated by at least half an inch. Wherever possible insert a fine space between each letter, for if used without they appear crowded together and unreadable. Tighten the end screw of the holder first, and then the side screw to bring the letters into exact line. Take

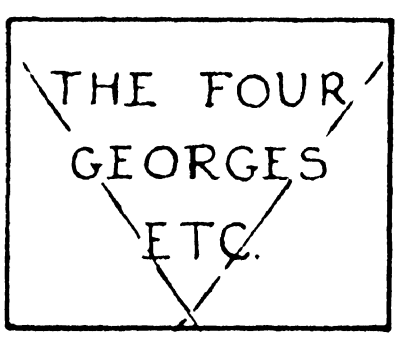
LETTERING.



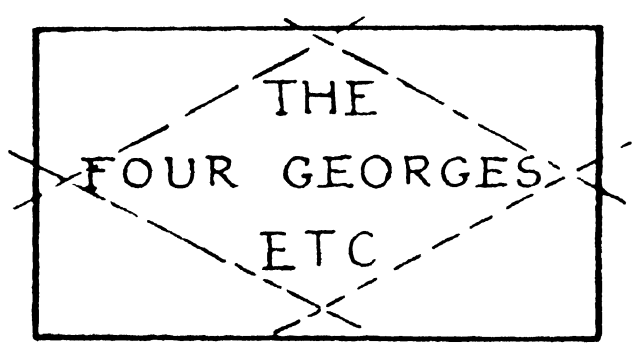
THE PYRAMID.



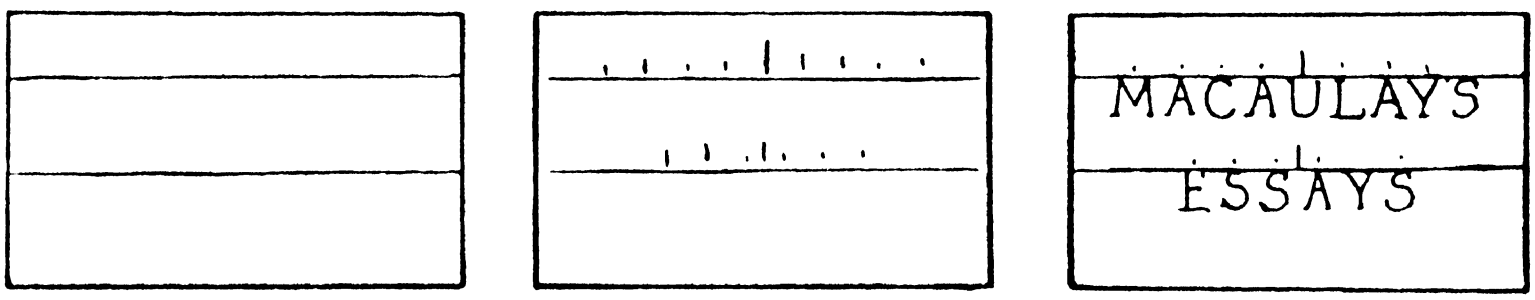
THE RECTANGLE.



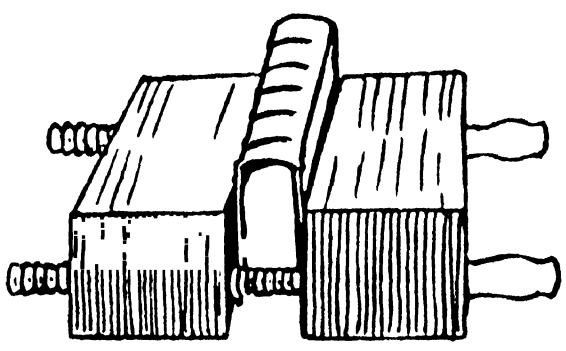
THE TRIANGLE.



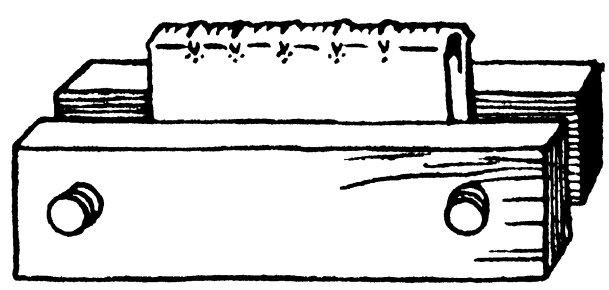
THE LOZENGE.



THE THREE STAGES IN HAND LETTERING.



BOOK ARRANGED FOR
HAND LETTERING.



BOOK ARRANGED FOR
TYPING.

an impression of the letters upon a piece of soft leather and see that the spelling is according to the title page of the book.

To mark up for typing, the spacing of the lines and the method of marking them with thread is the same as for hand lettering. The centre mark is also required, but instead of marking the individual letters, half the length of a complete line is set upon the dividers and this distance marked to the left-hand side from the centre mark on the panel. The type is now impressed across the book, the mark corresponding to the commencement of the line of lettering and the thread line is used to assure that it is straight.

BLOCKING.

The permanency of gold finishing relies upon the fact that an impression is obtained by the finisher pressing heavily upon the tools. The size of the tools that can be worked by hand is limited to somewhere about a square inch of surface, beyond which some mechanical appliance must be used. Such an appliance is the blocking machine, so called because in place of tools with wooden handles flat blocks or plates are employed. Blocking is confined to flat surfaces only, therefore the rounded backs of books must be hand-tooled. As in the case of most bookbinding machinery the blocking machine is of greatest value where large quantities of books are being produced to the same pattern. It should never be considered as a rival to hand-tooling, for its work always has a mechanical appearance and the same brilliancy of gold is never obtained, although its impression may be more perfect.

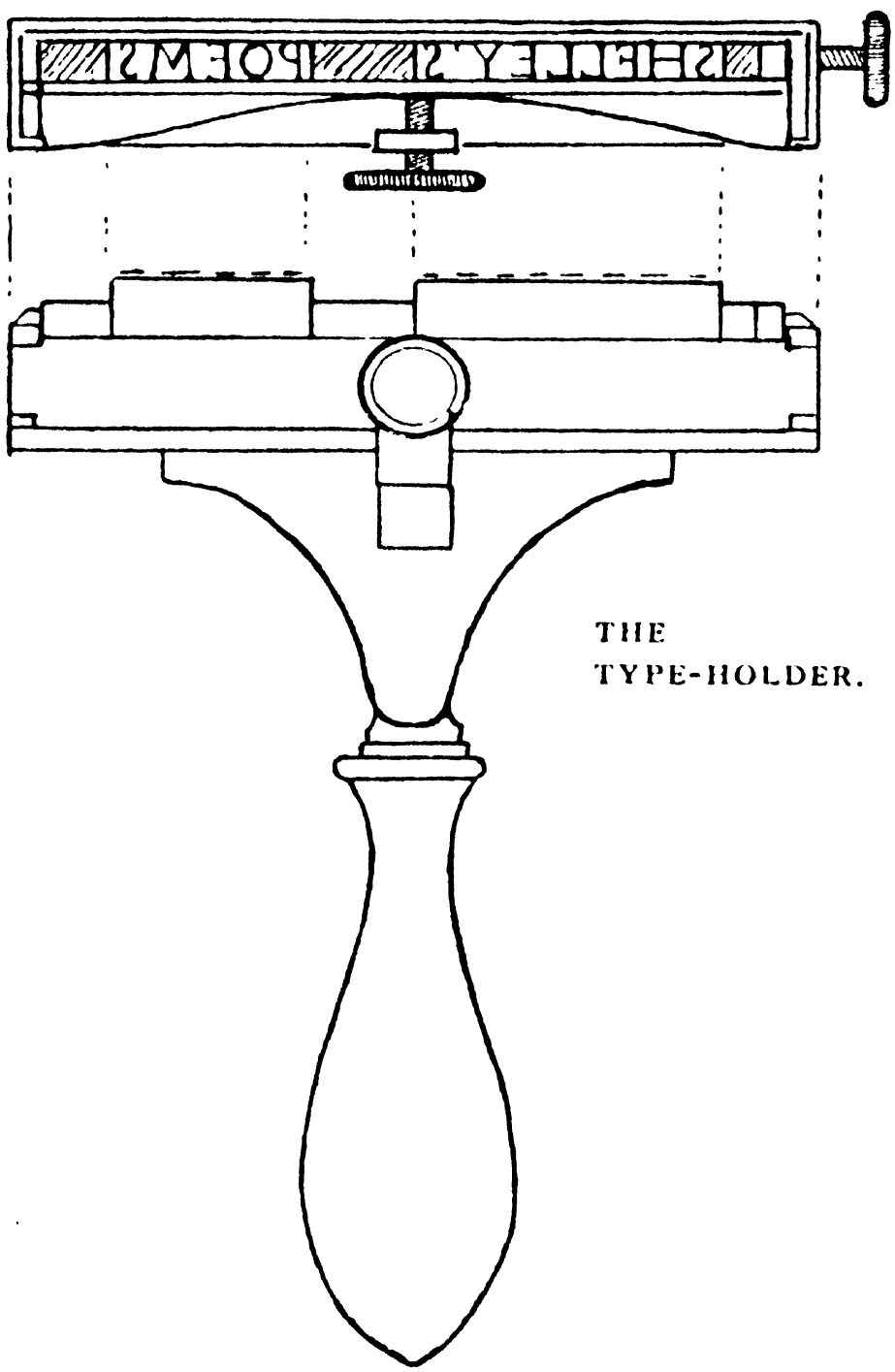
The machines themselves vary considerably with different makes, but all contain the following components: (1) a solid bed to hold the work, containing movable gauges; (2) the plate holder immediately above the bed; (3) a heating box for the plate holder; (4) a lever or power apparatus to bring the plate and the bed together. To make the machine ready for a run of books or cases the following is the procedure:—As it takes about twenty minutes for the correct temperature to be acquired, the gas should be lighted early. The plate holder should be taken down and anything remaining of a previous job scraped away. There are usually several of these for use according to whether the work is small or large. When fixing into the machine be sure that all screws are tight, for there must be no motion in the plate. *The gauges* have now to be fixed to the bed in such a position that when the work is put in, the impression of the block will fall under the exact centre of the machine. Any error in this adjustment will cause the impression to be uneven.

ABCDEFGHIJKLMNO
PQRSTUVWXYZ Æ &
1234567890 .,

A GOOD SERVICEABLE FACE FOR BOOKBINDER'S USE.

ABCDEFGHIJKLMNO
PQRSTUVWXYZŒÆ

ROMAN LETTERS FOR BOOKBINDER'S USE.



THE
TYPE-HOLDER.

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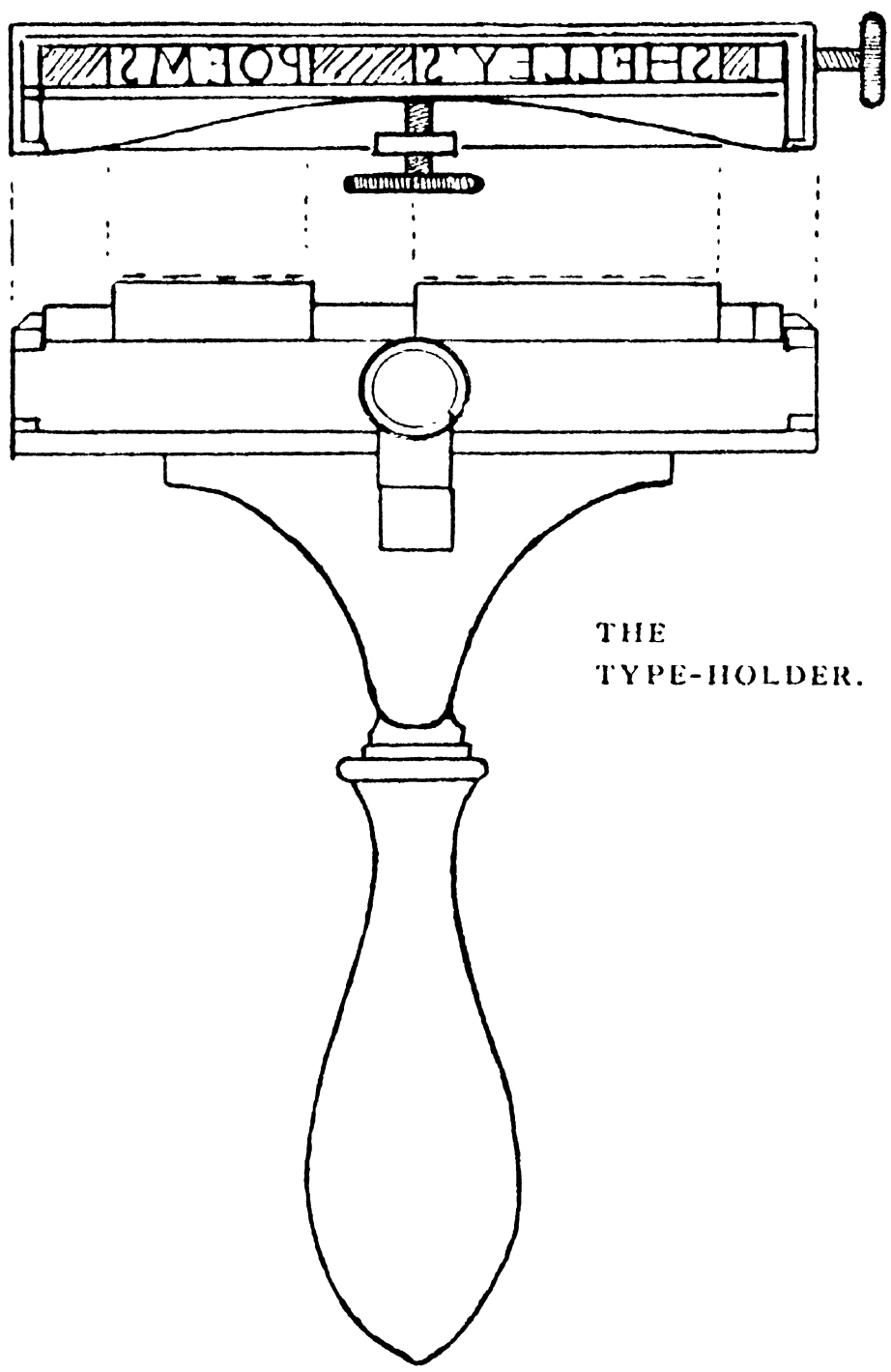
A B C D E F G H I J K L M N O
P Q R S T U V W X Y Z Æ &
1 2 3 4 5 6 7 8 9 . ,

A GOOD SERVICEABLE FACE FOR BOOKBINDER'S USE.

A B C D E F G H I J K L M N O
P Q R S T U V W X Y Z Œ Æ

ROMAN LETTERS FOR BOOKBINDER'S USE.



THE
TYPE-HOLDER.

The block. It may appear strange, but glue is still the most convenient method of fixing the block to the plate of the machine. As metal will not stick to metal very well, the back of the block is first lined with thick paper and, after trimming away any which overlaps, it is again glued ready to stick to the plate. To determine

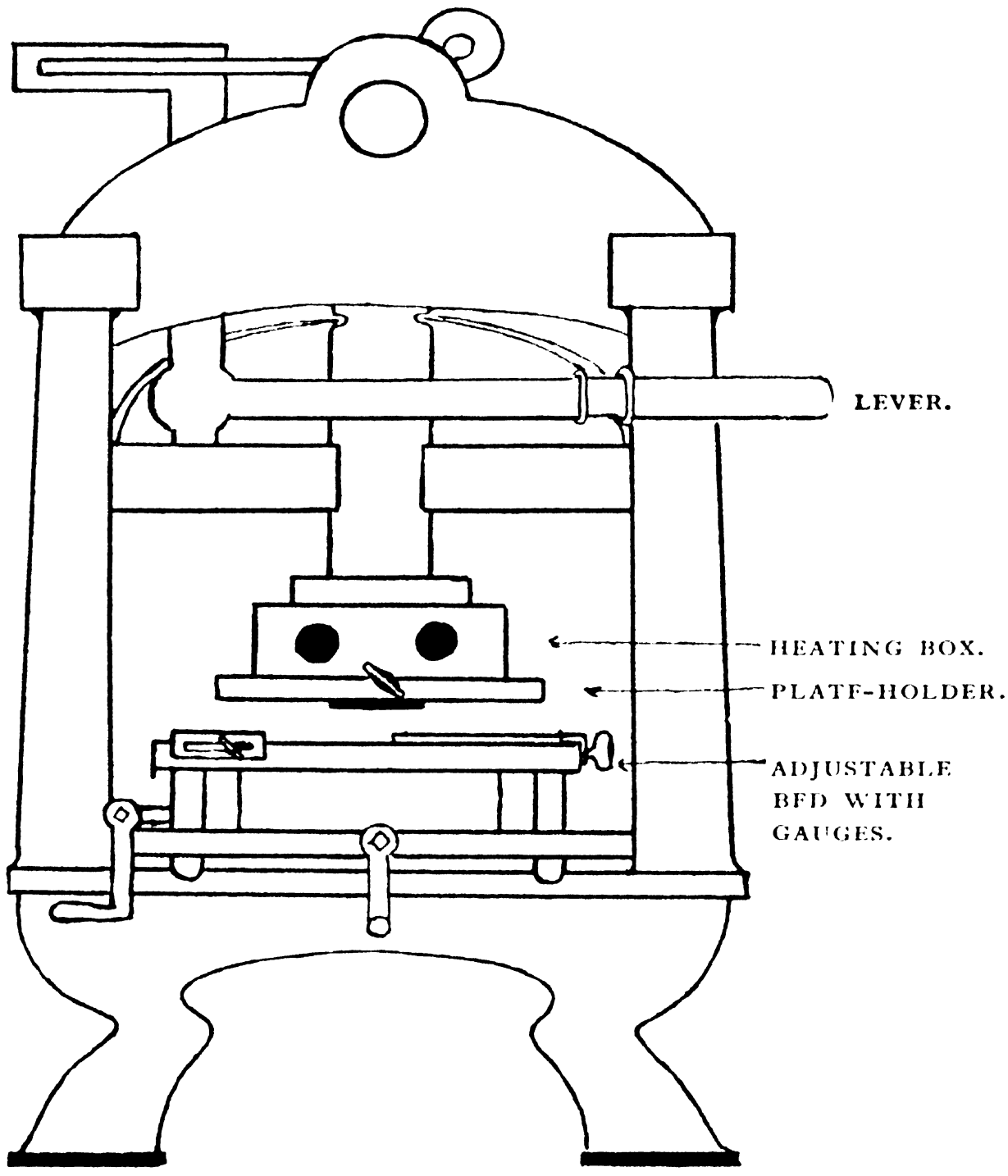


DIAGRAM OF A BLOCKING PRESS.

its position the block is laid, face downwards, upon the work to be gilded, or failing this, upon a dummy piece of board having an impression of the design marked upon it, whereby the whole may be placed against the gauges of the machine and the plate lowered, causing the glued block to be picked up by it. The height of the bed has now to be adjusted so that the impression is correct when the lever is pulled over to its full extent.

For blind blocking, the operation simply consists in placing the work against the gauges and pulling the lever over; the temperature being about the same as for gold finishing, just upon the hissing point when wetted.

For gold blocking, the preparation of the work is similar to that for gold finishing except that one coating of glair will suffice in all cases. A faint, blind impression is used to indicate the position for laying on the gold (a very important consideration when dealing with large quantities), and olive oil sparingly applied is used in place of vaseline. Soft gold rubber is best for cleaning away surplus gold and grease.

Blocking powder is a preparation by means of which material that cannot be wetted, such as rough calf and silk, may be blocked in gold The powder is sprinkled over the material and the leaf is laid on the block itself; some machines having special facilities for this.

Gold substitutes. The value of gold is in its permanency and colour, and a substitute for this expensive metal must possess both qualities in a fair degree to be effective. This has been done by combining bronze powder in a fine film of celluloid. Not only is the bronze protected from the tarnishing effects of the atmosphere, but the celluloid acts as its own preparation. Colours in addition to gold may be blocked in this manner.

Blocking inks used after a process of printing, but upon blocking machines with ink attachments, are used for cloth bindings. The ink itself is specially prepared, being quick drying and containing excess of gum to give it a glossy surface.

BOOKBINDERS' BLOCKS.

Brass blocks. These are produced by engraving by hand, or by a hand directed machine, upon the metal itself. The work is highly skilled and, as the design to be produced must be redrawn upon the metal, much of the detail may be left to the discretion of the engraver. Brass blocks wear longer and produce more brilliant results than those of any other process.

Line blocks. Printers' line blocks, when etched extra deep and upon heavier metal, may be used for bookbinding work. In this process the actual design is photographed upon the metal forming the block, and the design to be reproduced must be in clear black upon a white ground; it may be larger for convenience of drawing if desired. Line blocks require to be cleaned out well by hand when they are to be used for gold work. The zinc from which

they are made, being rather soft, has not the wear of brass and the results are not so bright.

Electros can only be reproduced from other blocks or from printers' type. They are very useful where it is desired to preserve the original brass block or for lettering. They consist of a thin copper shell backed with type metal, and in consequence their life is short, especially upon hard material.

When designing blocks for gold work it should be remembered that the final result consists of a light colour upon a dark ground, therefore a pencil or ink drawing is deceptive, and a sketch should be made in a yellow colour upon a tinted paper to see the effect. Outline drawings produce unsatisfactory blocks, for the thin lines cut the material and wear away quickly. It is better to develop the characteristics of blocked work than to attempt to imitate hand tooling, and for this reason the process is admirably suited for the productions of arms and large central devices that cannot be tooled.

LETTERPRESS FINISHING.—BACK PANELS.

When on the bookshelf it is the back panels only that are seen, and for this reason the book is always titled on the back, usually associated with some form of decoration. It is the tooling of these books that occupies the greater portion of the finisher's work. The diagram on page 161 illustrates a few standard styles of tooling, and the series of operations by which they are executed will be described in detail.

Cloth books. It would be out of place altogether to attempt any elaborate hand tooling upon cloth bound books. The final appearance of this class of work should depend upon the neatness of the forwarding and the selection of the colours of the cover, ends and edges. A leather lettering piece is an advantage, as it affords an opportunity for a little colour, and tools better than most cloths. The thin leather for these labels may be obtained prepared expressly for this work, or ordinary leather may be pared down. The position and size of the label is such that it would occupy the second panel on the book if it had been marked up for fine bands. The preparation for gilding in the case of the leather is paste water and glair once, but if the lettering is to be on the cloth direct, a sponge over the whole back with glair only is required. A two-line pallet is worked across the back upon the extreme edge of the leather and the book is lettered and cleaned off, after which the leather only may be varnished.

Library-style bindings. The lettering is of the utmost importance in this class of work, as easy reference is essential in all libraries.

VARIOUS COMMON BACKS.

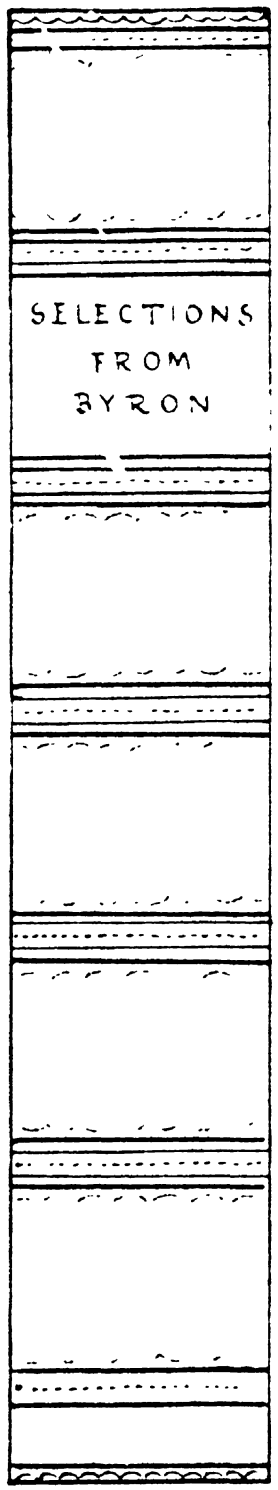
1 PALLET BACK, RAISED BANDS.

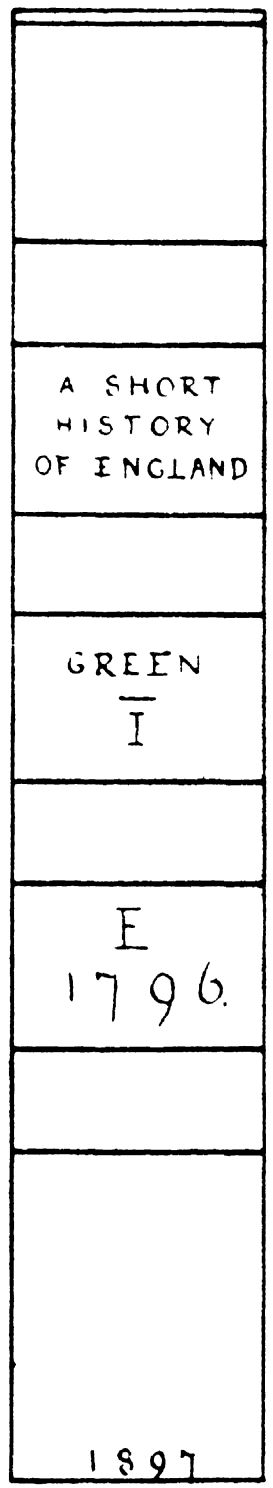
2 LIBRARY STYLE BACK.

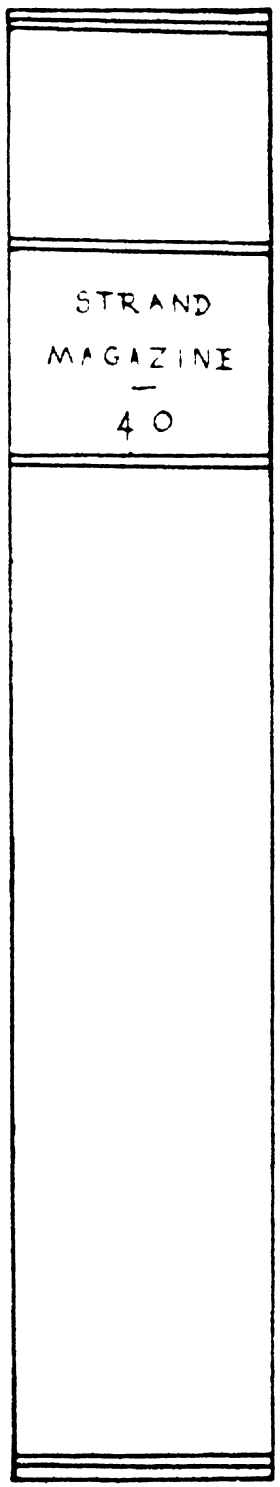
3 PLAIN CLOTH BINDING.

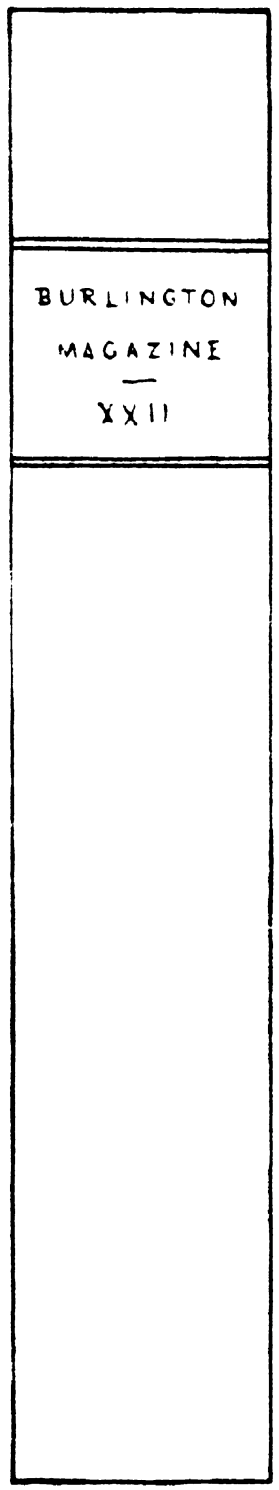
4 CLOTH BINDING WITH LEATHER LETTERING PIECE.

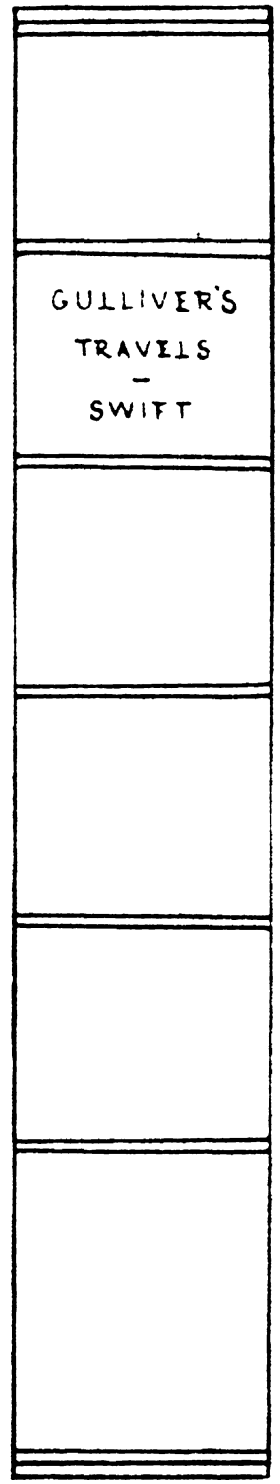
5 PLAIN LEATHER BINDING WITHOUT RAISED BANDS.









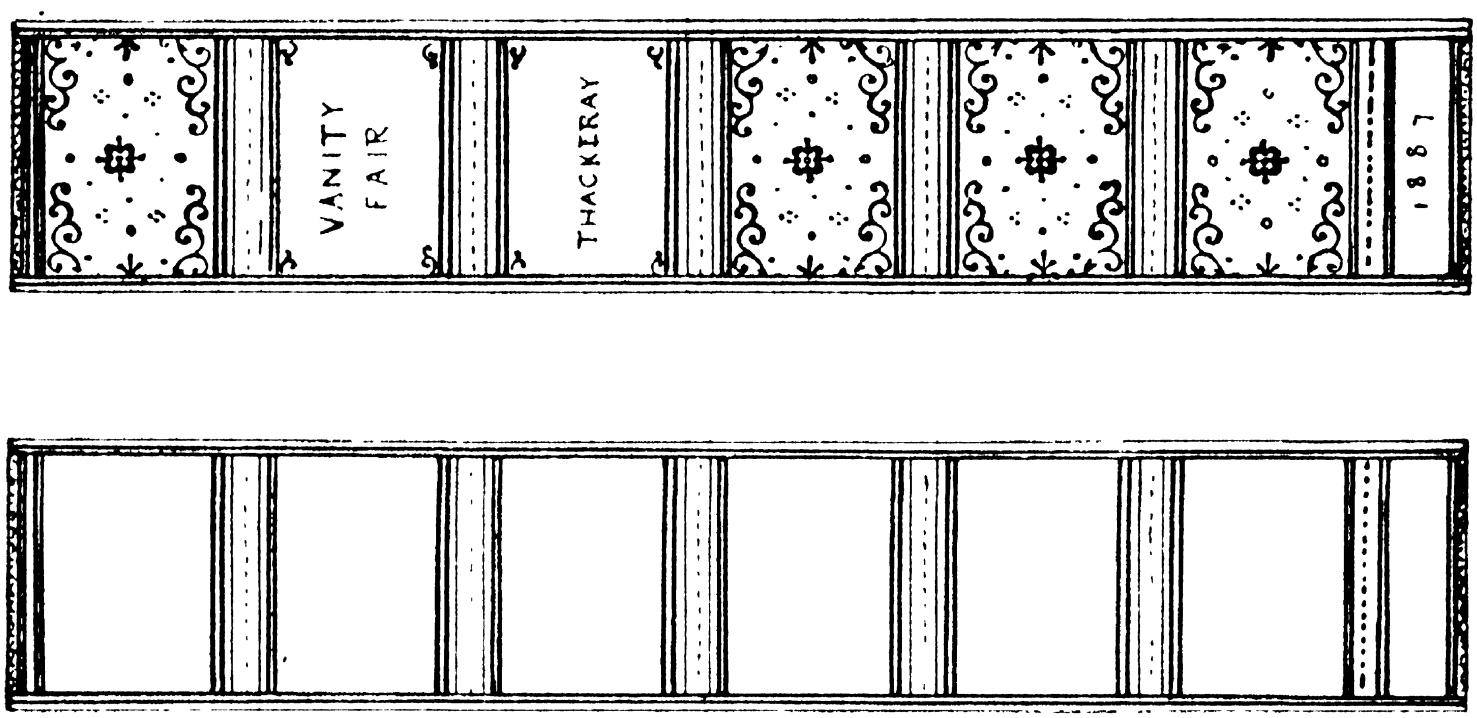


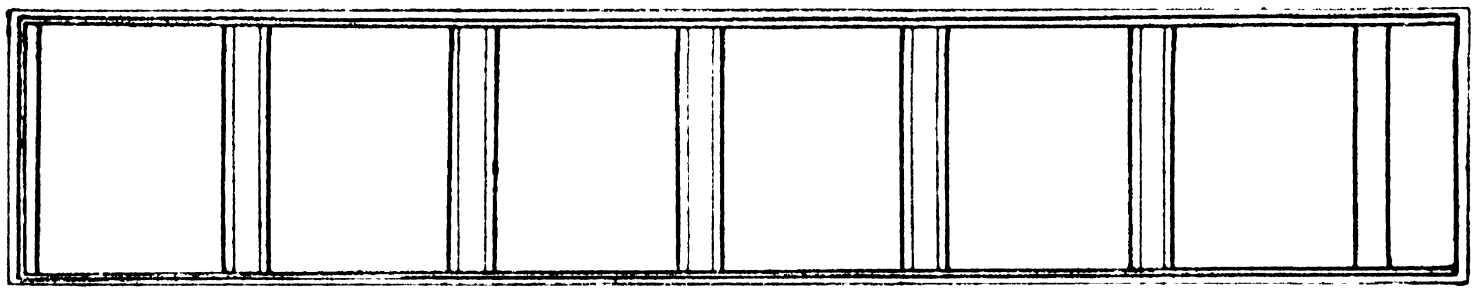
The author should not be placed in the same panel with the title, as both are used in the classification of books. The letter used should be plain and well spaced in order to be easily read.

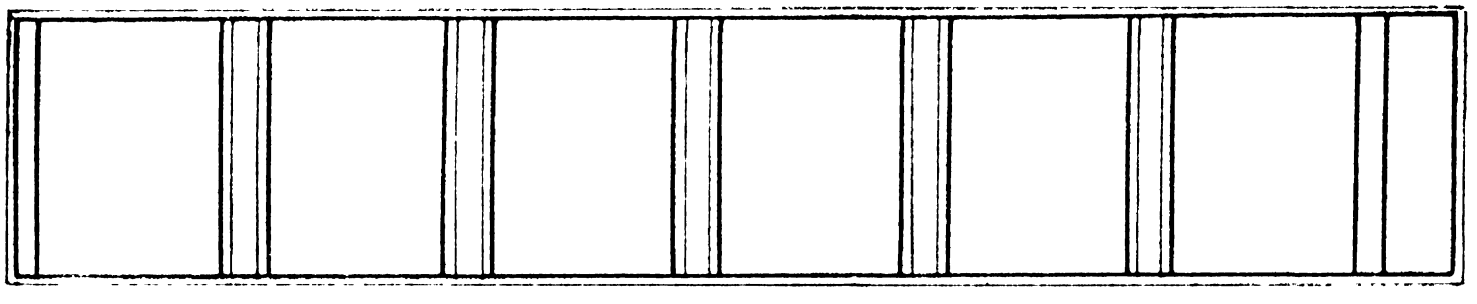
Calf bindings. The following is the method of tooling a pallet back with raised bands in polished calf: (1) A two-line pallet is impressed against the bands which has the effect of marking a line "away" from them; (2) the head and tail panels are measured off the same size as the other four and the small date panel formed by marking lines across with a thin folder assisted by a narrow strip of vellum; (3) the back is now to be well washed over with paste water and allowed to dry; (4) a vessel of thin hot size prepared and the back carefully coated by means of a small soft sponge—by working across the back the tendency for the size to froth is avoided; (5) when dry, the back is glaired twice, which must be allowed to dry between the coats—again the preparation must not be allowed to froth; (6) the gold is laid on, but as the back is not being tooled all over it is sufficient to well cover the bands, the lettering piece, and the head and tail; (7) by cleaning the gold away neatly along each joint, a tidy appearance to the ends of the cross lines is assured —a small piece of the gold rag round the end of the finger will do this; (8) a one-line pallet is worked across the back on the lines ready marked; after which the pinhead occurs over the bands, and then a simple fancy pallet each side of the gold one-line follows; (9) the book is lettered and the gold cleaned away.

The "run-up" back. This is the technical name given to a method of tooling the backs of leather bindings, whereby a two-line roll is worked along the edge of each joint. It is associated with the cheaper forms of gilt backs upon calf or morocco; usually the former. The first stage of the marking up is the same as that of the pallet back previously described, but in addition a straight-edge is placed on the board and along the joint and a folder line marked along the extreme edge of the back. Run-up backs may have coloured lettering pieces, in which case they are pasted on at this stage; the edges of the leather should be made to occur on the lines that enclose the panels. Calf leather requires to be prepared with paste water, size and glair as before, but morocco requires washing over with paste water and when dry one coat of glair. As the whole of the back is to be covered with tooling, the gold must be laid all over and where it has been found to break across the bands a second layer must be used. The order for tooling is the same for calf and morocco, and is as follows: (1) The book is placed in the mitre block and a narrow two-line roll is worked along the whole length of each joint to the line previously marked; (2) the gold is wiped away from outside these run-up lines; (3) the book

THE "RUN-UP" GILT BACK.







1 MARKED UP FOR GILDING.

2 LAID ON WITH GOLD. TWO-LINE ALONG THE JOINT.

3 TWO-LINE PALLET. PINHEAD PALLET. CATSTOOTH PALLET.

4 CORNERS, CENTRES, LETTERING.

is placed in the finishing press and the following pallets are worked across the back—two-line pallet, the cats-tooth pallet, the fancy pallet head and tail and the pinhead pallet on the bands; (4) the panels, other than those that are to contain the lettering, are filled in as follows—the four corner tools, the centre tools and the arrangement of fancy stops; (5) when all the books of the one batch have been tooled as above, the operation that follows is the lettering and the gold is cleaned away.

The mitred back. Among the diagrams for the tooling of books with bands will be found a set illustrating the make-up of a gilt back with mitred lines. Upon comparing this series with that of the run-up gilt back it will be seen that the difference lies in the enclosing lines of the panels, for in a mitred back these are carefully joined up at the corners. Although each back shown is a stage in the progress of the succeeding one, they are all complete in themselves—the first three forming excellent styles where a plain binding is required. Mitred backs are difficult to carry out well, and careful attention to every detail is required in order to obtain perfectly true panels.

Heavy grained leathers should have the backs polished with a warm polishing iron as a first operation, especially where the tools are fine in detail.

Marking up. The bands are marked away with a two-line pallet and the head and tail lines measured and marked with the folder. Where a set of books is being tooled it is important that these cross lines are exactly the same on all the backs, so that they are uniform when on the shelf.

One-line panel back. The vertical lines of the panels should be as near to the joint as possible, provided they do not occur near enough to be broken up when the book is opened. They are first marked with a folder and straight-edge and afterwards impressed with a hot tool consisting of a length of line.

Two-line panel back. This is shown in the third diagram of the series. The one-line previously marked is made into two by the impression of a two-line pallet for those that cross the book and a shorter piece for the verticals; in each case the corners are to be carefully mitred. The lettering panels and the date panel at the tail usually retain the original one-line in order to leave as much space as possible.

Centres and corners. Where the panels of a book require to be fully gilt, the placing of tools in the corners followed by a centre and other fancy tools is the simplest way to cover the surface. Other designs based upon the two-line and other mitred backs are given in a further series of diagrams.

STAGES IN THE EXECUTION OF A FULL-GILT BACK WITH BANDS.

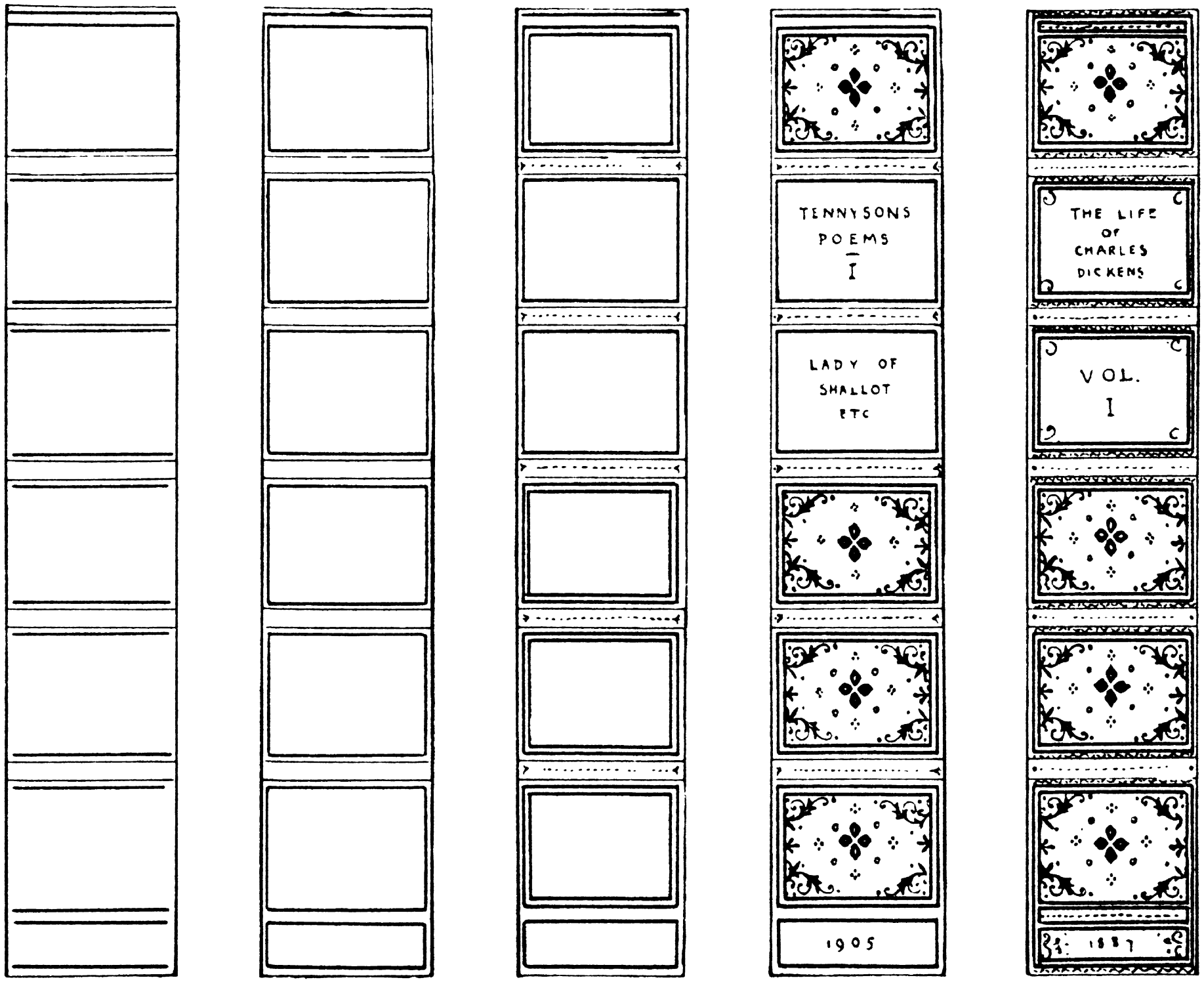
1 ONE-LINE AWAY FROM BANDS - HEAD AND TAIL.

2 ONE-LINE MITRE BACK.

3 TWO-LINE MITRE BACK.

4 THE FULL GILT BACK.

5 AN EXTRA FULL GILT BACK.



The gilding. The question of how far it is necessary to blind-in the tooling before the leather is washed up and glaired for the gold depends upon the skill of the finisher and the quality of the binding. Work that has been blinded-in produces a deeper and more permanent gold impression in addition to the fact that it is possible to paint the glair exactly where required, resulting in cleaner work. For a full gilt back similar to the one just described, a compromise may be effected by blinding-in the mitred lines, the centres and the corners, then when preparing for gold, sponge over the whole back lightly with glair once only, and for the second time paint in the heavy tools and lines. The one coat of glair will be sufficient for the small stops, etc., and also for the lettering, provided this is done before the preparation becomes too dry.

Extra gilt backs. Among the diagrams for book backs will be found a series of thirty designs suited for extra bindings. The first set is based upon the two-line panel. They are to be built up direct on to the back of the books from very small elements, such as flowers, leaves, gouge lines, etc. The French three-line consists of two lines very close together and a third some distance away, and the second set of backs is based upon this border. The advantage is that when the centre is filled with ornament the result is a border of plain leather round each panel. The English three-line consists of a thick line enclosed between two thin ones. When this thick line is in gold the result is very striking; it may, however, be left in blind in the case of the lighter leathers. The pallet back makes use of this tool to decorate the bands, leaving an oblong panel to be filled in or left plain as desired. With regard to the last set of designs it will not be possible to construct these direct on to the leather. It will be necessary to draw them out on paper and impress the tool through a working drawing, a process to be described in detail in a subsequent chapter.

FINISHING OUT HALF-LEATHER BINDINGS.

The placing of the sides and the pasting down of the endpapers of this class of work have already been described. Sometimes these operations are postponed until after the backs have been tooled, whereby the risk of thus becoming soiled or marked is removed. The following operation completes the binding.

Gold line on sides. The best finish for the sides is perhaps a one-line or a two-line roll upon the extreme edge of the leather on the back piece and the corners. The leather requires to be washed up to remove any paste marks from the previous operation, vinegar being used for morocco and paste water for calf—the latter leather

DESIGNS FOR BACK PANELS.

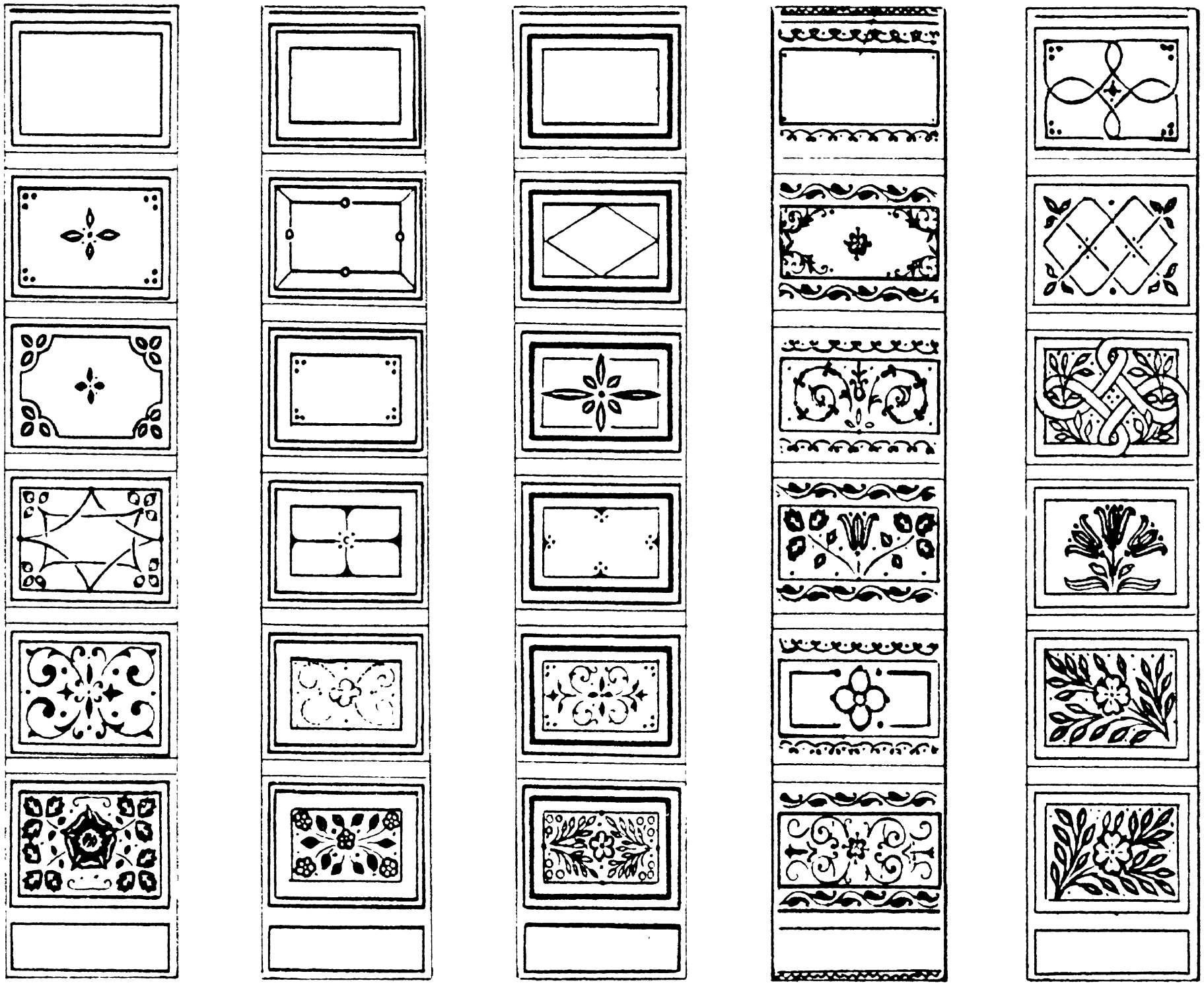
1 VARIOUS DESIGNS BASED UPON TWO-LINE.

2 VARIOUS DESIGNS BASED UPON FRENCH THREE-LINE.

3 VARIOUS DESIGNS BASED UPON OLD ENGLISH THREE-LINE.

4 VARIOUS PALLET BACKS.

5 BACKS FOR "EXTRA" BINDINGS.



had better receive a thin coating of size as a precaution against penetration of the varnish. To complete the preparation, paint a narrow strip of glair along the edges to receive the roll. There is a special way of running the gold lines on the sides which is a little quicker than the ordinary way and which results in a saving of gold. A good cushion and knife are required, as it is necessary to cut the gold into very narrow strips. Instead of rubbing the vaselined cotton over the leather, it is the edge of the roll that is greased after being heated to the required temperature. If the roll is carefully wheeled over the strips of gold they will be picked up by it and when completely covered may be impressed upon the leather in the usual way. A little difficulty may be experienced at first and the method should be confined to one or two-line rolls only, as it is difficult to repair a break in the more elaborate forms.

Ties. These form a very effective finish to the sides of leather bindings with bands, the only tools required being a leaf—or three leaves in a tool—and a one-line pallet. They should be worked in blind only, the lines forming a continuation of a pair from the bands of the book.

Polishing. A special iron made hot and worked over leathers such as calf or morocco will produce a polish. The iron is used at about the temperature of a finishing tool, but this varies with different leathers, some turning dark if it is at all warm.

The face of the tool must be kept clean and bright by means of a pounced leather pad. It must never be allowed to stop when on the cover of the book or a black mark will result, but it should be worked over the surface in a circular or figure-eight motion all the time. The order for polishing the various parts of a binding is as follows:—

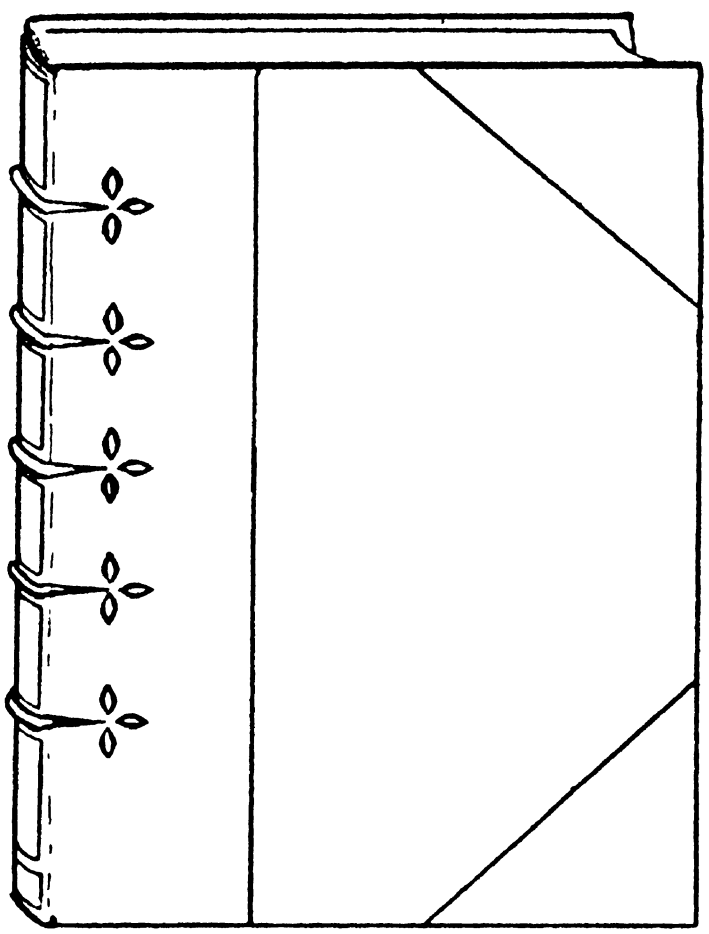
(1) *Inside the squares.* This must be done with the board well supported and without allowing the iron to touch the end-papers or the cloth sides.

(2) *The back panels.* The iron is worked between the bands with a circular motion. The bands themselves may be polished and a heavy blind line worked each side will sharpen them up.

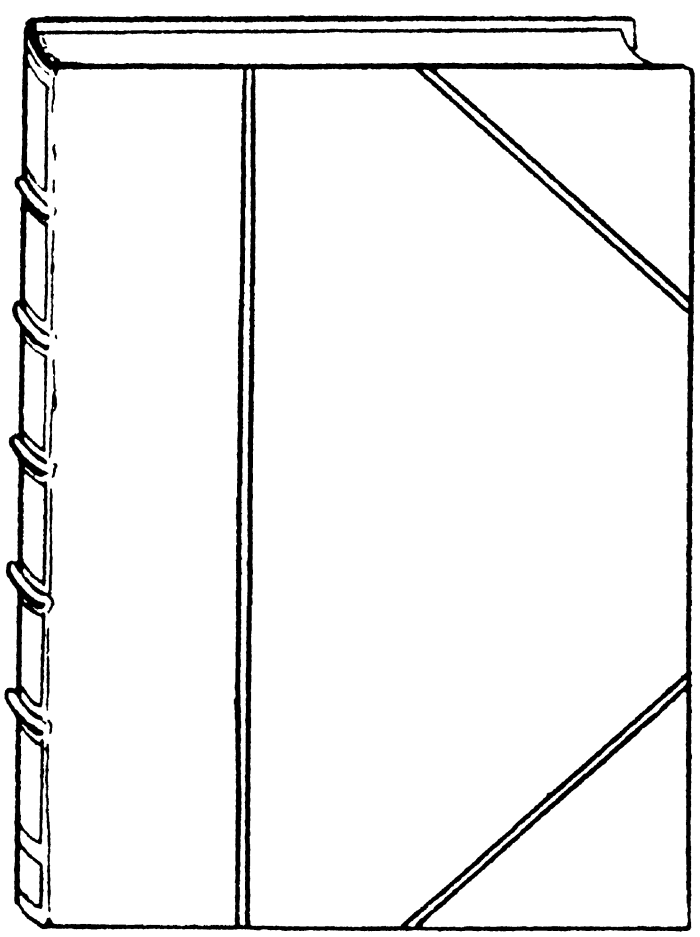
(3) *The edges* of the boards and the head caps are now polished.

(4) *The sides.* These must be done without allowing the iron to touch the cloth or paper sides. An effort should be made to keep the polish uniform.

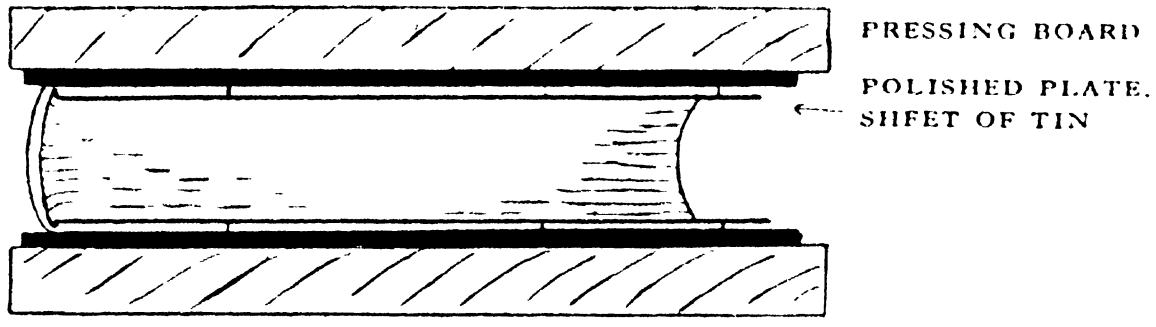
FINISH FOR SIDES OF HALF-BINDINGS.



BLIND TIES—ONE LINE.



TWO LINES ON SIDES.



BOOK ARRANGED FOR THE FINAL PRESSING.

Varnish is an improvement to some leathers. It consists of fine lac dissolved in spirit, and should be pale in colour and quick drying. It is applied very sparingly by means of a piece of cotton wool, the pad being worked with a quick circular motion over the surface of the leather. Varnish does not improve good quality morocco and should never be used upon porous leathers, or it will penetrate the material and turn it black. It is useful to neutralize the effects of glair upon glazed leathers and for calf where this material has been prepared by sizing.

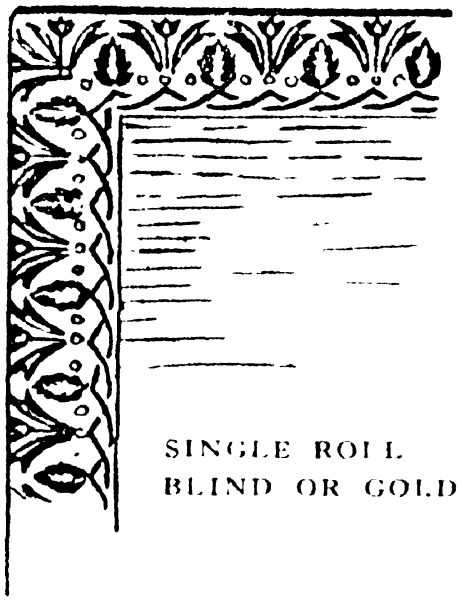
Pressing. This is usually the last operation the book receives. It serves to give a final polish to the leather and to set the joints. Sheets of tin-plate kept for the occasion are inserted inside the boards and special polished nickel plates are used outside. The tins must be clean and the nickel plates kept bright and free from scratches, particularly for calf leather. The pressure may be as much as the books will stand, but upon any sign of creasing in the back it must be stopped. Several hours in the press complete the book.

FINISHING THE INSIDES OF FULL LEATHER BINDINGS.

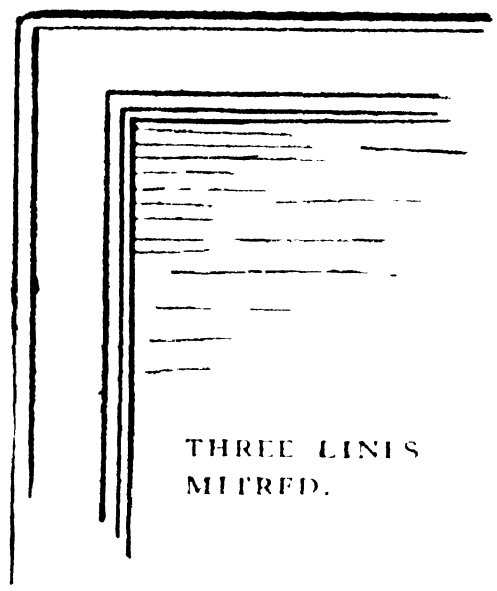
The turn-in of the leather of a full bound book is shown as a narrow margin upon the insides of the boards. It may be quite narrow or it may be left wide enough to take an arrangement of rolls or lines in either blind or gold, and in the case of leather joints it forms a complete frame round the board enclosing a panel which is called the doublure. Owing to the pressure that finishing tools require, some form of solid support must be given to the boards and for this purpose the *inside rolling block* is used. This block is shown in a diagram where it will be seen that, owing to the hollowed out portion, support is given right up to the joint. Because this portion of the leather cover is not seen at first glance at a book it is often neglected, but it affords an opportunity for fine finishing which is protected from general handling, and at least one famous binder made a practice of leaving the outsides of his books quite plain and elaborately tooling the insides.

Mitred lines in gold. Several arrangements are shown which may be carried out with single line rolls. For marking up, a pair of dividers is all that is necessary which, when set at the required distance and using the edge of the board as a guide, will mark a line on the leather sufficient to be seen when the gold is laid on. The points of the dividers must not be sharp or the leather will be cut. Extra thick lines should be blinded-in before gilding.

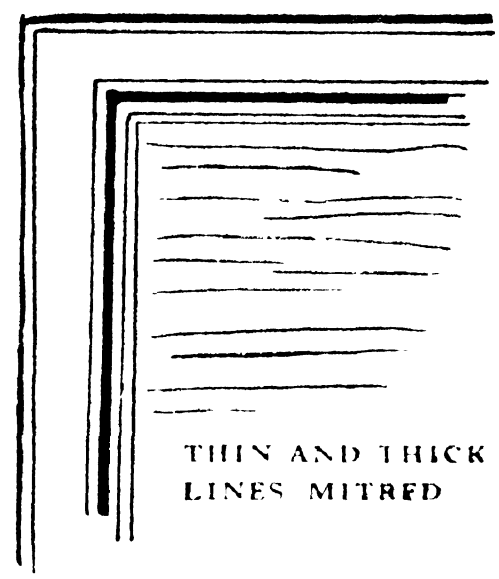
INSIDE BORDERS FOR FULL LEATHER BINDINGS.



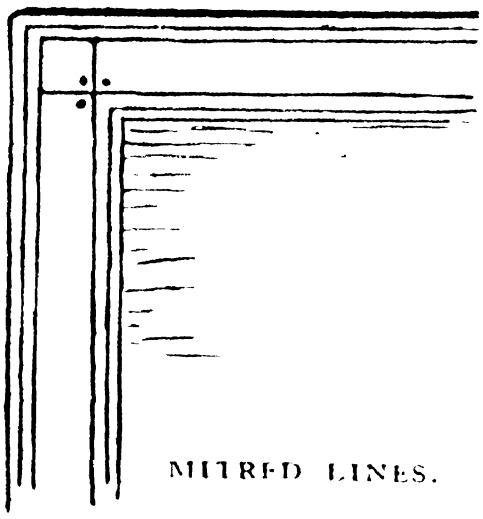
SINGLE ROLL BLIND OR GOLD.



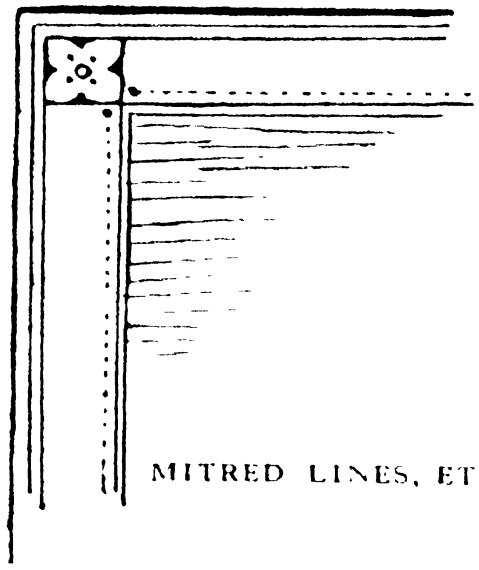
THREE LINES MITRED.



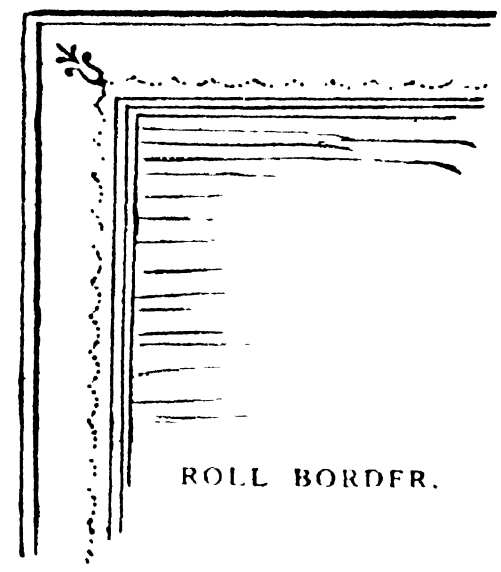
THIN AND THICK LINES MITRED



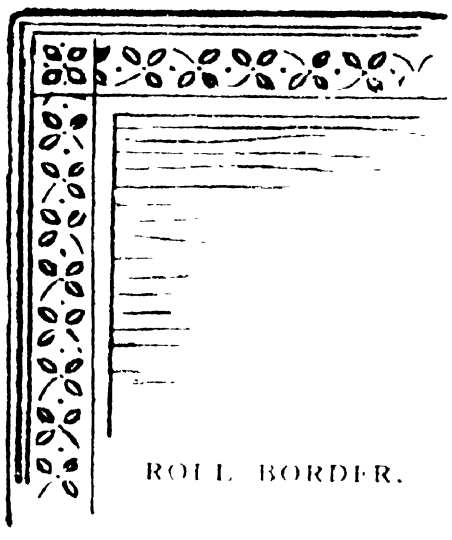
MITRED LINES.



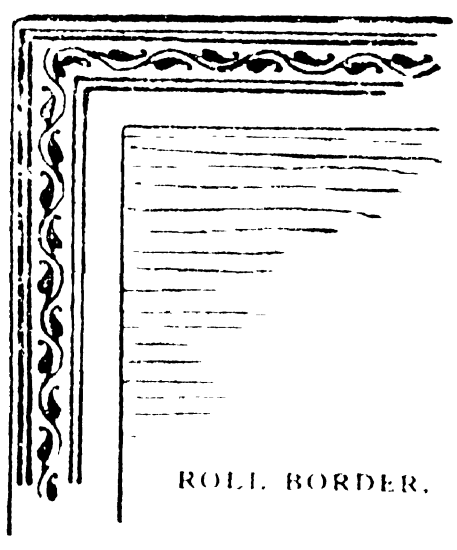
MITRED LINES, ETC.



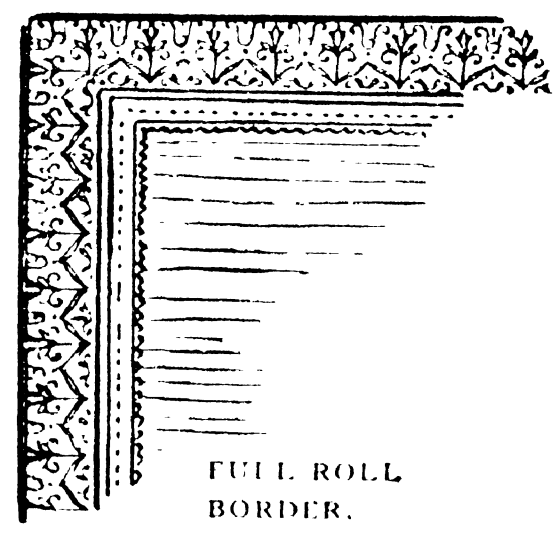
ROLL BORDER.



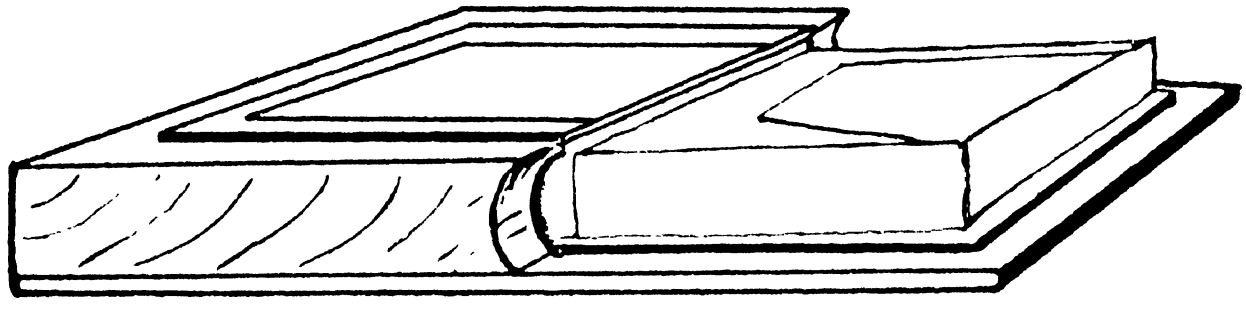
ROLL BORDER.



ROLL BORDER.



FULL ROLL BORDER.



Neat roll borders in gold. These are made up of single or two-line rolls with one or two ornamental rolls in addition. No previous blinding-in is necessary, neither is it possible except in the case of plain lines. The difficulties with the corners are obviated by the use of a small sprig tool.

Full roll borders in gold. These require to be extremely well done to be effective. Here again most of the tooling is done straight on to the gold, the necessary constructional lines being marked in with the dividers beforehand. The particular pattern may be worked after the endpapers are pasted down, whereby the extreme edge of the paper is covered by the first roll. The complete order is as follows:—

(1) Polish the leather with the iron to assure its being perfectly flat.

(2) Wash up with vinegar or paste water, according as the leather is morocco or one of the porous varieties.

(3) When dry, glair twice. It is important that there should be no doubt about the gold sticking, as elaborate rolls cannot be tooled a second time. Allow the glair to extend $\frac{1}{16}$ inch over the paper.

(4) Lay on the gold. If a number of books are being tooled to the same pattern, lay on one side of each. If both sides are laid on, one will become rubbed while the other is being tooled.

(5) Tool a two-line roll on the leather against the paper, corners to be correctly mitred.

(6) The roll must be wide enough to extend from the lines to the edge of the board or a little wider with advantage. The pressure must be uniform throughout, and there must be no hesitation at the commencement or the heat of the tool will dry the preparation and the gold will not stick. The corners are always a difficulty with rolls, but it is possible to mitre them. When the first side has been impressed clean off the gold at an angle of 45 degrees, and when commencing the next side note the pattern on the roll and endeavour to start again where it left off.

(7) A narrow roll is worked on the edge of the paper from the other side of the two-line, completing the tooling. Clean off with benzine to remove all grease from leather and paper and polish.

FINISHING THE SIDES OF FULL LEATHER BINDINGS.

The sides of full bindings may be plain or elaborately finished in blind or in gold or a combination of both. With the diagrams that accompany this chapter an attempt has been made to place before the student a series of simple patterns for hand-tooled book covers. It will be noticed that they are arranged as follows:— Borders, corners, centres, and a few simple all-over patterns. Each of these elements will form a complete design for a book cover if desired, or they may be combined together in a number of ways.

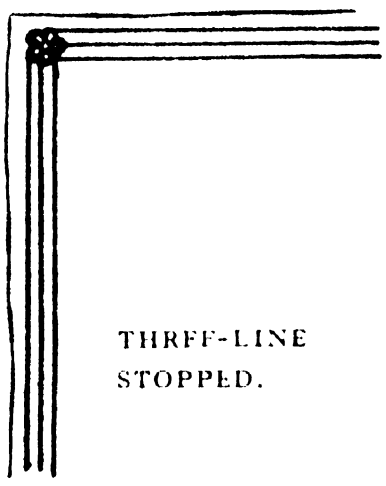
Line borders. The first two shown on the diagram are extensively used upon calf bindings, while the mitred lines are to be preferred for morocco. The use of a small rosette in the corner saves the trouble of mitreing the lines. These patterns involve the operation of laying on narrow strips of gold. In order to avoid waste of gold and time, a special pad should be prepared which may consist of a small cushion of soft leather mounted on a card and fitted with a handle; the gold cushion and knife must be kept in good condition. There is a special piece of apparatus on the market for this work. For its use the gold leaf is supplied in a continuous roll, enclosed between a paper ribbon which when fitted in its holder may be wheeled over the narrow strip to be tooled. Another device consists of a wooden wheel about 10 in. in diameter, mounted on a carriage. The rim of this wheel is covered with leather and when the gold leaf has been cut into strips in the usual way they may be picked up on the wheel in a continuous length and transferred to the work.

Roll border designs. These are fairly straightforward and special attention has been paid to the junctions of the rolls at the corners. They are composed of tools that are to be found in most finishing shops. The lines themselves form the construction lines of the pattern and require to be marked upon the leather beforehand, but the rest may be tooled direct on to the gold. Tool in the following manner: (1) Lines; (2) mitres; (3) hand tools; (4) the rolls. After the hand tools have been impressed, the gold may be carefully rubbed off at these places to assure that the impressions of the rolls do not extend too far.

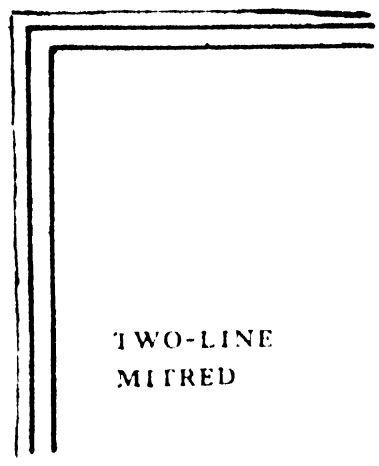
Line border designs. These are made up of lines and small tools. In the first one the tie lines from the bands have been incorporated in the design and a contrast in the thickness of the line introduced; the thick one may be in either blind or gold as desired. The first three of these patterns may be constructed direct on to the leather,

FINISHING THE OUTSIDES OF FULL LEATHER BINDINGS.

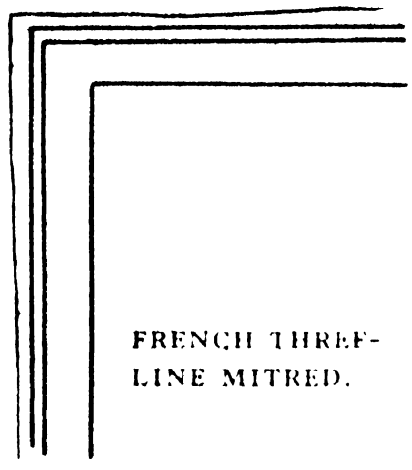
TWO-LINE STOPPED.



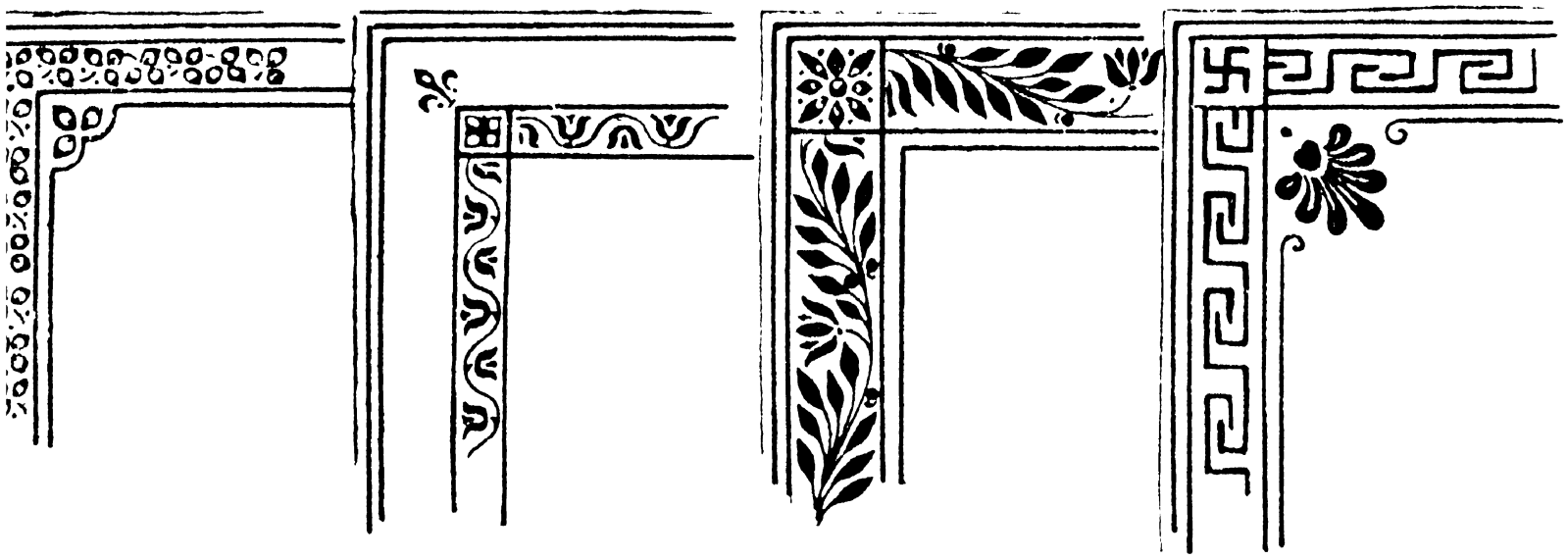
THREE-LINE STOPPED.



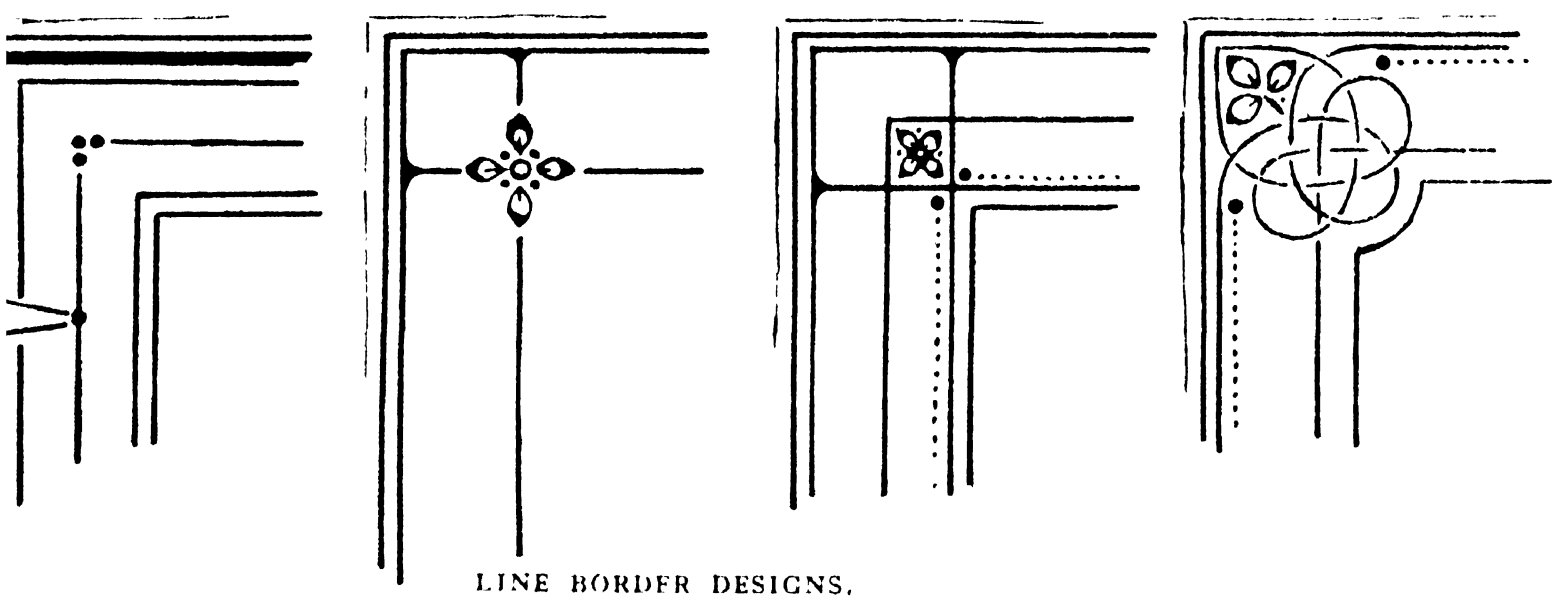
TWO-LINE MITRED



FRENCH THREE-LINE MITRED.

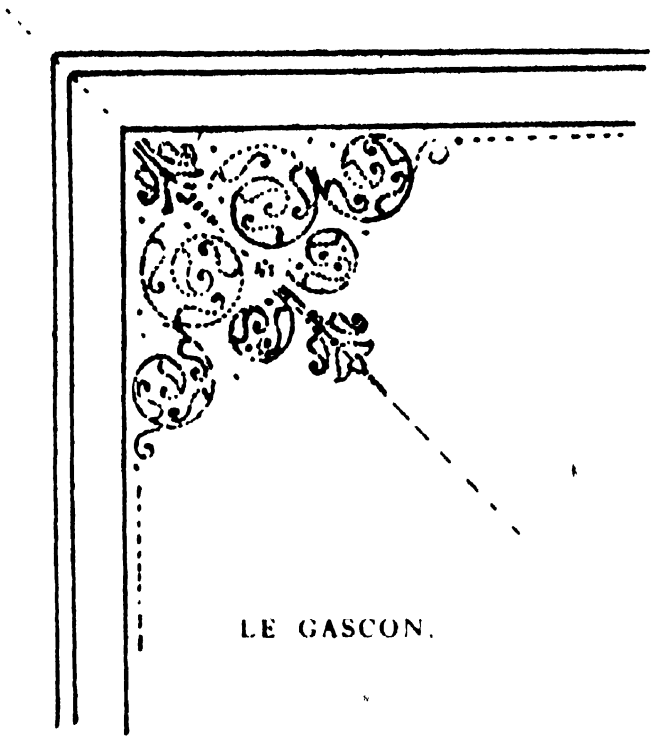


ROLL BORDER DESIGNS.

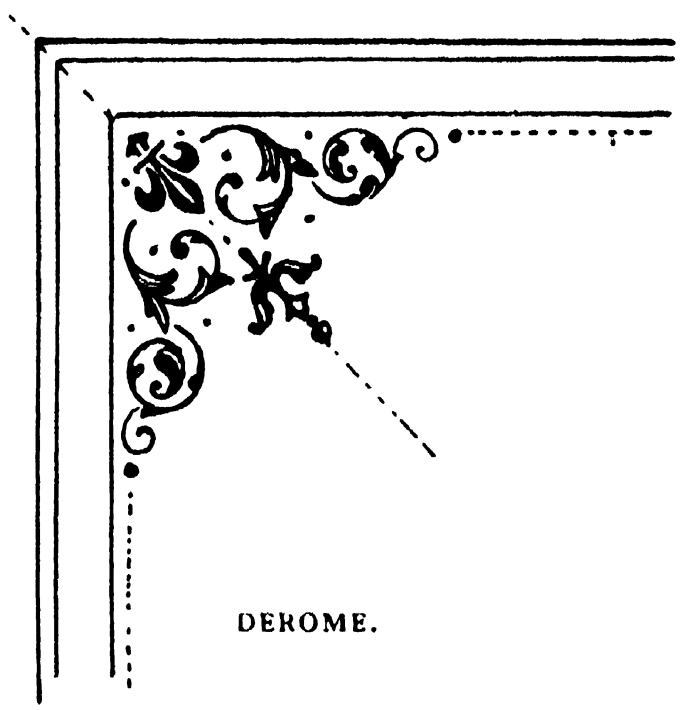


LINE BORDER DESIGNS.

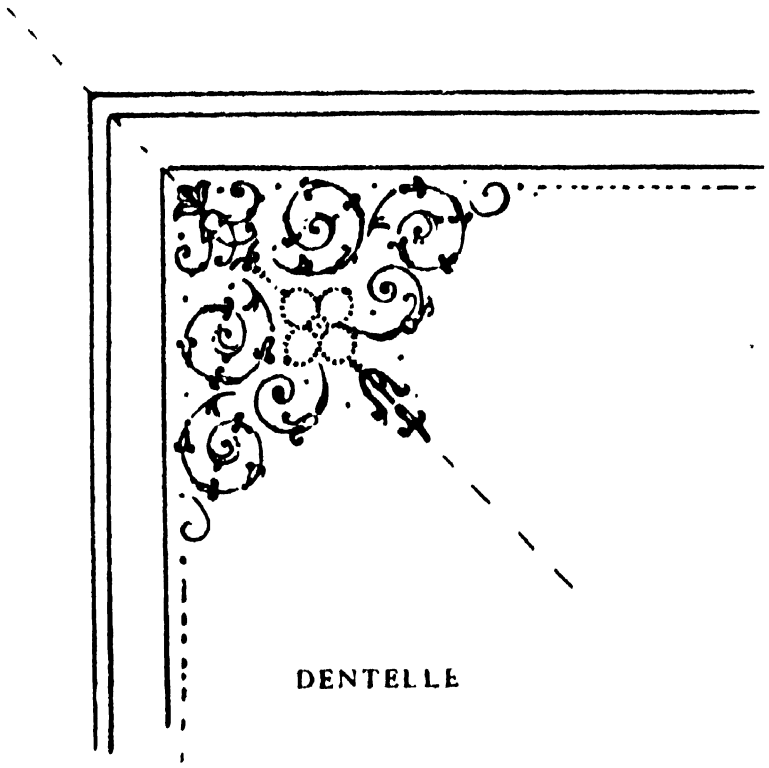
CORNER PATTERNS.



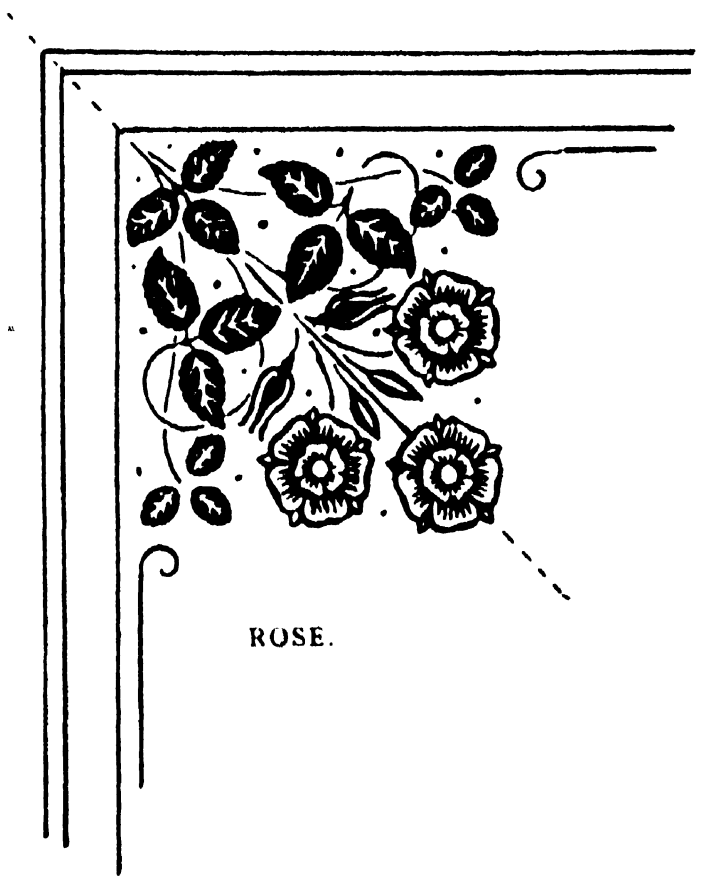
LE GASCON.



DEROME.

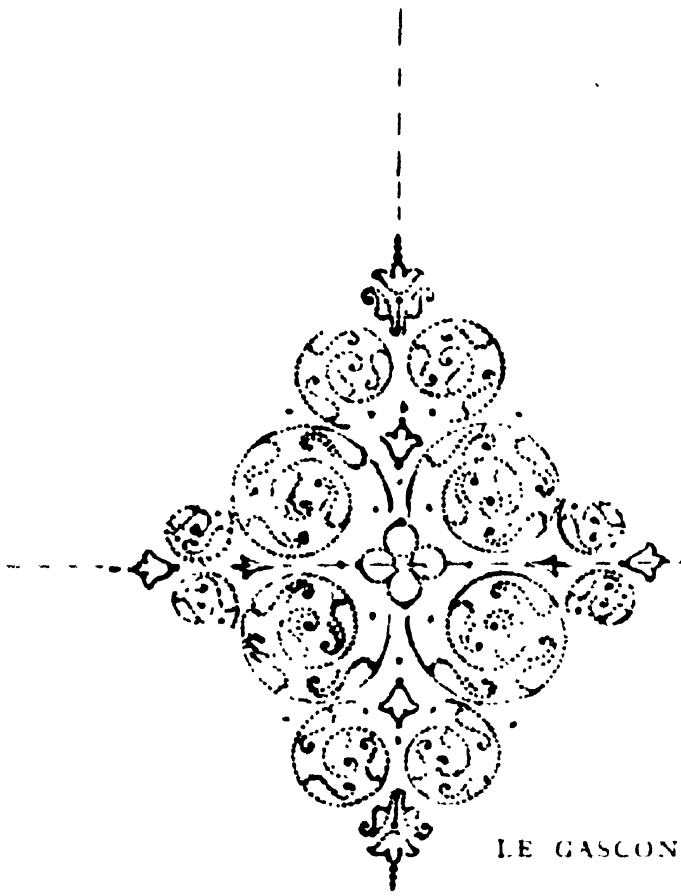


DENTELLE

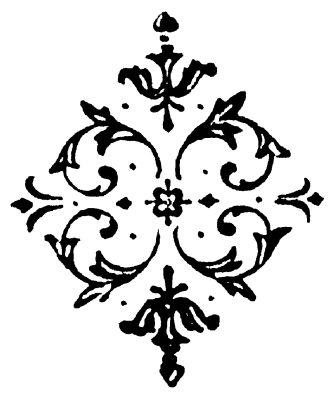


ROSE.

CENTRES.

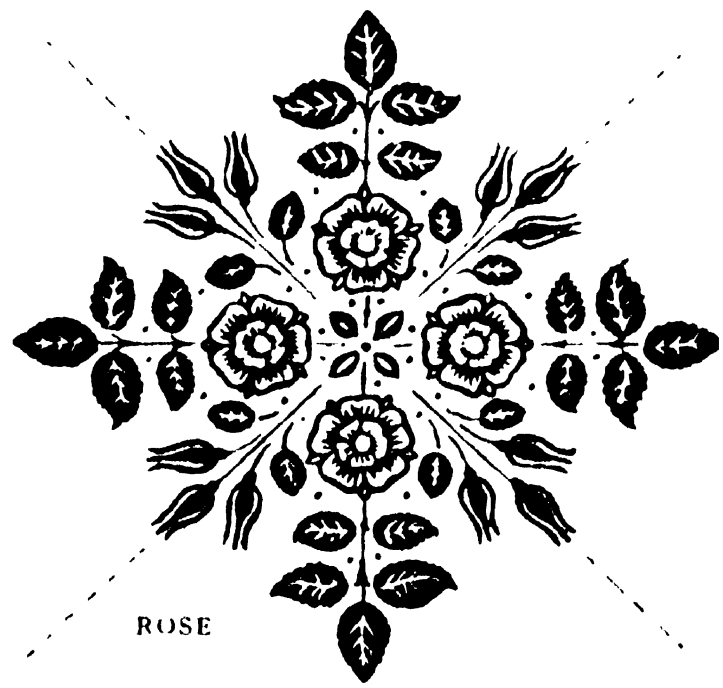


LE GASCON.



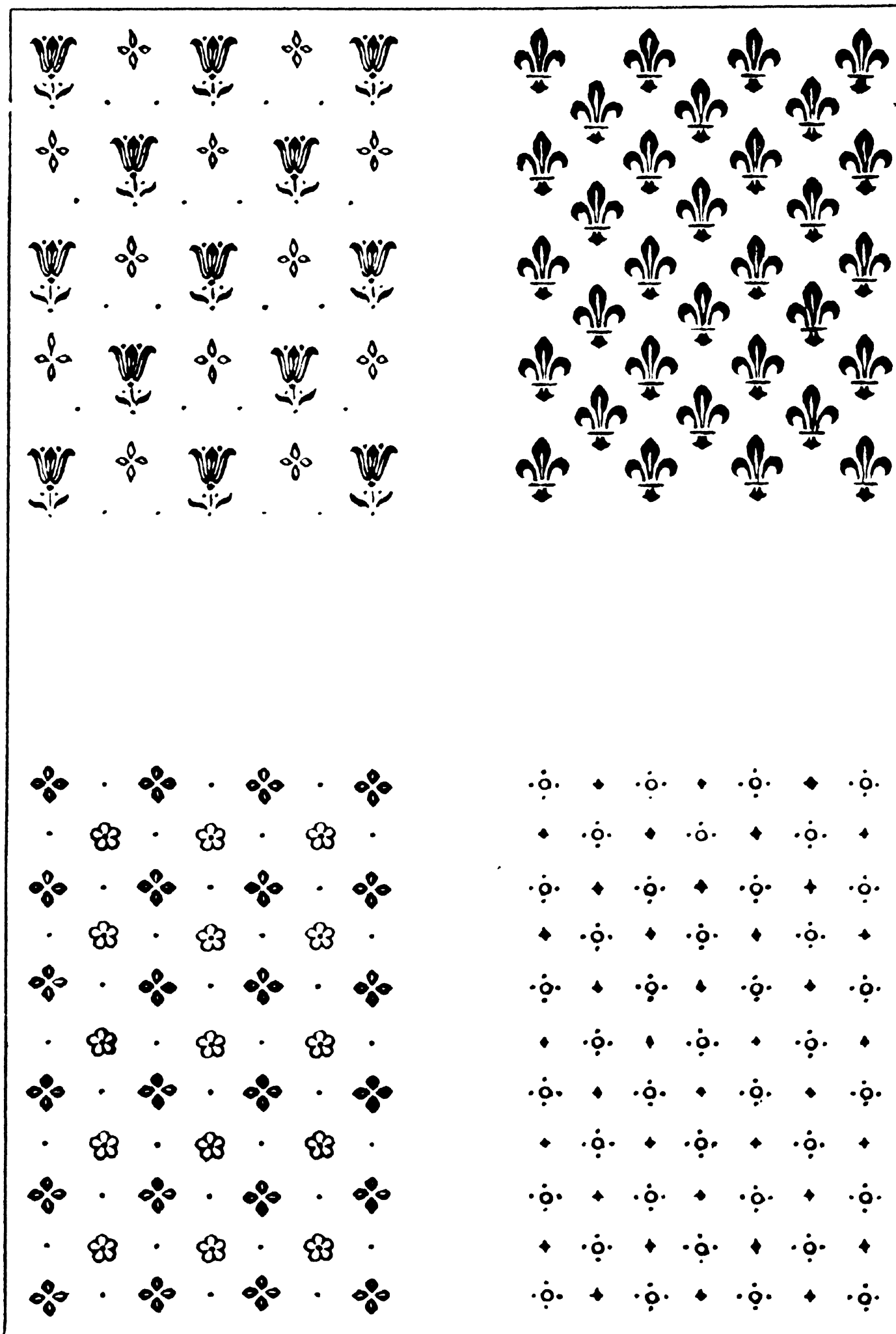
DE ROME.

DENTELLE.



ROSE

DIAPER OR SPOT PATTERNS.



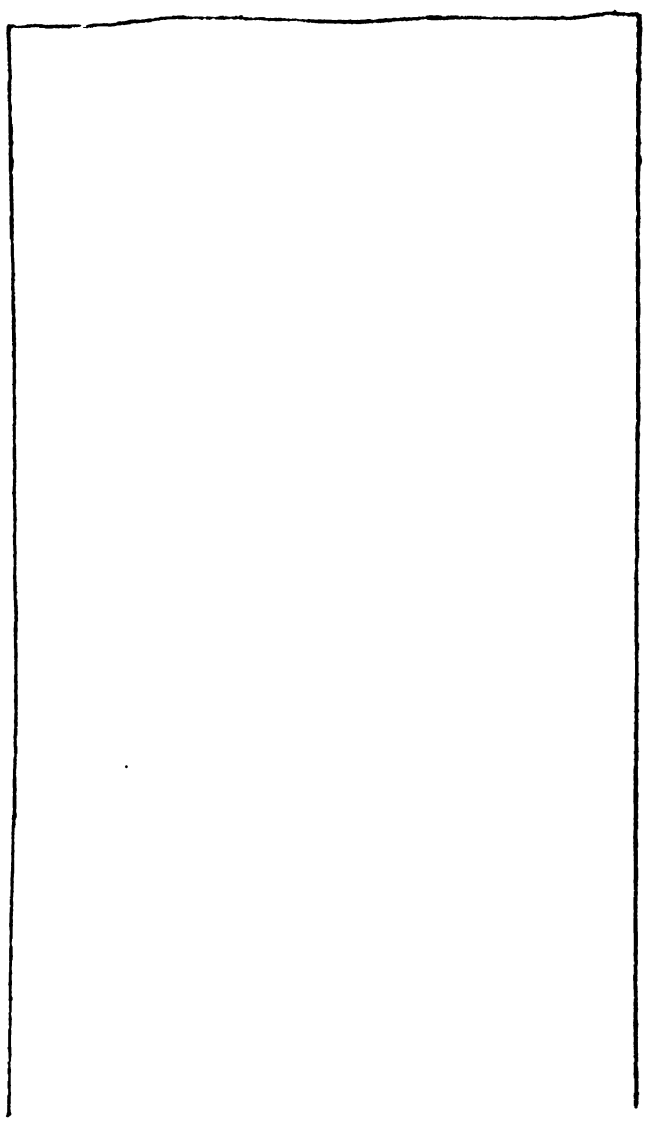
as they are but variations of straight-line borders, but the fourth is more difficult unless the interlaced line corner consists of one tool. Failing this the pattern must be drawn out on paper and then impressed through on to the leather by means of small curved line tools, called gouges. A more complete description of this method will be given later.

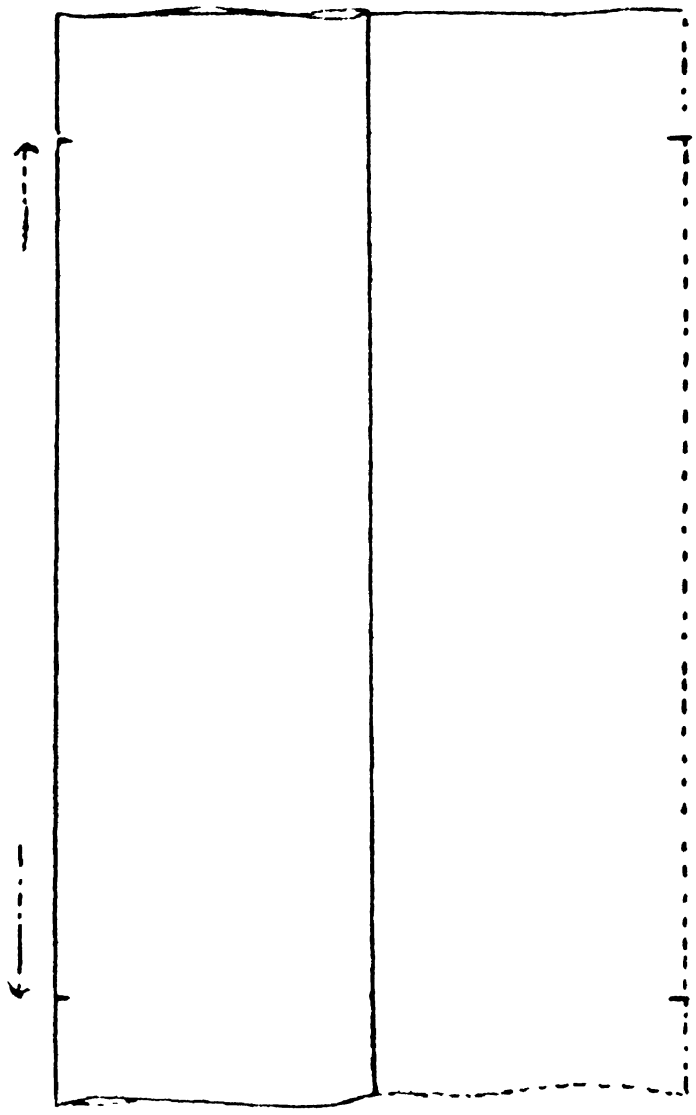
Corner patterns. Upon looking into these patterns it will be seen that they are made up of a comparatively small number of tools. Le Gascon, a French bookbinder, used a series of scrolls and sprigs composed of dots instead of the usual solid lines. It is important that an equal depth of impression is obtained for all these tools or the effect will be uneven. Derome, another old French binder, used the solid scroll tools shown in the second corner design. A later style used lighter scroll tools, giving the effect of lace. The fourth design is a conventional treatment of the rose. The flower itself, the leaves and buds are all separate tools and the stems are worked with gouges. *Four centres* are given to correspond with corners, together with a few suggestions for all-over patterns.

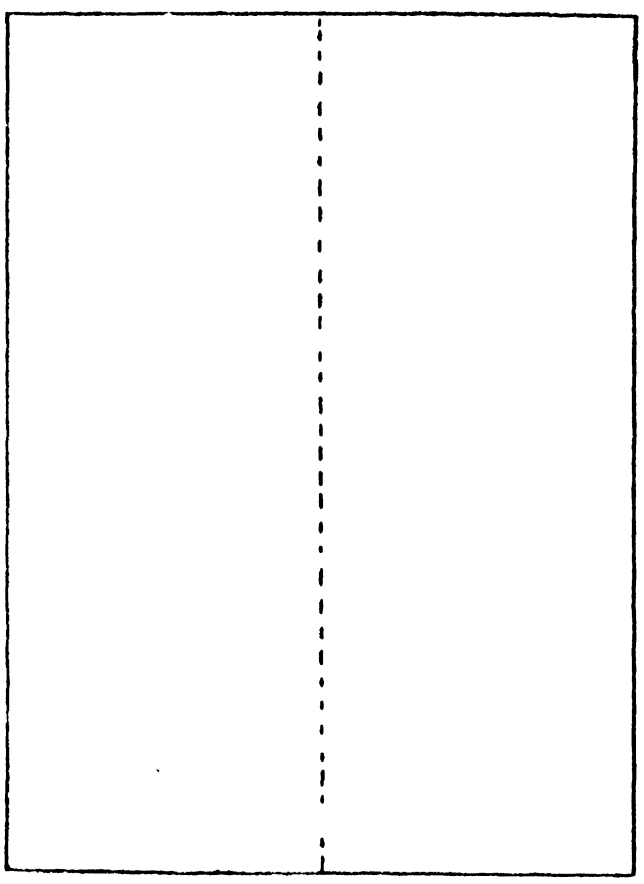
Working patterns. These are required wherever the design is too complicated to be constructed direct to the leather. They consist of black impressions of the tools upon thin, strong paper which is then tipped with paste to the book and the design impressed through. The paper must be thin but strong, a hand-made "bank" being most suitable. Use can be made of folding the paper to produce turn-over patterns, but accuracy is essential. For a side pattern a piece of the paper is taken and cut to the exact size of the board and tests by folding should be made to assure that all sides are square. It may be folded to half down its length, but a more useful fold for the width will be opposite the middle band which is slightly above the true centre. A fold across the corners will help in the construction of symmetrical corner patterns. Lines may be drawn in pencil, but the most convenient means of producing a black impression of the tools is to hold them in a candle flame for a few seconds. Four diagrams are given showing the construction of a pattern, consisting of a corner, centre and spot diaper. The first figure is the paper with its construction lines and folds and with a repeat of the corner and centre. The second shows the result obtained by folding and rubbing over the repeats. The third has the construction lines for the diaper, and the fourth represents the book with its pattern lightly held to the board with a little paste at the corners ready to have the tools impressed through.

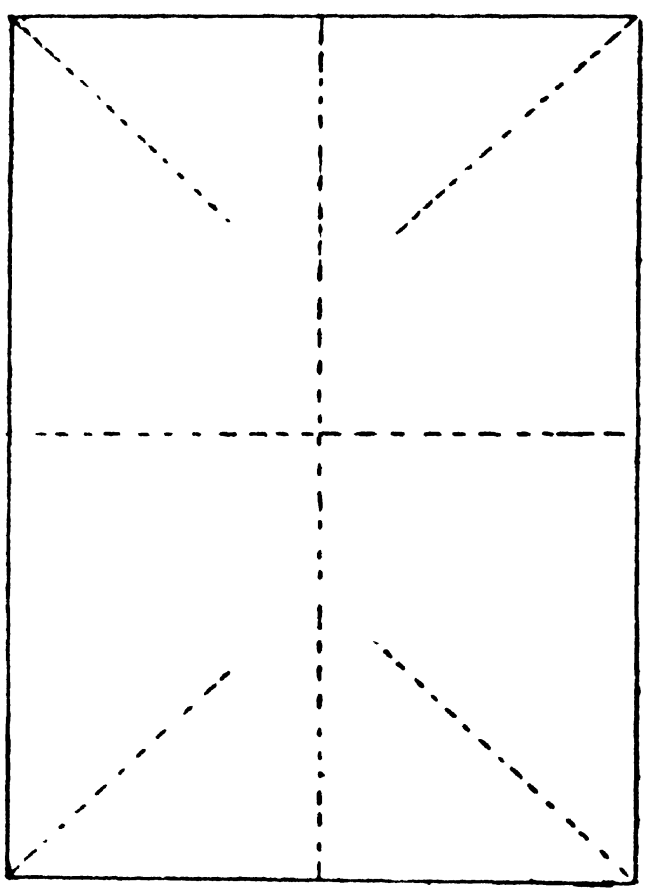
For the particular pattern shown in the sketch the impression of the tools through the paper should proceed in the following order, the temperature being about the same as for gold finishing:—

METHOD OF CUTTING A TRUE PAPER FOR WORKING PATTERNS.









(1) *The flower tools.* There should be a mark on these tools so that when the time comes to make the second impression they can be used the same way round.

(2) *The leaf tools*, dealing with the largest first and finishing with the smallest.

(3) *The buds.*

(4) *Straight lines and gouges.* Commence with the mitre pieces and then the straight stems. For the gouges commence with the flattest of them and work to the roundest.

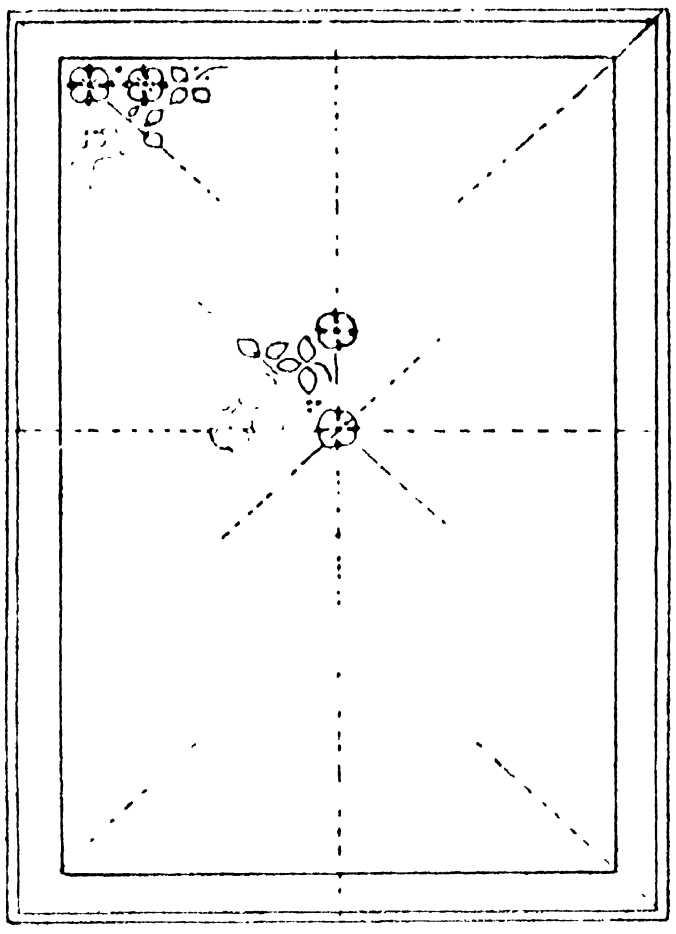
(5) *The large stops.* Small dots or stops should not be blinded in, but worked direct on to the gold. At this stage the pattern may be removed.

INLAYS.

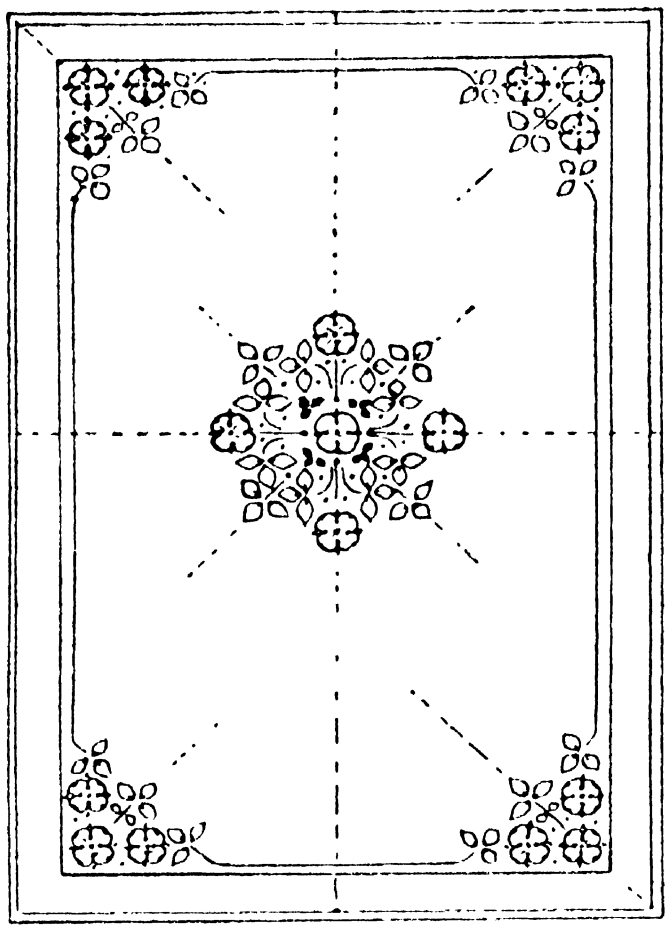
This is the best means by which colour can be produced on a leather book cover. It consists in shaving small pieces of leather very thin and pasting them on to a previously prepared shape and binding the extreme edges by means of gold or blind tooling. Morocco only is suitable, which must be pared extremely thin, large pieces must be cut to the shape ready blinded-in to receive them, but the most convenient use for this work is in the case of small open flowers where the pieces may be punched out by a specially made steel punch. Contrasting colours should be used to withstand the effect of gold. Inlays require to be well pasted before being placed into position, and when they are thoroughly dry, the tools should be blinded-in again.

Extra gold tooling is the same in principle to ordinary work, but there are one or two points that deserve consideration here. Every care must be given to the preparation, in order to obtain the utmost solidity and brilliancy to the gold. The grease used is important. Vaseline will answer, but where, as in the flower pattern shown, the tools are close together the heat tends to dry it up, causing the gold to flake off. This trouble is experienced in the summer weather and the remedy is to lay on smaller portions at a time. The tooling should be systematic—the fillet lines first, then all the heavy solid tools; from these work down to the lightest, finishing with any fine stops; inlays should be left until last as they hold moisture. An even depth of impression is important by regulating the pressure to the size of the tool. Upon the proper cleaning away of the surplus gold depends its final brilliancy and clearness of the colour of the leather. Refined benzine will do no harm provided it is not allowed to run to other parts of the book and that it is left exposed for it to dry out, and it thoroughly clears away the

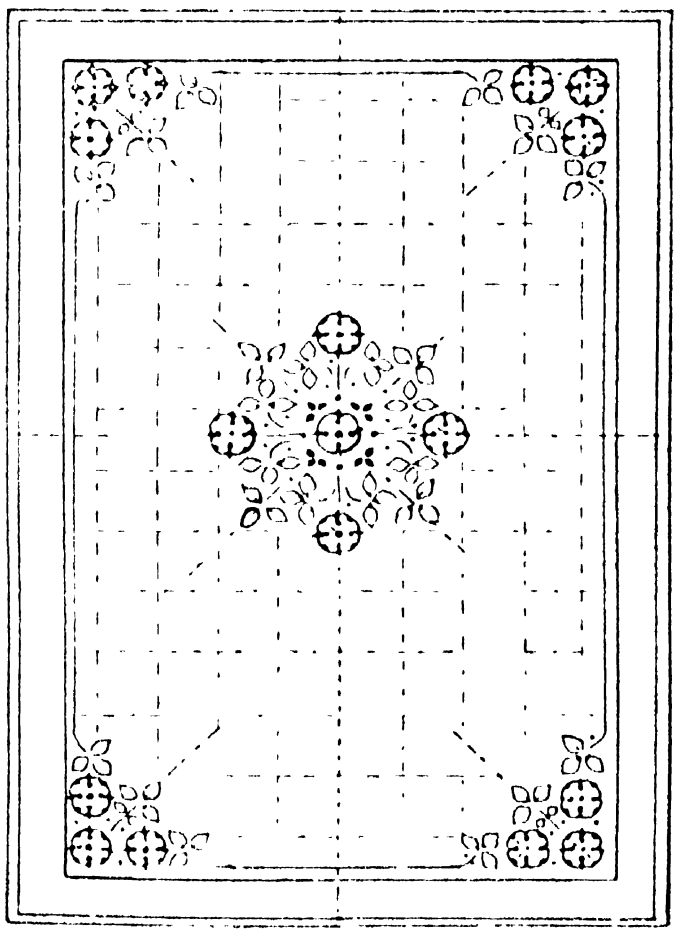
THE WORKING PATTERN.



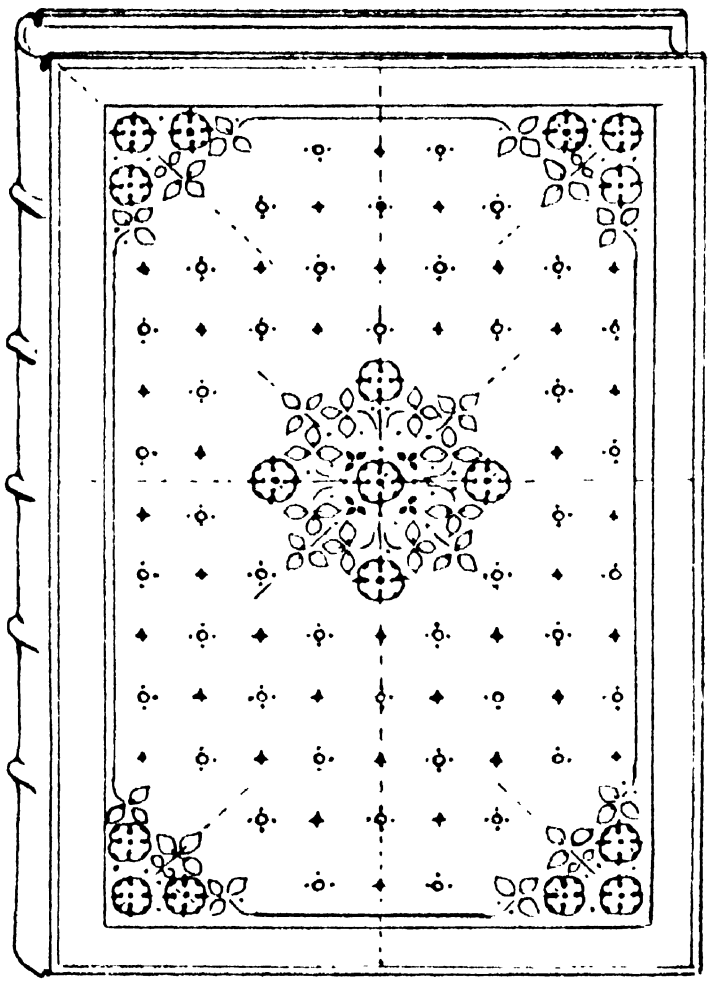
WORKING PATTERN SHOWING REPEATS.



CENTRE AND CORNERS FORMED BY FOLDING THE PAPER.



CONSTRUCTION LINES FOR THE BACKGROUND PATTERN.



COMPLETED PATTERN IN POSITION ON THE BOOK.

excess of gold and grease; but on the other hand, if sparingly used the effect is to work the surplus into the grain of the leather with a bad effect upon the colour.

Each piece of tooling should be perfected as the work proceeds. Any impressions that are not quite solid should be glaired and regilded. Should it be decided to retool a side it is necessary to wash up and glair again, as the heat of the tools has the effect of destroying the previous preparation.

DESIGN FOR HAND-TOOLED LEATHER BINDINGS.

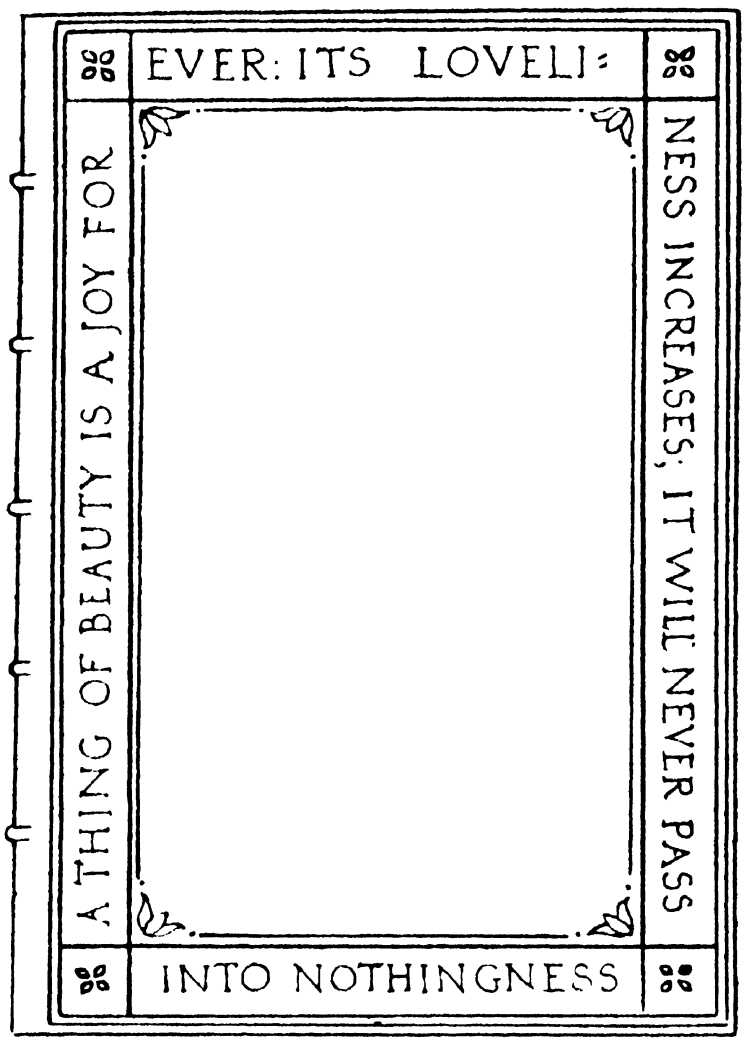
There is a mistaken notion that design is always associated with an elaborate pattern of floral or other forms; but any object that has been produced after careful thought may be said to have been designed. In this sense the forwarder as well as the finisher is a designer, and if the former has done his work well there is very little for the latter to do. For the purpose of this chapter, however, the object of the designer is to add interest to the binding by the addition of ornamental lines and forms, etc., employing a process known as tooling.

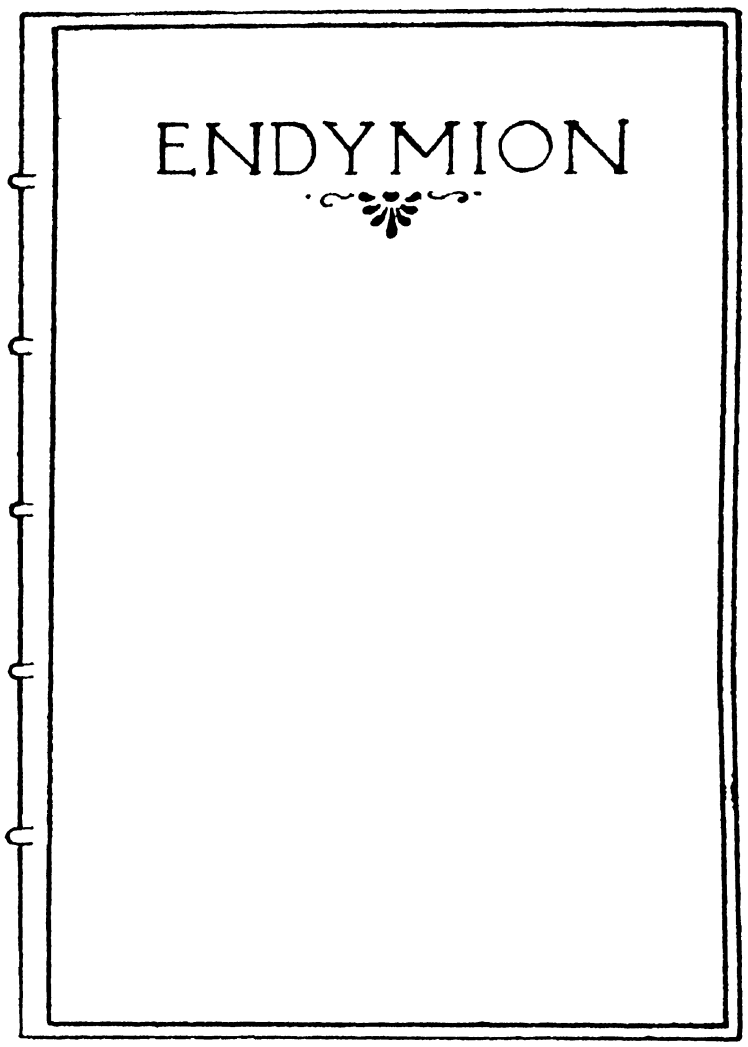
A designer, whether he is aware of it or not, uses certain recognised elements of interest when he creates a pattern. Those which in particular apply to bookbinding design are: (1) *The lettering*, without which a book is incomplete; (2) *line* and (3) *form*, the basis of nearly all design; (4) *colour*; (5) *texture*; (6) *the symbolic element*; (7) *the historic element*; (8) *the element of workmanship* or technique.

The lettering. One of the simplest and most effective means of adding interest to the side of a book is to make use of carefully planned lettering. It should not, however, attempt to take the place of the title page by completely describing the contents of the book, but should attract by form and arrangement. Four suggestions are given, the first making use of the first lines of the poem actually made to form a border design. The second consists of a brief title placed at the top of the panel whereby the actual distance between the top and the sides is made the same, which necessitates careful planning. A lettering of this description may be used in conjunction with several of the line borders already given. The other two diagrams are letterings arranged as centres. They may be used in conjunction with some of the corners or narrow borders.

Line. A drawn line has a character given to it by the tool by which it is produced. In the case of the book finisher this tool consists of his brass roll or his gouges. The gold line produced in the soft leather by this means consists of a definite impression

LETTERING.


EVER: ITS LOVELI-
NESS INCREASES; IT WILL NEVER PASS
INTO NOTHINGNESS
A THING OF BEAUTY IS A JOY FOR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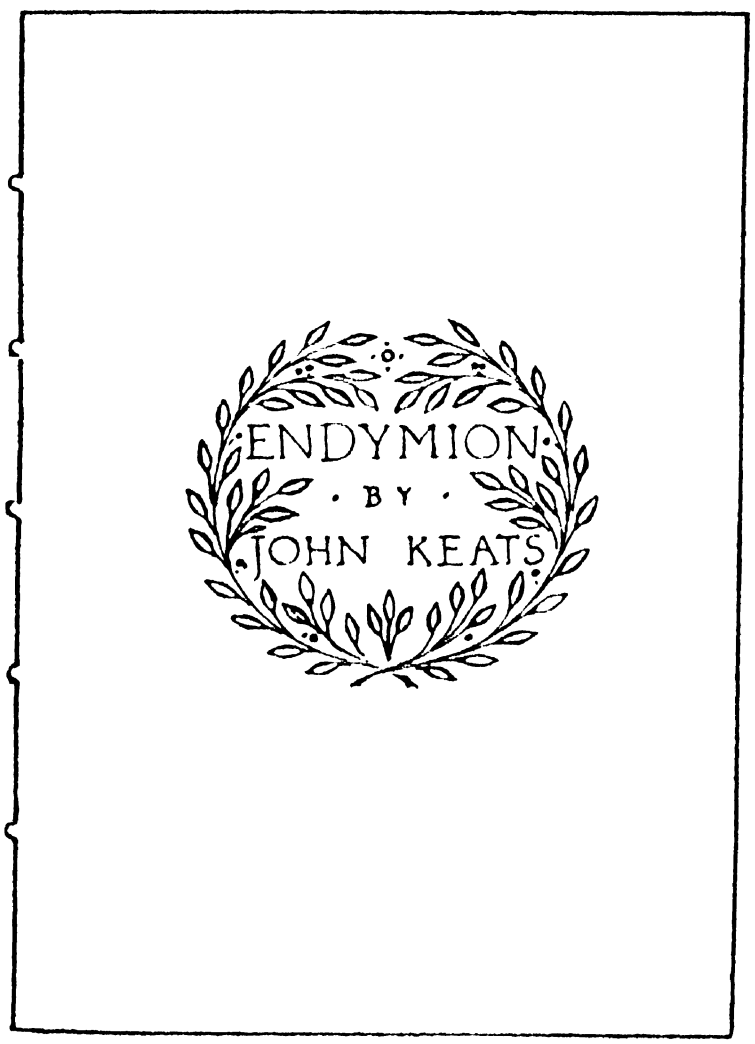
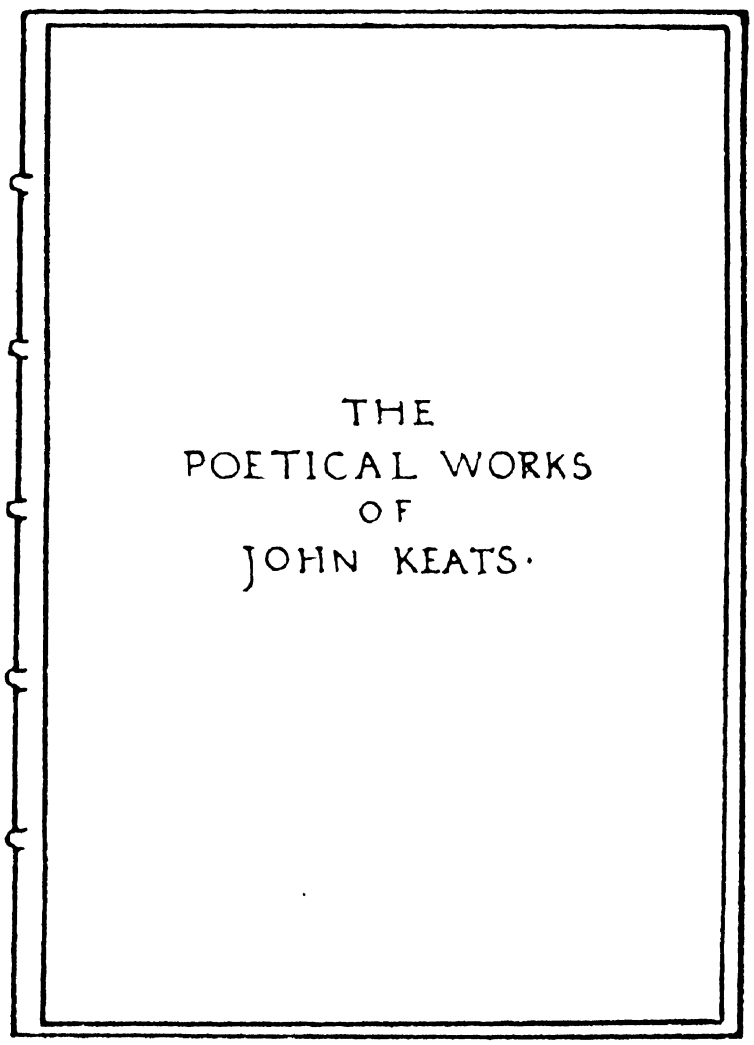

ENDYMION
· BY ·
JOHN KEATS


THE
POETICAL WORKS
OF
JOHN KEATS·

whereby the bright metal reflects the light in different directions according to the varying planes. This result is a certain brilliancy of gold which is characteristic of the hand-tooled bookbindings, but is only imperfectly produced where a brass block has been used.

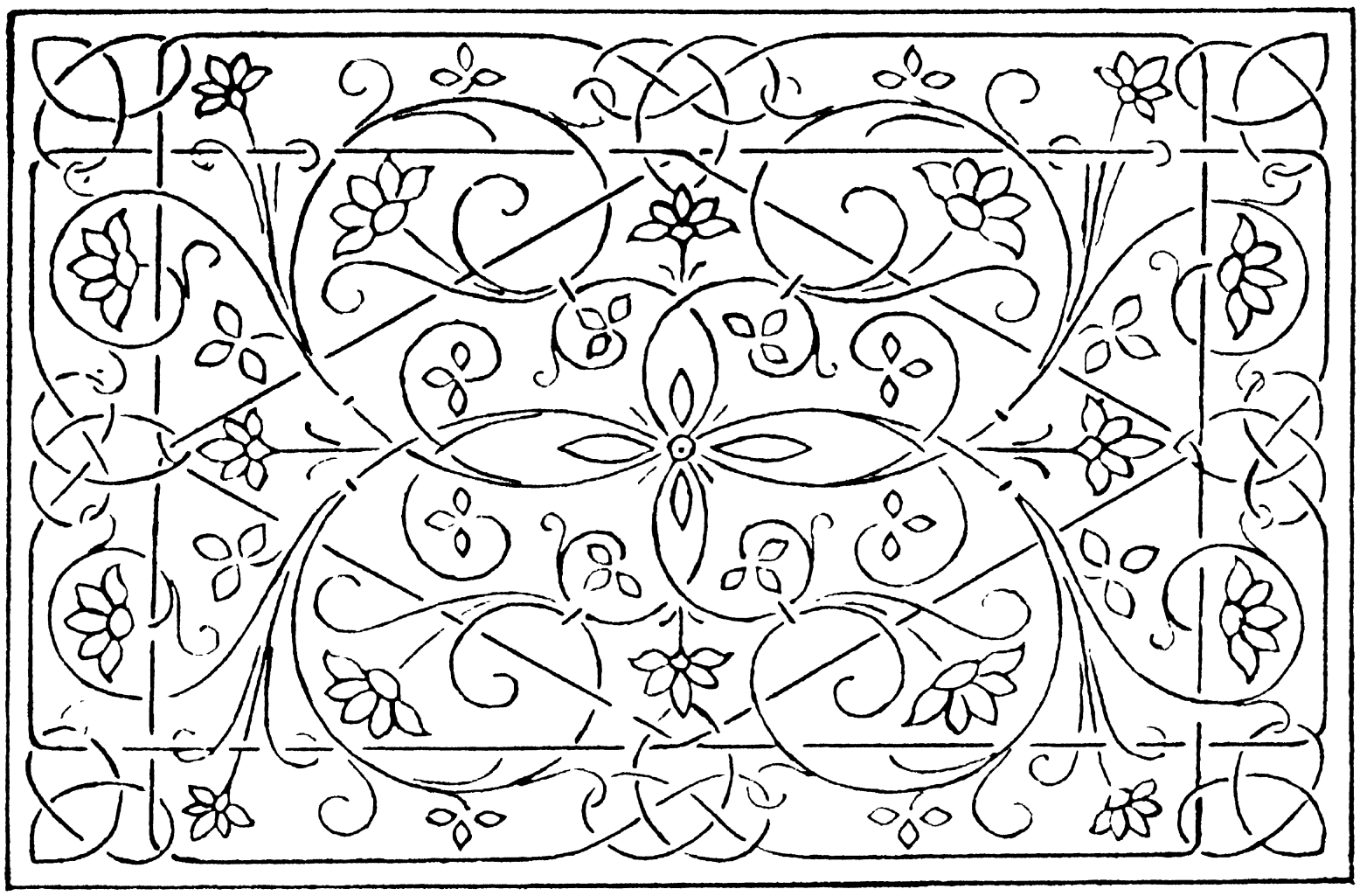
Although it is a fact that an experienced finisher can reproduce in gold any line that can be drawn on paper it does not follow that it will be as effective and at the same time may be extremely difficult and laborious. As a general rule the difficulties of the finisher increase with the curvature of the lines, straight lines being the easiest, then flat curves, tiny sharp curves being the most difficult. The last mentioned are the least effective in gold, therefore, a pattern made up of small curves would give less for the trouble than one composed of straight lines or good swinging curves. As the labour is principally taken up in finding the various gouges to fit the lines of the design, it follows that where there is plenty of repetition in its various elements the work will be easier and some of the most effective bookbinding patterns are produced by a few simple tools constantly repeated.

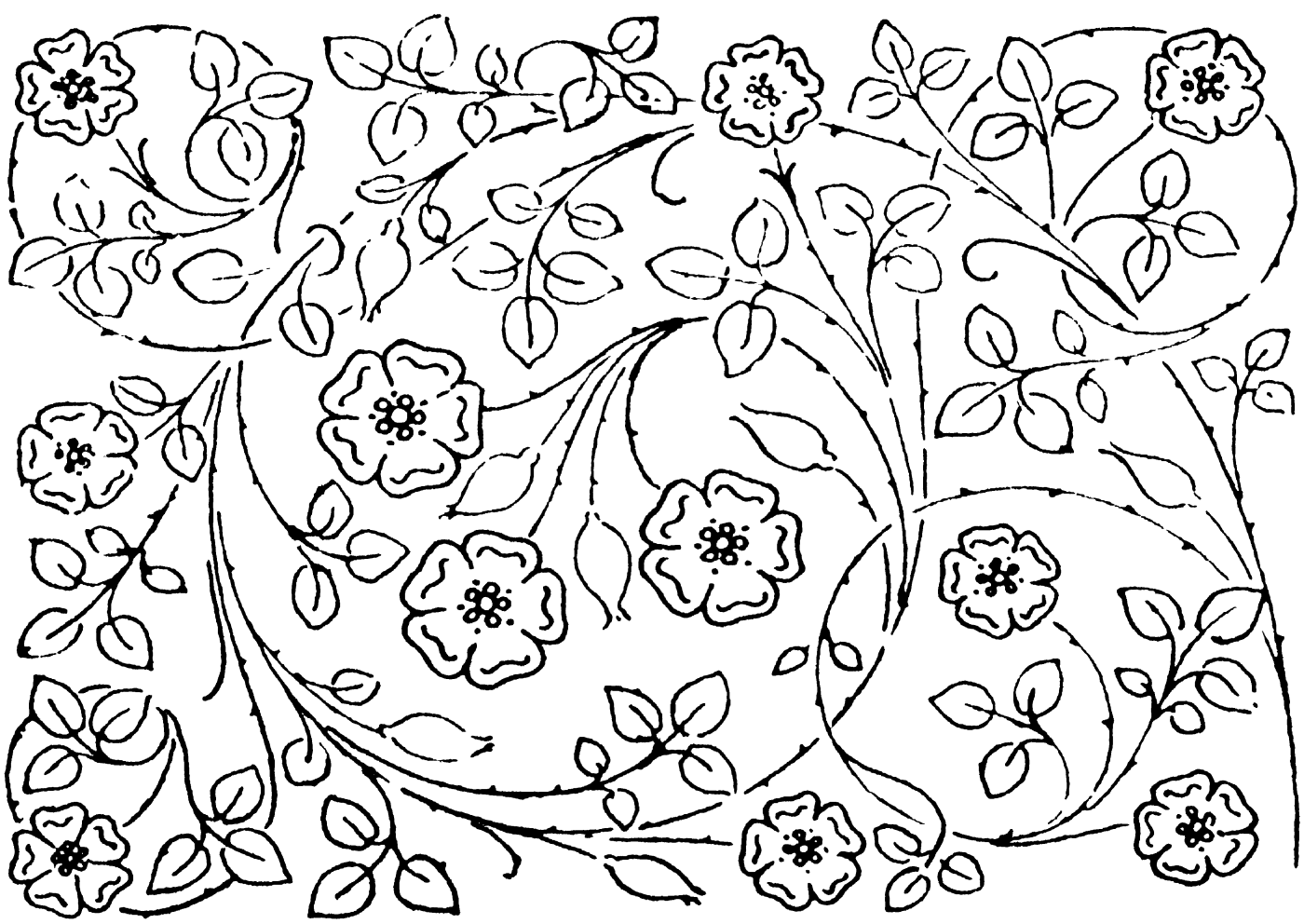
By means of the illustration on page 185 an attempt will be made to explain a few rules that may be applied to the design of hand-tooled bindings.

Gradation is shown in the sizes of the scrolls as they grow from one another and in the curvature of the stems as they proceed towards the extremities. *Contrast* is seen where the lines cut one another, the angle formed being as near a right angle as it was possible to make it, also by a comparison of the straight-line framework and the floral growth. *Repetition* is seen in the forms of the curves themselves, in the leaves and flowers, and in the turn-over of the pattern. *Variation* is contained in the sizes and the reversing of the curves, which also produce *balance*.

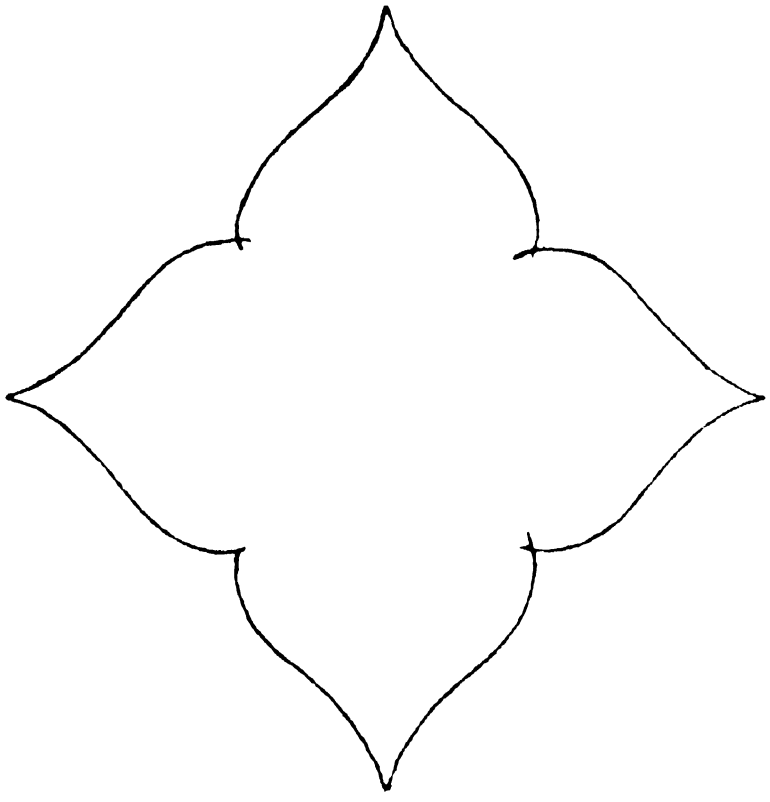
Form. Forms are produced by lines, by masses of detail, and by other forms. It is rare that forms produced by accident are happy, therefore, the shapes that are being developed as the design proceeds should be in the mind of the artist all the time. This is the value of the first rough sketch of any pattern, for, before the details are determined the forms and their distribution are decided. The more simple the shapes are, the better will they withstand repetition and, considering that a bookbinding design is composed of more or less rigid tools bounded in by the four edges of the board, complicated forms are out of place. There is no need to employ forms other than the well-known geometric shapes to produce all the variety required in these designs, and formal construction lines should always be used as a basis for the patterns.

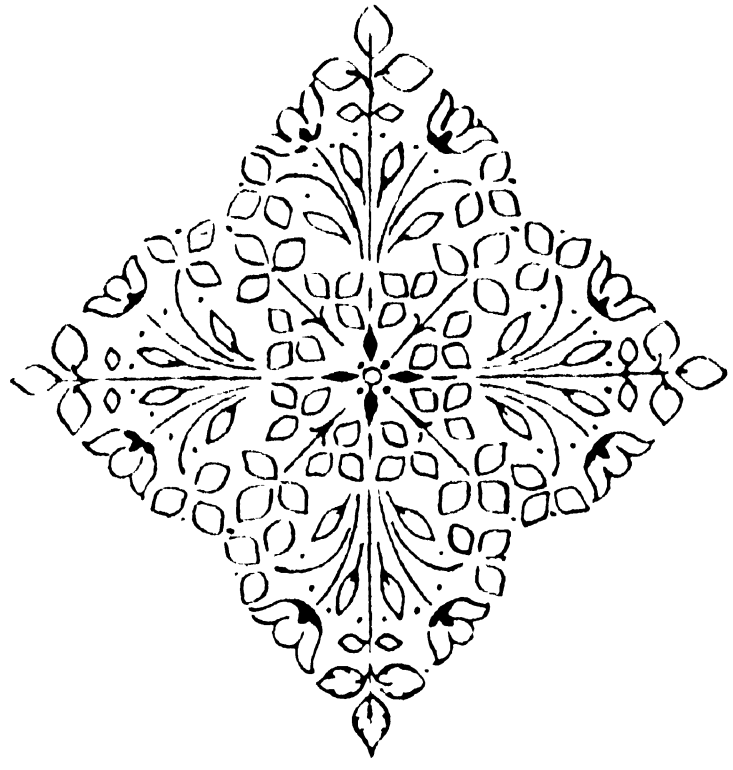
LINE.

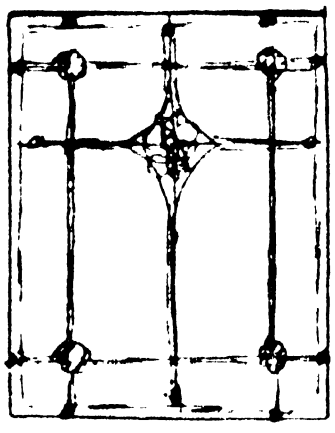


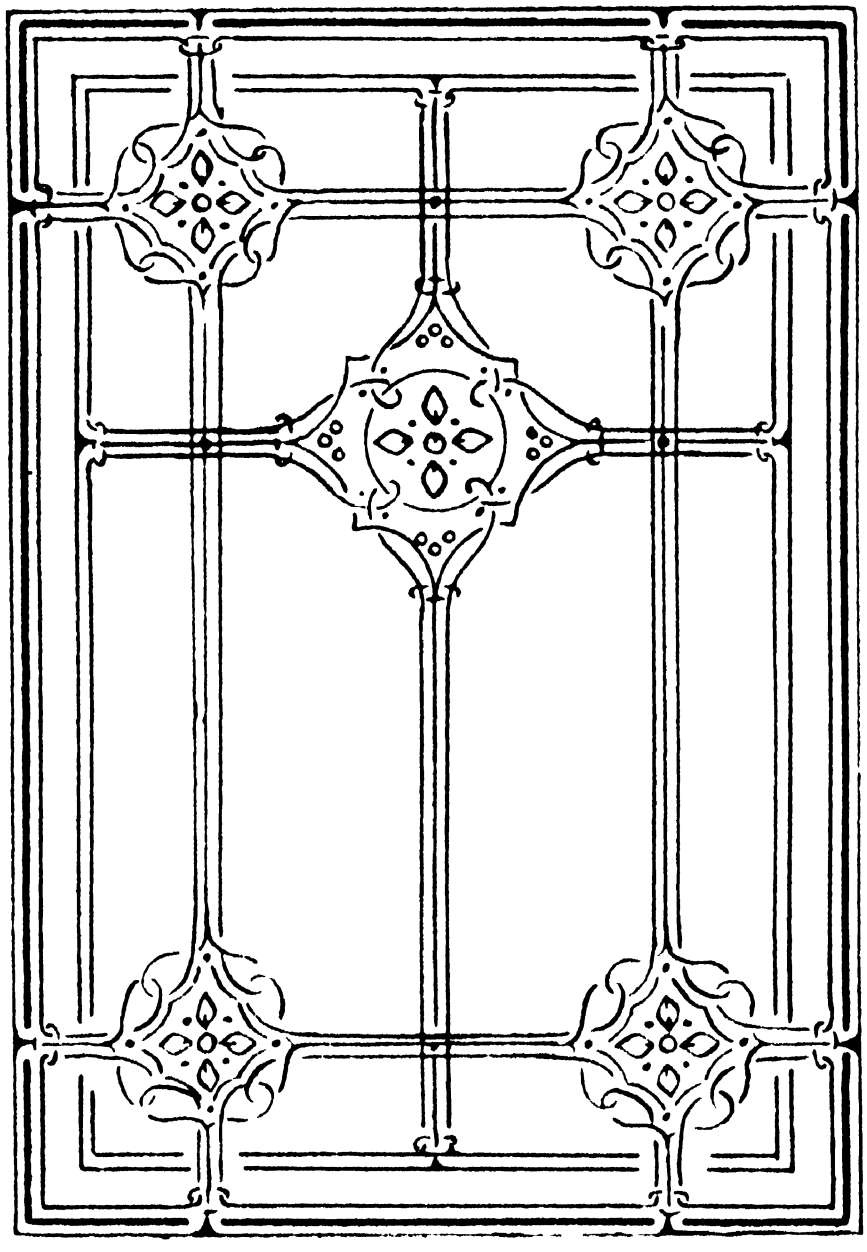


FORM.

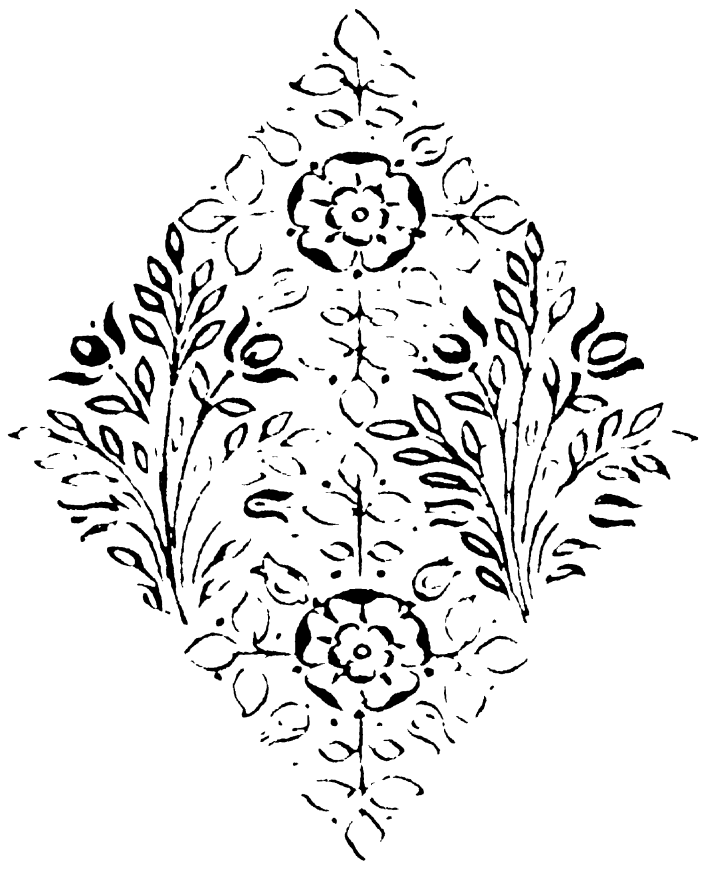








COLOUR AND
TEXTURE.



Colour and texture. At one time colouring the leather while it was on the book was a common practice, and while it must be admitted that specimens are to be found with the leather quite sound, there is always a danger of destroying the fabric of the material, due to a lack of chemical knowledge.

The best method of introducing colour into the decoration of leather bindings is by means of inlays. The term is rather misleading, as the coloured leathers are laid on the surface of the original. In its simplest form this method is used for the lettering pieces of the backs of books. It is also used for flower and leaf shapes, whereby punches are made to cut out the pieces which are pasted into an impression of the tool. When dry they are again blinded in and gilt in the usual manner. Any shape may be inlaid in this manner, such as strap-work, floral or animal forms, but it is necessary to tool the outlines in order to bind them down more securely.

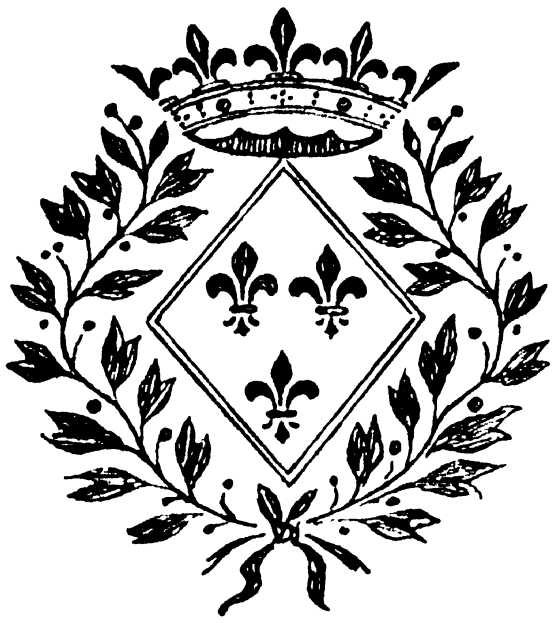
Colour in its wider sense does not always mean a different tint. Different textures in tooling, combining blind and gold work, the use of small dots for backgrounds, are means by which the effect of colour may be produced.

The symbolic element. The symbol has been an important element of interest in design from the earliest times. From the first use of leather for bookbinding, arms and devices were cut in brass and stamped upon the covers. To-day a small emblem such as a monogram will be considered of greater importance than the most carefully planned abstract design.

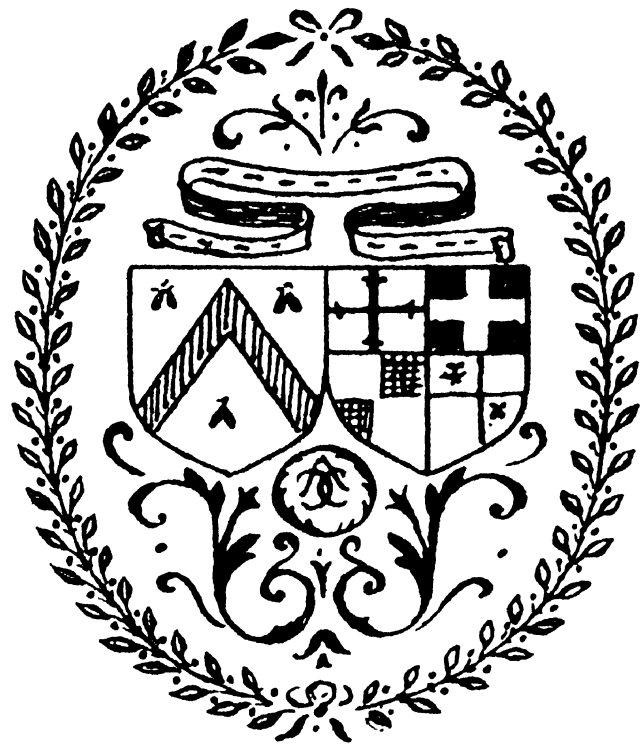
A collection of small emblematic tools forms an important part of the letterpress bookbinder's equipment. Such tools, however, should be designed and not merely represent some article without regard to proportion, balance, etc.

The most common application of the symbolic element in bookbinding design is in the use of armorial bearings. These usually consist of brass blocks, for they are too large for hand tools. There is abundant scope for design in these blocks in spite of the prevalent idea that heraldry is governed by a rigid set of rules. In the text book of heraldry there will be found a system of representing the colours or tinctures, *i.e.*, gold by means of close dots, silver plain, blue by horizontal lines, red by vertical lines, black by cross lines, etc. This system works fairly well for black and white drawings, but it must be remembered that a binder's block is for a gold impression, with the result that silver becomes the colour of the leather, which is usually dark, and that black becomes a series of gold cross lines. Hence it will be seen that the system should not be followed too rigidly for this work.

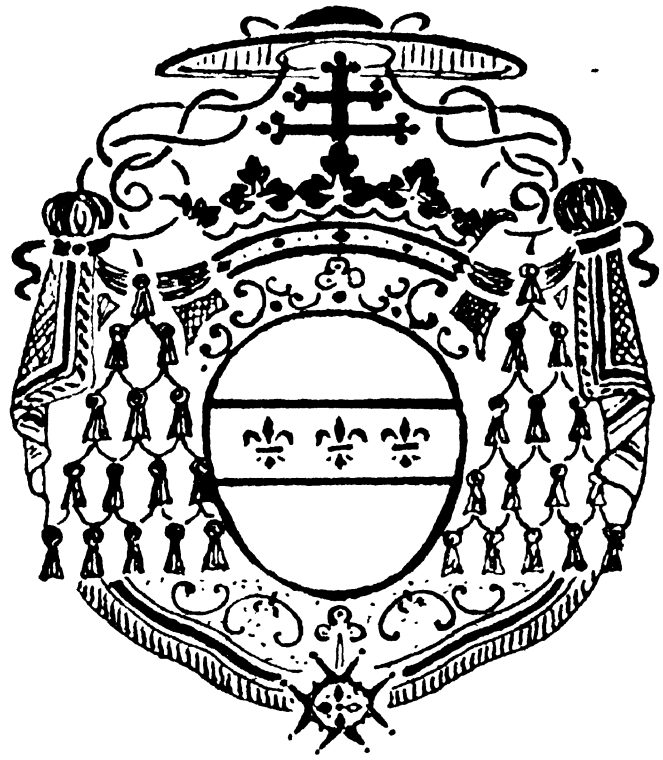
ARMS AND DEVICES.



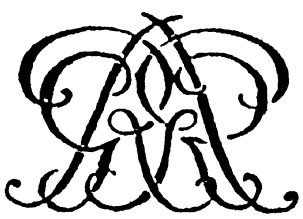
DEVICE USED BY
THE DAUGHTER OF
LOUIS XV.

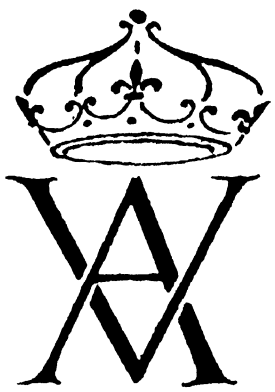


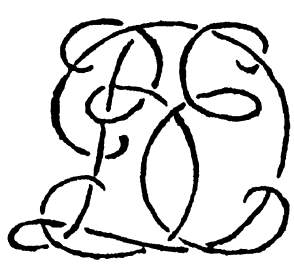
DEVICE USED BY
ANNE BOLEYN.

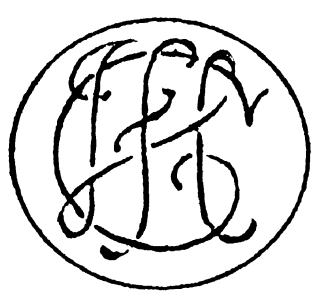


CT. DE BEAUMONT
ARCHBISHOP OF PARIS
1703-1781.









Failing a coat-of-arms, a monogram introduces a personal note into a design. This may consist of a special brass stamp, in which case the designer is free as to treatment, or, where a single book is concerned, it may be made up by means of gouges, the letters being in outline. A monogram should be interesting and fairly readable: the letters may read in their correct order or the surname may be a little more prominent. Where interlaced letters are used, the points of interlacement should be clear of other strokes and the serifs should be free and not hidden. The shapes formed by the interspaces should be interesting and should be about equal in size. As these devices are for use as centre ornaments, they should balance well and should form a pleasant shape as a whole.

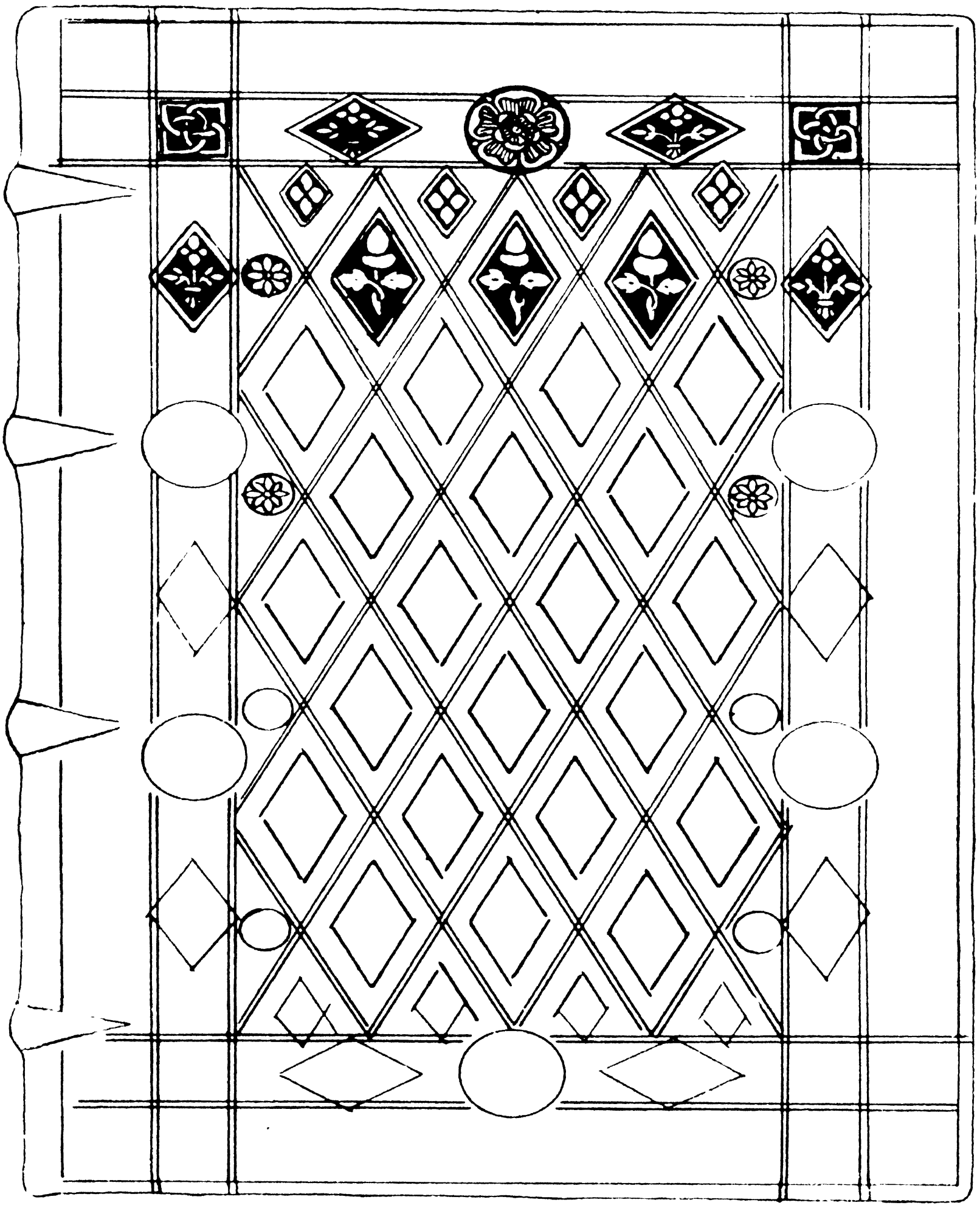
THE HISTORIC ELEMENT.

The history of bookbinding and its associations is a subject of great interest and about which many valuable books have been written. In these books will be found reproductions of the original old bindings that have been handed down to us and are now in public museums or in private collections. While a study of these is necessary to the student of design, we have not the space here to give anything but a brief review of the periods in the history of the trade that have led to the methods of to-day.

The fifteenth century. Before the invention of printing, that is, before the middle of the fifteenth century, the books of that time were written out and bound by the occupants of the many monasteries that existed. Leather was only one of the materials used for covering these books, for wood, ivory and metal were also employed.

It is with the leather bindings that we are concerned, and these appear to have been executed in a remarkably consistent manner. The boards were of wood and the leather was decorated by means of the impression of a number of small stamps, together with straight lines, all of which were in blind, as the method of gilding had not been discovered. These stamps were impressed upon the damp leather either by hand or by some form of press. They were cut in the reverse manner to what the majority of tools are cut to-day, whereby the background became impressed down, leaving the device in slight relief upon the leather.

Panel stamps. Later, the size of these stamps increased until they nearly covered the whole side of the book, when they consisted of religious devices, arms of the owners and sometimes the binders of the book. These panel stamped bindings formed a marked English period which continued for nearly two centuries. With regard to the forwarding, the sections were strongly sewn round heavy cords which ultimately formed the bands of the book. These



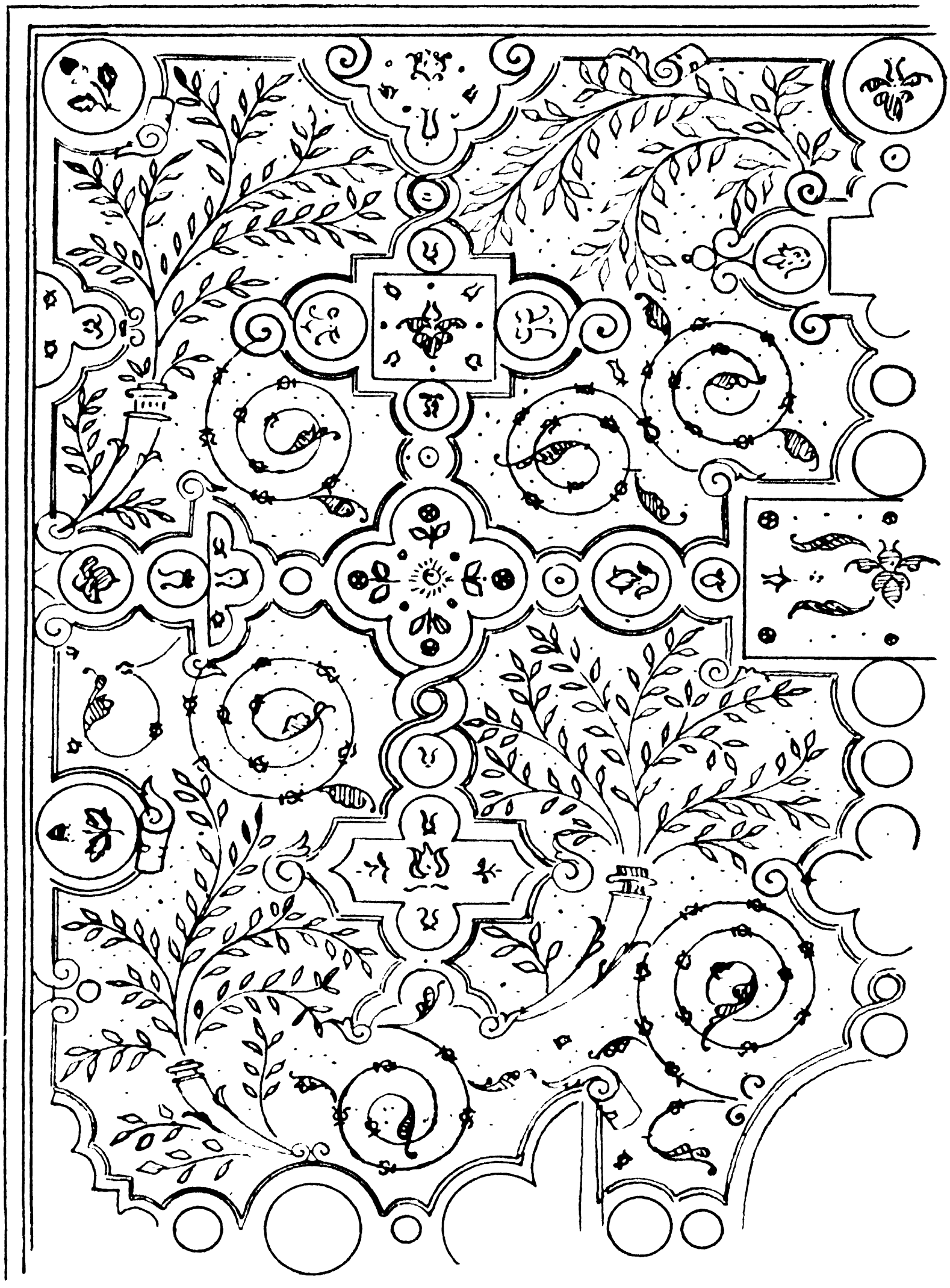
EARLY STAMPED BINDING.

cords were used to secure the boards, which were sometimes of wood and sometimes composed of card formed by pasting paper together. Their leather was not the pliable material we have to-day, as evidenced by their methods of covering, for it was necessary to tie the book round with string while the paste dried, the marks of which can still be seen.

Fifteenth century (late). The second half of the fifteenth century saw the introduction of printing and with it a great period of binding. Books became smaller and more plentiful and found a place outside the monasteries. The binding in Italy was strongly influenced by the East at this time, for while adhering to the method of using small stamps to decorate their leather, arabesque designs were used. Their blind-tooled books were at first relieved by metal roundels or by painting, but later, gold finishing as we know it to-day was introduced.

Sixteenth century (early). The great Italian period was at its height at this time. The comparatively large number of well-printed books produced by Aldine, and the encouragement given to bookbinding by such collectors as Grolier and Maioli, had done much towards it. A number of the methods and designs for tools, etc., introduced at this time are in use to-day. The bindings of Grolier consisted of tooled strap-work (which was sometimes painted in colours) relieved by arabesque scrolls. In England and France the bindings were soon affected by the introduction of gold tooling, and in the former country Thomas Berthelet, a binder to Henry VIII, produced a number of books that show a marked Italian influence. Embroidered covers were also much used in the English royal bindings at this time.

Sixteenth century (late). The work of the Italians declines somewhat before a great French period. Some of the books of Grolier were bound in France and some in Italy. The designs in both cases consisted of strap-work relieved with scrolls, but while in the latter the gold impressions were solid, the French "azured" theirs by engraving a series of parallel lines over them. Later the Italian influence lessened and new types of designs were introduced. Clovis and Nicholas Eve were responsible for many of the historic bindings of this period and, unlike Grolier and Maioli, they were the actual producers, being the recognised binders to the Royalty of the time. The well-known *semi* patterns, consisting of a simple element such as a fleur-de-lys powdered over the whole cover, were produced by these craftsmen; also the three-line strap-work pattern and a filling of long-leaf sprays. By the number of these *semi* patterns of this period that now exist they were very popular, probably owing to the ease with which a large surface of leather could be covered. The three-line strap pattern with its



NICHOLAS EVE, 16TH CENTURY.

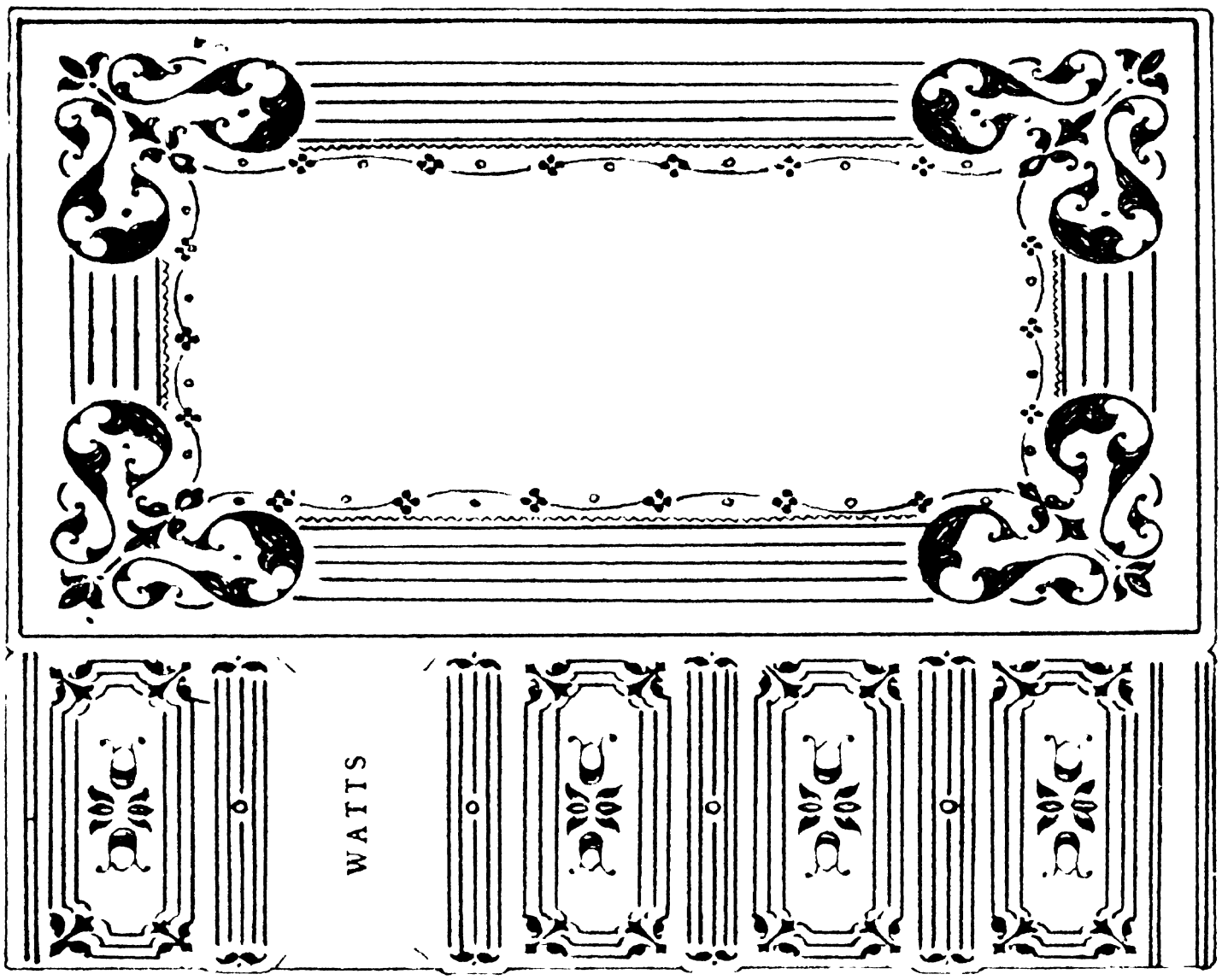
long leaf filling was often known as the "fanfare" style, and was produced by the binder Eve for August de Thou, another great book collector. They represent a marked advance in technique, for such patterns were not built up with large tools, but by means of small elements and careful drawing. In England at this time a series of books was produced having large centre and corner blocks of Jacobean-like ornament. Thomas Wooten, an English collector, was responsible for a series of bindings resembling those of Grolier.

Seventeenth century (early). The great French period of bookbinding lasted longer than the Italian period that preceded it. The productions of Le Gascon, of whom but little seems to be known, are very striking. Many of his bindings consist of the three-line strap, but instead of the floral fillings he used arabesque scrolls composed entirely of dots. The most successful of these "pointelle" bindings is a small New Testament now in the British Museum. The English bindings of this period show the French influence, central arms and devices being a great feature.

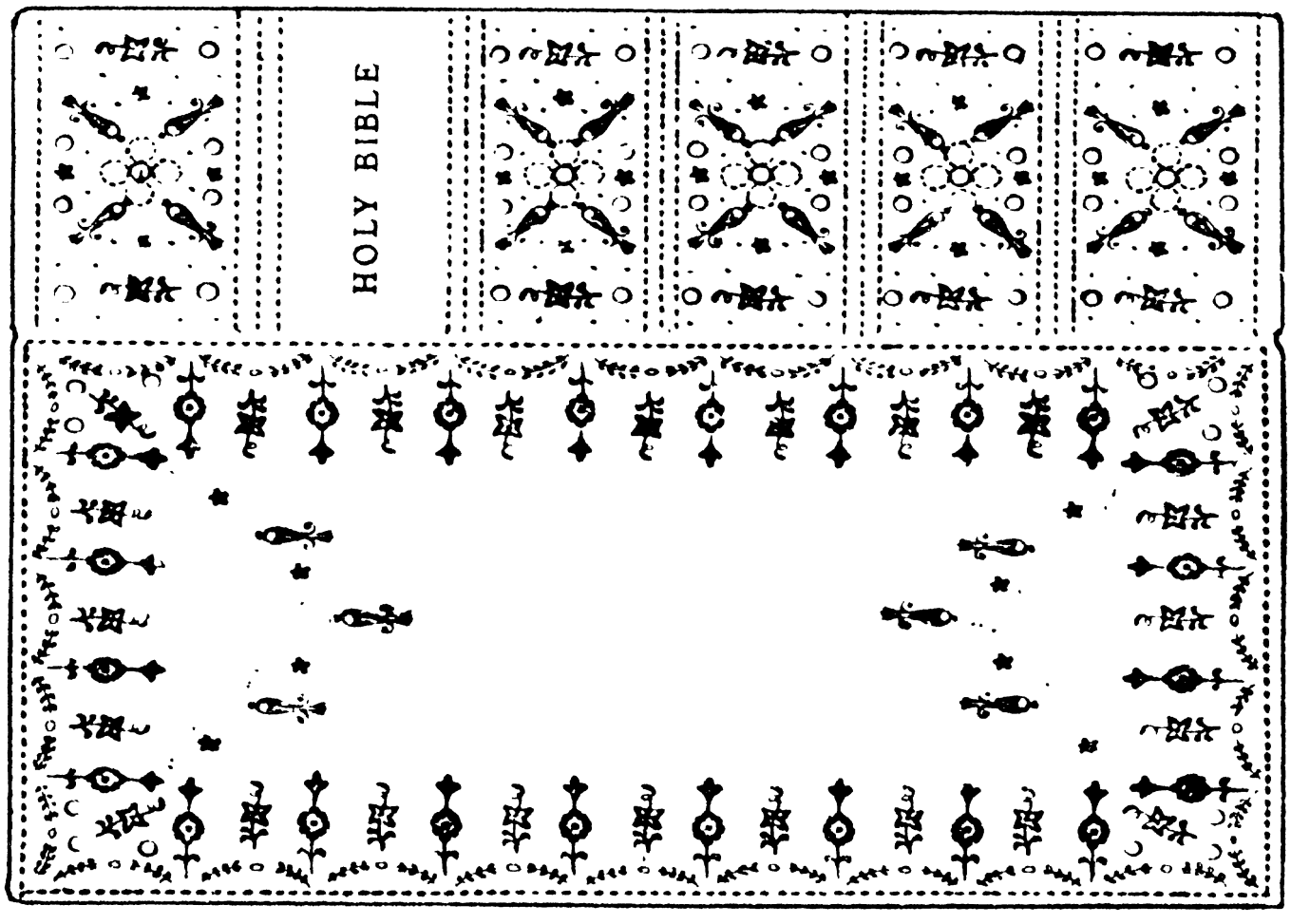
The leathers used upon the bindings of this time were excellent and the books have been handed down to us in a remarkable state of preservation. Large folios were common, which were sewn flexible with sometimes as many as seven bands. Gilt edges, marbled edges, and marbled paper for ends were in use.

Seventeenth century (late). In the year 1660 Samuel Mearne was appointed bookbinder to King Charles II of England, which office he retained for some twenty years, when he was succeeded by Charles Mearne, who was probably his son. During this period a series of well-designed bindings were produced. The tools used consisted of new flower and leaf shapes, sprigs, etc., which were ingeniously planned to form borders and fillings. The familiar "cottage roof" pattern is usually associated with this binder, although many of them were produced many years after his death.

Eighteenth century (early). For nearly the whole of the eighteenth century England continued to produce bindings of the Mearne type, so great was the influence of this craftsman. Large folios as well as small devotional books are to be found tooled with the "cottage roof" or one of the other Mearne patterns. Black morocco was very popular, although red and a dark green were also used. The boards were, as a rule, thin and the bands of the book were kept shallow. Silver clasps and sometimes silver corners were a feature of some of these books. In France at this time a bookbinder, Michel Padeloup, introduced new methods of tooling combined with good forwarding. A large number of his books are plainly tooled, but he used a type of design whereby the whole of



FARLY 19TH CENTURY.



ROGER PAYNE, LATE 18TH CENTURY.

the side of the book was covered with a diaper of inlaid leathers, producing a "mosaic" effect. In others, bold flower and leaf shapes were similarly treated, each specimen representing many hours of work. Although Padeloup was not the first to line the inside of the boards with leather, it was a great feature of his, many of which he elaborately tooled.

Eighteenth century (late). Dennis Derome was another French binder who followed a little after Padeloup and whose work has received considerable attention. His patterns consisted of lace-like borders made up of a series of graduated scrolls, fancy corners, centres, etc. His forwarding was excellent, and many of his works are well preserved; red morocco was his favourite leather.

English binding at this time is associated with Roger Payne. He was a somewhat eccentric bookbinder about whom much has been written. His books were excellently forwarded, his designs and the tools used in them were new, and his finishing was neater and daintier than anything before attempted. It is important to note that whereas the morocco bindings of Roger Payne have lasted well, whenever he used russia leather these have perished.

The nineteenth century. Binders of some note belonging to the early nineteenth century were Lewis & Edwards, of Halifax. This century saw the introduction of machinery into this and other trades, and with it a general decline in design and the quality of materials used. It is a fact that whereas eighteenth century bindings are fairly plentiful, those belonging to a later period are not to be seen. Lewis attempted to carry on the work of Roger Payne, but he introduced hollow backs, flat backs and broad flat bands, together with a morocco leather having an artificial grain in place of the natural one. Following this a style was introduced from Germany consisting of thick bevelled boards which sometimes had heavy metal corners, dull brown leather heavily blind-tooled, with the edges of the books stained a brilliant red ! Several passing fashions had their effect upon book design as the century advanced, the most noteworthy being the Arts and Crafts movement, the influence of which is still to be felt. It has lasted because the principles of book construction were based upon the best of the old work. Hand-made papers were again introduced and special precautions were taken to assure that leathers were free from mineral acids. Its designs were fresh, for while flowers and leaves were conventionalised sufficiently for the operation of gold tooling they were not altered beyond recognition. It affected the printed page of the book, and new types were designed based upon the best of what had gone before, and wider margins were produced.

THE ELEMENT OF WORKMANSHIP OR TECHNIQUE.

Upon an examination of old bindings one is at once struck with the varying degrees of workmanship associated with different periods in the history of the craft. The marks left by the string with which the books were tied up at the time of covering, or the uneven impression of the blocks, suggest at once the conditions under which the work was carried out. There was a great variety in leathers and they were far from pliable; tools were heated over a charcoal fire and a cumbersome screw press was made to answer the purpose of blocking machines. Even so, the extremely careless way in which some of these tools were arranged is difficult to understand.

Bookbinding is a handicraft and machines will never be associated with fine bindings. They have decreased the cost of production of the every-day book in a very wonderful way, but they have gone no further than this and there will always be a demand for the hand-produced article. Workmanship, materials and design are of equal importance in the production of an extra binding.

In the first place, the book itself must be worthy of the time and materials that are to be spent upon it. It may have some special value on account of its associations or the excellence of its printing. The widths of the margins are important and all plates should be guarded in. Flexible sewing should be used whenever the paper and style of the binding will allow. The endpapers require careful selection, so that they match the cover and the paper of the book.

The quality, thickness and weight of the boards must be judged according to the size and purpose of the book. Gilt edges should always be used unless it is decided to leave them uncut, when the top edge only is done. Tooled edges afford a relief to a solid gilt edge, but the work should be light in character. The colour of the gold used should be the same as that employed for the finishing. Hand-worked head bands are essential, as all other forms are but imitations. The back of the book must be a good shape, its roundness should not be allowed to exceed one-third of a circle. The bands must be even and sharp and, of course, perfectly square. The leather selected for the cover should suit the size of the book, lighter skins being used upon small work. The full thickness should be left upon the sides, other portions being left as thick as circumstances will allow.

With blind finishing the aim should be to obtain an even depth of impression and colour throughout. With gold work the points to be considered are: (1) Correct placing of the tools; (2) uniformity

of impression; (3) solidity and brilliancy of gold; (4) preservation of the original colour of the leather. The lettering is more important than the decoration. Hand letters are preferable to type, even if it is not possible to obtain the same perfect alignment. The extreme edges of the boards should receive a gold line and the head caps should not be neglected.

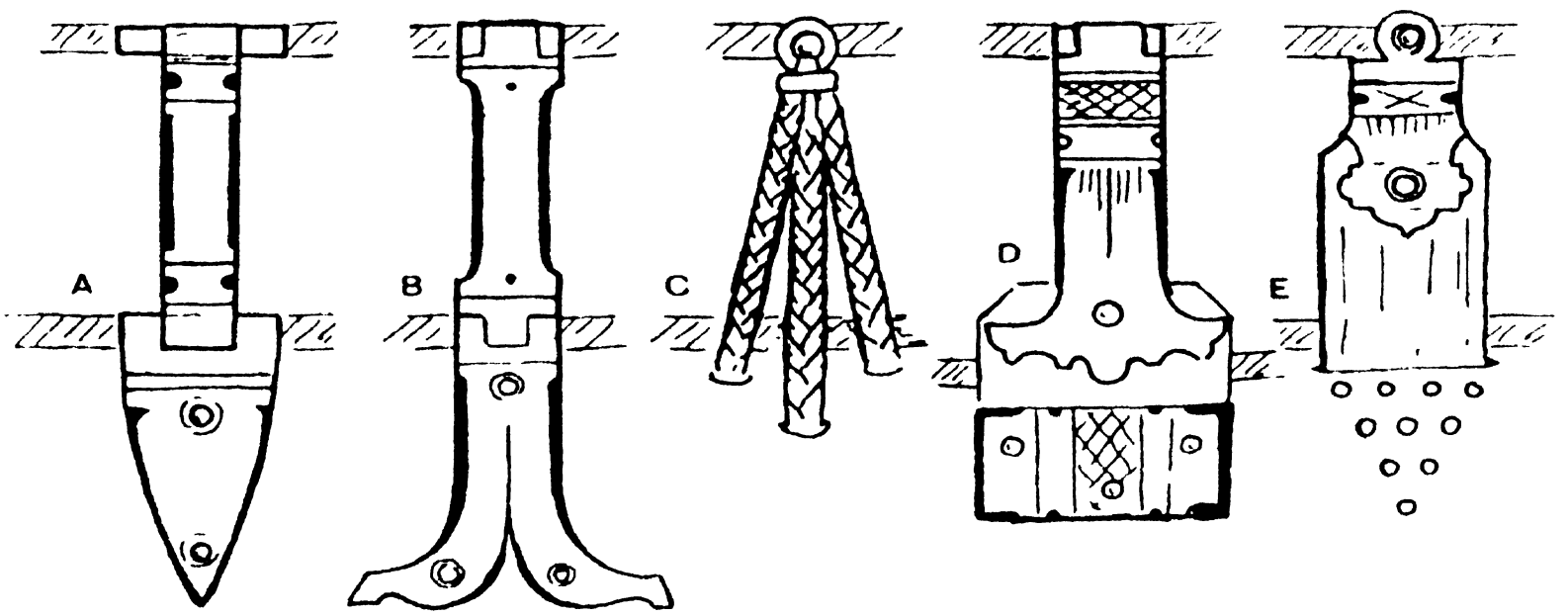
Some morocco leathers are capable of taking a fine permanent polish without the aid of varnish, and where this is possible it is to be preferred, as the original feel of the leather is preserved.

Extra bound books are usually worthy of a cloth-covered protecting box, especially where they are required for presentation. Some forms completely enclose the book, while others form a sheath, leaving the back exposed.

BOOK CLASPS.

In former days clasps were used in order to keep the books shut. The volumes, generally, were larger and heavier than they are now and the paper and leather were not so pliable. Where there is no danger of the boards gaping open with use, there is no need for

BOOK CLASPS FROM THE ANTIQUE.



A AND B. METAL HINGED CLASPS. C. PLAITED LEATHER.
D AND E. METAL WITH LEATHER HINGES.

clasps, except that they give an air of importance to the contents of a book. Important records, church books, photographic albums, and books printed or bound in vellum, may have clasps with advantage.

There are serious objections to metal projections on the sides of books that have to stand by the side of others on the bookshelf,

which do not arise in the case of a volume for the table. Clasps may be conveniently attached after the book is covered and finished with the exception of the board papers, for then the final thickness is determined and any rivets on the inside may be hidden. A single clasp has the tendency to distort the boards in the case of a large volume, therefore, two should be used and the most convenient positions are opposite the centres of the second and fifth back panels of a book with bands. All metal-hinged clasps have to be made to the book, as a perfect fit is necessary, but where the hinge consists of a leather strap, adjustments are readily made. Leather has a tendency to stretch with use, whereby a looseness results, but this may be avoided by making a strap of this material over a piece of vellum, obtaining additional strength at the same time. Where the metal portions of the clasps are to be gilt, care should be taken that the colour of the gold matches that used by the finisher.

BOOKBINDING REPAIRS.

The miscellaneous bookbinder, both in the letterpress and stationery trades, is often called upon to undertake the repair of books, using the old covers. This may be because the old binding has some sentimental or historical value, or for the purpose of economy. In either case the work is difficult and requires much skill and ingenuity on the part of the repairer, for in the first place the old books are usually very fragile, and in the second the time to be spent upon the work is limited.

Re-casing. With cloth books, and with some hollow-back leather bindings where the boards have been insecurely laced in, it usually happens that the leaves have left the case entirely. The remedy is to re-sew the book if necessary, supply new endpapers, glue, round, and back, re-line the back, leaving the usual flange of linen and glue the book back again into its case; supplying a new hollow to the latter if necessary. The edges cannot be trimmed or the back will be too small for its case.

Account books may be re-cased in this way. In this case it will be necessary to cut right through the joints in order to remove the book, which will require new endpapers and re-sewing. After the back linings have been renewed it may be placed back again into its old cover by treating the same as a case and pressing well.

Re-backing. Often in the case of leather bindings the sewing will be found quite strong and sound, the back and the sides of the cover will show but little signs of wear, but the leather along the joint has completely broken. Such a book needs re-backing,

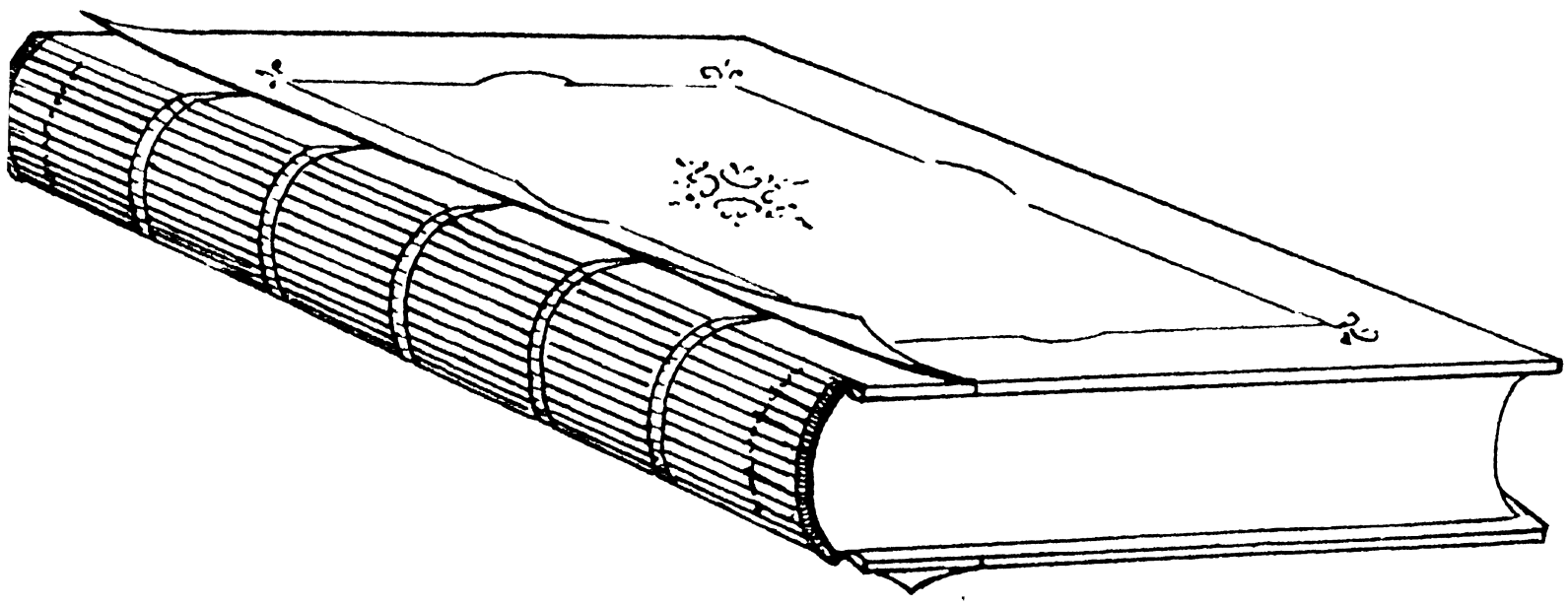
for, although the leather on the back may be otherwise sound, there is no satisfactory method of making a sound joint without. This defect is particularly noticeable with comparatively well-bound books that have been left undisturbed upon a library bookshelf for some years. It is caused by the action of the impurities in the atmosphere upon the leather, the back and sides have been protected by the varnish, etc., but at the joint these preparations had cracked and left the leather exposed.

To re-back a book the old leather is removed from the back and a new piece supplied; this new back binds on to the boards for about half an inch underneath the old cover. If the old back is in good condition it may be replaced; on the other hand, the new leather is re-tooled to match the sides as near as possible. The operations described in detail are as follows:—

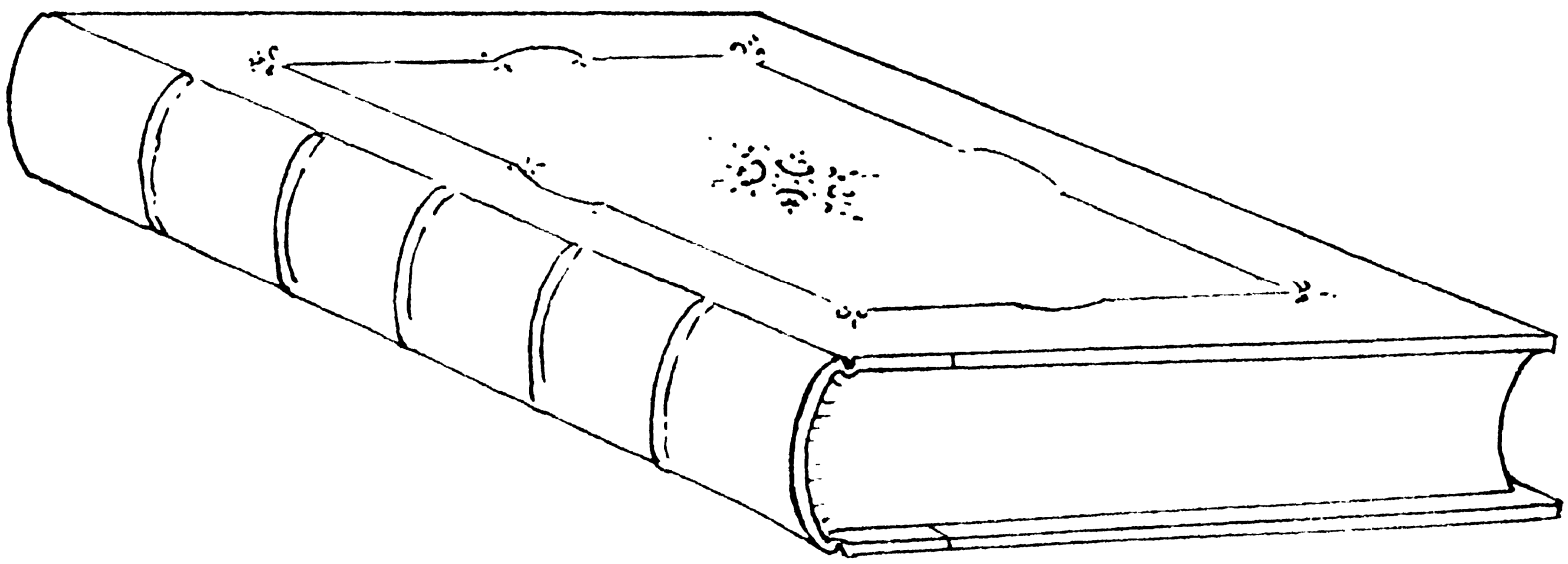
With a book that had been bound with a hollow back the removal of the old leather is a simple matter, for by cutting through the paper liners it will come away. With a tight back there is not much chance of it coming away intact, therefore, it must be scraped off with an old knife, dry if possible, but there are occasions when warm water is necessary. If the cords that are laced through the boards are intact it would be well to leave them alone; the head bands may be renewed or not as required. In the case of where a new hollow is to be made see that good strong brown paper is used, as where the slips are weak this forms the principal attachment to the book; this is the advantage of a tight back.

The leather on the boards must now be split along the joint for about half an inch inwards, disturbing the surface as little as possible; this is not an easy matter where the material has perished, and a sharp knife is required. After the bands have been fitted the book is ready to receive the new back. The leather must, of course, match the original as near as possible, and it must be strong without being thick, or a neat repair cannot be made; it must be shaved thin at the turn-in and carefully thinned where it goes under the old cover on the side. Where the old endpaper is to be preserved it is necessary to lift up the corners at the joint to allow the leather to turn in underneath. When covering, be sure that both the back of the book and the leather are well pasted, even then if the latter is at all thick, tying up will be necessary to assure sticking. The finish depends upon whether an invisible repair is required; if the old back is pasted over the new one there still remains the joint to contend with. Leather shaved extremely thin will cover this up, provided the edges may be hidden by the side and back tooling; gold lines offer a ready means of hiding a join in the leather.

RE-BACKING.



BOOK WITH OLD BACK REMOVED
TO RECEIVE NEW LEATHER.



BOOK RE-BACKED READY FOR
RE-LETTERING, ETC.

Furbishing. Much can be done towards the appearance and the preservation of leather bindings by periodic furbishing. Much of the deterioration of leather, and especially with russia and unpolished calf, is due to the drying out of the natural grease contained in it. This can be counteracted to a certain extent by the application of animal fat to those bindings that are likely to remain untouched for years—remarkably enough books that are frequently handled derive this from the hands that come in contact with them.

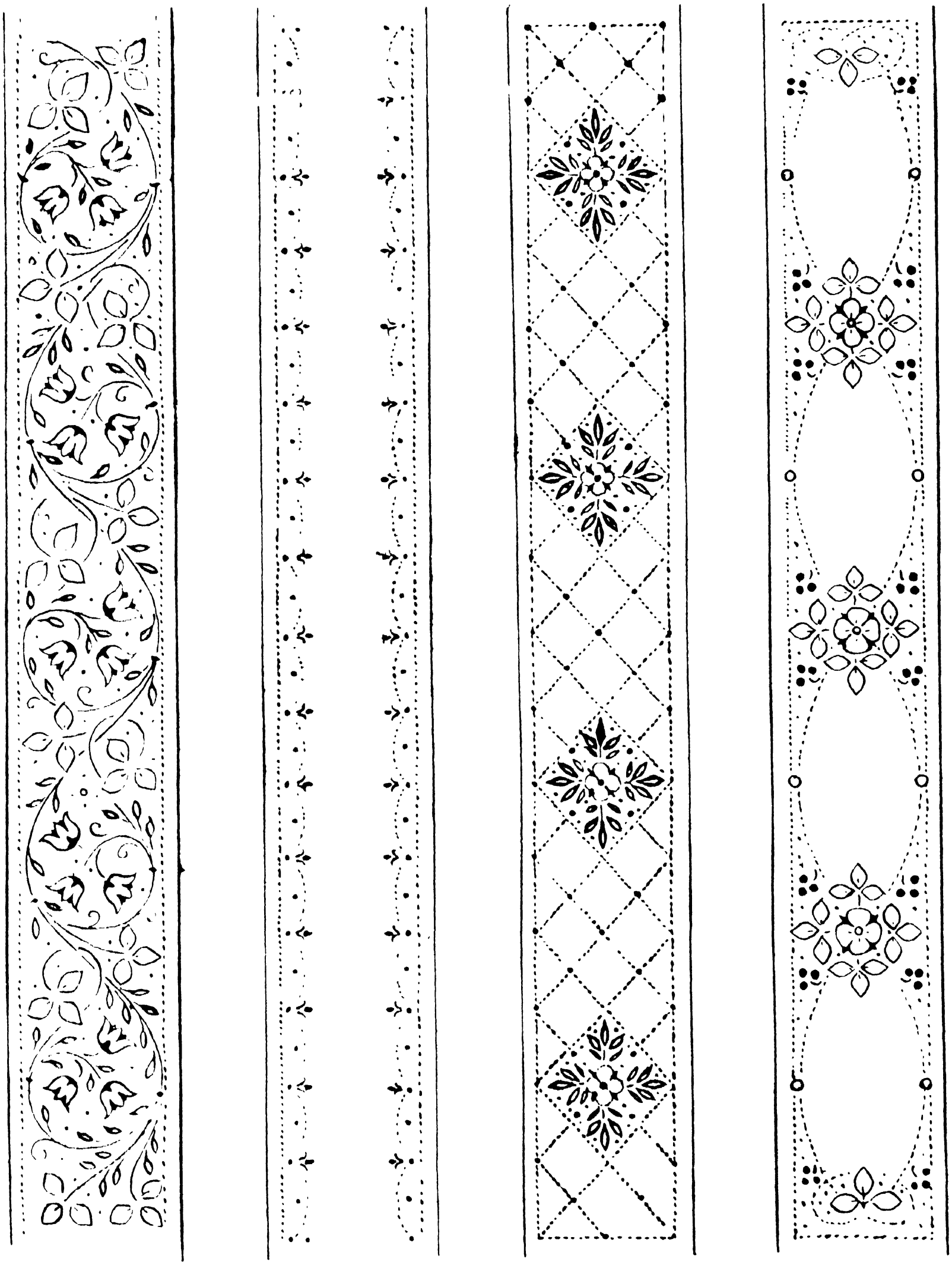
A common cause of shabbiness in leather is when the surface has become rubbed, leaving a patch of a lighter shade than the original. An application of a water stain of the right shade will improve it, for the rubbed places being more porous will absorb a greater portion of the colour and become darkened. An application of a wash of paste water will renew the surface, and if very bad a wash of thin size will allow bookbinder's varnish to be applied—varnish will stain badly when the leather is at all porous.

Re-tooling. Difficulties with re-tooling an old book occur when the original cover already contains gold work which has become toned down with age. There is something very attractive about old gold, and attempts have been made in many industries, particularly furniture, to reproduce it. These difficulties are greatest when complicated tooling has to be coloured down to match real old gold placed directly alongside and without staining the leather. Water stains will not take the gold and spirit dyes affect the leather. Ordinary bookbinders' varnish will tone the gold, but this is usually not sufficient; but varnish diluted to about half strength with methylated spirit and then stained with brown umber will give the right colour, light or deep according to the strength. It will stain the leather a little, but this may be washed off again with methylated spirit, provided the gold is carefully avoided.

Endpapers. A broken endpaper joint is not easily mended and usually the whole end must be renewed. Original bookplates, when required to be preserved, must be soaked off and replaced. With old marble ends it may be possible to renew the joint, for with that paper joins do not show.

TOOLED EDGES.

The edges of books, provided they are gilt solid and that the paper is not too soft, may be decorated, using similar tools to those employed for ordinary finishing. As it is a condition that the books are firmly held in the laying press during the process, it is better if the work is done before the leather cover is added, especially



DESIGNS FOR TOOLED EDGES.

as the roundness of the fore-edge may require to be reduced for the time being.

Large and heavy tools are quite unsuitable, the best effects are obtained by a mere breaking up of the plain gold surface by delicate sprays, small flowers and leaves, dotted lines, etc. A simple fringe pattern as shown in the second diagram may be built up direct on to the edge of the book, or a light roll may be used, but for anything more complicated use a working drawing in exactly the same manner as that described for extra finishing upon leather. The tools that have been impressed through paper will be found to be very dull, so that it will be necessary to go over the pattern again to restore the brilliancy and sharpness, the temperature required being about the same as for gold finishing.

Flowers and leaves that are cut in outline may be coloured in upon the gilt edges of books, giving a similar effect to that of inlaid work on leather. Colours in the form of stains are better than water colours, as the latter, although offering a wider range, tend to chip off and dry dull. As the colours will not take to the burnished gold of the edges, this must be carefully scraped away with a sharp knife, leaving the white paper exposed where the stains are to be applied.

SECTION IV.

ESTIMATING.

SECTION IV.

ESTIMATING.

It has been shown that bookbinding consists of a series of operations which follow one another from the printed sheet to the finished book. In the case of cloth bindings, these operations have been reduced and simplified and the quantities concerned are large, but there still remains, and always will remain, a large proportion of the trade, the work of which consists of a comparatively small number of books, and the binding is of such a varied character that hand work must play an important part.

In estimating the cost of an article that has been produced by the extensive use of machinery, the expenses and capital outlay of the machines become as important as the cost of the labour employed to work them, but where hand work is largely employed, an easy and direct method is required to obtain an estimate of the more numerous items.

There is a difference between working out the cost of a job before the work has actually been done (estimating), and finding the cost afterwards (costing), although the same principles may be employed; and it is difficult to say which is the more important.

Before any work can be undertaken an establishment of some kind must be in existence, which represents capital expenditure from which interest is required. Money is also required for rates and taxes, light, and a large number of minor expenses which have to be met *whether work is produced or not* and apart from the actual labour and material. When a job has been completed it is a fairly simple matter to calculate the cost of the labour and the material, but it is important that all other expenses are recovered, and recovered in correct proportion as they are expended. The cost of handling the materials is less than the expenses incurred in organizing a workshop, therefore, the percentage to be added to a job which included more for material than for labour would be less than if the reverse had been the case. Not only is it sufficient to separate materials from labour but, in the case of larger establishments, it becomes necessary to separate the different departments,

to calculate their proportion of the general expenses, and to allot accordingly. The wages in the women's section are about half those of the skilled journeymen, but the floor space, light, heat, etc., are about the same per person, therefore, the percentage to be added to the lower wages is greater.

Suppose, then, that the necessary calculations have been made, and we have found that the percentages to be added to the various departments in a bookbinding workshop are as follows:—

Cost of handling materials . .	16⅔ per cent.
Cost of Women's Section . .	25 ,,
Cost of Forwarding Section . .	20 ,,
Cost of Finishing Section . .	20 ,,
Office expenses	25 ,,

As an example it is supposed that an estimate is required for the following work:—Bind 200 books, crown 8vo, 256 pages (16 sections of 16 pages), half morocco, marble paper sides and ends; top edges gilt, lettered, gilt bands, gold line on side.

Materials.

	£	s.	d.
¼ ream double crown 30 lbs. for ends . . .		5	0
6 quires marble paper for sides and ends . .		18	0
100 lbs. machine boards @ 30/- cwt. . . .	1	7	4
60 square feet leather, say 65 feet @ 2/- per ft. . .	6	10	0
250 leaves gold @ £2 10s. per 1,000		12	6
Extras	1	0	0
Net cost of materials	10	12	10
Add 16⅔ % = ⅙th cost of handling materials . .	1	15	6
Gross cost of materials	£12	8	4

Folding and Sewing.

	£	s.	d.
Folding 3,200 sections (per hand, bolts cut through) @ 250 per hour. 13 hours @ 1/- . . .		13	0
Gathering, 2½ hours		2	6
Collating, 2½ hours		2	6
Sewing, per hand, 22 hours	1	2	0
Hand-worked headbands, 30 hours	1	10	0
Net cost of wages in Women's Section . . .	3	10	0
Add 25 % to cover expenses in Women's Section .		17	6
Gross cost of women's work on job	£4	7	6

Forwarding Department.

	£	s.	d.
Rolling, pressing, etc., 5 hours (*a*) 2/-		10	0
Making and attaching endpapers, etc., 8 hours		16	0
Gluing, cutting, rounding and backing, 16 hours	1	12	0
Edge gilding, top only	2	5	0
Cutting and attaching boards, etc., 20 hours	2	0	0
Lining backs, 10 hours	1	0	0
Cutting leather, 3 hours		6	0
Paring and covering, 50 hours	5	0	0
Net cost of wages, Forwarding Department	13	9	0
Add 20% to cover expenses in Forwarding Department	2	13	10
Gross cost of forwarding	£16	2	10

Finishing Department.

	£	s.	d.
Lettering and tooling backs, 100 hours	10	0	0
Attaching sides and pasting down ends, 65 hours	6	10	0
Finishing out and pressing, 30 hours	3	0	0
Net cost of wages in Finishing Department	19	10	0
Add 20% to cover expenses of department	3	18	0
Gross cost of finishing	£23	8	0

Summary.

	£	s.	d.
Gross cost of materials	12	8	4
,, ,, ,, Women's Section	4	7	6
,, ,, ,, forwarding	16	2	10
,, ,, ,, finishing	23	8	0
Gross cost of materials and labour	56	6	8
25% office expenses	13	19	5
Total cost of production	£70	6	1

£70 6s. 1d. = 7s. per book.

To which must be added net profit to obtain required estimate.

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TECHNICAL TERMS.

As compiled and endorsed by the Master Bookbinders' Association, London.

Back. The portion of the book where the sheets are secured together by thread or other means and the corresponding external portion of the binding.

Backing. The turning over of sections from the centre of the back of the book so as to form the two joints.

Bevelled Boards. Bevel-edge boards, either flat or rounded on three or four edges, usually done on heavy-weight boards.

Blocking. The impression of lettering or a design into a case or binding.

Bolt. Any folded edge of a section.

Cancel. A leaf, four pages or more of matter, printed to replace a similar portion containing an error or which may for some reason require alteration.

Cancelling. Cutting away a leaf or pages of a book and replacing with a similar portion containing a correction or alteration.

Case. The made-up binding of a book consisting of cloth or other material, and boards, made separately from the book.

Cloth Covered or Cloth Limp. A binding consisting of a cloth cover secured to the back of the book and to the endpapers.

Cloth Joints, Paper or Leather Joints. The reinforcing or replacement of the fold in the endpaper by cloth, leather or a stout paper.

Cloth (or Paper) Stiffened. A binding consisting of a cloth or paper cover secured to the back of the book and stiffened on the sides with thick paper or board introduced between the cover and the endpaper.

Coloured Brushed Top. The decoration of the head of a book by colouring and burnishing slightly by brushing with a hard brush.

Coloured Burnished Top. The decoration of the head of a book with a dye and burnished.

Coloured Top. The decoration of the head of a book with a dye.

Coloured under Gilt Top. The decoration of the head of a book by gilding after colouring.

Cover. Any material cut to size for the binding of a book.

Cut Away. Any portion of a section which is removed and not replaced by a cancel.

Cut Edge. Any edge (head, fore-edge, or tail) of a book, cut clean with a knife, so that all the pages on that edge are flush or solid.

Cut Edges. All three edges of a book cut in the manner described for "Cut Edge."

Cut Flush. This term, following any of the terms "Paper Wrappered," "Paper Covered," "Cloth Covered," or "Cloth Stiffened," indicates that the edges of the book are cut after the application of the cover, so that the latter is included in the cut.

Dull Gilt Top. The decoration of the head of a book with gold leaf unburnished.

Endpapers. A piece of plain, fancy, or printed paper folded into four pages to the page size, sewn or pasted to the first or last section and used (with the mull and/or tapes) to secure the book to the case or binding. The endpaper at the beginning of the book is the front endpaper ; that at the end of the book is the off endpaper.

Ends on Book or Own Ends. An endpaper which actually forms part of the first and/or last section(s) of the book.

Filling-in Guards. Narrow folded strips of paper secured into a book to swell the back to compensate for extra thickness caused by matter which has been or may be inserted into the book.

First Lining. The process of coating the back of an unbound book with glue and adding thereto a piece of mull or coarse muslin for strengthening purposes.

Flat Back. In forwarding the book the processes of rounding and backing are omitted.

Fore-edge. The edge of the book opposite and parallel to the back.

Forwarding. The processes of gluing up, first lining, rounding, backing, and second lining a book.

Front Side or Front Board. The side of the case or binding nearest to the title-page of the book.

Gilt Top. The decoration of the head of a book with burnished gold leaf.

Gold or Gilt. Where these terms are used without any accepted or comprehensible qualification indicating an imitation, the use of real gold is implied. Unless otherwise indicated it is of at least 22 carat quality.

Half Bound. Where the back and some portion of the sides and corners of the binding consist of one material, and the remainder of the sides of another.

Head or Top. The edge of the book parallel to and above the printing (normal page). Also used to indicate the upper positions on the binding.

Headband. An ornamental piece of cotton or silk material attached to the back of the book at the head, or tail, or both, to improve the appearance. The piece attached at the tail is called the tail-band.

Insert. An insert is a piece of paper or card laid between the leaves of a book and not secured in any way.

Inset : Outset. A section of four or more pages laid within another section so that when sewn both form one section. The outer section is called the outset.

Interleaved Plate. A plate to which has been attached a piece of printed paper for descriptive as well as protective purposes. *Note.—All the foregoing definitions of plates apply equally to maps, plans, and similar matter.*

Interleaving a Portion of the Book. Insetting into and folding round sections of a book pieces of paper of a different nature from that used in the general body, such as writing paper, blotting paper, etc.

Made Endpapers. An endpaper lined on the inner page with a piece of blank paper. The blank paper is usually part of a four-page or of a section of the book.

Marbled Top. The decoration of the head of a book by transferring thereto a fantastic pattern of colours from a surface of liquid size.

Note.—In the foregoing definitions from "Gilt Top" onwards the substitution of the word "edges" for "top" means that the particular form of decoration is to be applied to all three edges of the book.

Mounted Map or Plan. A map or plan strengthened by lining it all over on the reverse side with calico or some similar material.

Mounted Plate. A plate secured to any portion of a leaf of the text, or to a separate piece of paper or board (the mount) which is held in position in the book by any of the means described for plates. Plates are mounted by : (1) Pasting down all over. (2) Tipping edges (pasting one or more edges). (3) Tipping corners (pasting one or more corners).

Off Side or Off Board. The side of the case or binding nearest the last page of the book.

Open Edge of a Sheet. The edge of paper in a section which is not closed by a bolt or fold.

Paper Covered. A binding consisting of a paper cover secured to the back of the book and to the endpapers.

Paper Covered and Overlapped. A binding consisting of a paper cover secured to the back of the book and to the endpapers and extending beyond the edges.

Paper or Cloth Boards. A binding consisting of a case made from a paper or cloth cover. The book unless otherwise stated is fully forwarded.

Paper Wrappered. A binding consisting of a paper wrapper secured to the back of the book only.

Paper Wrappered and Overlapped. A binding consisting of a paper wrapper secured to the back of a book only, and which is larger than the book and extends beyond the edges.

Paper Wrappered, Turned Over. A binding consisting of a paper wrapper secured to the back of the book only and folded over on to itself or the endpaper to come flush with the edge.

Pasted Plate. A plate secured to the back edge of a page by means of a narrow strip of paste.

Pasting. A slip, leaf, or four pages of text secured to the back edge of a page by a narrow strip of paste.

Plate. An illustration printed separately from the text and usually on different paper.

Plates Folded in or Round Sections. Plates printed to form sections of four or more pages and insetted into or folded round and sewn with a section of the text.

Plate Guarded and Hooked. A plate secured into the back of a book by means of a narrow strip of paper or linen (the guard) pasted to its back edge, and the guard folded in or round a section and sewn with the section.

Plates Guarded and Joined. Two plates joined together by means of a strip of paper or linen, thus forming four pages which can be included in the sewing of the text.

Plate Hooked on Own Guard. A plate secured into the back of a book by folding the margin of the back edge in or round a section and sewing it with the section.

Plates Joined on Own Guard. Two plates joined together by means of a narrow strip of paste down the back edge of one, so that they can be folded to form a four-page section which can be included in the sewing of the text.

Quarter Bound. Where the back and some portion of the sides only of the binding consist of one material, and the remainder of the sides of another.

Register. A piece of ribbon placed in the book, and attached to the back at the head, to be used as a bookmarker.

Rounding. The shaping of a book so that a convex form is given to the back and a concave form to the fore-edge.

Second Lining. The process of coating the back of an unbound book which has already been first lined, rounded, and backed (unless any of these processes have been purposely omitted) with glue, and covering it with a piece of paper.

Second Gluing. The foregoing process, but without the final addition of the piece of paper.

Section. A sheet of paper consisting of four or more pages folded ready to be incorporated in the main body of the book.

Sprinkled Top. The decoration of the head of a book by spraying on a pigment or dye.

Squares. The marginal difference between the edges of the bound book and the case or binding. Squares vary in proportion to the area size of the book and according to taste. They are described relatively as pin-head, neat, ordinary, full, or bold.

Tail. The edge parallel to and below the printing (normal page). Also used to indicate the lower positions on the binding.

Tissued Plate. A plate to which a sheet of plain flimsy paper has been attached for protective purposes.

Trimmed Edge. An edge (fore-edge or tail) of a book where the larger projecting leaves only have been trimmed down, thus leaving the edge with a rough appearance.
Note.—The term "Trimmed Edges" to describe a book with an uncut head and trimmed fore-edge and tail is abandoned, as the style is obsolete and the term now open to misconstruction.

Whole Bound. Where the cover used for the binding consists of a single piece of material.

PRINTED AND BOUND
IN ENGLAND