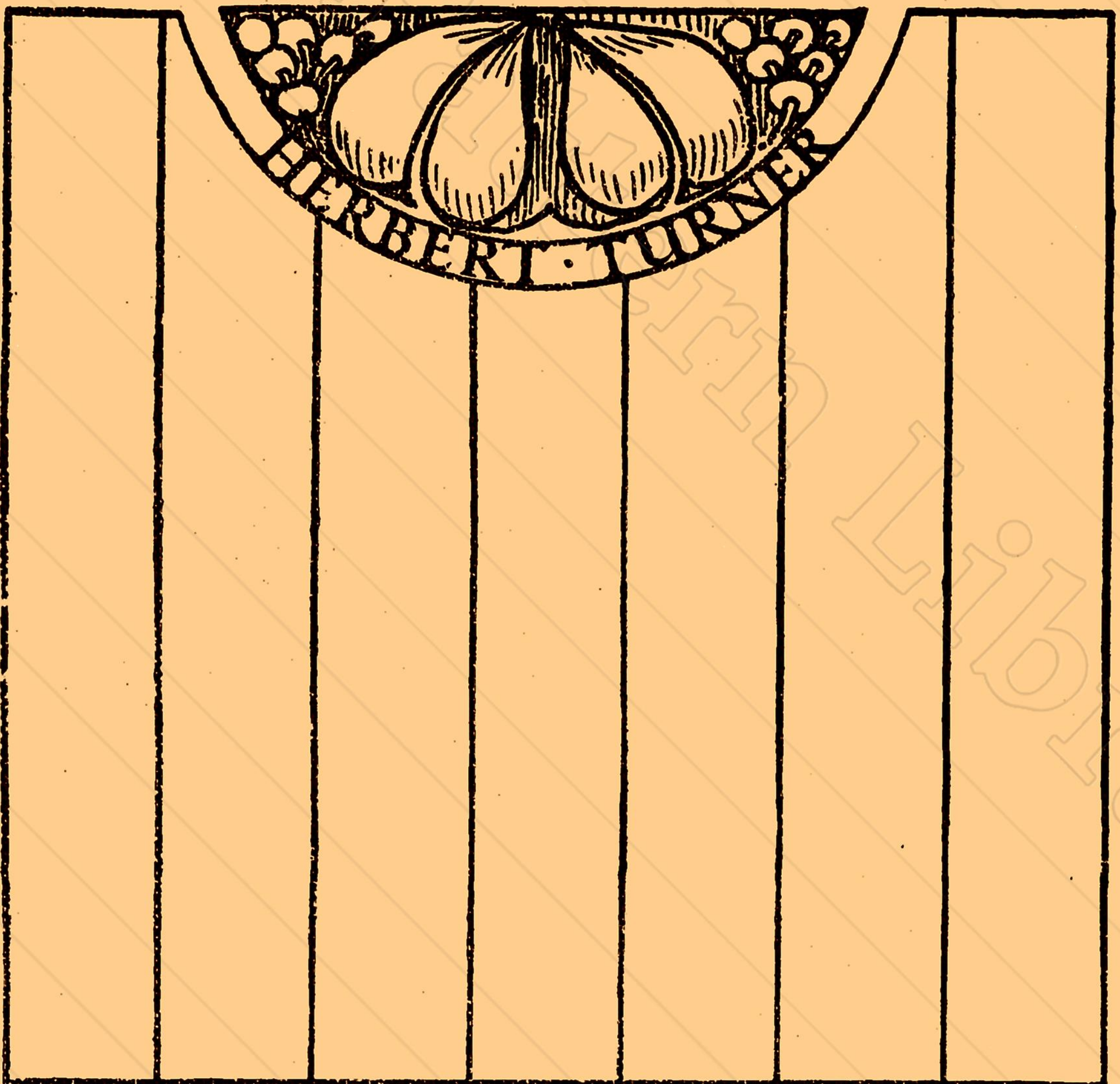


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1926

From Jack._

ARTISTIC
LEATHER CRAFT



A PAGE OF EXAMPLES OF ART LEATHER CRAFT.

Frontispiece.

ARTISTIC LEATHER CRAFT

BY

HERBERT TURNER

DISTRICT ORGANIZER OF HANDWORK UNDER THE
LEICESTERSHIRE COUNTY COUNCIL
AUTHOR OF "A GUIDE TO SCHOOL HANDICRAFTS,"
"PRACTICAL INSTRUCTION FOR THE SENIOR SCHOOL,"
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PREFACE

THE extent of the popularity of Art Leather Craft during recent years is both extraordinary and gratifying: extraordinary, because leather craft, so decorative, and, withal, so eminently useful, has had to wait so long to come into its kingdom; and gratifying because it is satisfactory to find the general public, in its capacity either as maker or buyer, so eagerly pursuing a craft that is so useful and so artistic. The pursuit of such a beautiful craft is distinctly of benefit in another direction: it is so capable of arousing the real love for beautiful things that is inherent in humanity, although it may be latent, that its spread should receive all possible encouragement.

It is hoped that the examples given in Chapter VI will call attention to the need of design in all craft work, and that readers will be stimulated to work out their own schemes of ornament.

The use of punched patterns, i.e. patterns formed of the repetition of simple elements unmeaning and devoid of interest in themselves, but which derive their value from repetition and alternation, is recommended: first, because the patterns so made constitute good ornament; and, secondly, because the use of this method is a good introduction to the further study of design in the case of children and beginners. The composition of simple elements into pleasing groups is the stage immediately antecedent to creation.

Section III deals with leather and its preparation. No apology is offered for this section, as it is felt that all who are dealing in the material, for whatever reason, should have some knowledge of it. Especially is this so in schools, whether elementary, secondary, technical, art, evening, or private schools.

The bibliography is not extensive. It was, in fact, the scarcity of books on leather craft that suggested the need for a book dealing with the present phase of leathercraft comprehensively enough to meet the needs of schools of all types as well as those of the private craftworker.

My thanks are due to Mr. Geoffrey Turner, B.Sc. (Hons.), London, for writing Chapter X, and to Miss Preston for the use of her work shown in the photograph on page 91.

HERBERT TURNER.

LEICESTER, 1926.

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ARTISTIC LEATHER CRAFT

INTRODUCTORY

LEATHER work, in some form, has been familiar to the amateur craftsman for many years. Some readers will doubtless remember the modelled fruit studies, consisting of thin leather stretched lightly over wooden shapes, that were popular many years ago. Then came the turn of embossed and of modelled leather, but still only for the comparatively limited circle of amateur craft workers.

New Type of Leather Work.

But quite recently has come a renaissance of leather craft on the sane and entirely reasonable basis of production for use. Leather articles such as marketing bags, gloves, purses, wallets, Treasury note-cases, cushions, and the like, are made for real use. Many of them lend themselves to ornament, but the original conception of these articles was based on Utility and not on Ornament. Some of these articles are such that the constructional plan automatically supplies the scheme of decoration, and there is no need for applied ornament; e.g. a cushion in which the ornament is supplied by variations in the colour of the leather used; or by the stitching or thonging of the pieces; or by means of weaving of the leather.

In others, plain surfaces occur which suggest applied ornament such as modelling, embossing, stencilling, staining (plain or in patterns), the mounting of jewels or Ruskin stones, inlay, overlay, or some other similar type.

This renaissance, although it has affected amateur craft workers to a large extent, and has caused an extension of their activities, yet has had a very much greater effect upon Educational Handwork.

In all classes of schools, the practice of leather work of some kind has entered. It is a pleasing occupation; leather gives a wonderful pleasure to handle and to work; but the best thing about it is the reality of the articles that are made, and the very real purpose they serve.

The real end and purpose of the work is Utility; and in the pursuit of that end all those advantages follow which have, in the past, been sought for as ends in themselves.

The spreading of the practice of leather craft is causing the flow of literature on the subject ; and a few books are now published dealing with the Craft as a Craft.

Bearing on School Handwork.

But although we pursue Craft as Craft, yet the adaptation of any craft to school purposes is a very necessary process. The limitations of children in regard to age and development ; the size of classes ; the difficulty—the impossibility, in fact—of getting enough real craft workers on the staff ; the uncertainty of getting suitable equipment ; the requirements of school organization ; the supply of materials ; their distribution to the children—these are problems that the ordinary craft worker has not to meet, and they call for much modification of the ordinary usages of the Craft.

Thus follows the need of some direction in regard to leather work in its adaptation to the needs of a school, for the teacher engaged in School Handwork. Hence this book.

Value of Leather Craft in Schools.

The value of this newer type of leather work to schools was not long in being appreciated ; and to-day there is an increasing amount of Art leather work being done in schools.

It is no longer the occupation of a few amateur workers, but it is becoming rapidly widespread in the extent of its practice ; and is doing its share in providing suitable channels for the adequate expression of the child's intelligence through his inherent capacity for Art craft work. To provide such channels, and to guide children along them, is perhaps the teacher's chief work ; and it is certain that the native intelligence of children is drawn out better if they have work to do in which they can take interest. Their psychological development follows, and it is proportionate to the interest they have in their work.

Its Practical Value.

How often is the question asked in connection with the introduction of some new educational form : “ What is its use ? ” or “ What practical value does it possess ? ” Generally speaking, what is meant is, “ What will be its value in increasing the child's future capacity for either profit or wage earning ? ” The greatest value any study can have is that it will help in the unfolding of the hidden self ; that it will transform potential into active energy ; that it will stimulate a “ growing point ” in the child's mental and spiritual make-up ; that it will cause a greater internal correspondence with external conditions ; and it will so help Consciousness to evolve in greater degree.

So many of the recent innovations in educational life have had for their end this purpose ; and we may safely say that this fact is

a measure of the extent to which the larger view in education has entered the domain of public educational opinion.

This larger view has as its end the fitting of the individual to Life, rather than to Livelihood.

These views are becoming increasingly prevalent, and in Handwork circles especially. What the material used does to the child is coming to be recognized as being of greater importance than what the child does to the material. Psychological, rather than logical, schemes are being put into practice.

The basis of Educational Handwork practice is being extended because of this. It is realized that different children are interested in different studies and activities. We must provide a wide enough basis of study and activity for the greatest possible number of children to become self-moving. This possibility of self-movement opens up the way to individual growth, and leads to self-government.

Leather work in Schools is one of the developments that have arrived in this work of broadening the basis ; and it is of considerable value in quickening the process of individual development.

Its Connection With Art.

Art in schools has not hitherto been so fully associated with craft work as seems to be necessary. Fortunately, the hiatus between Construction and Ornament, and between Utility and Art is becoming less apparent, and we do now get a greater connection between Art and Craft in our schools.

Both benefit ; Art, because it has an end to which it can direct its activities ; it is not merely an Art training, or a form of Art for Art's sake, or a subject of academic value only. It is strengthened and vivified by this connection.

Craft, on the other hand, receives, perhaps, greater benefits. Its outlook is altered. It no longer serves purely utilitarian ends with no regard to appearances. Forms are chosen which still serve utilitarian purposes, but which, at the same time, are attractive in their external lines and proportions.

A law to be observed in construction is that the perfection of an object lies in combining the maximum of utility and strength with the minimum of material. It is, then, a wholly artistic production. We can then consider the possibility of applying ornament to it, if only such addition does not interfere with its utility, or with its lines and proportions. Leather work lends itself well to this view and conception of Art. Objects can be made whose shapes, lines, proportions and colours alone make them artistic productions. Objects can also be made that offer spaces on which suitable applied ornament can be placed, or on which design can be worked. The study and practice of design becomes automatic because it is necessary to the end in view ; which is not that of learning Art principles, but that of making a utilitarian object.

Individual Teaching.

Children develop individually, however much we may surround them with unsuitable circumstances, and whatever inhibitions we thus place upon them. If we take the trouble to provide an environment favourable to individual growth, then the development of the child is quickened. This is the reason for such innovations as the "Dalton Plan." Advanced children do mark time if no special provision is made for them. Also children in leaving classes need some special arrangement.

Leather work can play its part in this. It can be used as one of the subjects in which advanced children can find opportunity for individual expression.

Especially is it suitable for girls. It can be done at the desk, and it is possible to do without special bench equipment. With boys also it can be made a help to individual development, by giving it to those boys who do exceptionally well at Handicraft. Only a little help on the part of the teacher is needed from time to time, and such advanced children can carry on quite well alone.

Leather Work in Practical Instruction Rooms.

Where such a room exists it is possible to make leather work a most effective part of the instruction given. It is becoming a more general practice now to vary the type of work done in the Handicraft Room (which is being now known by the Board of Education as a Practical Instruction Room).

Thus we may have work proceeding in Wood, Metal, Clay, Card and Leather as chief materials, with, of course, others as subsidiary materials.

The syllabus of practical work can be arranged to allow all boys to have some instruction in the use of all materials, and those who find their interest satisfied and sustained in any one material to pursue work in that material. Leather is a material that fascinates, and work in it will always, if introduced, be a popular craft.

It can be done on the ordinary bench ; but I find it well to have tables of a slightly greater height than the woodwork bench, if used to stand at ; or a little lower if used to sit at. Tables fixed to the wall are of the greatest value.

The equipment for each individual as well as for the class is dealt with in Part C of each chapter

Plan of the Book.

It is proposed to lay out the book on the following plan. There will be *Three Sections* ; the *First Section* dealing with types of leather work, processes, methods of construction and ornamentation, and tools to be used. Specific and representative examples will be given, and each step in the work will be fully described. Thus, if the instructions are carefully followed, as good a knowledge

INTRODUCTORY.

5

of leather work will be obtained as can be, short of actual expert personal instruction in class, or individually. The *Second Section* will contain illustrations of work that can be done, and which will be especially suitable for school work. Plans and working drawings will be given, and essential dimensions supplied so that, if necessary, the objects can be made from these illustrations. The *Third Section* will deal with equipment and materials, and the commercial geography connected with Leather-work.

Plan of Chapters.

In Section I each chapter will be built upon a definite plan as follows—

- (A) Description of type of work.
- (B) The materials used.
- (C) The tools needed.
- (D) The description of one or more specific examples.
- (E) Cost—annual and capital.

A Bibliography will be given at the end of the *Third Section*.

SECTION I.

TYPES OF LEATHER WORK, TOOL OPERATIONS, TECHNICAL PROCESSES, METHODS OF LAYING OUT THE WORK.

CHAPTER I.

CONSTRUCTIVE LEATHER WORK.

(A) DESCRIPTION.

MUCH of the work that is available for school practice is entirely constructional, that is, it can be made without any applied ornament. Not that it is not ornamental in character—far from that; but its decorative character consists in its planning; in the proportions that exist between each constituent part; in the lines of the object; in the character of the thonging; in the contrast of colour, and in the beauty of the skins.

Planning.

It must ever be insisted that all objects made must be intimately related to some definite utilitarian purpose. There is a temptation always present in any art craft work to pursue ornament for the pure pleasure and joy of doing it. This has its value for the purpose of development, and I would not ignore its use in this connection; but it tends to promote the making of things which exist purely for ornament, and which serve no useful purpose whatsoever. In the making, then, of any object, we commence with the purpose for which it is to be made.

For example, a wallet is made to contain papers, notebook, diary, stamps. We commence, then, by getting the size of these and planning their relative positions. The ultimate size of the wallet in length, width, and thickness depends on this utilitarian purpose.

Patterns or Templates.

A paper or thin cardboard pattern is made first, and this enables us to form a conception of its size and shape. Patterns are made for each part in this way. They are labelled and numbered, and the number of leather parts that are needed to be cut from each pattern are marked on. Thus, "2 off" means that two pieces of leather need cutting to this pattern.

An advantage of having a pattern for each piece is that children

can form a better idea of the ultimate appearance of the object, and of how it is to be put together.

When the pattern is ready it is applied to the leather, marked round with a pencil, and the leather cut to shape with a pair of scissors or with a sharp knife. In the latter case the leather rests upon a millboard cutting pad.

The leather parts are now to be marked for punching ; the thong has to be cut ; and then the parts are thonged together. Thongs can be bought ready cut, or they can be cut by hand.

The threading of the thongs can be done in various ways. If the hole is large, say twice the width of the thong, a raffia needle can be used with the leather thong threaded through it. If the hole does not allow for this, the tapered point of the thong can be bound round with thin brass foil, thus stiffening the point. Another method is to stiffen the point with glue, paste, or dextrine. Thongs are best cut from goatskin, which is of greater strength than suedes or even sheepskin. It can be stained to the right colour.

Fixing the ends and joining the thongs present initial difficulties which are soon overcome. When all the parts have been thonged together, the object is complete, unless it needs a fastener such as a spring catch or a press stud. If the object has been done on a "natural" skin, it needs staining. This is best done before thonging, care being taken to stain the thong.

(B) MATERIALS.

Leather is a material which appears in so many forms, has been subjected to so many different treatments, is marketed for so many varying purposes ; and leather craft is so specialized, that even experts do not know, individually, much more of it than comes within the scope of their daily practice. This is not said to alarm the gentle reader unduly, but to point out that the work that can be done may vary—will vary, in fact—in different districts in one country, let alone as between different countries.

Skins.

The usual leathers that are available in our country for school practice present a wide choice, and, fortunately, a large number of firms now offer this wide choice, and in many cases give advice free, so that beginners need not fear that they will go far astray.

For work that is intended to be subject to hard wear, CALF is the best material. This can be obtained in various thicknesses, and it can be had in natural colour, or in brown, blue, black and other colours. Leather workers must, however, bear in mind that it is not always possible to get any one colour they may decide upon, because the stocks of retail dealers are subject to the immediate

demand, and they have usually to order a parcel of a dozen skins of the same kind from a wholesaler, and this is not a business proposition unless their sale is assured.

COWHIDE is thicker and tougher, and is used for work which will have exceptionally hard wear.

SHEEPSKIN is used for many purposes, and especially as a substitute for calf where it is felt that calf is too expensive. It is obtainable in natural colour—and in many shades of colour. It is dressed for many purposes, and can be quite stiff or soft, or of a medium stiffness. It is often called “Basil.”

It can be obtained with the surface “grained” in many ways, and is used for imitations of crocodile, rhinoceros, and other skins. A question here arises as to whether it is advisable to resort to imitations; let the reader think this out, and he will, I think, come to the conclusion that imitations are not nice—and, in fact, are not necessary—being the result of a vitiated, or, at least, an artificial, taste. Leather is a beautiful material in its natural state; its “feel,” and its appearance are soft and pleasing; and the addition of artificial “graining” is suggestive of the folly of “gilding the lily.”

SUEDES are obtainable in many colours, and form the chief variety of leather suitable for school work.

They are sold in first and second qualities, and there is need for some discrimination in buying them. Reputable firms can be relied upon to supply the quality ordered. Suedes of first quality are well finished on both sides, so that each side can be used; but the soft velvety finish of the suede side makes it pre-eminently the side to be used, as the principal side.

VELVET PERSIAN skins are delightful skins for the best constructional work. They are strong, elastic, velvety, with a good pile, and make up well.

VELVET SHEEP skins are stronger than the Persians, but are not quite so uniform as regards colour and pile; being thicker, they are suitable for larger articles which have to endure much wear.

WILLOW CALF. This is a waterproof, and extremely durable, leather. It is usually brown in colour.

SKIVERS. These are skins that are cut, or “skived,” from thicker skins. They are used for linings, and can be obtained in various thicknesses, colours, and grains.

SPLIT SUEDES. These are split skins, and are finished suede on both sides. The pile, however, is rougher than the usual suede, and this leather does not make such beautifully finished goods as the usual suede. But it is strong, durable and good, and works up into very good articles. For school purposes it has the advantage

of being cheap. Very often it can be had in "scraps." These are cheaper still, and are useful for smaller articles.

Thongs.

These are sometimes known as "Laces." In many cases they are cut from the piece of leather from which the article is being made. Sometimes, however, this, especially in thin suedes, is not strong enough. It is then better to use thin calf or goatskin in natural colour, and stain it after the thongs are cut.

The thongs in a large skin are as well cut quite straight, i.e. along the length of the skin. A more economical way, which uses up small pieces, is to cut them in circular fashion from smaller circular or elliptical pieces.

For school work which has *development* as its basis, it is better to cut the thongs by hand, and from smaller pieces.

Thongs can be cut by means of thong cutters. These are of various kinds, and are obtainable at Art Leather Stores. It is not a difficult matter to evolve a good thong cutter, adjustable for cutting thongs of varying width.

Press Studs.

These are used as fasteners for purses, bags, and cases. Each one is in four parts. The holes for them are made by the leather punch, and they are fixed up by means of press-stud punches.

Spring Catches.

These are obtainable at Art Leather Stores, and are quite easily fixed. Usually two fine pins, riveted, are used to fix them to the leather.

Eyelets.

These are useful on occasion to fix leathers together. Holes are made by the leather punch, the eyelet slipped through, and the best way is for the eyelet to be fastened with a spring eyelet punch. These, however, are rather expensive, and for school work a cheaper apparatus is necessary. No substitute will, however, fix the eyelets as neatly as the spring punch.

A good method of substitution is to use a wide centre punch to spread out the eyelet shank, and then to flatten these split ends on a metal block with a hammer. For those who have a lathe and can turn metal, a punch with an end section as shown will find that this will turn the shank end over in a neat edge (*see* Fig. 7, page 11).

Bag Frames.

These can be obtained in celluloid, tortoise-shell, steel, nickel plate, silver, pewter from Art Leather Stores and Drapers. The metal frames can also be made by art workers.

Ruskin Stones and Glass Jewels.

These are sometimes used to ornament leather goods, but they should be used with considerable discretion and restraint. They can be obtained also at the Art Dealer's Stores. They are obtainable in all shapes and colours and sizes, within the reasonable limits of the material.

Fixatives.

Thong ends have to be fixed ; linings are often pasted on ; stones and jewels need fixing, and there are other odd occasions when adhesives are needed. There are on the market well-known kinds of adhesives, such as Seccotine, Le Page's glue, Dextrine, Higgins' vegetable glue, Perfecta, L. A. P., some cold water pastes such as Rex, Stekko, and the like, that are really good.

Croid, Gluak, Quikfix are good cold glues.

For school use it is well to make one's own, and L. A. P. and Perfecta are good powders for hot water pastes ; whilst Rex and Stekko are both very good cold water pastes.

But the usual flour paste (with alum, and a little oil of cloves for keeping purposes) is quite good, if made fairly thick.

Stains and other Colours.

The natural leathers are quite good to use in their natural state ; but often stains can be used with great effect, especially in small patches of colour that stand out well against the background of natural colour.

The stains are generally obtainable in powder form, soluble in either water or spirit. The latter is the more convenient form in which to use them, as they dry quickly without going through the leather, and there is less opportunity for them to spread.

Art leather dealers now make up packets of ten or twelve stains in powder form, which first need the addition of three or four table-spoonfuls of methylated spirit to dissolve them into a strong solution, which can be diluted as needed. The best method to adopt is to take as many six- or eight-ounce glass bottles as are needed, and make up all the stains at once. It is cleaner, and if the bottles are well corked, little evaporation of spirit will take place.

These stains can be mixed to obtain any desired shade.

WATER STAINS can be had ready mixed, which is the better way of obtaining them. They can also be had in powder form for dissolving in either cold or hot water.

WATER COLOURS can be used, and as schools often have these in tubes, recourse to them, on occasion, may be had ; but it is well to say that stains are better if they can possibly be obtained.

OIL COLOURS are used to produce soft effects, and thinned with turpentine are quite good.

CONSTRUCTIVE LEATHER WORK.

STENCIL COLOURS in oil and water are necessary, and may be had from the Art dealers.

Gold, silver, bronze, and other powders are sometimes used ; but again, one should be warned against the attempt to "gild the lily."

Polishes.

Wax polishes are good for leather, and combined with "elbow grease" will produce good effects. Ronuk and similar polishes are good.

Glair is a grain filler and may, on occasion, be used before polishing. A paste wash (i.e. ordinary paste thinned down) is used to fill the grain also.

Sometimes a very high polish may be required (although this is usually foreign to the spirit of leather work) and bookbinders' varnish (which is a kind of French polish) is then used.

Needless to say, stains and polishes are reserved for the natural skins, and the suedes, if ornamented at all, will need only the stencil colours.

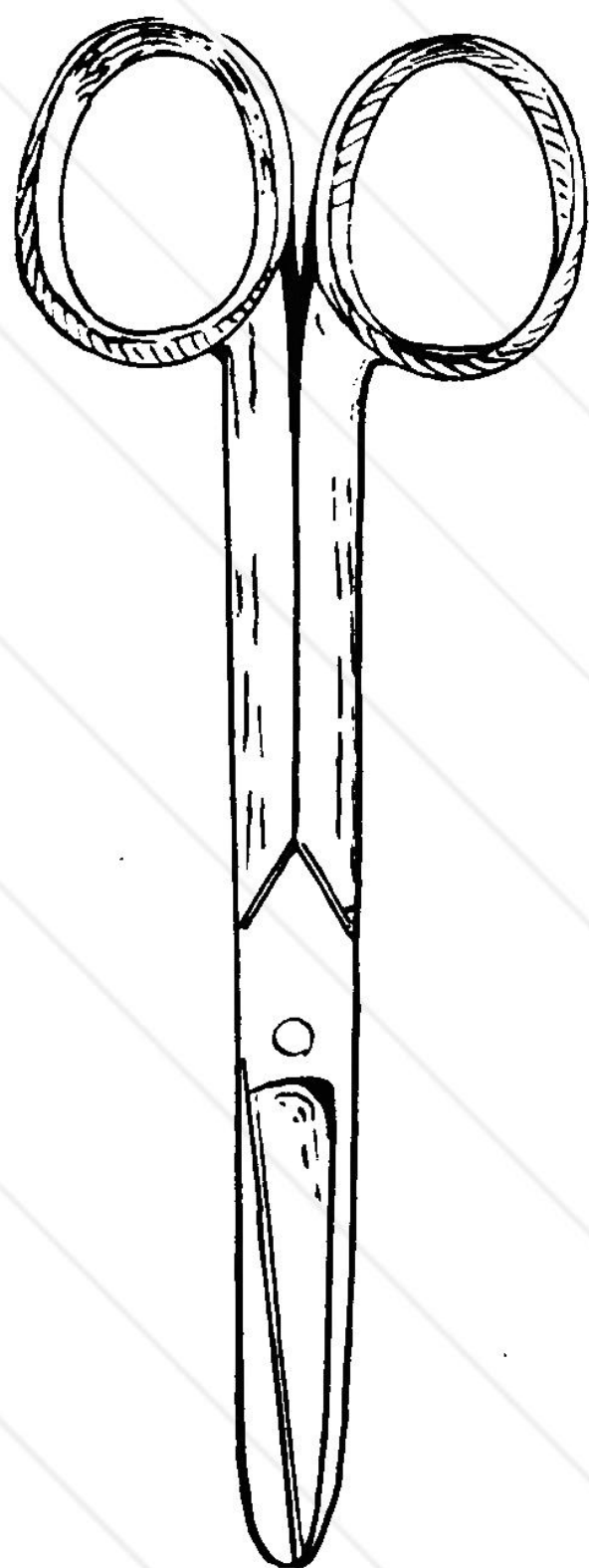


FIG.1. SCISSORS

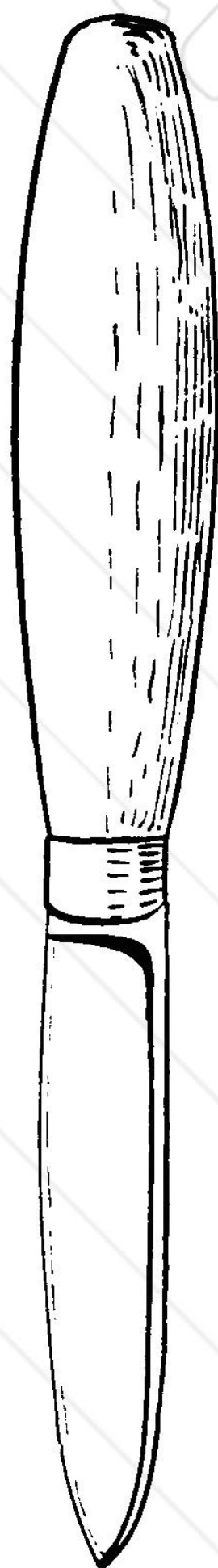


FIG.2. KNIFE



FIG. 6 ,
SADDLERS
PUNCH

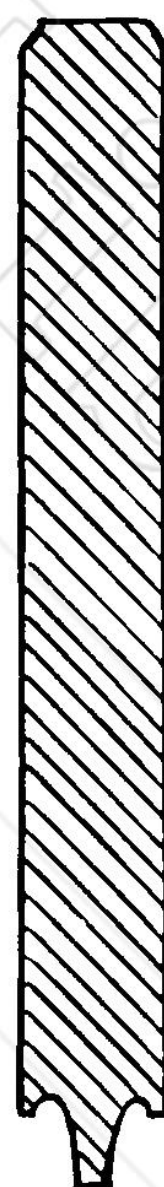


FIG. 7
EYELET PUNCH
IN SECTION

(C) TOOLS.

Not many tools are needed for the purely constructional work. These are they—

- (1) A pair of scissors of medium size. (Fig. 1.)
- (2) A strong knife, preferably with a fixed blade. (Fig. 2.)
- (3) A "rap-stick," i.e. a piece of wood having a strip of emery cloth on one side, and a strip of leather on the other, for keeping the knife sharp. (Fig. 3.)
- (4) A 6-way leather punch. (Fig. 4.)
- (5) A single leather punch. (Fig. 5.)



FIG. 3. RAP STICK.

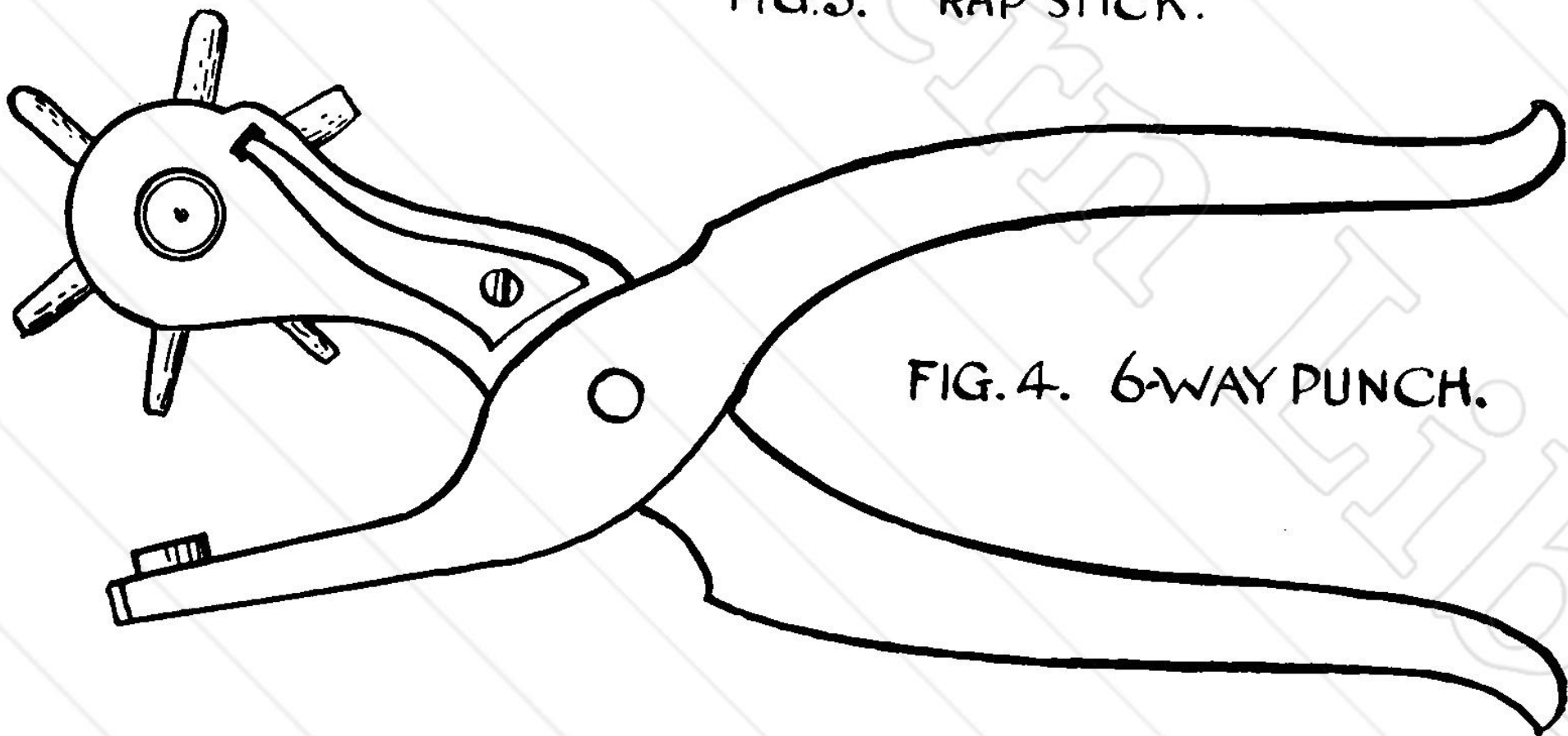


FIG. 4. 6-WAY PUNCH.

- (6) A saddler's punch. (Fig. 6.)
- (7) A punch for eyelets. (Fig. 7.)
- (8) A set of press stud punches.
- (9) Two stencil brushes, Nos. 4 and 6. (Fig. 8.)
- (10) A millboard pad for cutting stencil plates on.
- (11) A raffia needle.
- (12) A small mallet. (Fig. 9.)
- (13) A small hammer. (Fig. 10.)
- (14) A small block of iron or lead to act as an anvil during punching of press studs or eyelets.
- (15) A brass 12-in. rule.

There may be other tools added from time to time as the need arises. Indeed, many of the above are not needed at first, and

can be added as progress is made. Such things as edge tools (Fig. 11), shavers (Fig. 12), brass punch handles to take various sized punches for single punching with a hammer (Fig. 13), and a stitching punch (Fig. 14) are some of the tools that may be added later.

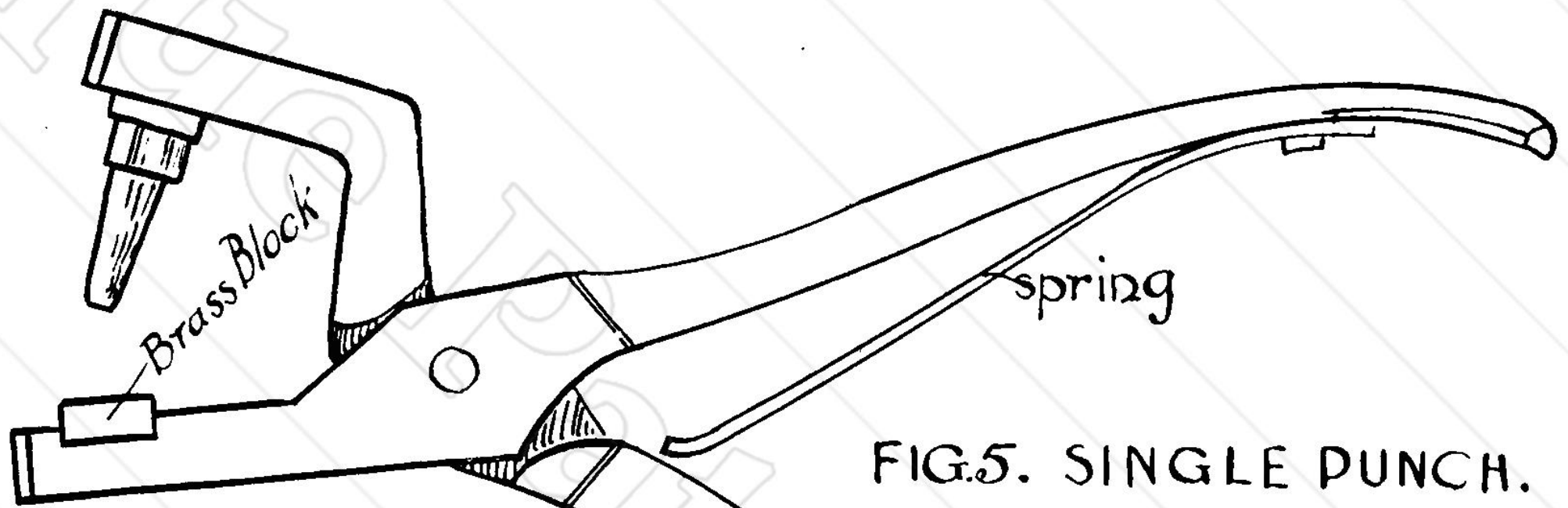


FIG.5. SINGLE PUNCH.



FIG.8. STENCIL
BRUSH

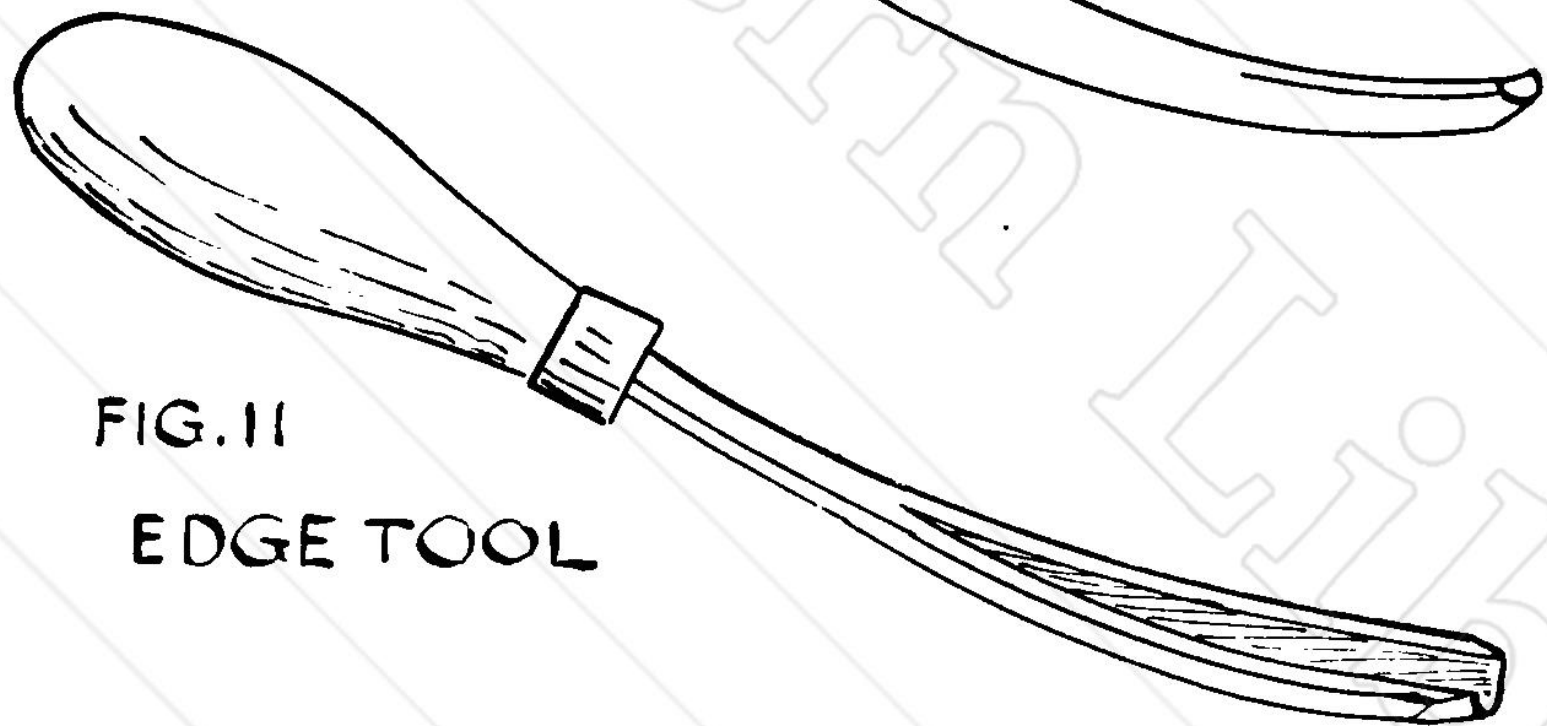


FIG.11
EDGE TOOL

To commence the work, Nos. 1-4, 8-13, 14 and 15 of those mentioned are what are quite necessary; the others can be added from time to time.

The stain is generally put on with a sponge, and water colour brushes; and the wax polish with a cloth.

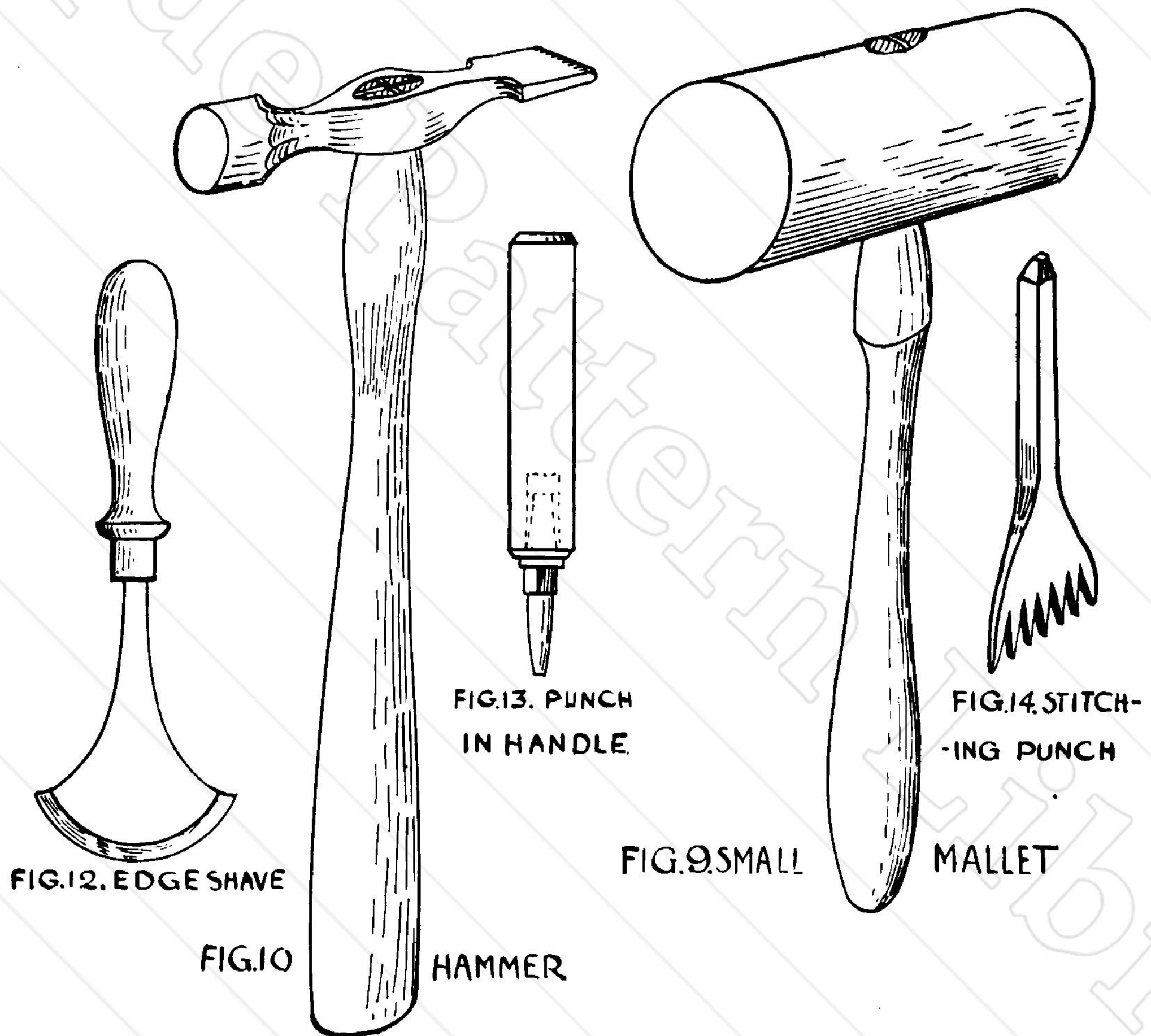
For pierced work about three carving tools will be found useful to get a vertical cut, although a sharp knife is sufficient. The tools do the work more quickly and perhaps leave a cleaner edge.

1. Plain Thonging.

A Marketing Bag. (Fig. 15.)

Materials Used.

Brown glazed sheep, or tan willow calf, or split suede (any colour).



(D) THE DESCRIPTION OF THE TOOL OPERATIONS AND TECHNICAL PROCESSES INVOLVED IN THE EXECUTION OF SPECIFIC EXAMPLES OF VARIOUS FORMS OF CONSTRUCTIONAL LEATHER CRAFT.

Tools Needed.

Scissors, rule, leather punch.

First Step. On cartridge paper, or stiff brown paper, draw out the shape of each part of the bag. In this case there will be four pieces; one to form the body of the bag, and three to form the two sides and bottom.

Fig. 16 shows these shapes, or "templates," to scale, with

the setting out for the holes for thonging. Cut these out to shape.

For school purposes it is necessary that the sizes and shapes of parts should be discussed with the pupils and their opinion invited with reference to the suitability of various shapes and sizes for the work.

Second Step. Take the skin and search it for defects; there

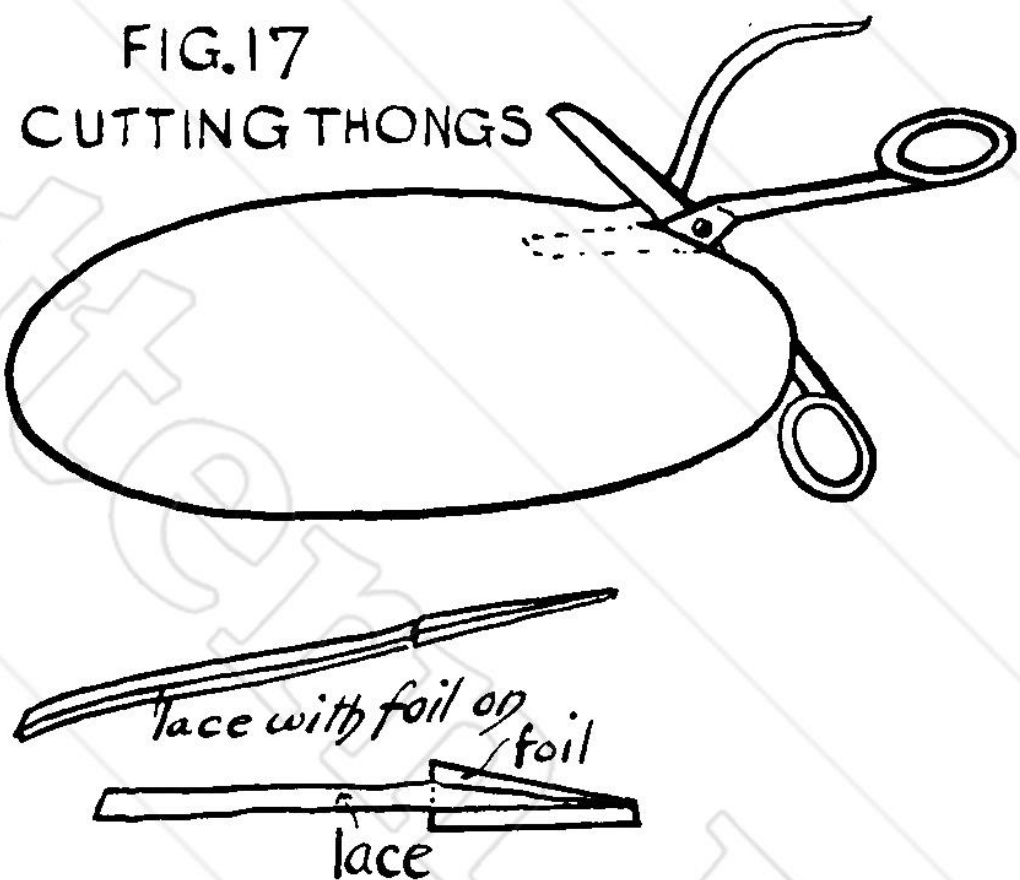
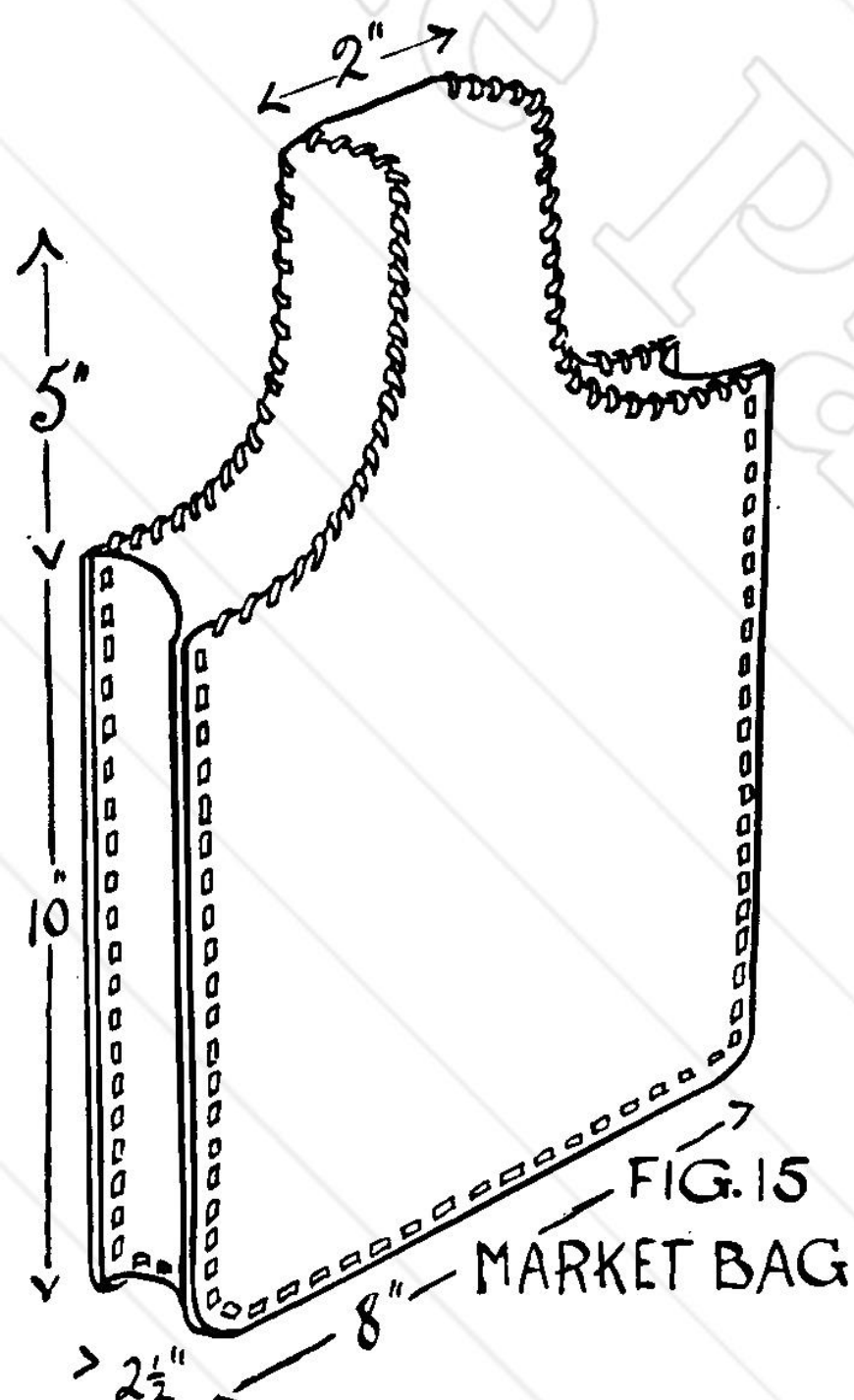


FIG. 18. BRASS FOIL ON LACE

will be holes and thin places; rough and weak places; sudden changes in colour. Hold the skin up to the light in your search for defects.

Then lay the paper patterns or templates on the leather (on the back preferably) and mark round with a sharp pencil. The paper patterns can be stiffened with French polish or "knotting" if thought desirable. Cut out exactly on the line with a pair of scissors. Scissors are more manageable for young pupils than a knife, but some of the reliable older pupils may be allowed to try the latter. If it is intended that a knife should be used, it is better to have thick templates so that the knife can be taken round the edges direct.

Third Step. As experience is gained, punching the holes may be done without previously marking them. Until then it is better to mark the leather for the holes.

The usual method is to mark a line round the leather $\frac{3}{16}$ in. away

from the edge. On this prick out the holes $\frac{1}{4}$ in. apart. These points represent the centre of the hole. It is better to mark these holes on the face side of the leather. Now punch the holes. Sometimes the punch does not cut quite a clean hole. There are two remedies. The first is to place a waste piece of leather under the piece you are punching; the second is to rub down with an oil stone slip the edge of the punch, to get it level. This is the better method. Where two pieces of leather are to be thonged together there are several methods of making the holes coincide. One method is to punch one piece separately; then lay it down over the other and mark through the holes with a pencil, and punch this now marked second piece. A second method is to rely entirely upon the accuracy of the original marking of each piece.

A third method is to fix the two pieces together with paper

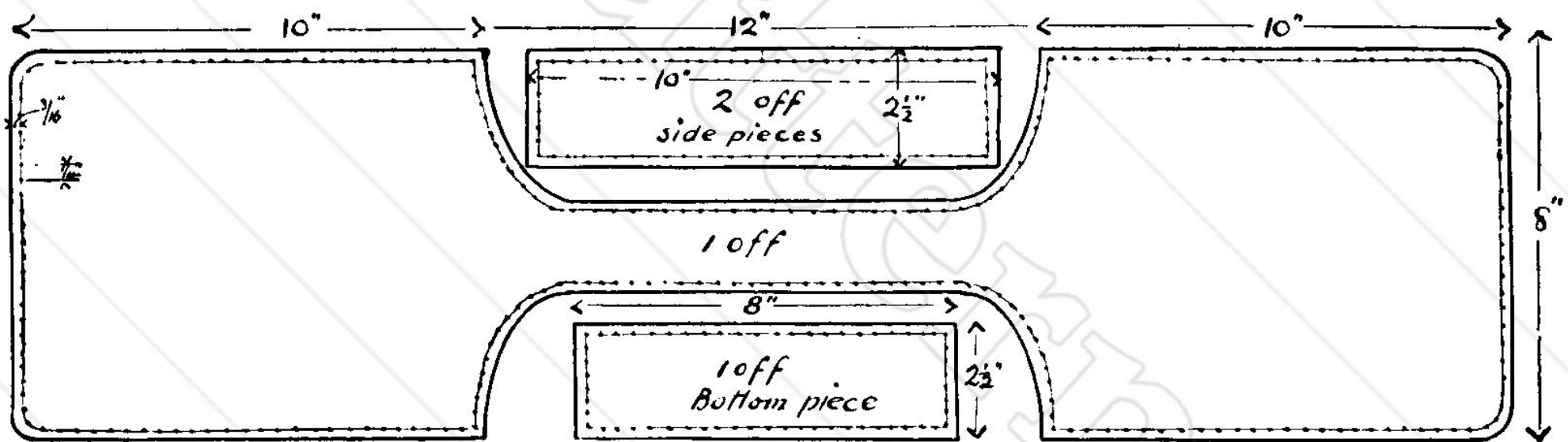


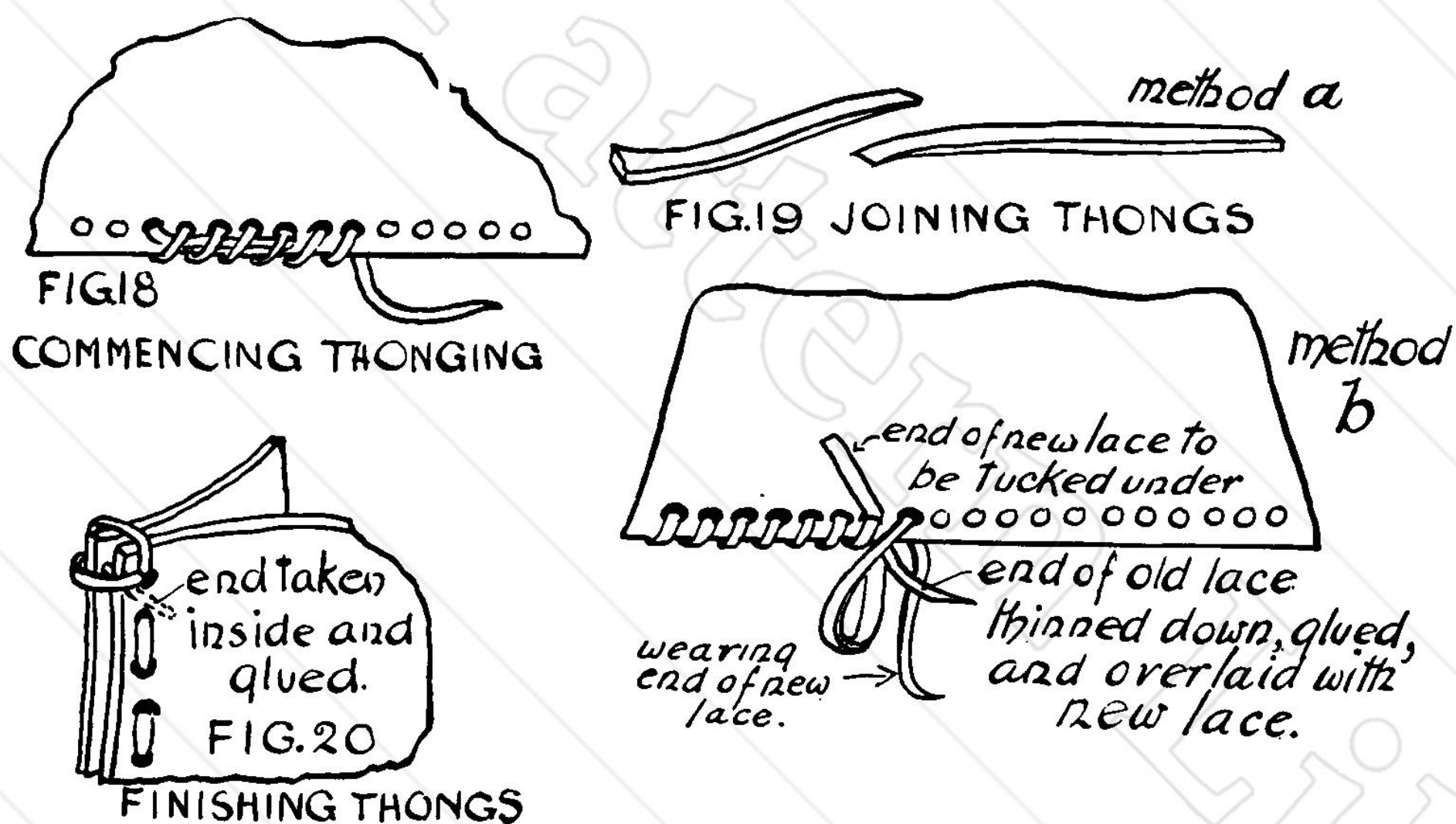
FIG. 16. TEMPLATES OF PARTS OF MARKET BAG

clips or "bulldog" grips, and punch both at one time. A fourth method is to paste the two pieces together temporarily, and punch them at one operation. It is not much use trying to punch two at once unless they are, in some way, fixed together, because of the tendency to "creep" that is shown by the leathers.

It must be insisted that care shall be taken to be accurate in the matter of holes, because otherwise the work will not lie straight and square; one part will pull another part into ripples, and the work will twist, or in other ways not look nice. The edges of the handle will need thonging. This is for strength as well as ornament—and constitutes a real case where the ornament arises purely from a constructional need. As regards the size of the hole, No. 3 from the smallest punch would be good to start with.

Fourth Step. The pieces now need thonging. The thongs can be obtained, ready cut. They are certainly more uniform obtained in this way, as they are machine cut. But it is good training to practise cutting one's own: it is a real method of development of skill, steadiness, and judgment. Two methods of cutting may be employed. One is to take a skin and reserve it entirely for thongs. In this case long, straight thongs can be cut. Another method is to cut small circular or elliptical pieces from the same skin as the bag is being made from, and cut around the circumference

as in Fig. 17. Avoid sharp bends; it may sometimes be necessary to cut off any which may appear, so that the thong may be without awkward lumps and kinks. Keep the thong of uniform width; this is all important, and, it may be said, somewhat difficult. Keep the scissors well sharpened. The width of the thong must be a matter of taste eventually; but a width of $\frac{1}{8}$ in. may be suggested as suitable to commence with. Each thong should have an end pointed. Sometimes the point seems weak; then it can be strengthened by a piece of brass foil gathered round it as shown in Fig. 18, page 15. It also may be strengthened with glue or paste, which, when dry, will harden out quite stiffly.



It will be found that a narrow thong threaded through a wide hole will look well. In such a case the thong can be threaded through a raffia needle, and this will make the work of thonging much easier.

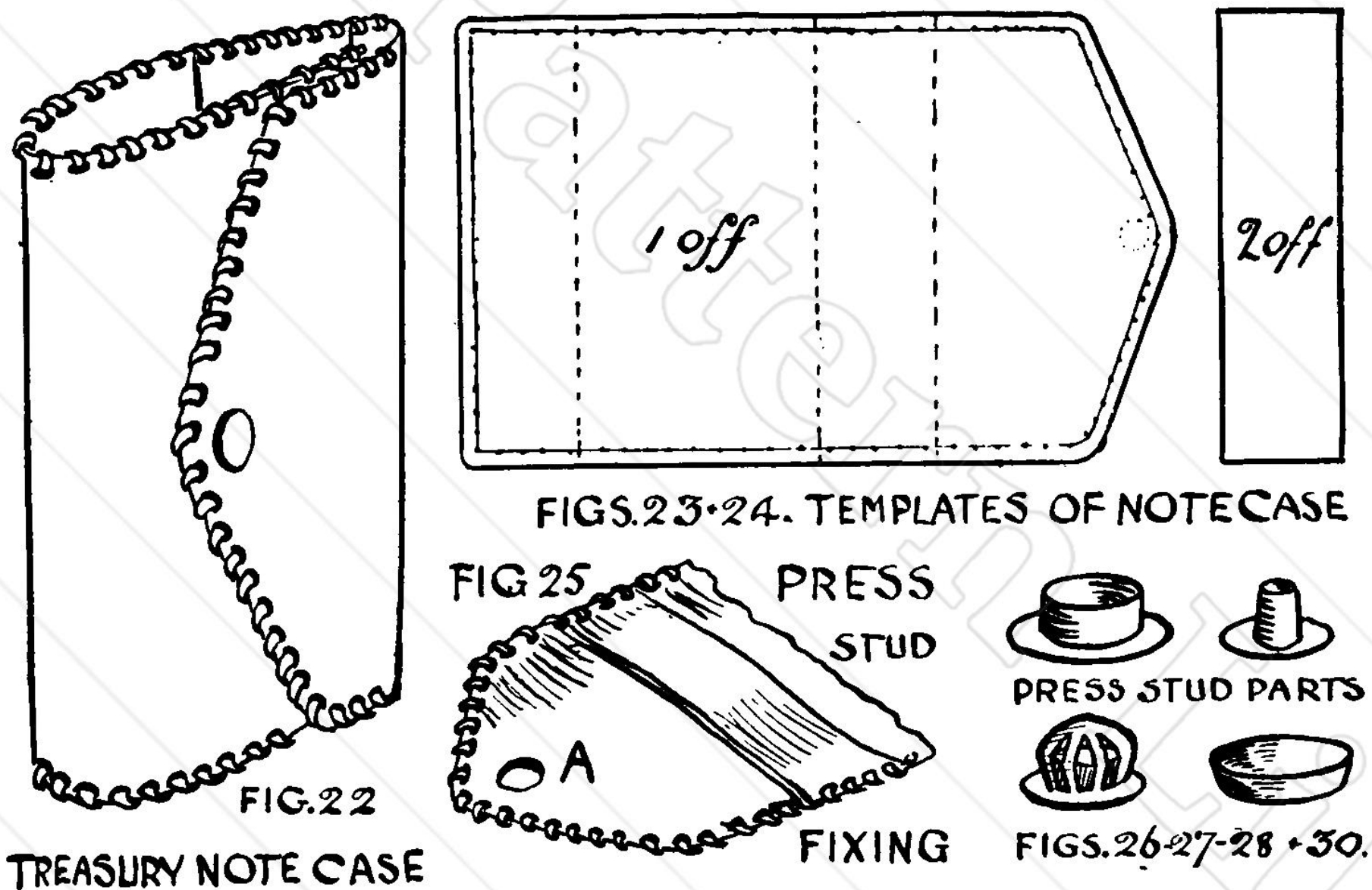
Starting a thong, joining, and finishing it are the most difficult problems that present themselves, and not one is difficult. Fig. 18 shows the commencement, Fig. 19 a method of joining, and Fig. 20 a method of finishing. Ends should be left until the thonging is completed, unless any end is going to be tucked under, or bound over by subsequent stitches. They can then be tucked under and glued, or they can be simply glued down. A very small drop is sufficient—too much hardens the leather and often makes a mess.

The kind of stitch will vary. In this case an "in and out" stitch is used (*see* page 19 for a variety of stitches). Stitches should be firm, without being pulled too tightly. There should be no looseness. At terminals it is often advisable that a double stitch should be made to strengthen a place where greater strain may

occur. The handle is better with an oversewn stitch, giving greater strength. Although it means a lot of threading through the holes, yet it is better to have a thong the full length to avoid joins, if it can be obtained. An in and out stitch gives the least length required of any stitch, and its length can more easily be calculated.

Fifth Step. The finishing is the next stage. In this case the only operation needed is to give the exterior of the bag a good polishing with a wax polish.

If the back of the skin is rough it may be treated, before thonging, with an application of paste wash; this, when dry, is lightly glass-papered, and this process gives a face to the skin.



2. Press Stud Fixing.

A Treasury Note-case.

Materials Used.

Split suede (any colour), 1 press stud (colour to match).

Tools Used.

Scissors, leather punch, rule, press stud punch, hammer.

This is a simple case that will slip into one's waistcoat pocket.

Fig. 22.

First Step. Draw and cut out the template as already described (page 6). (Figs. 23-24.)

Second Step. Apply it to the leather, after having searched the skin for defects, mark round it, and cut out.

Third Step. Punch the holes (see page 15).

Fourth Step. Cut the thongs and thong the pieces together.

An oversewn stitch is used, and it is taken right round to stiffen the whole, and to give a better decorative effect.

Fifth Step. Fix the press stud. Take the leather punch, using the largest punch, and make a hole at A, Fig. 25, large enough to admit Part I of the press stud (Fig. 26). If the punch does not make a hole large enough, nibble round the edge with the punch until it is of right size. Push Part I through from the front. Fold the flap over until it is in the right position, and mark where the hole should be for Part III of the press stud (Fig. 27). This will need a smaller punch hole. Push Part III through from inside the case. Now lay the flap (inside downwards) on the metal block, and place

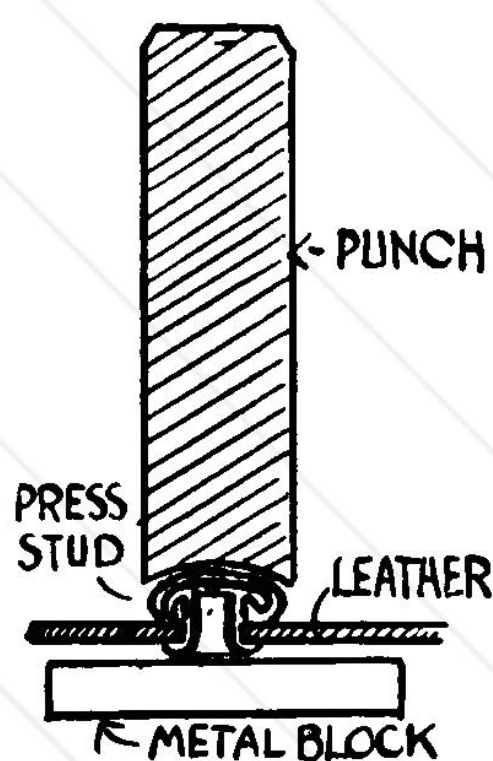


FIG. 29. FIX-
ING TOP PART
OF PRESS STUD

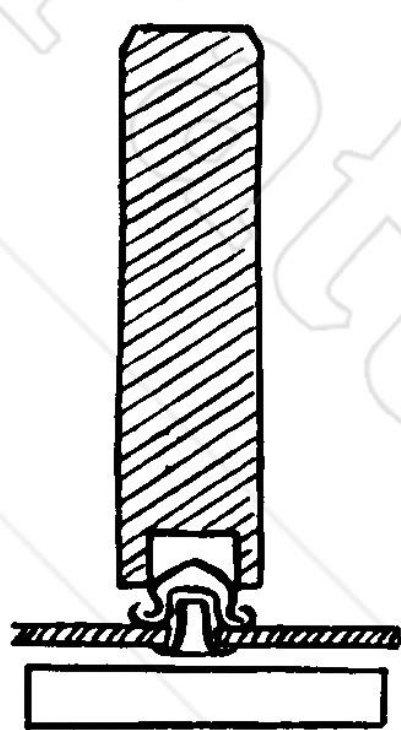


FIG. 31. FIXING
UNDER PART
OF PRESS STUD

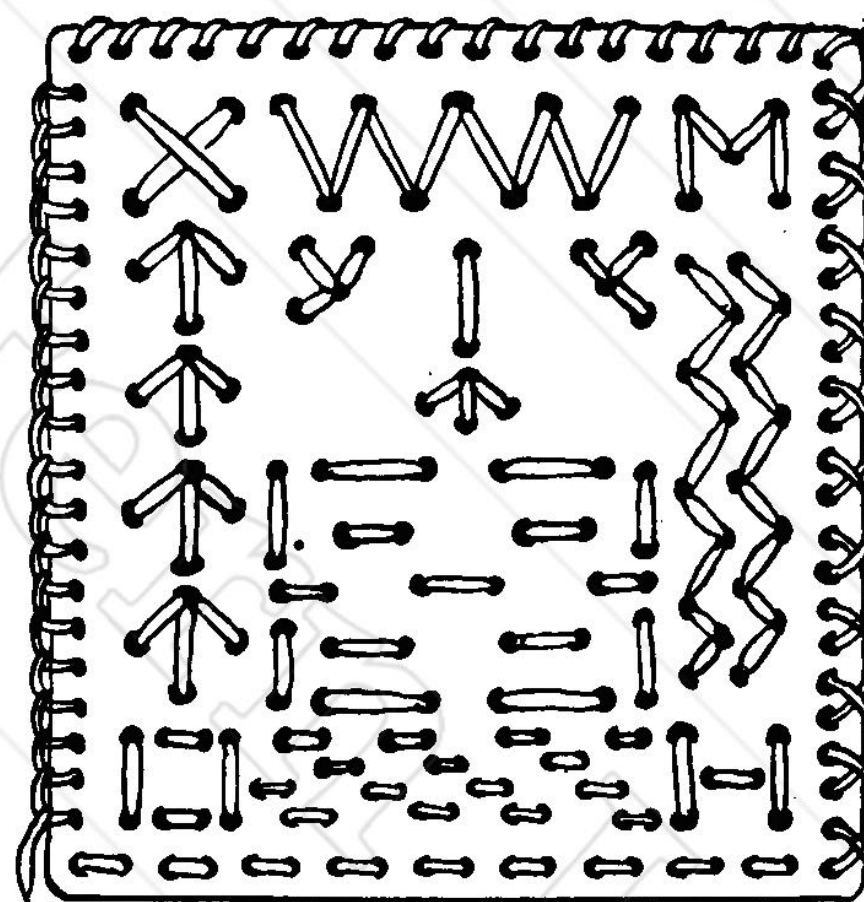


FIG. 32. SAMPLER OF STITCHES.

Part II (Fig. 28) (the part having the celluloid front) on Part I Fig. 29 gives a section which shows how it will now appear, together with the punch used to push it home. Now hammer the punch gently until it drives Part II on to Part I. Take Part IV (Fig. 30) and place it on Part III, and with the appropriate punch gently drive it home (Fig. 31). Part IV can be made narrower by pressing on its sides with a pair of pliers, or wider by gently tapping it on the head.

Sixth Step. Rub with the wax polish.

A Sampler of Stitches.

This is given at this point, because it is well to know for future work what stitches can be used; and in all probability the worker can add to the number by inventing further stitches.

Some stitches are needed for edges, and some for across the body of the work. The application of most of these stitches will be seen in various ways through the book. Always try to give a decorative effect in arranging these stitches. It is not necessary to strain

after effect ; but so long as the strength of any stitch is not interfered with, it is well to use it in a decorative way. Fig. 32 gives the illustration of stitches that are possible.

4. The Use of Eyelets.

The use of eyelets is a great help at times, and this example is given to show how they can be used, and how to fix them.

A Three-pocket Purse. (Fig. 33.)

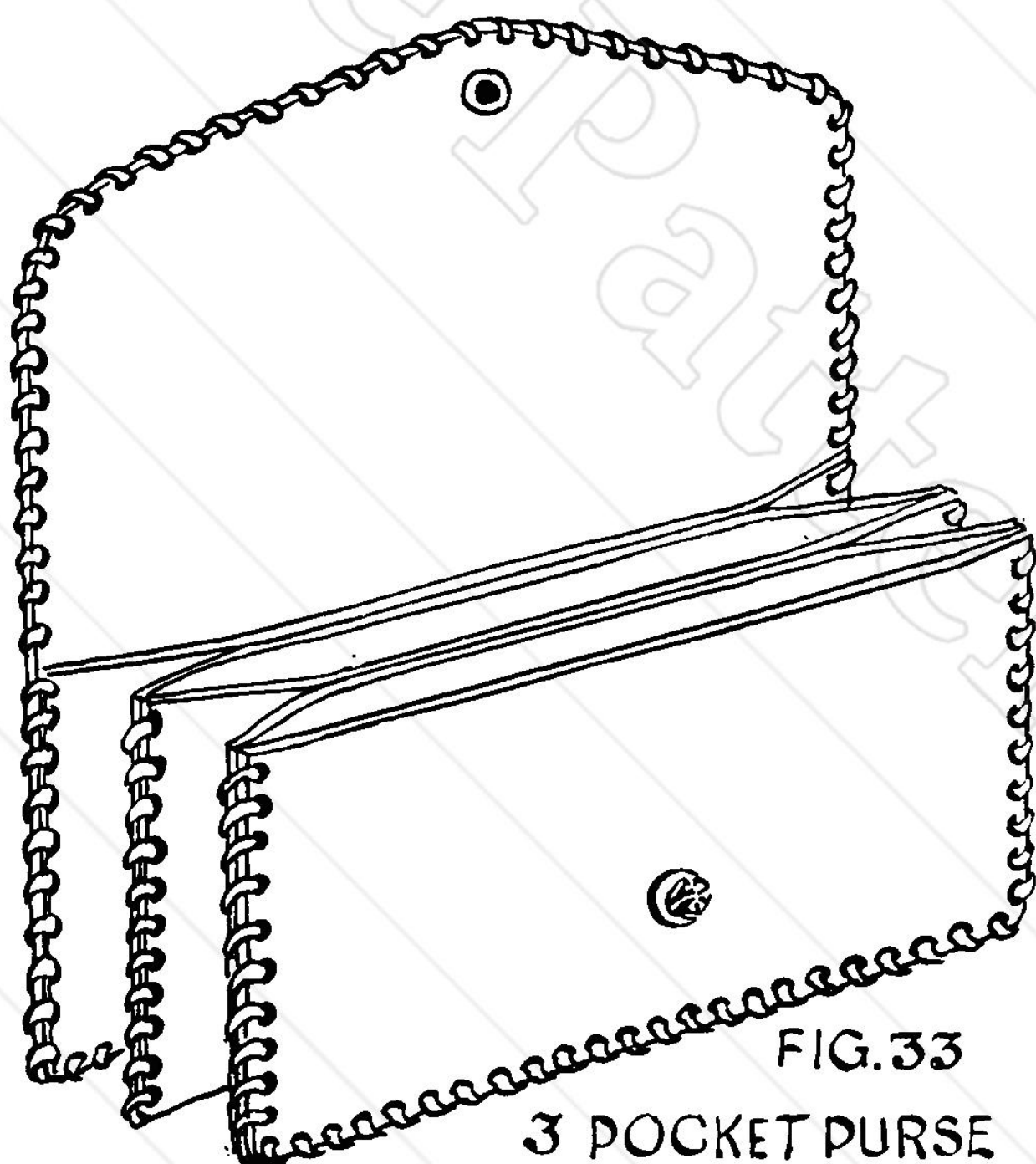


FIG. 33
3 POCKET PURSE

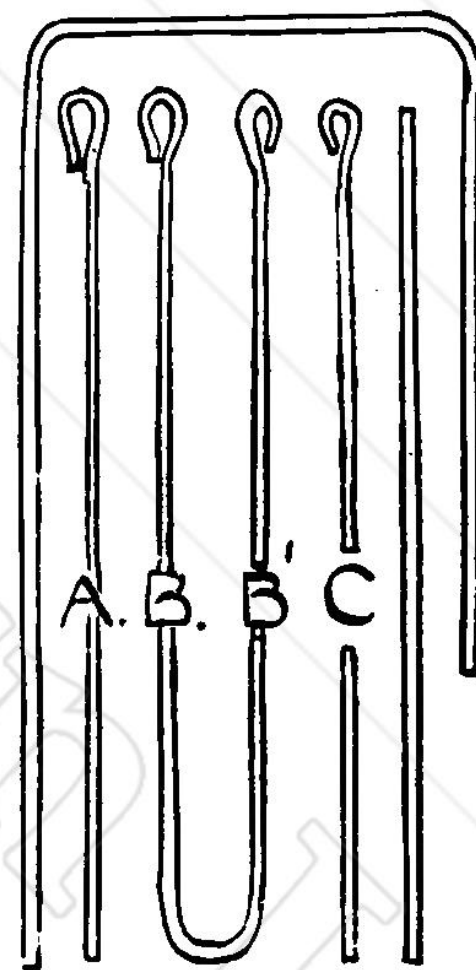


FIG. 38. DIAGRAM-
MATIC END SECTION
OF 3 POCKET PURSE

Materials Used.

Brown calf of medium thickness for the outside, brown calf (thin) or brown glazed sheep for the interior, 8 brown eyelets, 1 press stud.

Tools Needed.

One rule, scissors, leather punch, press stud punch, eyelet punch, hammer.

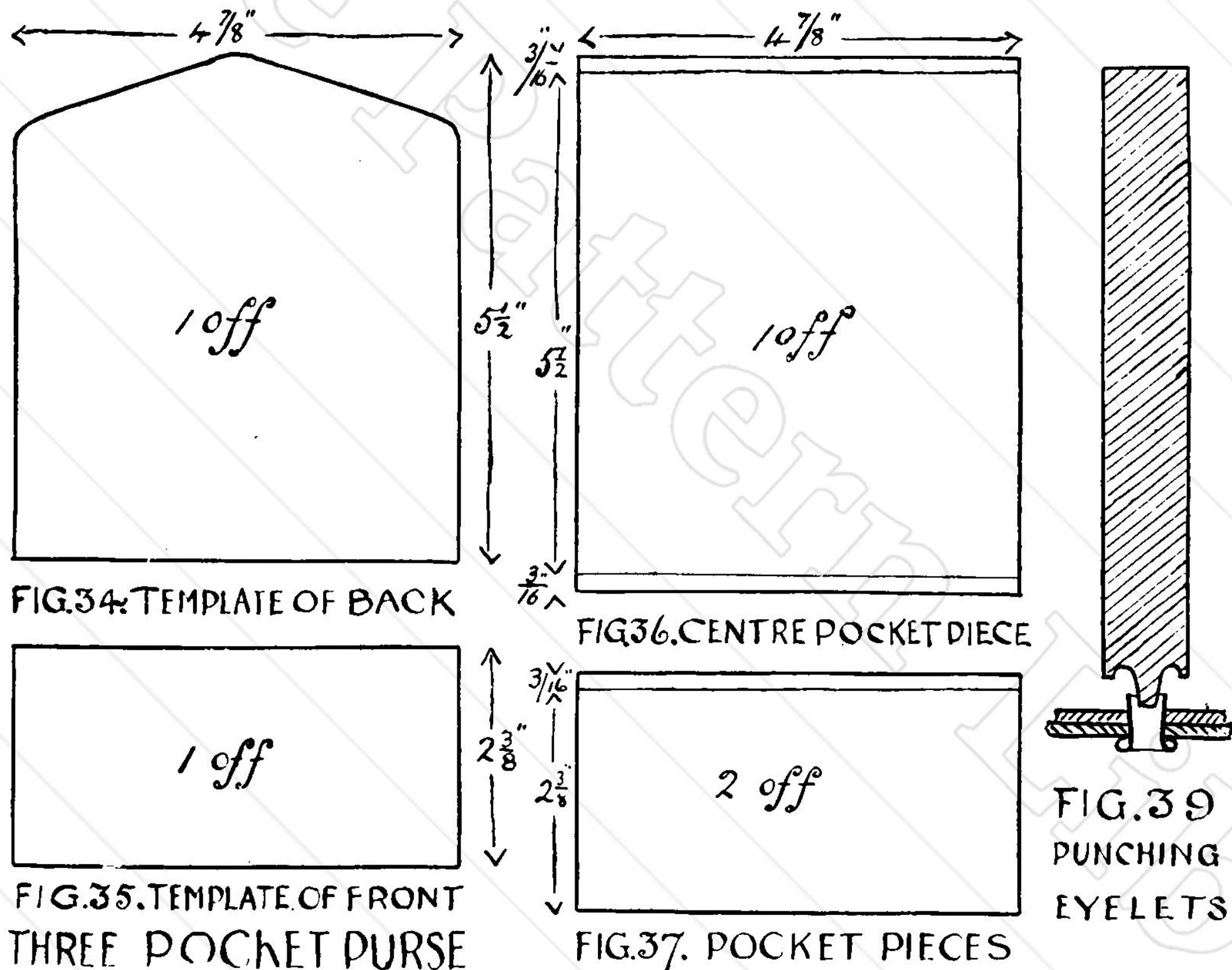
First Step. Draw and cut out a template for each piece. There will be four needed: one for the outside piece, one for the front piece, one for the centre piece, and one for the two other pieces. See Fig. 37, and compare with the end section in Fig. 38.

The interior pieces are arranged to have a doubled over-edge for strength and neatness. The centre interior piece is arranged to be doubled so that it will not be thonged on its lower edge.

Second Step. Examine the skin for defects, mark from templates, and cut out with scissors.

Third Step. Mark for thong holes and punch the holes. Some people may care to sew the centre interior on its ends, but there is no reason why it should not be thonged. The whole of the edge of the outside piece, and the top edge of the front piece, are to be thonged.

Fourth Step. Cut the thongs. They may be cut from the same material, or they could be cut to make a contrasting edge from



another colour. Arrange to start where the top edge of the smaller pieces joins the outer piece, and estimate the length of the thong to be long enough to carry you completely round the edge of one piece.

Fifth Step. The interior pieces should have their top edges shaved thin, and then bent over and glued as shown in Fig. 38. Now the eyelets should be used to fix together pieces A, B, B' and C. Mark the exact positions and punch the holes in each piece. It is well to mark one piece from another to make sure that the holes coincide. Push the eyelets through, and, using the metal block and the eyelet punch (Fig. 7), close up the shank end of the eyelet (see Fig. 39). The oblong space enclosed by the eyelets may be glued for extra strength. An alternative to eyelets in a case like this is to thong the pieces together or to stitch them. In

my opinion, eyelets give much the better method because they fix the pieces more tightly together, and they are quite neat in appearance. The next thing to do is to prepare the back of the leather, if it appears to be rough. It should be coated with the paste wash and then, when dry, glass-papered with fine glass paper. If you think it necessary, you can stain it now and polish it.

Sixth Step. Thong the parts together.

Seventh Step. Fix the press stud.

Eighth Step. Polish the exterior

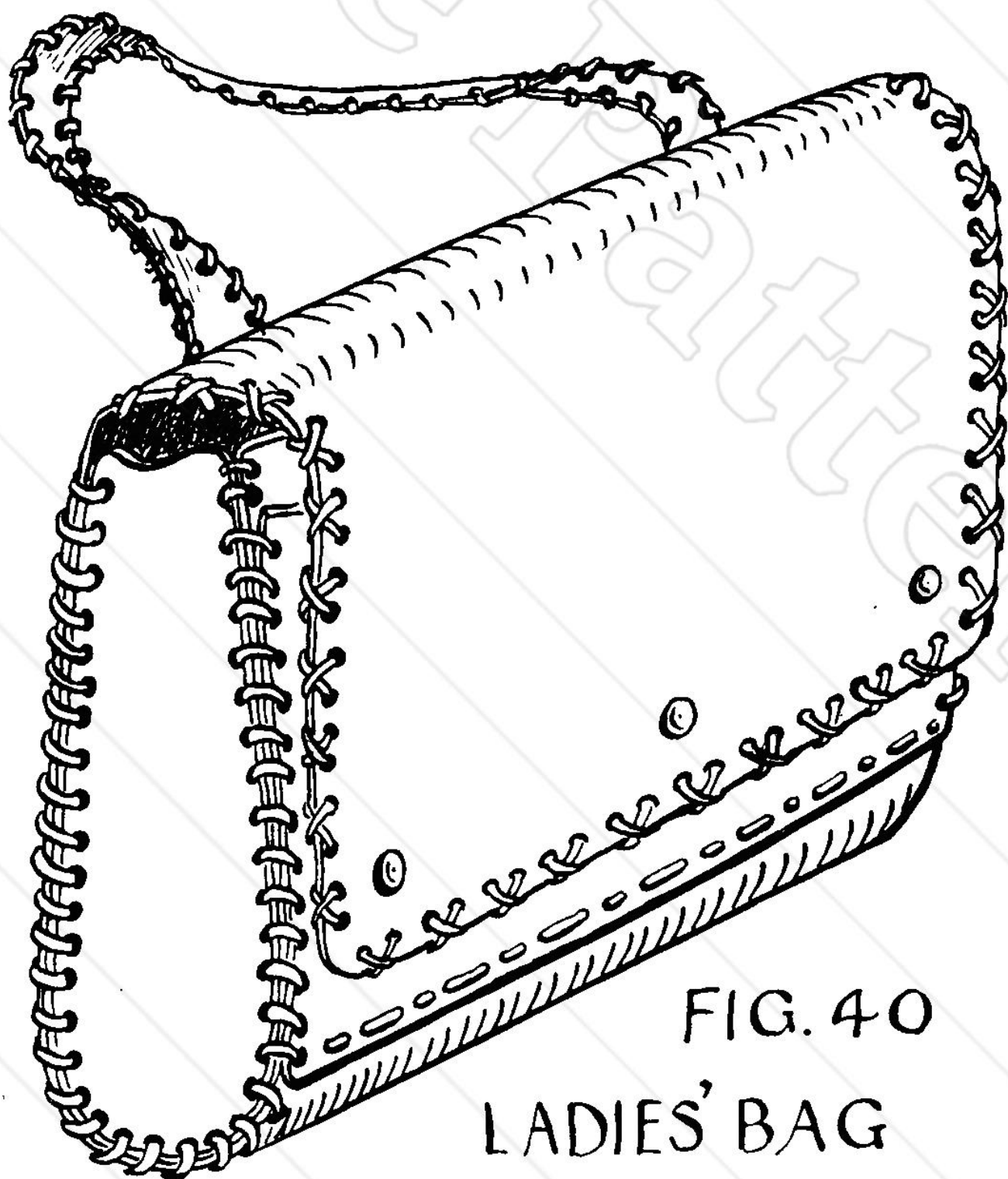
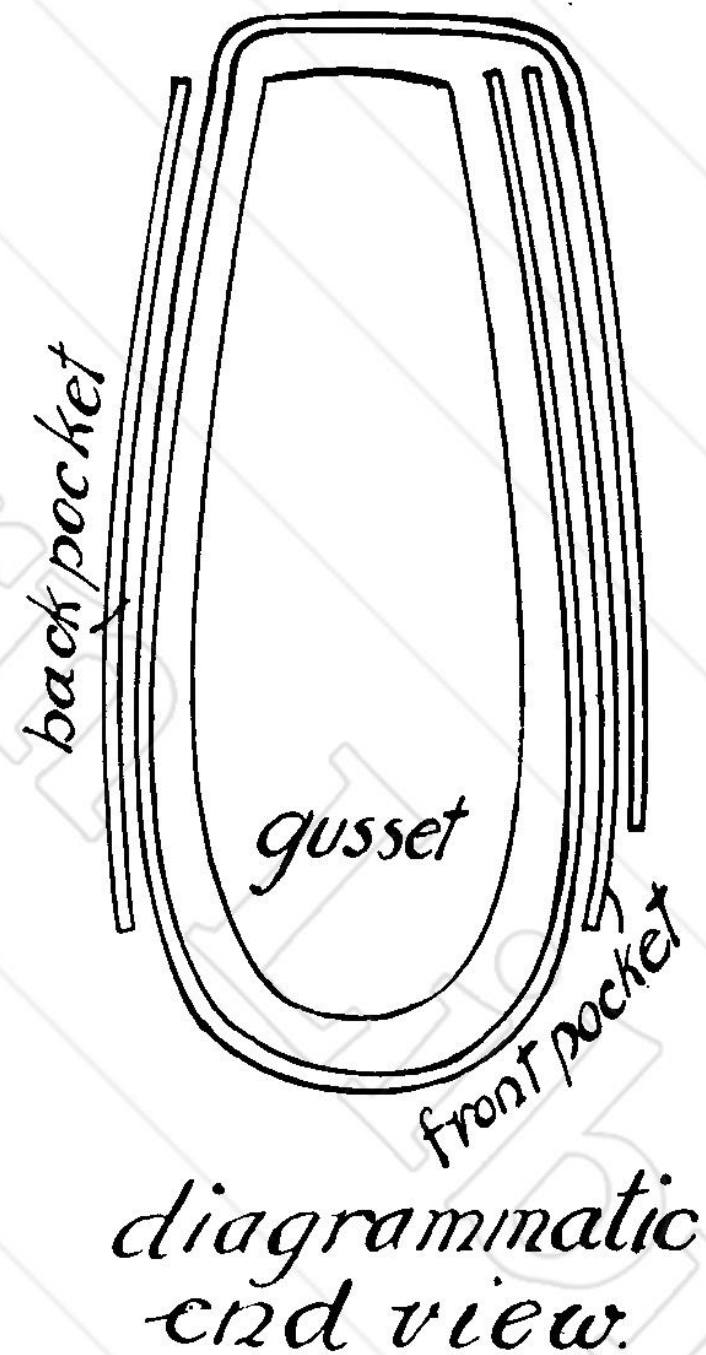


FIG. 40
LADIES' BAG
WITH 2 OUTSIDE POCKETS



5. Linings.

A Lady's Bag. (Fig. 40.)

Materials Used.

Natural calf (medium thickness), brown skiver for lining, 2 press studs.

Tools Needed.

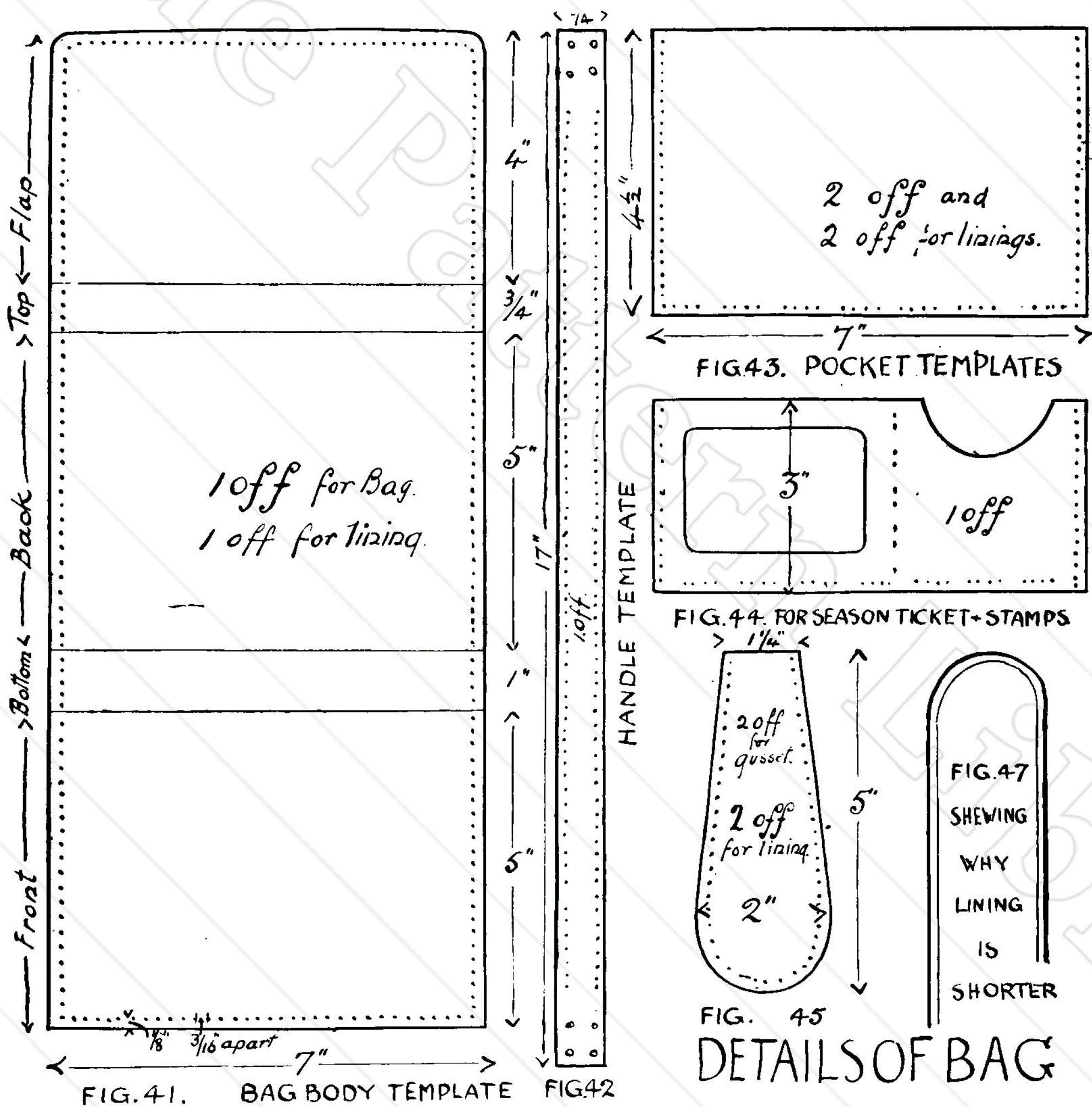
Rule, scissors, leather punch, press stud punch, hammer.

First Step. Draw and cut out the templates needed for the various parts of the bag.

Second Step Examine the skins and look for defects which,

when found, mark. Lay the templates on the skins, mark round them, and then cut out.

In using the templates, note carefully that the templates for the pieces which need the lining can be used for the linings also—with this exception—that the outside, and largest piece should, for the lining, be used as if it were $\frac{1}{8}$ in. shorter than it is; because allowance must be made for the bend; for, to use a racing term, the



lining takes the inside course. A reference to Fig. 47 will clearly show that the lining should be shorter to allow for this. If the lining be made more than $\frac{1}{8}$ in. shorter, it would refuse to stretch sufficiently to allow the flap of the bag to open.

Third Step. Mark for the thongs, and note that a slight adjustment of holes (but only slight) will have to be made because of the lining being $\frac{1}{8}$ in. shorter, so far as concerns the larger piece.

Now punch the holes, according to any of the methods already described. Use No. 4 of the 6-way punch.

Fourth Step. Now commence thonging. You will find that four thicknesses of leather now have to be thonged together, and this will need patience. It may be that you will need a blunt-ended bradawl to push through the holes to keep them clear, as you thread the thongs.

Fifth Step. The press studs need fixing now on the outside flap.

The lower edge of each of the outside pockets is fixed with in-and-out-stitches; the other edges are in the oversewing on the edges. The handle consists of two pieces of leather oversewn on both edges and fixed to the back of the bag, through slits in it, by means of crossed thonging. The lining is sometimes pasted on, but I prefer it not pasted—it folds better so.

Sixth Step. I wish to protest against a misconception that a stained skin is better in appearance than skin of natural colour. The latter, especially when it is tanned by atmospheric influences, assumes a very pleasing colour, a colour that one must note is entirely natural, and is not in any way artificial. If it is preferred that the natural skin should be stained, this would be done before thonging.

The thongs also would be done at the same time. But we do not propose to do this. The natural calf when wax-polished is quite pleasing, and we propose to leave it unstained. The only thing to do is to polish it well with Ronuk or some wax polish, and so leave it.

6. Glove Making.

A Pair of "Slip-on" Gloves.

Materials.

Any kind of gloving leather—chamois, doe skin, wash-leather, suede, tan cape, Persian, etc., 1 pattern to size needed. Peri-lusta No. 12, or buttonhole twist. Beeswax.

Tools.

Gloving needle, No. 5 or No. 6 ordinary needle, scissors or knife, and (optional) a stitching tool.

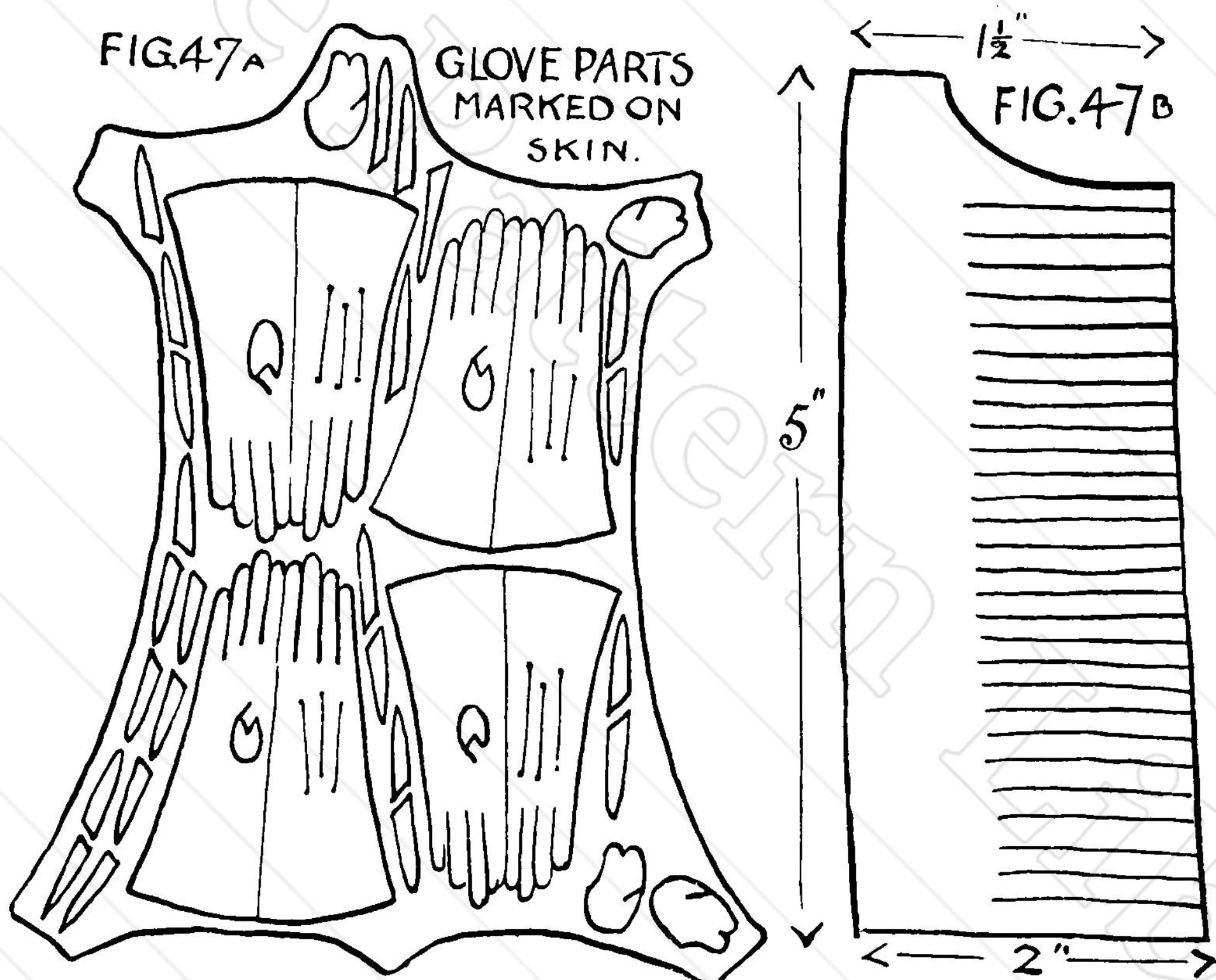
First Step. The first thing to do is to get a pattern. There are several types of patterns on the market. Some are made in zinc or in thick cardboard, so that they can be used for a knife to go round their outline as a clicker's knife will. Others are made in stiff thin card, and others are just wisps of thin tissue.

Second Step. The next step is to get a skin. Note that a thicker skin will make a glove that is tighter than a thin skin.

Third Step. Examine the skin for defects. Remember that the skins stretch one way more than another. Further, remembering

that a glove should stretch *across* the hand, find out which way the skin does stretch the most.

Fourth Step. Now lay the patterns on (Fig. 47a) and mark round its edge, on the wrong side of the leather. I find a pen makes a more definite mark than a pencil, but it needs using carefully. Reverse pattern for right and left hands. Make the fourchettes (fingers) with the stretch across. Always cut the thumbs out of the strongest part of leather, as they get most wear.



Fifth Step. Cut exactly on line with a pair of sharp scissors. You will have two large pieces for the hands, two thumb pieces, and, in pairs, 12 finger sides—16 pieces in all. Avoid jagged edges, and above all be exact.

If you need cowboy gloves, cut out four pieces—two to each glove—to Fig. 47b; cut these to a fringe pattern, and sew in two to each glove when sewing down the outside edge of glove. The effect is thin if one only is sewn in.

Sixth Step. On the patterns I have mentioned are Nos. 1, 2, 3, and 4. The thumb pattern is first stitched in. Make the numbers on thumb coincide with numbers on main piece. Start at No. 1 and go on to No. 2 and No. 3, and half-way down side of thumb hole. Restart at top of thumb, stitch to No. 4, and join up where you first left off.

Seventh Step. Now do the three lines on the back of glove. Fold up on each a crease, and stitch through.

The stitch used is a "stabbing" stitch. The needle is pushed right through, about $\frac{1}{16}$ in. from edge, and then taking a stitch $\frac{1}{16}$ in. long pushed through both pieces back again, and so does it continue.

Eighth Step. The pairs of finger sides are turned face to face and stitched on the sloping base together, with an oversewn stitch. Sew these up the side, starting at the base on the back of the hand. Accommodate the length of each glove finger to the finger of your hand. Cut off any length not needed, and reshape the taper of the finger pieces. These finger pieces should finish about $\frac{3}{16}$ in. below the centre of the finger ends, on the main piece. Continue until all these pieces are sewn in.

Ninth Step. Fold the glove in half and, with a long thread, sew up the fingers, always keeping an eye on the adjustment of the pieces. Then join up the side of the glove.

Gloves can be made buttoned, or with a gusset in centre, or with a gauntlet. The bottom of the gloves can be cut to shape or straight off.

(E) THE COST.

(a) Capital Cost.

This is not a great item ; a class can be equipped for a comparatively small sum. Scissors generally already form part of a school's equipment. A class of 20 may be adequately equipped with tools for £4.

(b) Annual Cost.

The net annual cost can be so arranged as to be nil. This involves the organized sale of finished goods. School sales and Parents' Days are useful in this respect, and often individual pupils will purchase their own.

It must be remembered that Art leather goods always command a ready sale.

But for purely instructional purposes it is possible for a class of 20 to carry on on an annual expenditure of £5.

CHAPTER II.

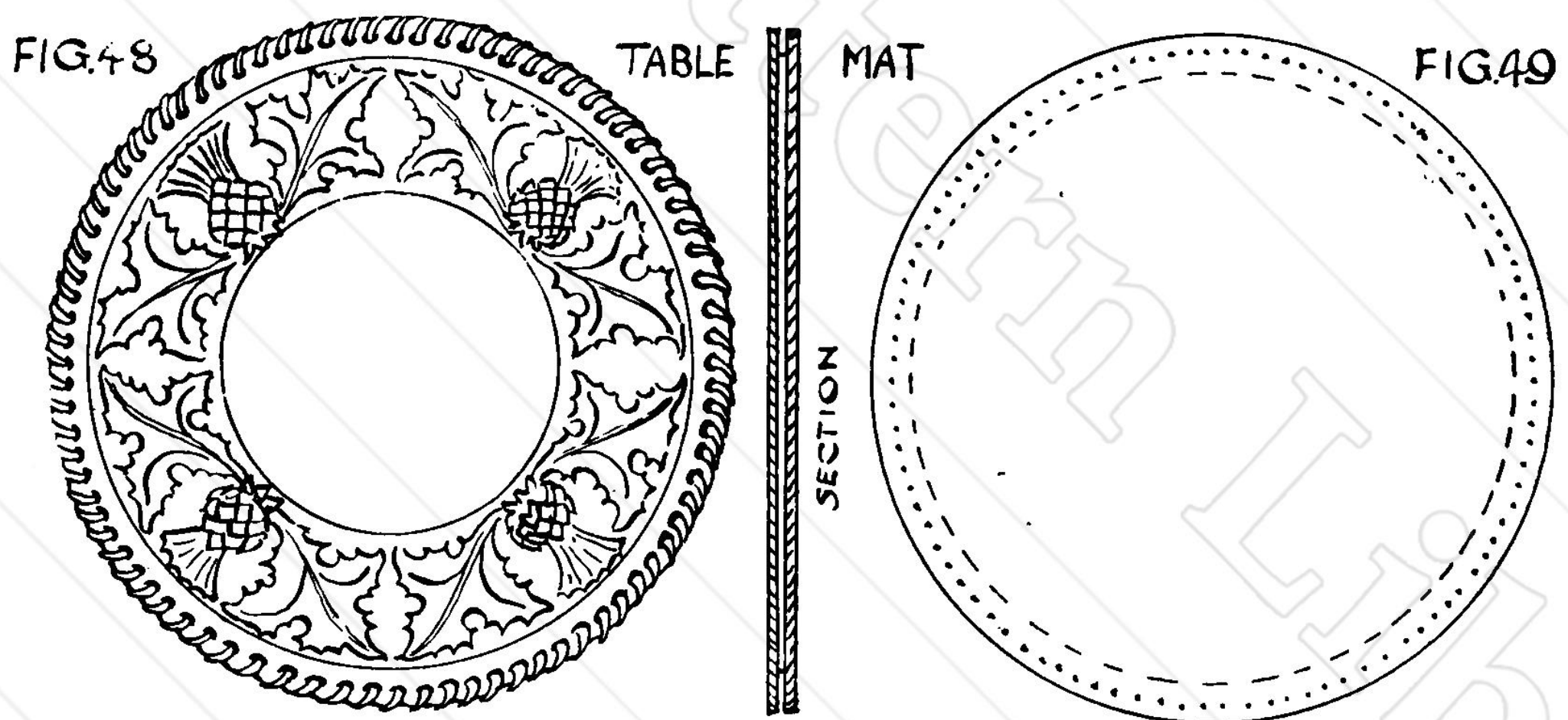
CONSTRUCTIVE LEATHER WORK TO WHICH IS ALLIED SOME FORM OF ORNAMENT.

(A) GENERAL DESCRIPTION.

A GOOD deal of purely constructive work lends itself well to the use of applied ornament, without in any way impairing its utilitarian value. Examples of such work will be given in this chapter.

(B) Materials. }
(C) Tools. } These will be specified under each Section in (D).

(D) TOOL OPERATIONS AND TECHNICAL PROCESSES.



1. Stencilling.

A Table Mat. (Fig. 48.)

Materials Used.

Brown suede for upper part, skiver for under part, thongs from suede, stencil oil colours, cartridge paper and knotting, and cardboard for stiffening the mat.

Tools Used.

Scissors, rule, leather punch, knife, and stencil brush.

First Step. Make templates for all the pieces. The top and bottom leathers will be cut from the same pattern; the cardboard from a smaller (shown in dotted lines). Fig. 49.)

Second Step. Examine the skin for defects, and mark from templates and cut out.

Third Step. Mark for punching and punch the holes.

Fourth Step. Cut thongs, and thong the two leathers, putting the cardboard between. It makes for greater stiffness if all three pieces are well pasted together.

Fifth Step. Draw the stencil design (Fig. 50) on the cartridge paper, and cut out with a sharp pointed knife, using a millboard

FIG. 50. QUARTER
OF STENCIL
DESIGN



pad to lay the paper on. The important technical feature of stencil designs is that "bridges" or "ties" shall be placed in the right places.

Sixth Step. Carefully mark the mat into quarters, and fix the lines on which the design has to be stencilled. Lay down the stencil plate on these lines.

Prepare the colours—in this case, blue, green, and purple. The exact shades may not be as the colours are in the tube; they may have to be altered to combine harmoniously.

Squeeze a little colour on the palette. Keep it thick in consistency. Thin with turpentine if necessary—but use it sparingly.

Take the appropriate stencil brush, and stencil in the colours by *dabbing*. Do not draw the brush across, or paint will squeeze under the plate and disfigure the leather.

Usually for three-colour work three stencil plates are needed, one for each colour. Only the spaces needed for that one colour are cut out in each plate, the remainder of the plate being "blind."

But with reasonable care, a three-colour design can be laid on by means of one stencil plate. It is well to have one brush for each colour.

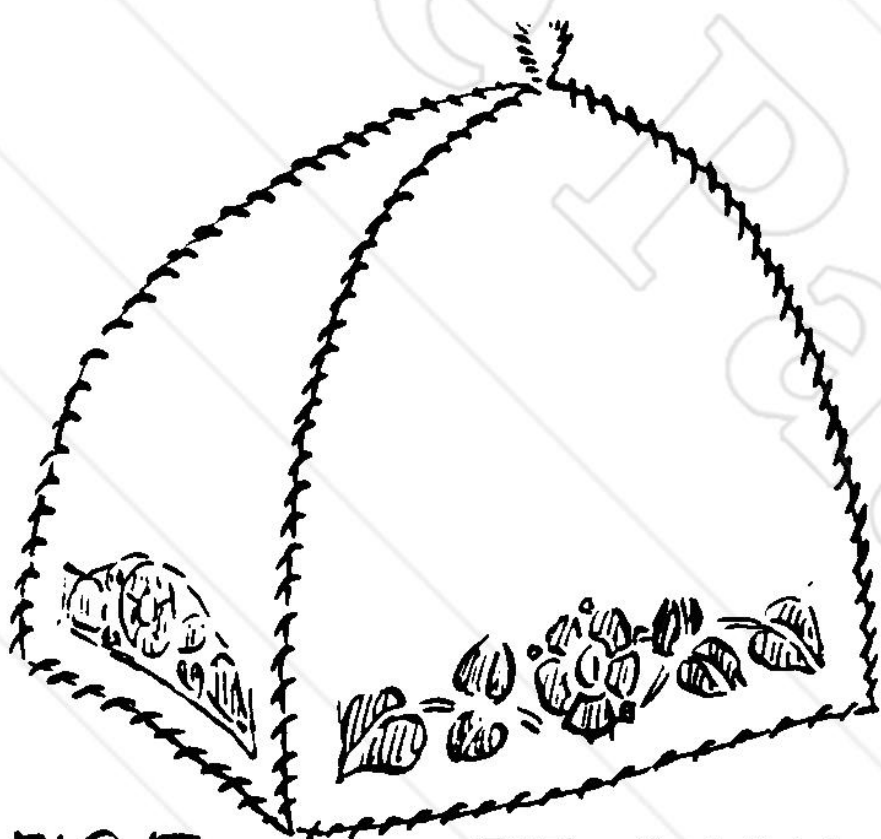
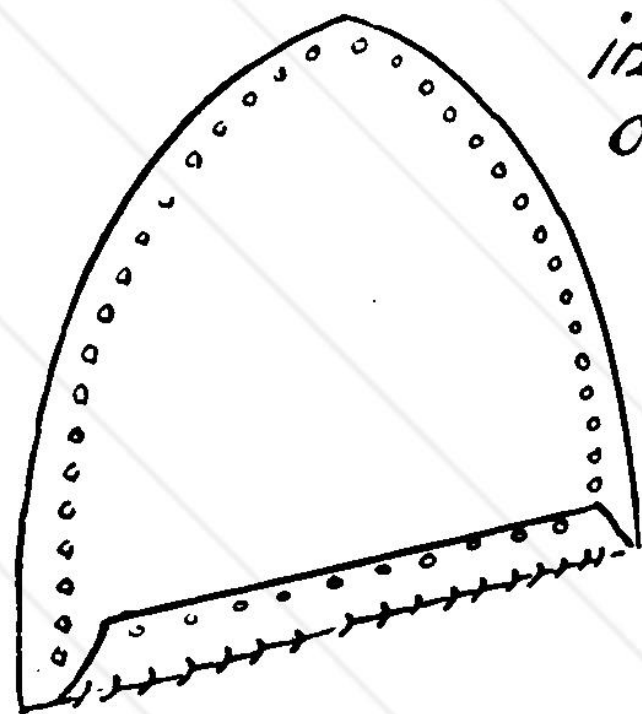
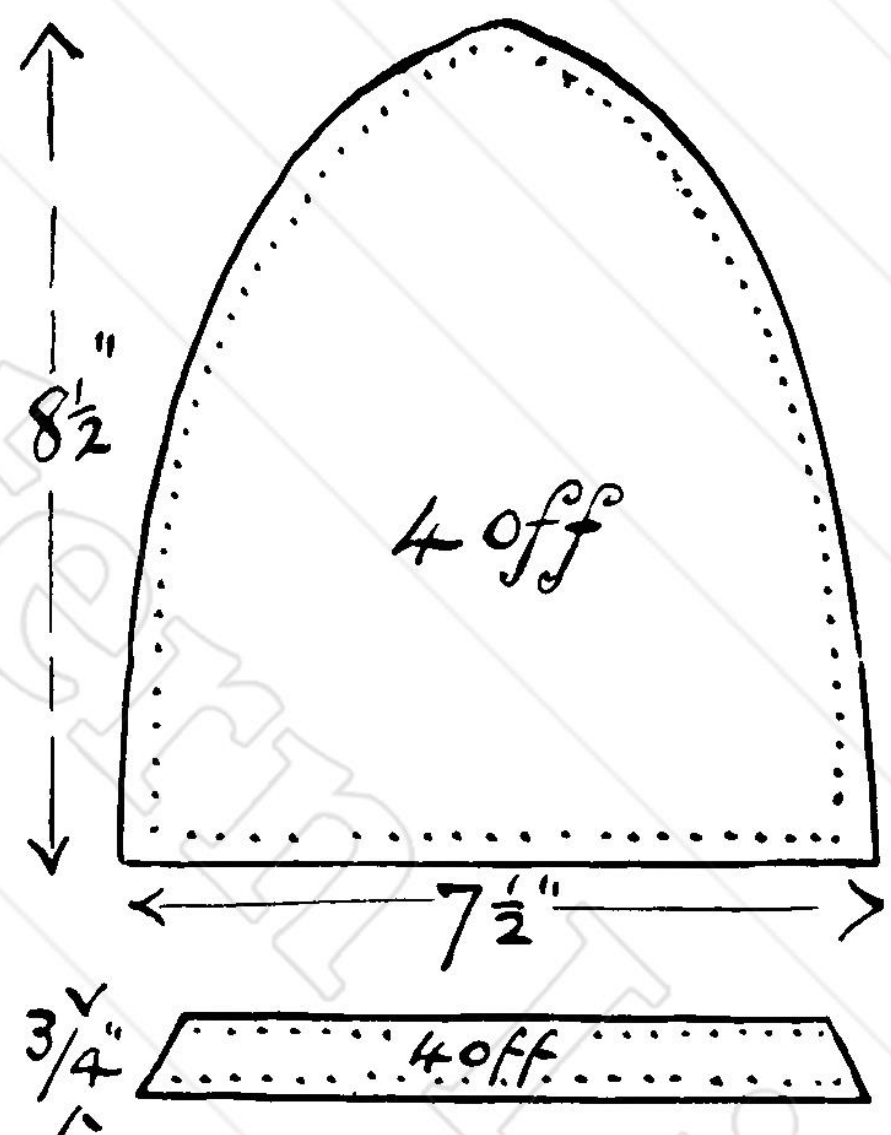


FIG. 51. TEA COSY



interior of one piece shewing strip to which the lining is fixed



FIGS. 52+53. TEMPLATES
DETAILS OF TEA
COSY

To wash out oil brushes use turpentine. The colour can be dabbed on in varying shades in the same space, which helps effect.

This completes the stencilling, and no further step is necessary.

2. Pierced Work.

A Tea Cosy. (Fig. 51.)

Materials Used.

Any colour suede or Persian calf in two contrasting shades; thongs same material; glue or strong paste.

Tools Needed.

Rule, scissors, knife, suitable carving tools, leather punch.

First Step. Draw and cut out suitable templates for the various parts. In this case two will be sufficient. Each of the four sides is the same size; and there is a small inner strip to which the padded lining will be attached. These are shown in Figs. 52 and 53.

Second Step. Examine the leather for defects, and mark out the shapes by the templates. Cut them out carefully and mark for punching. Punch the holes.

Third Step. Prepare a suitable design. This will be very similar to stencil designs in its character. Fig. 54 gives a suggestion, and it will be gathered from this how like a stencil design it is, with its "bridges." Draw this, or transfer it, to the leather, and then cut out by means of a sharp knife or by means of the carving tools. The latter are much the better tools for the purpose, because they can be had to fit the curves well, and by making a vertical cut they make it cleaner.

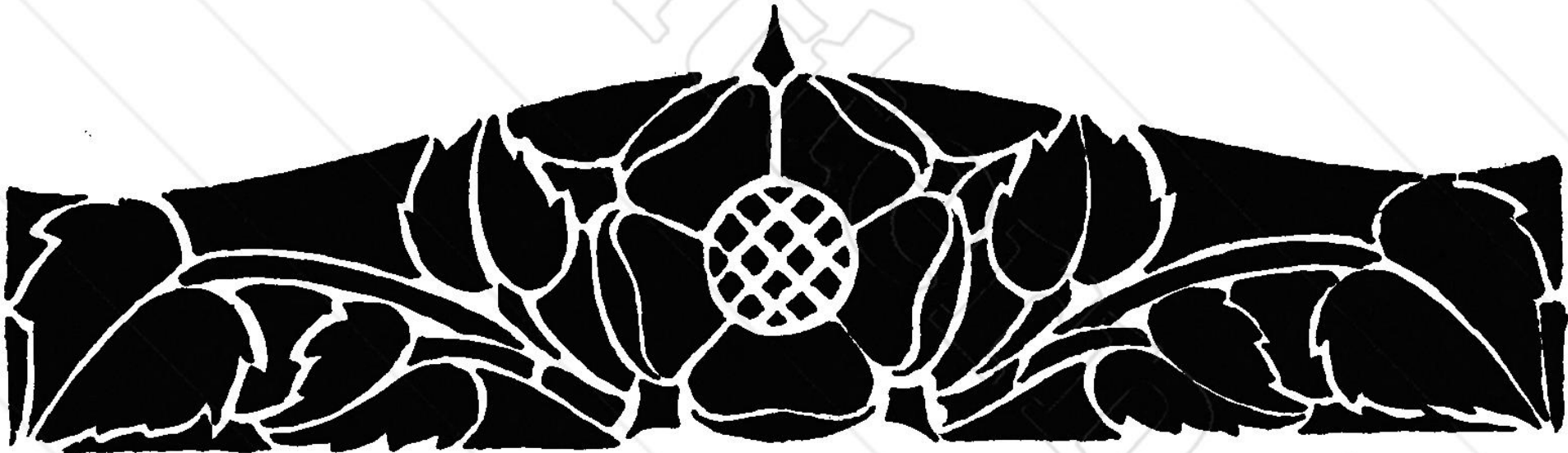


FIG. 54. DESIGN FOR CUT-OUT FOR TEA COSY.

Fourth Step. The backing now has to be fixed. This may be simply one piece of a different coloured leather of contrasting, or matching, shade; or it may be one piece of natural skin, stained different colours so that the pattern appears through as multicoloured.

In either case it will be glued on to the inside of the leather. In the latter case, of course, much accuracy is needed to get it in the right position, so that the various colours will coincide with the cut pattern of the tea cosy sides.

Fifth Step. The thonging is now to be done. Cut the thongs and thong the pieces together. Commence at a bottom corner; thong the lower edge (i.e. the inside narrow piece to which the padded lining is to be fixed) and thong up the angles, leaving the thong end about 8 in. long at the apex. Commence again at the bottom corner of the next piece, and continue as before. The thong ends at the apex will be plaited to form a looped handle.

Sixth Step. The padded lining can now be fixed into the inside strip.

3. Weaving.

A Hat Band. (Fig. 55.)

Materials Needed.

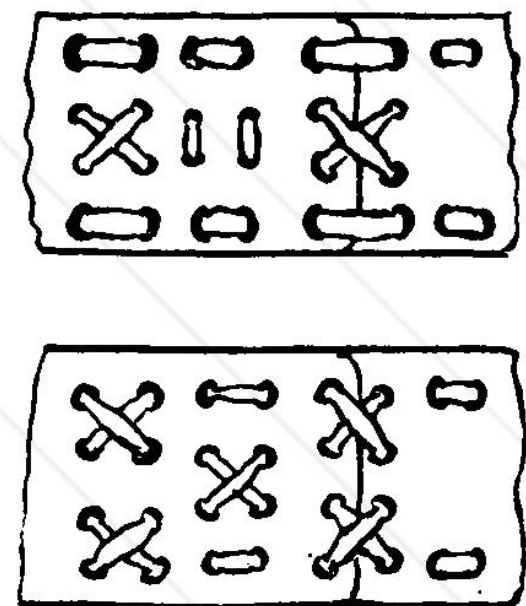
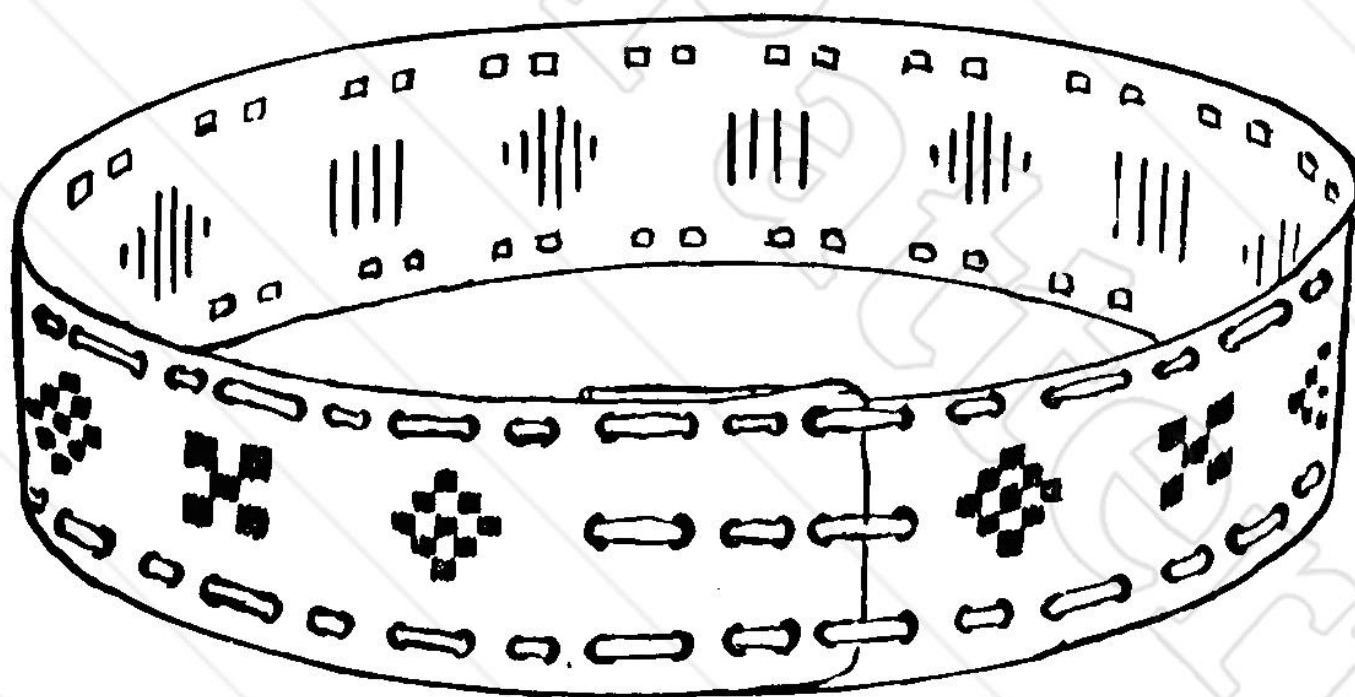
Suede, any desired colour; in two contrasting colours or shades.

Tools Needed.

Rule, scissors, leather punch, knife.

First Step. Draw and cut out a paper template, allowing enough for an overlap of 1 in.

Second Step. Examine skin for defects; then lay template on, mark round, and cut out.



ALTERNATIVE
LACINGS

FIGS. 55-56. WOVEN HATBAND
showing cuts for wearing and
lacing of join.

Third Step. Set out for the vertical cuts where pattern is to appear. Fig. 56 shows the thonging at the overlap, and the back of Fig. 55 the "lay out" for weaving.

Fourth Step. Cut out the leather, $\frac{1}{2}$ in. wide, needed to form pattern by threading through the vertical cut.

Fifth Step. Punch the holes for thonging and, having cut the thong, lace it up. Having accurately fitted the length to the hat, thong and lace up.

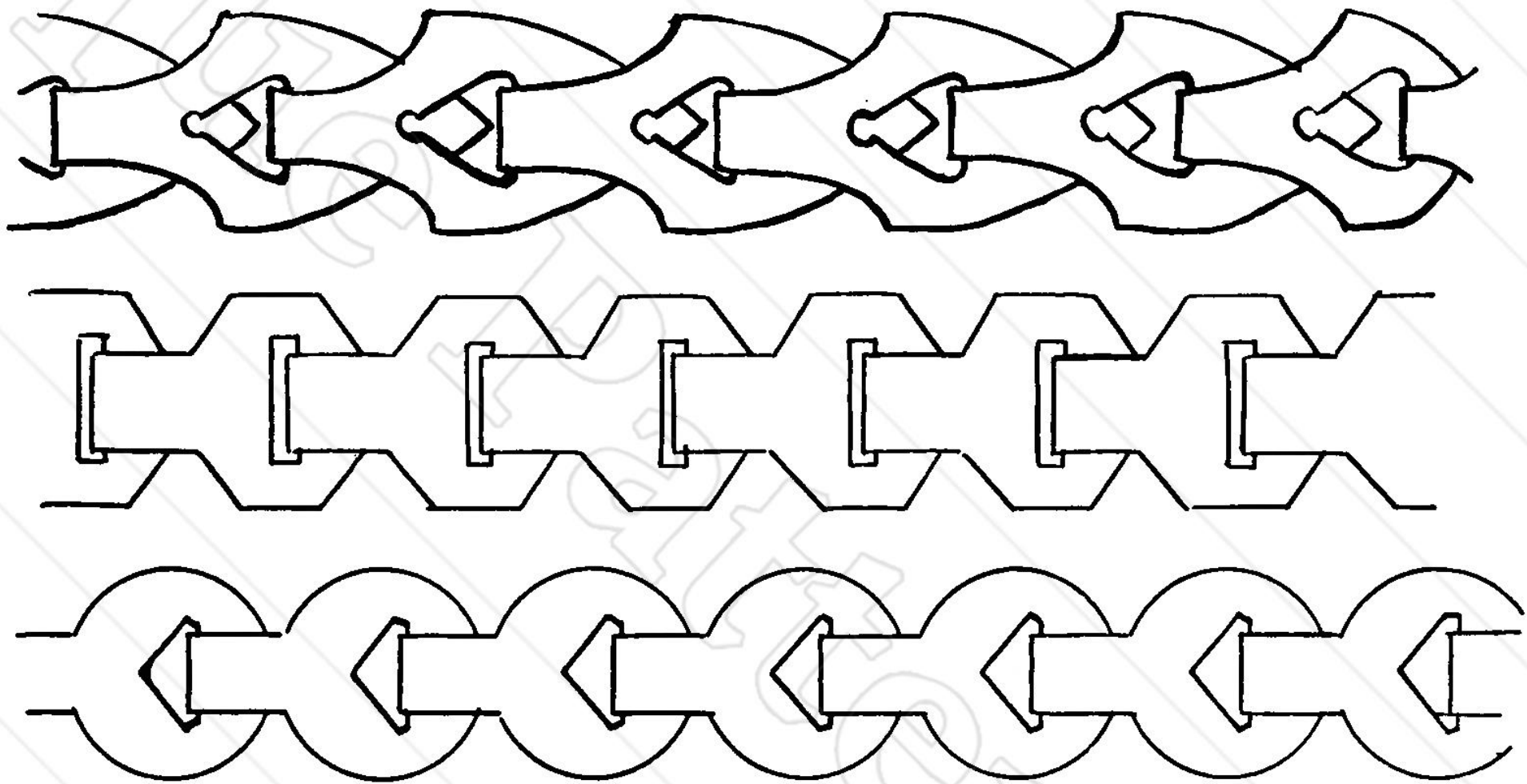
4. Belt Making. (Figs. 57, 58, 59.)

Three illustrations of belts are given herewith. These belts can be made out of scraps, or they can be cut direct from a skin. Cowhide or calf is the best leather to use, because a belt is useless if it is not strong. The pattern, it will be noticed, is reversed at the back, each half of the belt being joined to a central straining piece. This may be of leather; or it can be cut out of brass or copper plate. For fixing together, buckles may be made of brass or copper plate; or buckles may be thonged on.

Materials Used.

Cowhide or calf skin or scraps.

N.B.—If from scraps, a parti-coloured belt can be made. If from natural skin, each piece can be stained a different colour.



FIGS. 57-58-59. SUGGESTIONS FOR BUILT UP BELTS

Tools Needed.

Rule, scissors, knife, and two carving tools, leather punch.

First Step. Cut out a template in paper or thin card, the exact size and shape of the constituent unit of the belt, as in Fig. 60.

Second Step. Examine leather for defects, whether scrap or full skin. The strength of any chain is its weakest link. Lay the template on leather, mark round, and cut out. The exterior

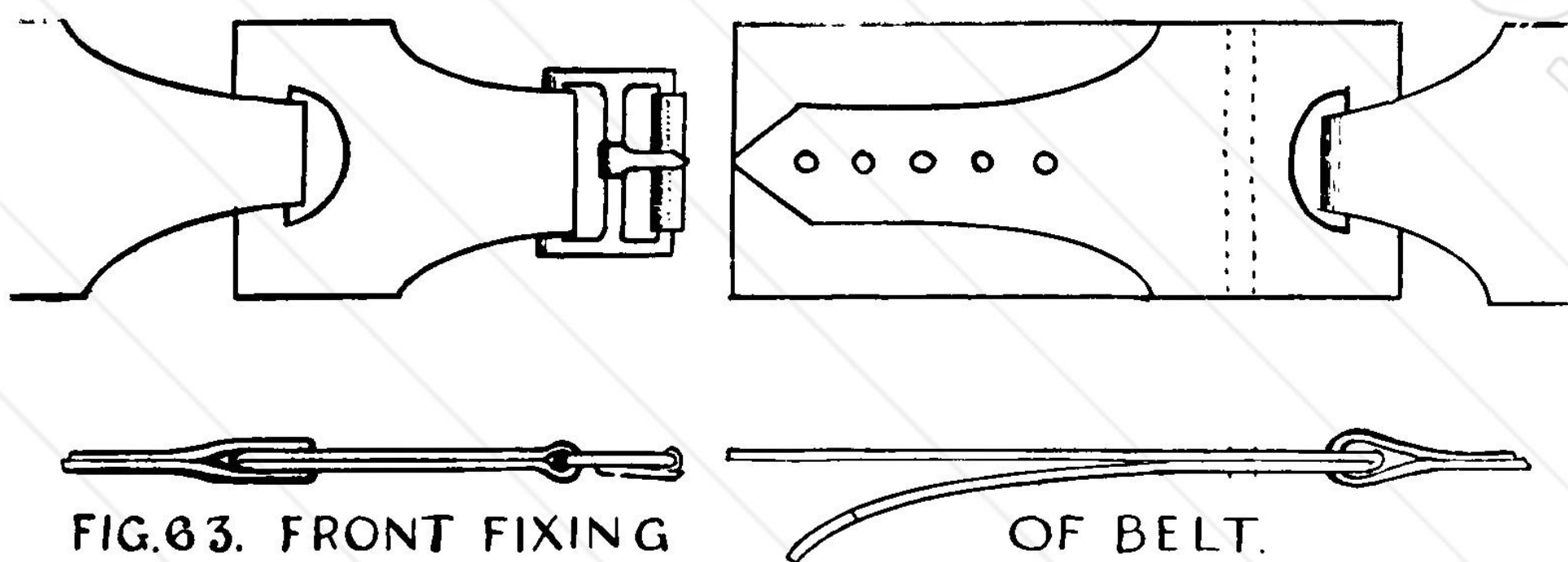


FIG. 63. FRONT FIXING

OF BELT.

outlines can be cut with a pair of scissors. The interior outlines are better cut with the carving tools by means of vertical cuts.

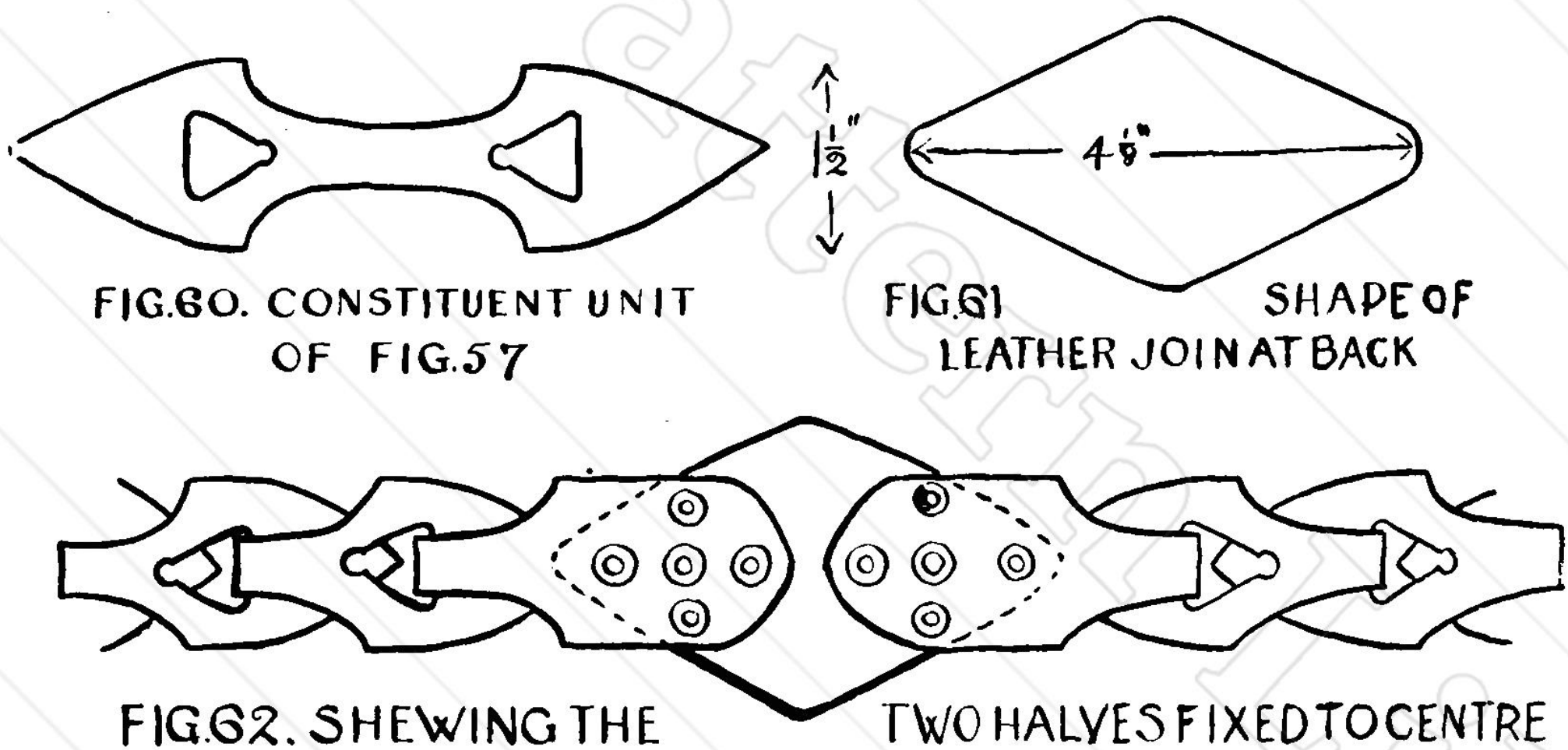
Third Step. The making of the link to join the two halves is the next stage in the work. In leather, Fig. 61 gives a shape for this, which would be fixed to the ends of the halves as

shown in Fig. 62, also the making of the buckle part at the front. Fig. 63 shows the shape of this in leather with a plain buckle. Fig. 64 shows the shape of this if finished off with a metal buckle.

The leather back piece and front buckle pieces can be thonged, or fixed with eyelets, or stitched. If the latter, fix it with a saddler's stitch, using two needles, as shown in Fig. 65.

Fourth Step. If it is desired to stain the leather, do so now. The pieces being small can be, and should be, dyed (i.e. steeped in a small bath of stain). When dry they should be paste-washed and, again when dry, polished.

Fifth Step. Now thread together, fix the back connecting piece, then the front fasteners, and the belt is complete.



Alternatives.

There are other forms of belt that can be made, illustrations of which are in the second part of the book ; and a girdle in a six-plait tubular form (as described on page 39) can be made by adding long fringes.

5. Inlay.

Blotting Pad. (Fig. 66.)

Inlay in leather means that one or more pieces of leather are fixed into one thicker base to form pattern.

Materials Used.

Velvet Persian suede will do for the base pieces ; and thinner suede of various colours for the inlay. A fixative formed of glue and paste will do well to fix the inlay. Bookbinders' paste, which is made of flour, alum and powdered resin, is also a very powerful fixing agent. Cardboard and paper are needed for the making of the blotter.

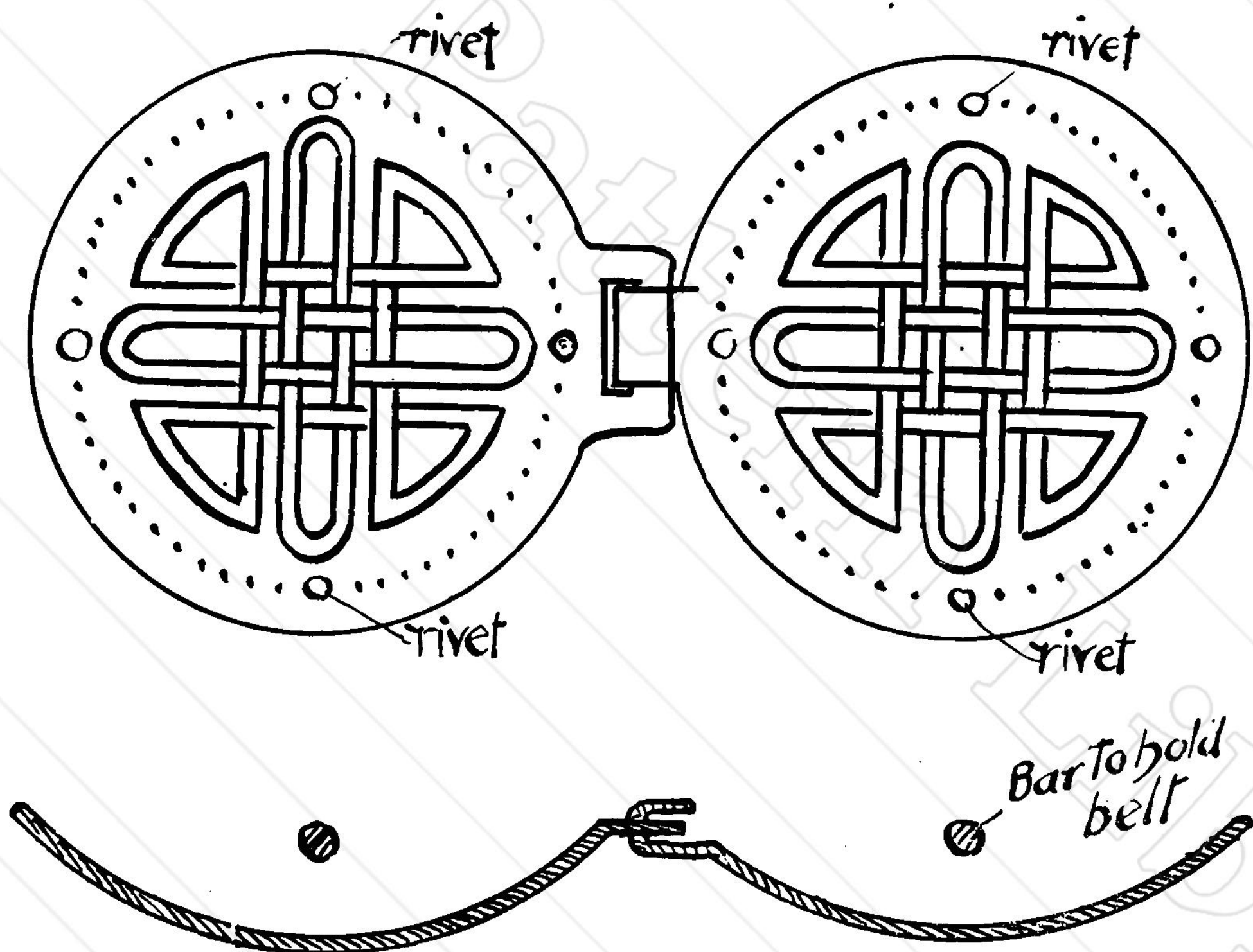
Tools Needed.

Rule, scissors, knife, and skiving tool. (Fig. 12.)

First Step. Mark and cut out paper templates for the exact size of each piece of leather for the base. Figs. 67, 68 and 69 give these; the cut-off corners allow for the leather, when bent over the cardboard, to form a mitre at the back.

Second Step. Draw out the design you desire to fix in, and cut out a template for it. Fig. 70 shows the design.

Third Step. On the base pieces lay carefully the inlay pieces in

**FIG. 64. SUGGESTION FOR METAL BUCKLES**

their right places. Over these place a stiff sheet of cardboard, and on this again place heavy weights, taking care to have these weights evenly placed. If you have a screw press available so much the better.

Fourth Step. It will be found now that the pattern has been pressed well into the base piece. It may, however, be necessary to tool carefully round the edges with a flattening tool (see page 43, Fig. 88), or something that will act as an efficient substitute. This process is to be done only if one's judgment so decides. Now paste the back of the pattern with the paste mixture quickly and place in the depression that has been made. This has to be done very

neatly and quickly. Replace the cardboard and the weights, and leave until set.

Fifth Step. When thoroughly set, which should be at the end of 24 hours, go round the outline with a tracing tool (see page 43,

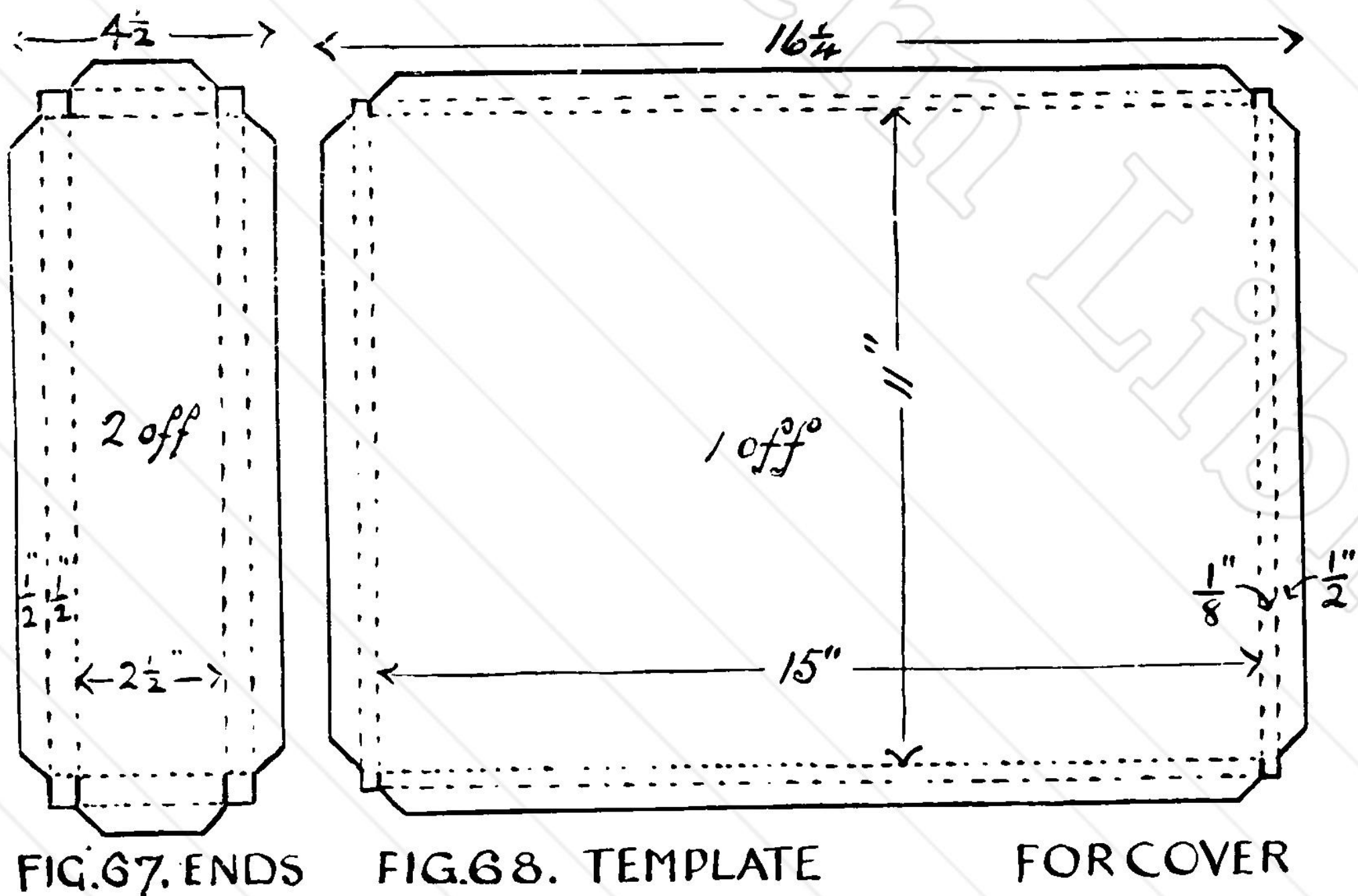
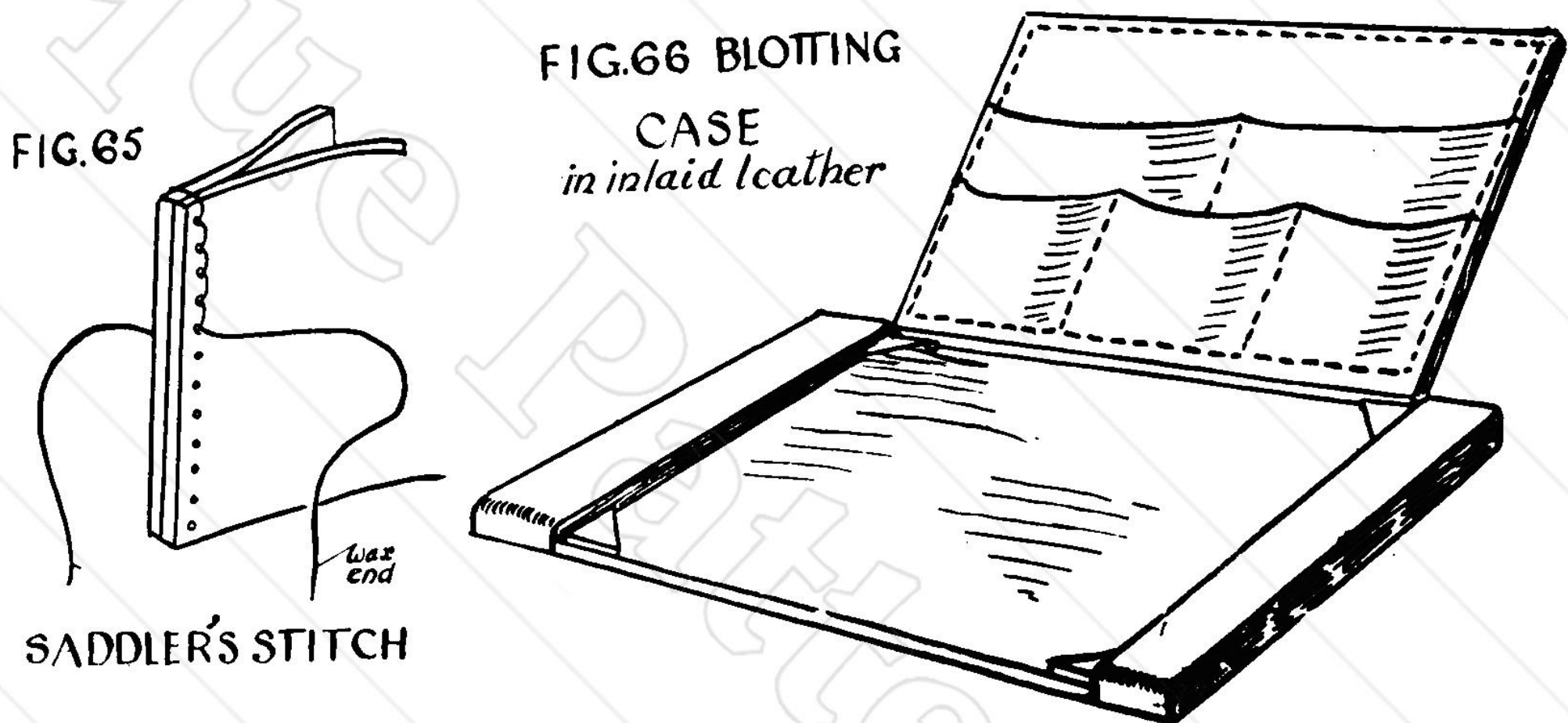


Fig. 87). This takes off any crudeness of outline that may have arisen, and defines the pattern.

Sixth Step. The edges of the base leathers should now be shaved down to allow them to be turned over the edge of the cardboard; this is done with the skiving tool (Fig. 12). The whole blotting pad can now be made up.

6. Plaiting.

For the making of handles the plaiting of leather strips is of great service. Herewith are given some examples that will undoubtedly help.

Materials used are strips of leather necessary to the making of the particular handle; and no tools are required—only the fingers.

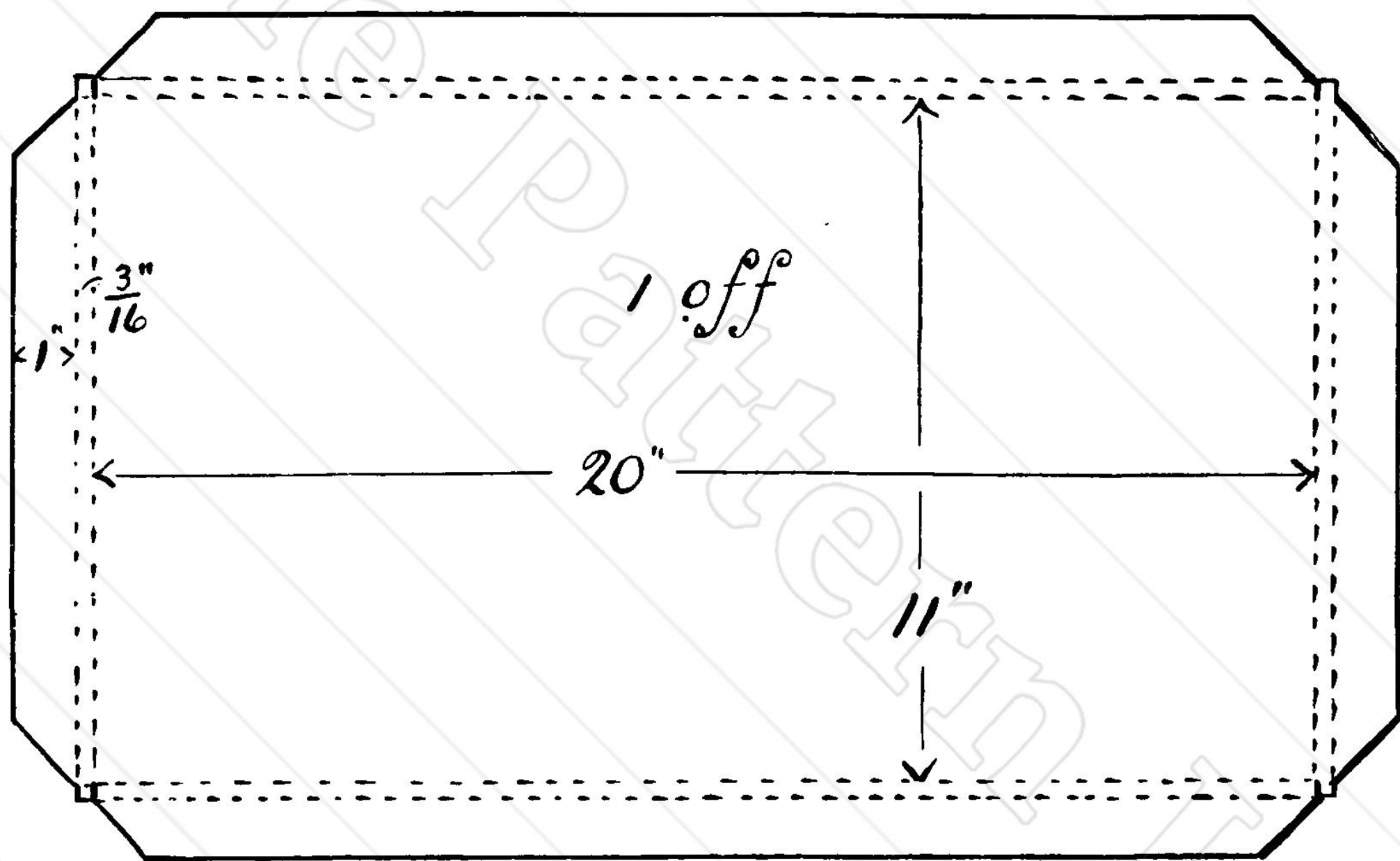
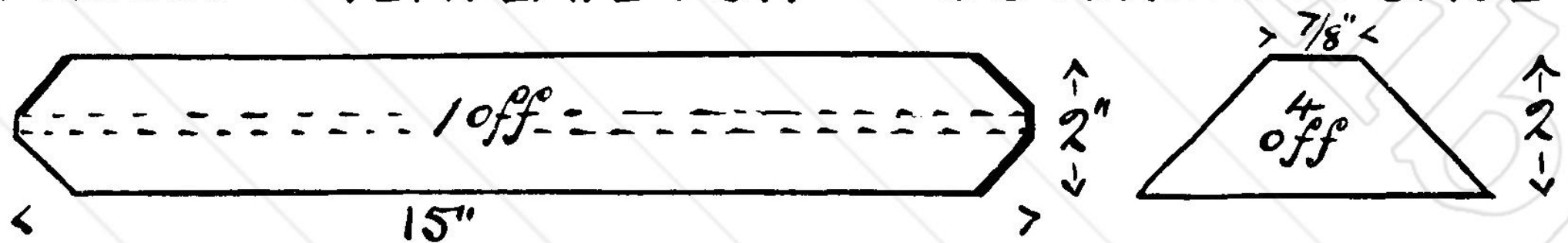


FIG.69. TEMPLATE FOR COVERING OF BASE



TEMPLATE FOR HINGE & FOR CORNER

A PLAIN THREE-PLAIT.

Cut the strips long enough to allow for the shortening that will come from their plaiting.

The width of the strips depends upon the size of handle; but a too wide strip is apt to look clumsy when plaited.

Pin the ends to the edge of the table, as shown in Fig. 71. Figs. 72 and 73 show the next succeeding stages, and the rest of the plait is just the same.

Pull each strip firmly, but do not strain the pull to extreme tightness. Uniformity of pull is what is needed. The first step is to take No. 1 over 2 and under No. 3; the next is to take No. 2 over No. 3 and under No. 1; the next to take No. 3 over No. 1 and

under No. 2. It resolves itself into taking always the *left* strand alternately over and under the other two.

A PLAIN SIX-PLAIT.

Fix the ends as in the three-plait. Then take the right-hand strand, No. 7, and, threading it alternately over and under, bring it out to the left of No. 1. Take now the right-hand strand, which is No. 6, and alternately thread it over and under the other strands, until it appears to the left of No. 7. Again take the right-hand strand, which is now No. 5, and similarly bring it to the left of No. 6. This is continued until it will be noted

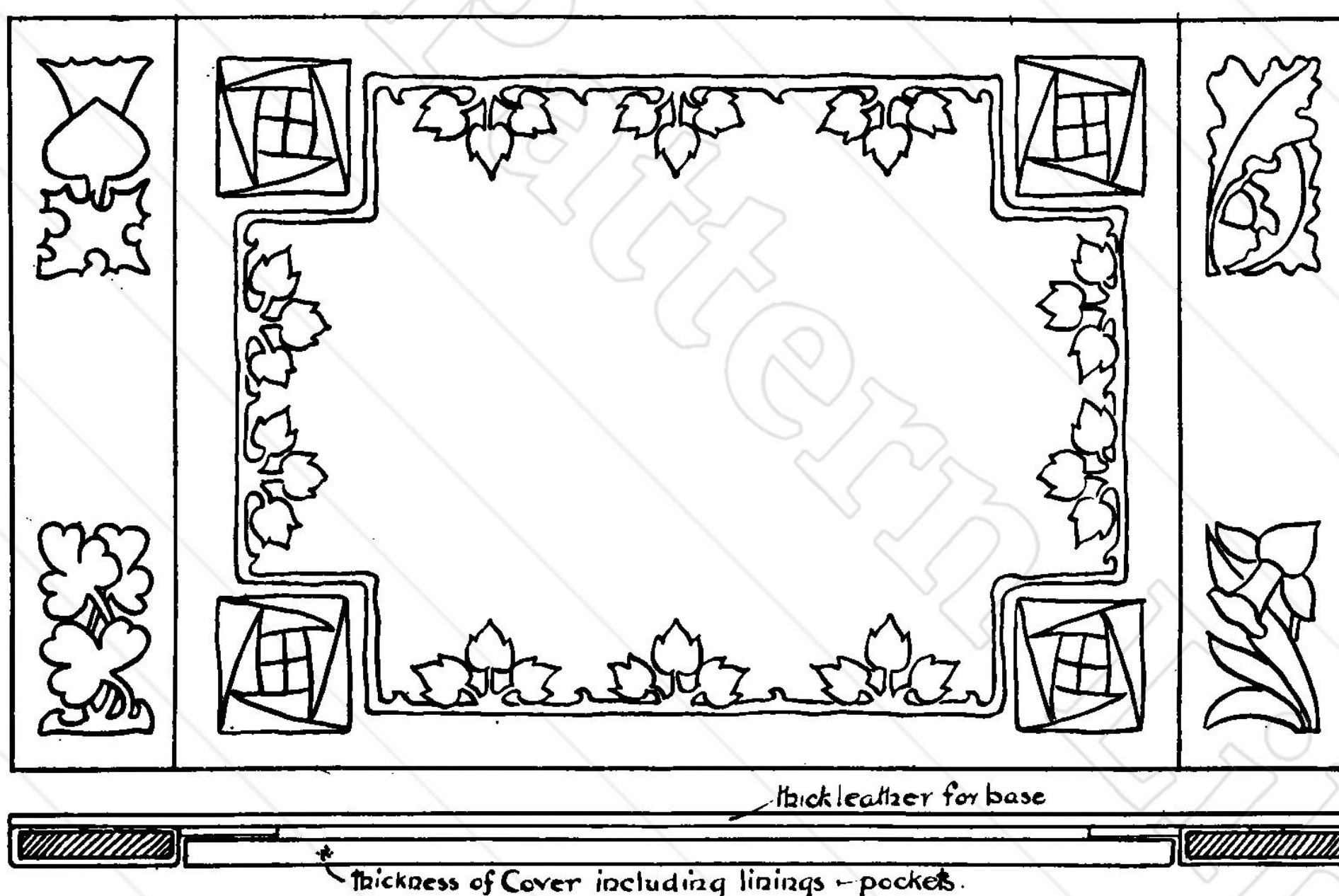


FIG. 70. DESIGN FOR LEATHER INLAY.

that the strands are again in their original numerical order. If each strand has been of a different colour, the unit of pattern will now have been completed, and the repeat will have commenced.

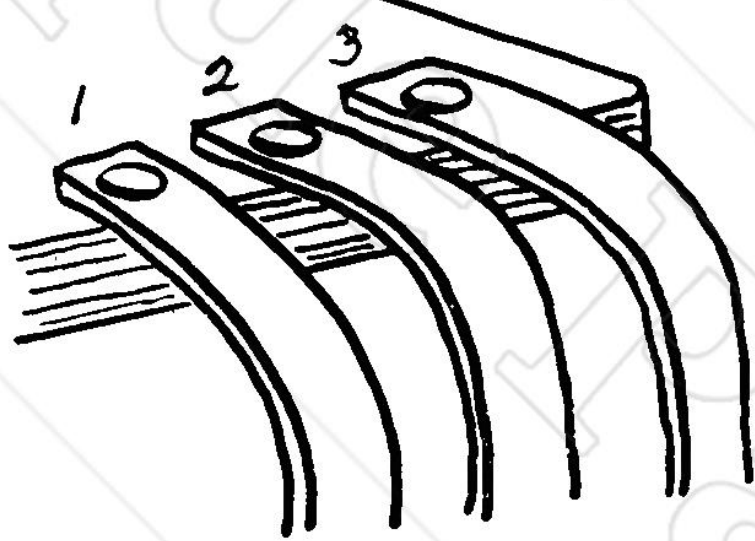
A PLAIN NINE-PLAIT.

If the strands are odd in number, proceed as follows. First pin the strips of leather to the table edge, or tie them to a stick which is held by someone else; or is fixed in some way. Then separate the nine strands into two parts—a five and a four (see Fig. 77). The outside strand in the group five is taken to the centre, alternately passing over and under the others; then the outside strand in the four group is taken to the centre, similarly. You thus have, alternatively, a five group and a four group on each side. Keep on repeating.

The strands may be all one colour; or they may be of several colours.

To finish the ends, the best procedure is to thread them through a piece of leather, and use these pieces to fix to the bag. An

FIGS. 71-72-73



THREE STRAND PLAIT
SHEWN IN THREE STAGES

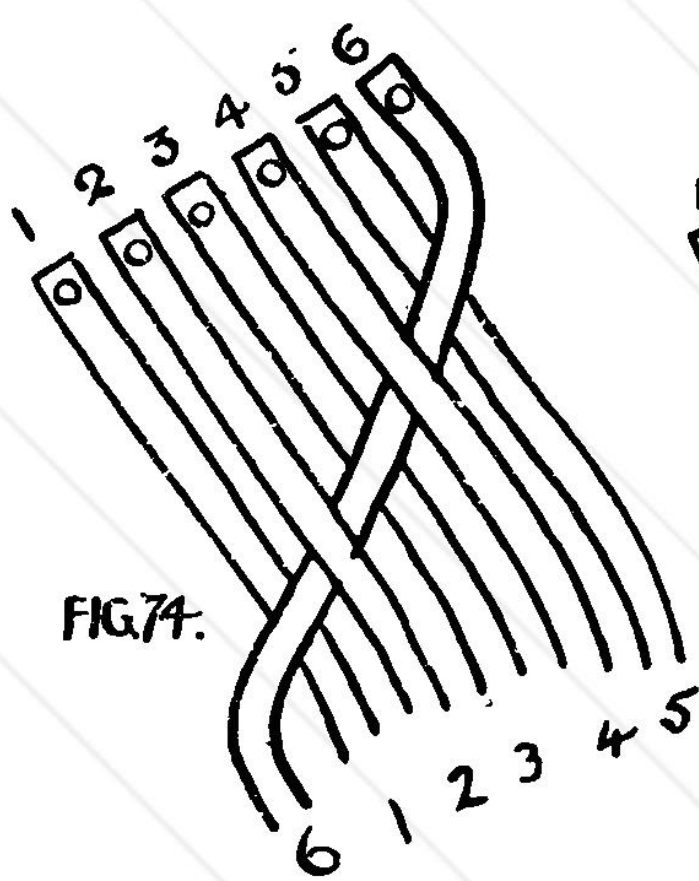
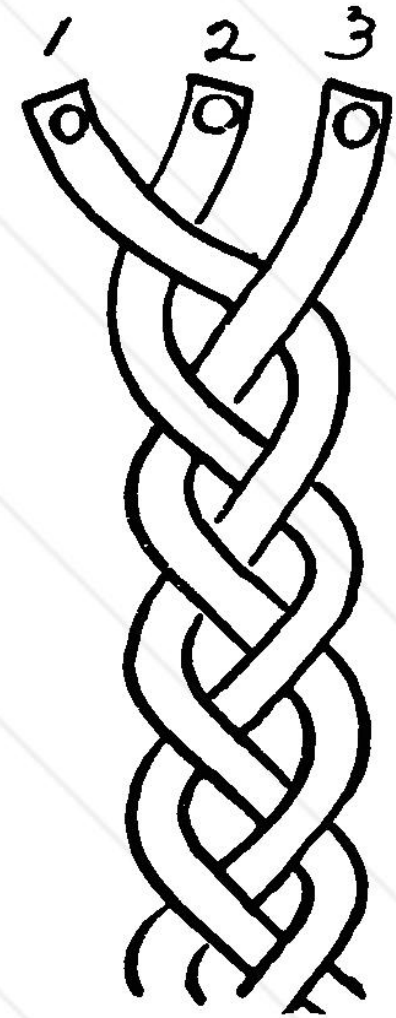
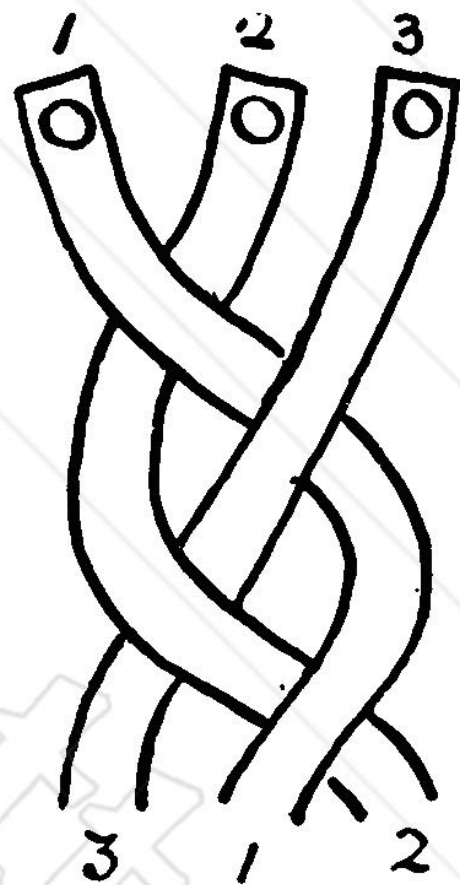


FIG. 74.

FIGS. 75-76
TWO STAGES
OF 6 STRAND PLAIT
FIG. 74 SHEWS START.

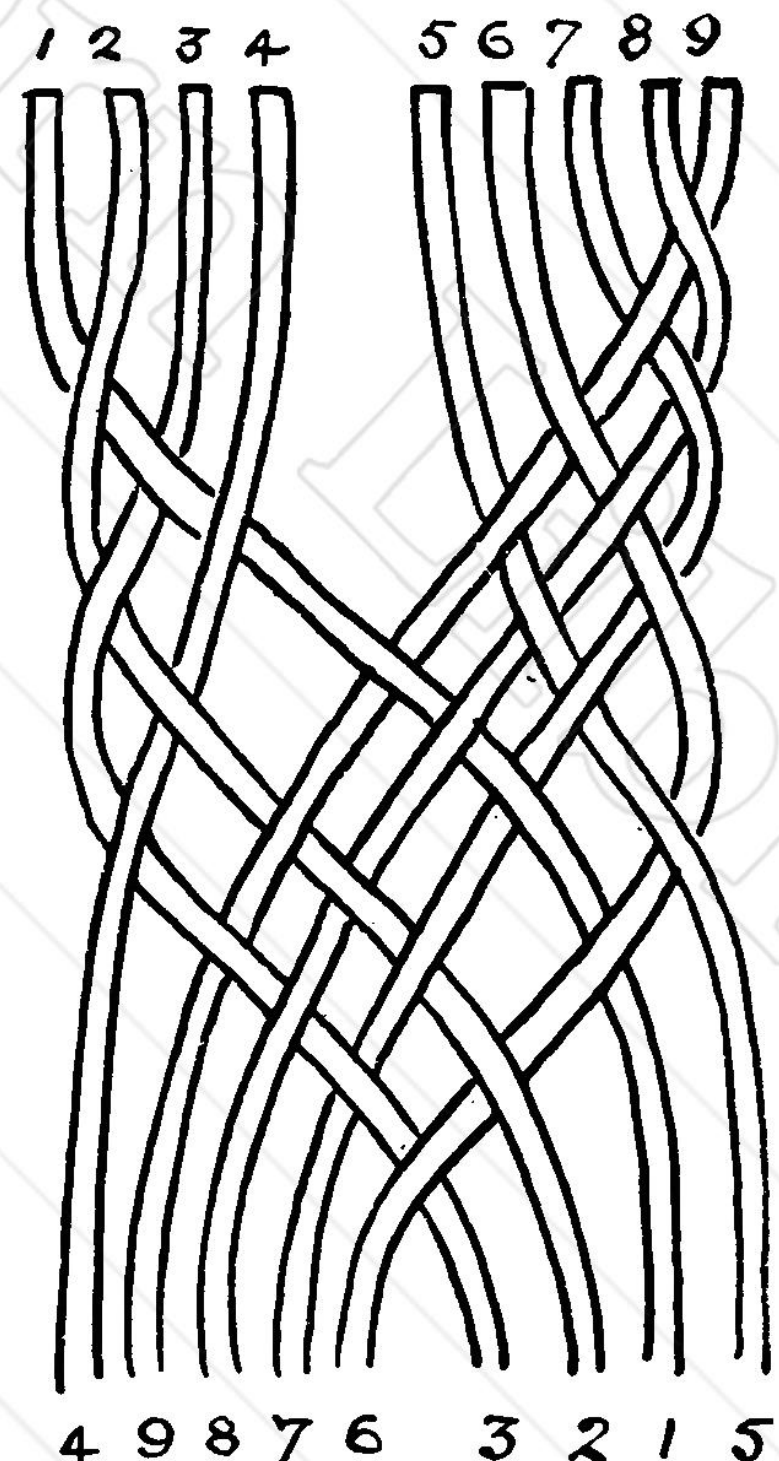


FIG. 77 9 STRAND PLAIT

ornamental feature that arises out of the necessities of construction is thus created.

A TUBULAR PLAIT.

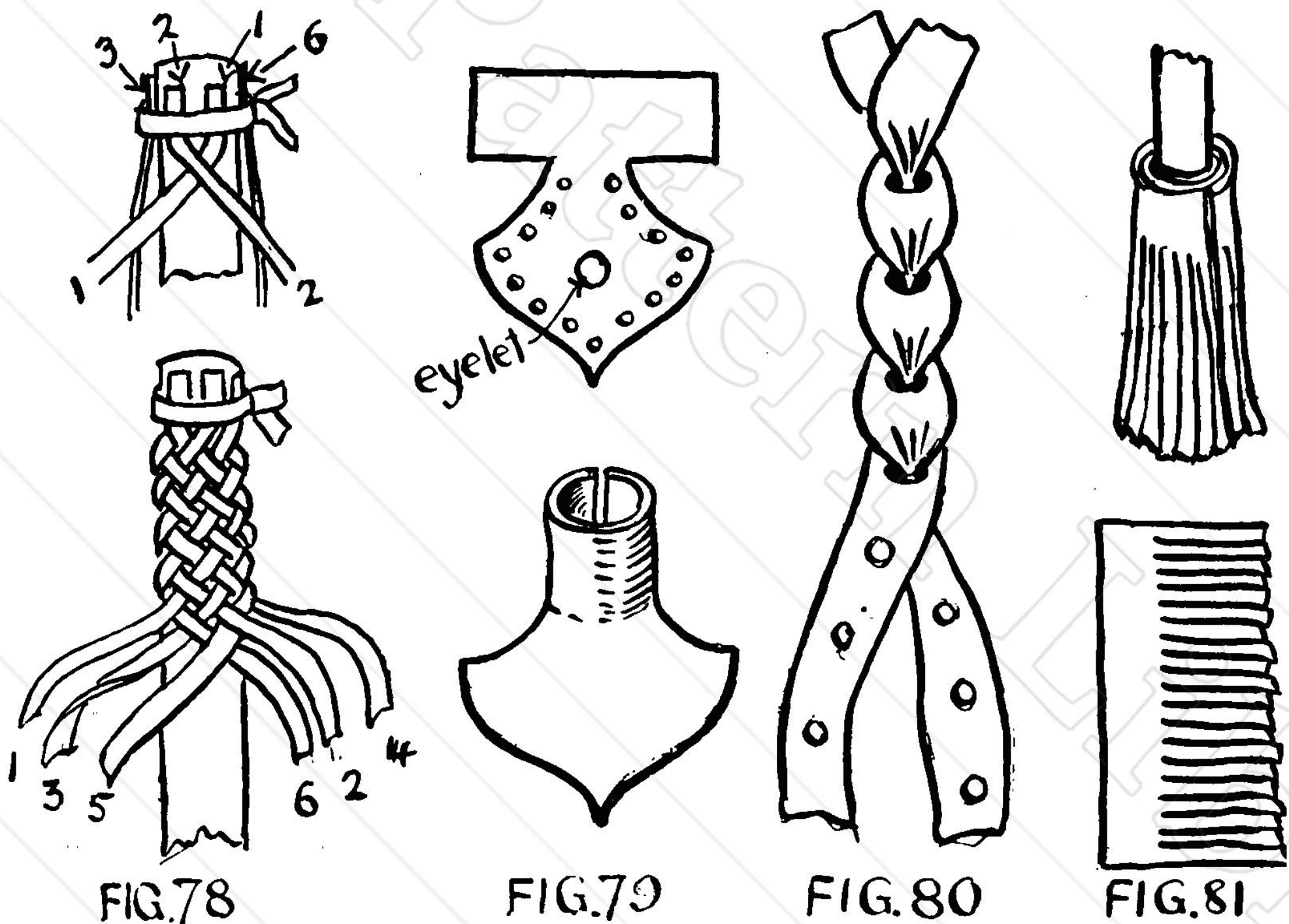
This makes a very effective handle for a bag ; if long enough, a

belt or girdle ; or if made thin, it can be used as draw-strings for closing bags. In the latter cases small fringe ends will be needed.

To make the tubular plait proceed as follows. For a handle, a piece of sash line or clothes line is useful to act as a permanent core. If a hollow tube is required, use a thin round stick.

Take six strands about $\frac{1}{4}$ in. wide ; or wider or narrower as may be desired. They can be one colour, or several, to match the bag. Number them, at the first at any rate ; afterwards, as you become more expert, you will know how to proceed.

Tie these strands round your stick, which may be about $\frac{1}{4}$ in. thick, and quite smooth. (Fig. 78.)



The first strand should be placed to the left at about 45° ; strand No. 2 to the right at a similar angle ; then alternately. No. 3 to the left under No. 2, No. 4 to the right, No. 5 to the left, and No. 6 to the right ; each going over and under ; then continue as before, and keep turning the stick round.

You must keep the strands close together, and give all the same "pull" ; but do not pull too tightly, or the pattern will not hold out uniformly.

When finished, *push* the plaiting off the stick.

To finish the ends, take suitably shaped pieces of leather, and either weave the ends of strands through, or sew round them pieces shaped as in Fig. 79. These pieces can then be thonged and eyeleted to the bag.

A Threaded Handle.

An effective form of handle can be made as follows. Cut out two strips of leather, say, $\frac{5}{8}$ in. wide, and of equal length. Using the largest point in the 6-way punch, make holes at intervals of $\frac{3}{4}$ in. Now proceed to thread these through one another as shown in Fig. 80. The finish of these, for the purpose of fixing to the bag, will be similar to the others already described.

Fringed Ends.

Cords need tassels, and Fig. 81 shows a method of making these. A strip of leather is cut, as shown, into a fringe, and it is then glued on to the end of the cord and rolled round. The end is glued down.

Overlay.

This is something like inlay, but varies inasmuch as the "cut outs" are just fixed to the surface. See Part II for designs.

Bookbinding.

Leather can be used for bookbinding with excellent results. Even if bookbinding is not practised in the schools, existing books may be re-covered with leather to good effect.

Take, for example, any book which is somewhat dilapidated. It may be stripped of its covers; and a cover made of several thicknesses of paper pasted on. Then on this may be fixed covers of suede leather with projecting edges. The result is a soft, pleasing cover of what is known as "limp" binding. This cover may be lined and stamped with heated punches, as described later in the book.

Thin skiver may also be used in conjunction with the worn cardboard covers of the books, in the usual bookbinders' manner.

(E) THE COST.

This is included in the figures named in Chapter I.

CHAPTER III. MODELLED LEATHER.

(A) DESCRIPTION.

It appears to have been a natural characteristic of mankind that a plain surface has proved, and still proves, too great a temptation ; and man has fallen, and still falls, and in all probability will still fall a victim to this temptation to display his decorative talents upon any plain surface he finds.

Plastic work has always provided a very enjoyable field for man's artistic activities. Leather is capable of taking plastic impressions when it is wet, and, when dry, hot tools can be impressed on its surface to make pattern. Bookbinders usually employ the latter method, and many examples of bookbinding so treated will come within the view or recollection of readers.

There are several methods employed in the plastic ornamentation of leather.

It can be incised and modelled ; it can be modelled without the incising ; or it can be embossed as well as modelled. These are the three methods that are to be described in this chapter.

The incised and modelled method is as follows. When the design has been drawn on the leather, its outline is carefully gone over with a sharp pointed knife, and incised to a depth of not more than one-third the thickness of the leather. This incision is afterwards opened out with a thin tool with damp leather, and the groundwork well pressed down, sometimes only near the edge, and sometimes over the whole surface.

Modelling only, without incising, is, in my opinion, the best method of all. The outline of the design is gone over with a tracing tool whilst the leather is damp, a deep impression being made. Within the limits of this depressed outline the design is modelled. Sometimes the ground is depressed, sometimes not ; often it is matted, often not.

Embossed work is similar to modelled work, except that some parts of it are raised much above the general level of the ground, by pressure from the back. This pressure extends the leather so that it forms hollows at the back, which require filling. They are filled with suitable fillings which will be described in the particular examples.

Modelled work is much the best because it is the most natural and the most restrained. Incised work weakens the leather, and embossed work is productive of " loud " effects that are not always pleasing

The leather is usually in its natural colour when used for plastic work ; sometimes, it is already stained ; and if not, it can afterwards be stained as desired. One would like to emphasize the desirability of appreciating the natural beauty of leather, and of not being led into thinking that a natural skin should always be stained so that not one portion of the natural colour should be seen. We are still suffering from the falsity of nineteenth century practice : one feature of which was that construction had always to be covered up, or hidden ; and that material was only beautiful if coloured, or painted over, or varnished, or in some other (and much less beautiful) way disguised.

(B) MATERIALS USED.

Cowhide, calfskin, and sheepskin are the materials used for modelling.

Cowhide is tough, and does not take such fine impressions as calf ; and is useful for chair seats and stools, and similar purposes where resistance to wear is needed, and where broader effects in pattern are the most suitable.

Calfskin is the best for modelling. It is beautifully responsive to treatment, and most delicate effects can be obtained. It can be had in thin, medium, or thick thicknesses, rendering it suitable for most purposes. There is an Indian calf obtainable at much cheaper rates, which is economical as regards price, and is, in that doubtful sense, suitable for schools. Persian calf can be modelled, and as this is usually supplied ready stained, it is serviceable. In browns it is capable of considerable artistic treatment. Natural skins are usually dealt with, and, if thought desirable, stained afterwards. Skins can, however, be obtained ready stained and glazed to various colours, and can be used so with good effect. One very satisfactory feature of natural skins is that they show not only the natural colour, but the natural grain. Imitation graining is to be deprecated. Sheepskins are used for modelling, but are not so satisfactory as calf so far as the modelling itself is concerned ; neither do they finish so well, either left natural or stained.

Where, however, the patterns are in outline only, or are just to be punched by means of heat, sheepskin is good to use.

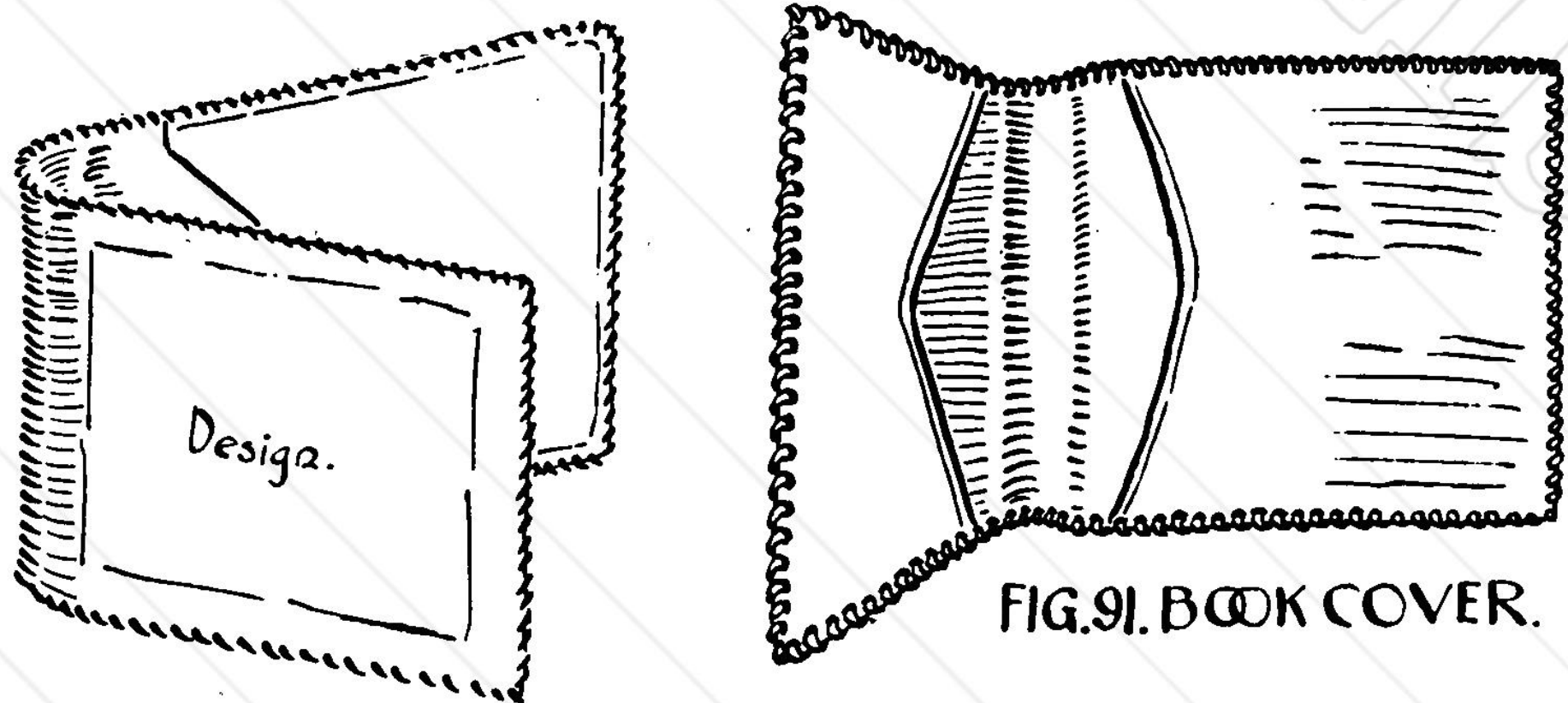
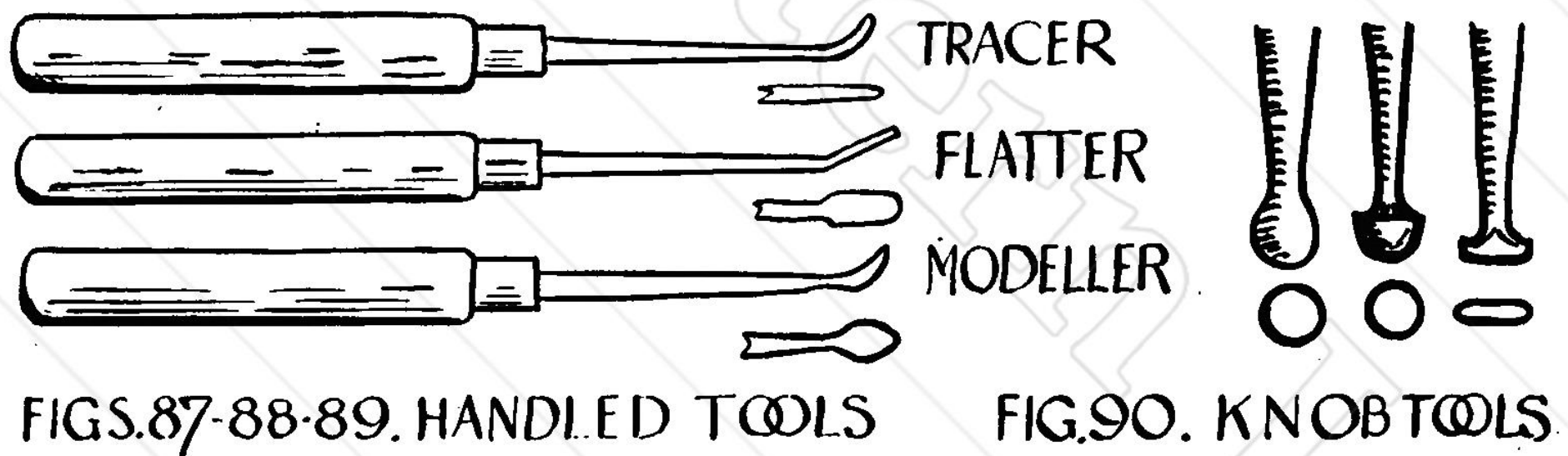
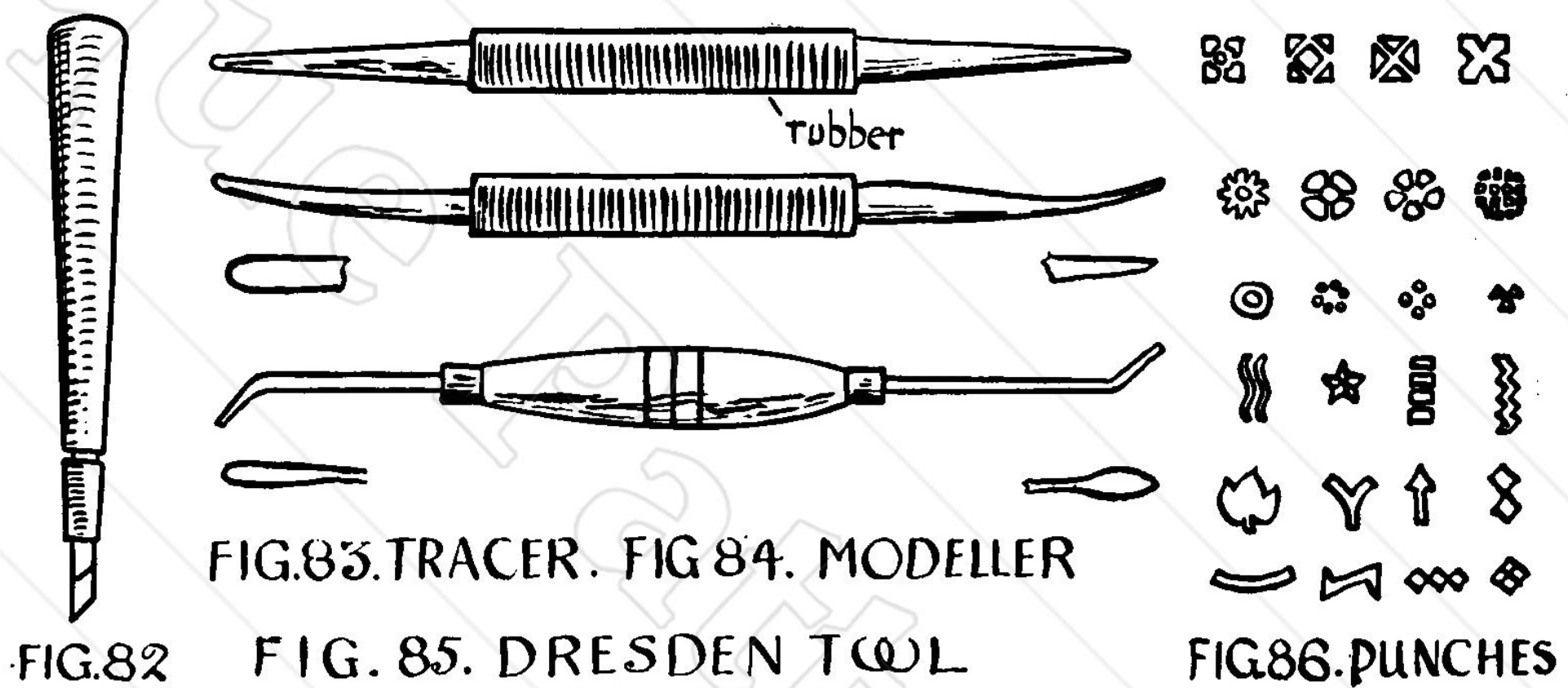
In making up Incised, Embossed or Modelled work, other materials are used, and these are described in Chapter I.

(C) TOOLS NEEDED.

Only the tools needed for the plastic work will be here mentioned and described ; the tools needed for making up being already mentioned in Chapter I.

A sharp pointed knife for incising, a stencil knife, or a wood block cutting knife will do (Fig. 82) ; 1 tracer (Fig. 83) ; 1 modeller (Fig. 84) ; 1 Dresden tool (Fig. 85) ; sometimes matting tools are

used for the ground, but I prefer to use them for the general scheme of ornament. Fig. 86 gives some forms of punches that will be found of service. Many of these can be made from brass screws and brass rods, with the help of a file.



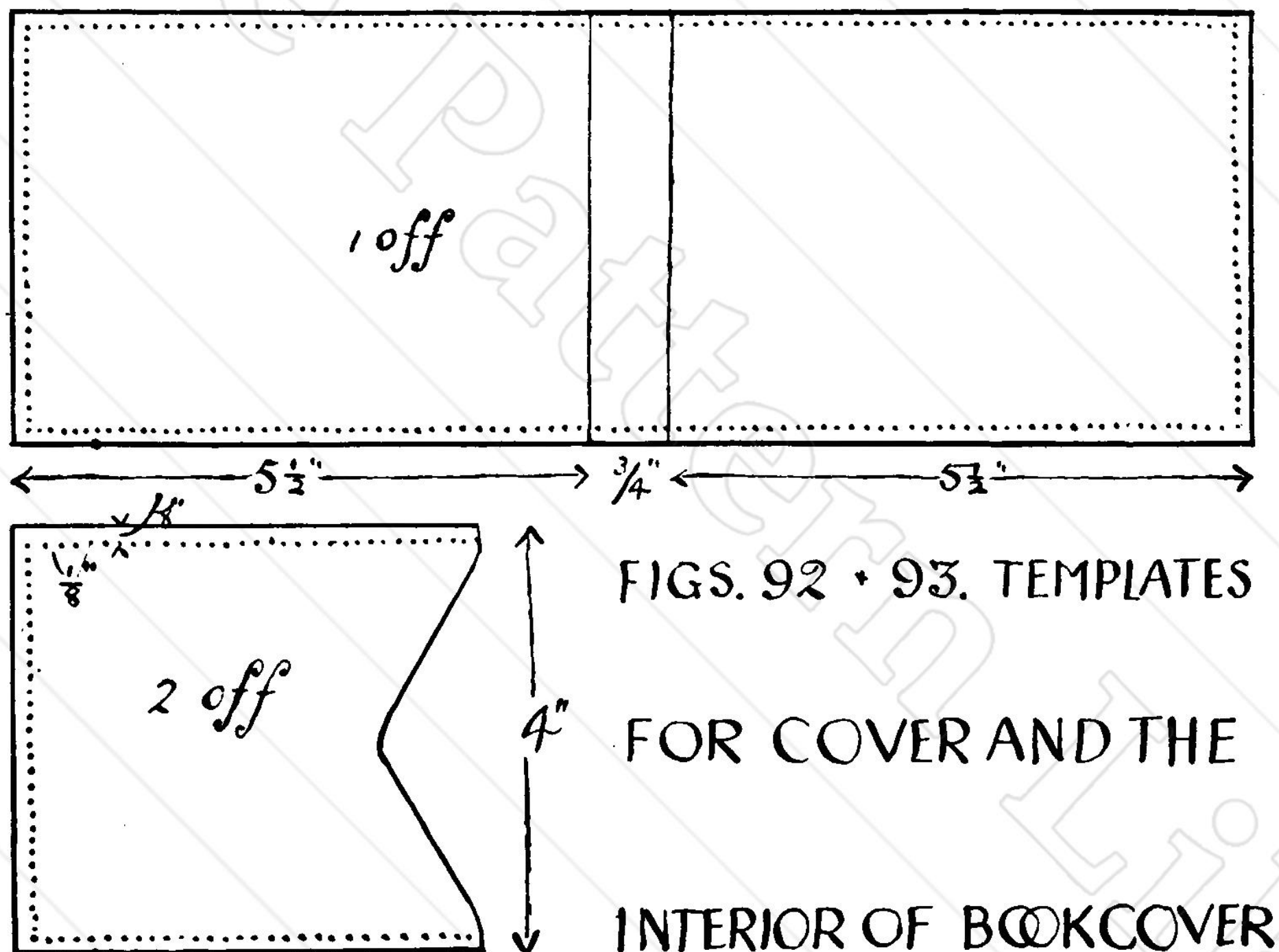
There are other forms of modelling tools used. One form is shown in Figs. 87, 88, and 89. This form of tool is often used for modelling in pewter. The tools are quite good for modelling in leather. They are known as tracer (Fig. 87) ; flattening tool (Fig. 88) ; modeller (Fig. 89). Knob tools in box wood are sometimes found of use, but are not indispensable. (Fig. 90.)

A sponge and saucer are needed for the water. A sheet of plate glass, a piece of linoleum, and a piece of felt are useful for the modelling.

(D) SPECIFIC EXAMPLES, SHOWING THE STAGES IN THE TOOL OPERATIONS AND TECHNICAL PROCESSES NECESSARY.

1. Incised Work.

Book Cover. (Fig. 91.)



Materials Used.

1 piece calf for outside cover ; 2 pieces suede for interior ; thongs.

Tools Needed. (for Incising and Modelling.)

Incising knife ; 1 modelling tool ; glass slab ; sponge.

First Step. Mark and cut out the templates for the cover and the interiors. (Figs. 92 and 93.)

Second Step. Lay these on the leather ; mark and cut out.

Third Step. Prepare and put on the design (Fig. 94). To put the design on the leather the best way is to wet the leather evenly, place the design on in its right place, and then go over it with the tracing tool. This will make an impression on the leather that, when gone over by the tracing tool on the leather itself, will make the outline permanent. If the design can be drawn direct on the leather, that would be the best course. Do not use carbon paper ; it is greasy and makes marks that are not easily taken off.

Fourth Step. With the incising tool now proceed to cut the outline. The cut that is made should be in depth about one-third the thickness of the leather. It should also be quite vertical; i.e. it should not be either undercut or sloping. Lines meeting so that a long point will be left should not be cut quite up to the point, so that the latter will always be quite strong and will not turn up. This incised cut is now opened out by means of the edge of the modelling tool. The leather will be well damped, and the

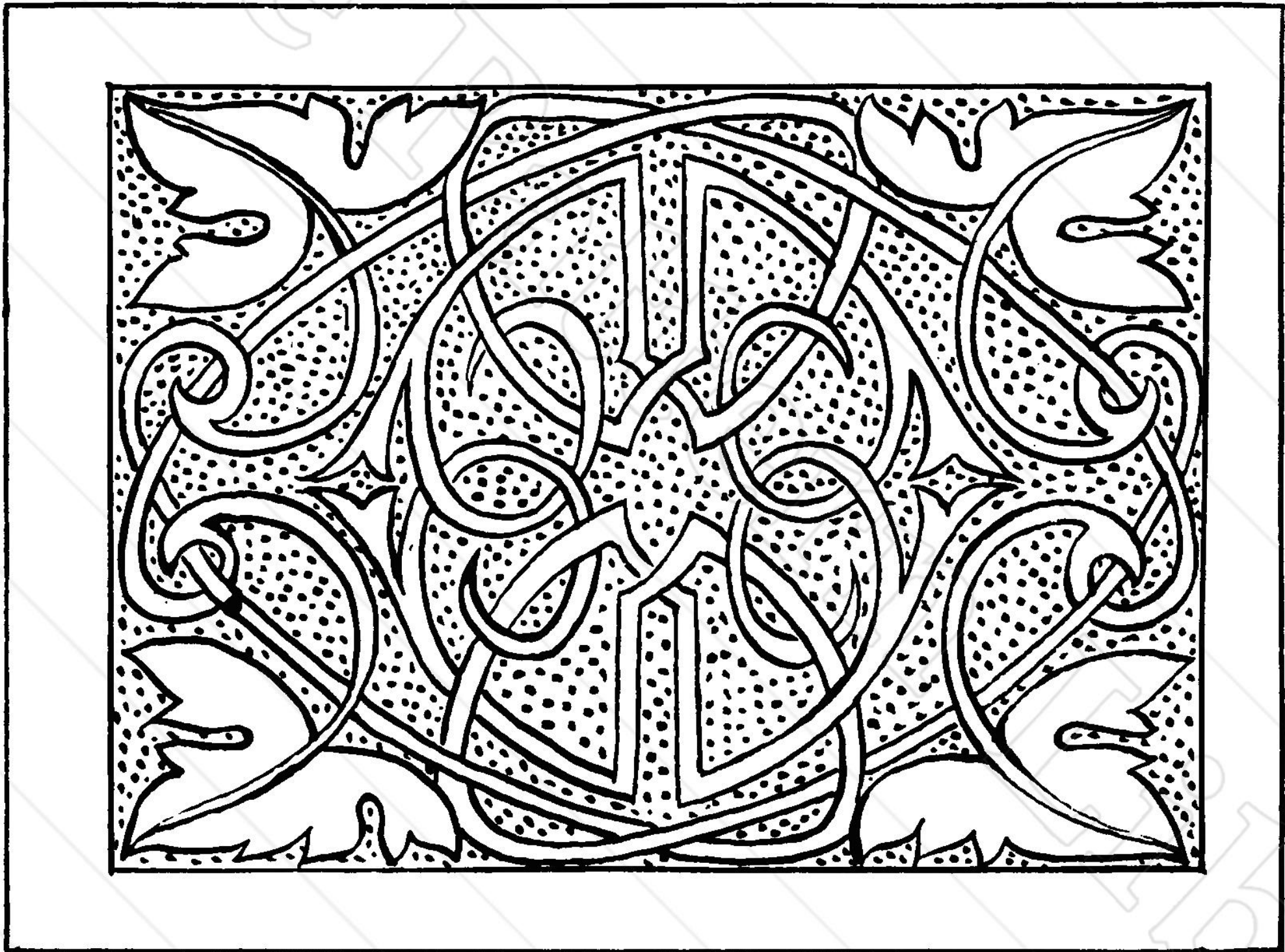


FIG. 94. DESIGN FOR BOOK COVER

edge of the tool inserted and pushed forward, leaning slightly on the ground side of the outline. This will press down the ground, and leave the edge of the pattern standing up clearly and sharply.

Fifth Step. Now depress the ground by flattening it with the modeller. The pattern may now be modelled, if it is intended to treat it in this way.

The ground may be stamped or matted with one or other of the punches. I find a very suitable method is to matt the surface with the end of a tracer, or the end of a modelling tool, whilst the leather is wet. Sometimes lines are drawn on only instead of holes being impressed.

Sixth Step. The leather should now be marked for punching and the holes punched in.

Seventh Step. If staining is in the original intention, it had better be done now.

Eighth Step. Cut the thongs, stain them (if needed), and thong the pieces together.

Ninth Step. Polish the whole with Ronuk, or some wax polish. (See Chapter IV for staining and polishing.)

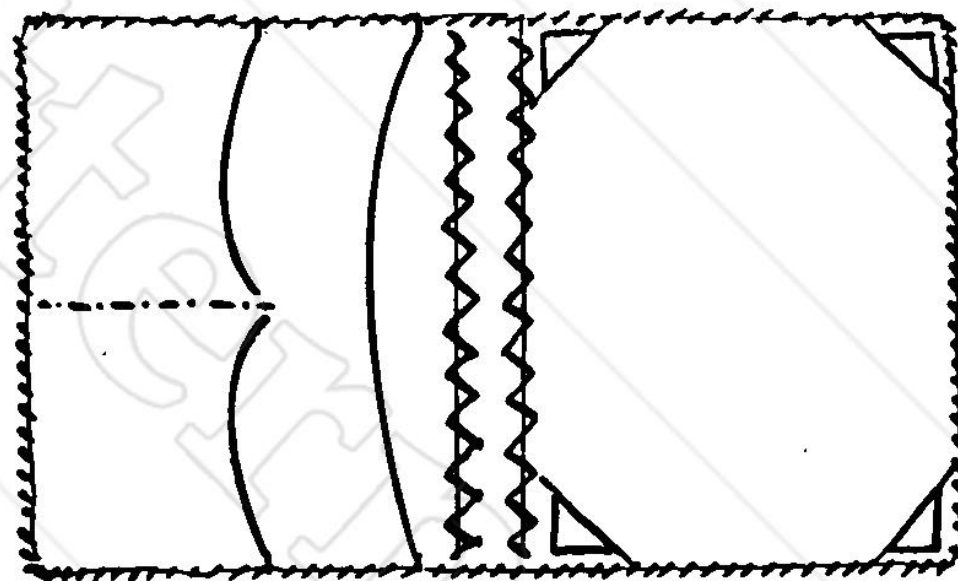
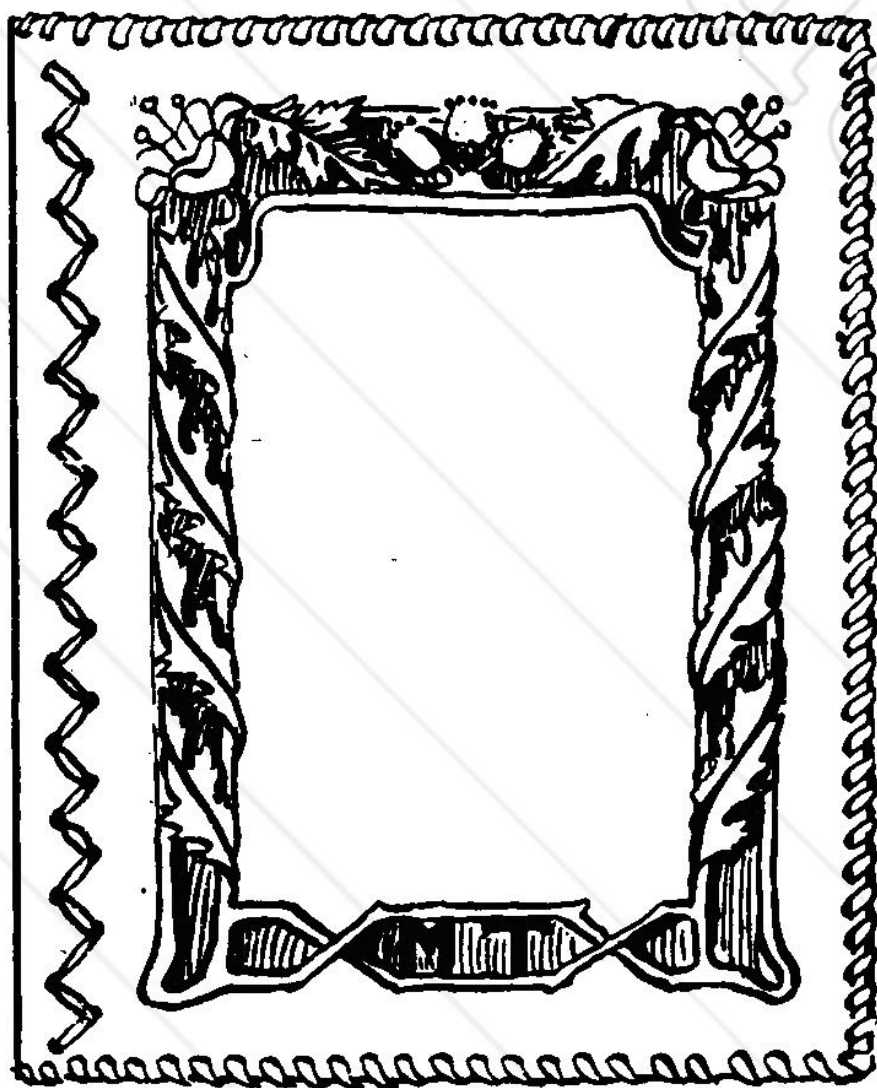
2. Modelled Work.

Blotting Case. (Fig. 95.)

Fig. 96 shows it open.

Materials.

Best medium thickness modelling calf for cover ; thin calf for interior ; thongs ; press studs.



FIGS. 95 + 96. BLOTTING
CASE SHEWING FRONT
AND INTERIOR OF CASE

Tools (for Modelling).

1 tracer ; 1 modelling tool ; glass slab ; linoleum ; sponge.

First Step. Mark and cut out the templates needed for the separate pieces. (Figs. 97, 98, 99, and 100.)

Second Step. Lay these on the leather to the best advantage, mark round them, and cut out with knife or scissors. A sharp knife used with a strong firm hand makes the best and cleanest cut.

Third Step. Prepare the design (Fig. 95) and either draw it on the leather direct, or trace it on.

Fourth Step. With the tracer deepen the outline of the design. The ground may be left just as it is—left on the same level ; or it may be depressed ; or it may be matted with the point of the tracer or the modeller.

Within the limits of the outline, proceed to model the design.

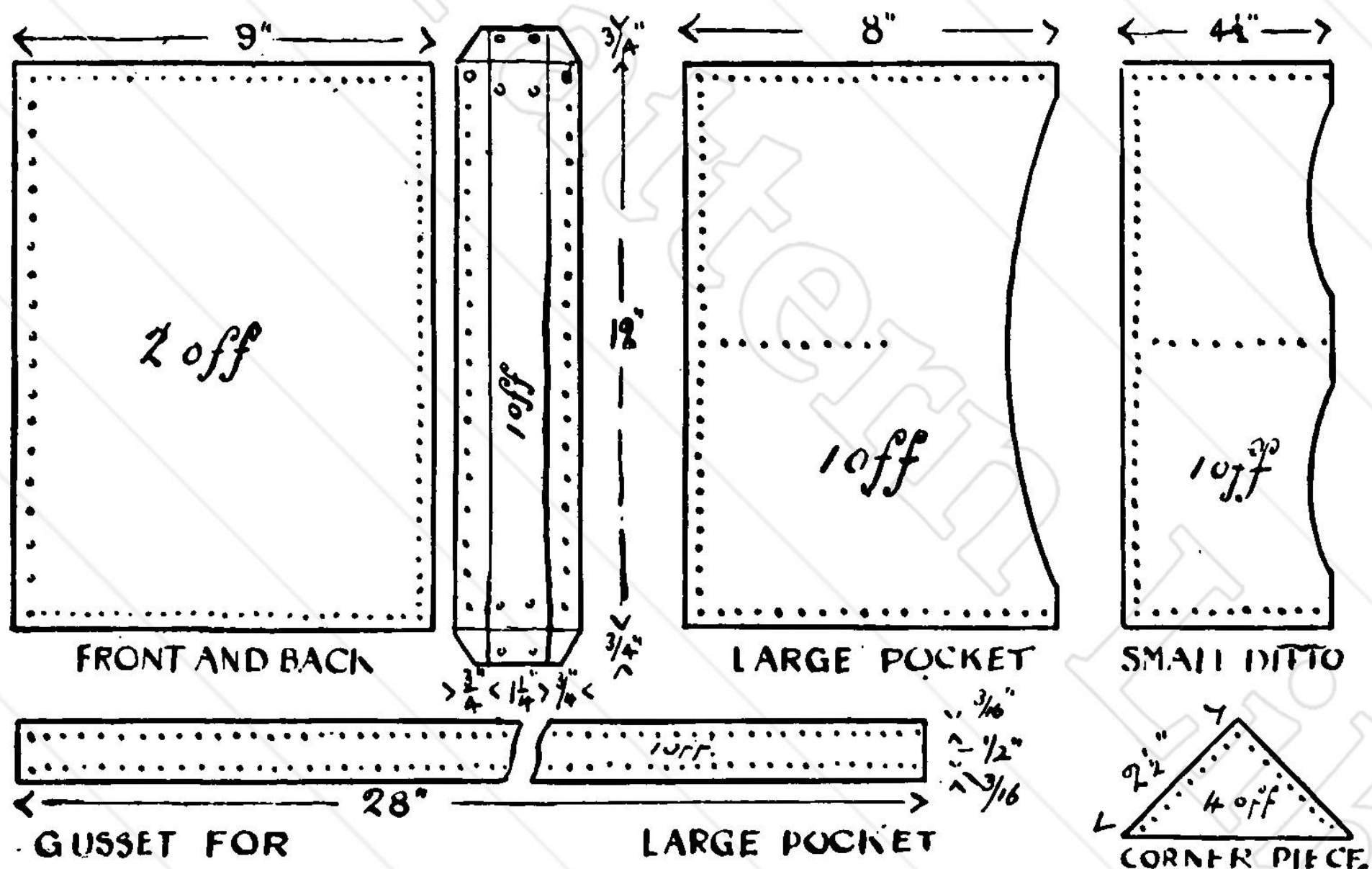
MODELLED LEATHER.

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This is not possible to describe in detail. It is a matter of individual "feeling" in every way. You just try to get movement in the elements of which the design consists. Avoid the monotony of treating each similar element in the same way; give to each an individual treatment. At the same time do not get such a great difference in the treatment of each that the balance of the whole is destroyed, and discomfort follows.

In this design, and in this kind of plastic work, nothing projects above the surface, and the utility of the object is not interfered with; neither are there any projections that will wear through before the rest of the surface.

Fifth Step. Mark the leather for punching, and punch the holes.



FIGS. 97-97_a-98-98_a-99+100. TEMPLATES FOR BLOTTER PARTS

Sixth Step. If it is thought necessary to stain it, do it now.

Seventh Step. Cut and stain the thongs, and lace up all the parts into one whole.

Consult the sampler (Fig. 32) for the kind of stitch you feel can be adopted. The thonging is always one of the elements of ornament.

Eighth Step. Finish by polishing. (See Chapter IV for instructions.)

3. Embossed Work.

A Table Mat. (Fig. 101.)

Materials.

Calfskin, or the best sheepskin of fairly good thickness; 1 piece of cardboard; 1 piece of skiver, thongs, and filling.

Tools (for Modelling and Embossing).

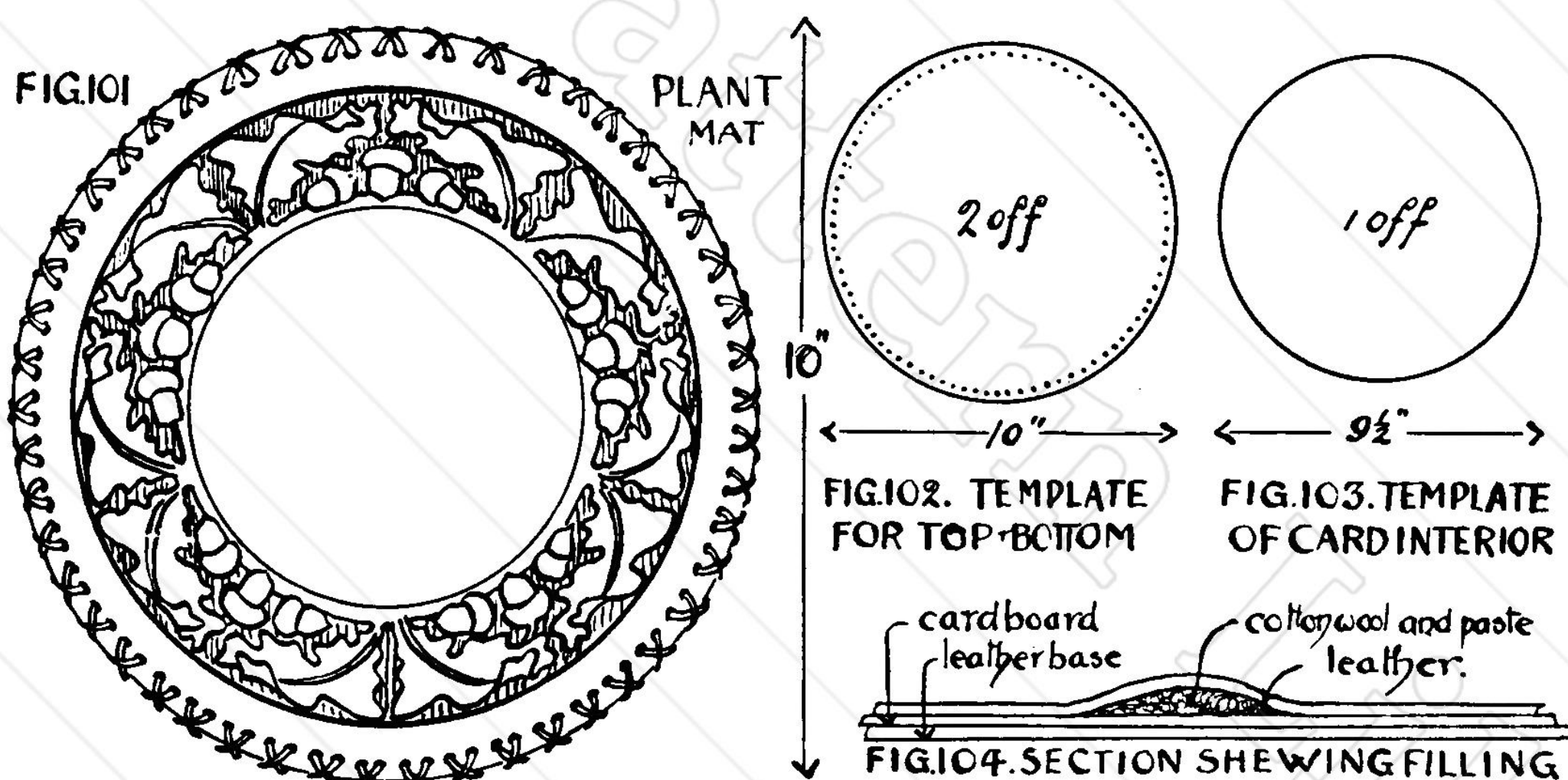
1 tracer ; 1 modeller ; 1 (or more) ball tools ; sponge ; glass slab ; linoleum ; felt pad.

First Step. Mark and cut out the templates needed for the mat. That for the cardboard core will be smaller than the others. (Figs. 102-103.)

Second Step. Lay the templates on the various skins ; mark and cut out.

Third Step. Prepare a suitable design (Fig. 101), and draw or trace it on to the skin.

Fourth Step. Follow the instructions given on page 46, with these additions. In embossing, some of the pattern is raised well above the surface. To do this, these parts must be stretched and



raised whilst they are wet. The fingers and thumbs will do this quite well for larger spaces. When using tools, turn the leather over on its face, on the felt pad. Then holding the leather with the left-hand, draw the modelling tool or the ball tool over the part to be raised, pressing well down ; this stretches the leather and, with care, a well domed raised portion of the leather can be produced. When this has been raised high enough, it must be *filled*.

Fifth Step. The filling can be one of many. Brown flour made up into a stiff paste is good ; stiff paste, in which is mixed cotton wool well fluffed and teased out, is another good filling. Whatever filling is used it should not be used in too wet a condition, or the water soaks into the leather and stains it.

Press well into the raised portion, and then cut the surplus off from the back with a straight edge. Cover over with a piece of thin tissue paper, and await its setting.

Sixth Step. The state of the filling governs the next process, which is that of surface modelling. The filling must not be allowed

MODELLED LEATHER.

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to set hard. On the other hand, if you try to work on it whilst soft, you will not be able to model the surface, and will run the risk of damaging the general shape of the doming.

Its condition, for perfect work, should be firm enough to withstand pressure ; yet plastic enough to receive impressions.

The surface modelling finishes off the work already embossed. The surface, although raised, is plain, and needs the pattern definitely picked out and emphasized ; and the shapes of members need attention. The leather can now be left to dry.

Seventh and Subsequent Steps. The punching is now the next job ; then the staining (if needed) ; then the thonging, and lastly the polishing.

CHAPTER IV

STAINING ; POLISHING ; BLIND AND GOLD TOOLING ; FIXING RUSKIN STONES ; THE USE OF PUNCHES.

THIS chapter will give examples of the various processes coming under this head ; a general description has already been given in Chapter I.

Leather often appears to be difficult to stain ; and some leathers appear to be treated in such a way that the stain, whether it be water or spirit stain, does not spread evenly. Calfskin, as a rule, does stain pretty well, and satisfactory results can generally be obtained. But a good deal of care is always needed, and some experience, and, most of all perhaps, common sense.

One very insistent complaint is that the stain will not spread evenly, but is patchy and spotty. Let us deal with this. In the first place, a perfectly uniform shade of colour is not by any means always necessary, or desirable. It is a belief that has attained wide acceptance, that uniformity is an artistic necessity. This is surely not so. If the "patchiness" is not sufficient to disturb the balance of the general appearance, it is no drawback ; and, often enough, an unevenness in colour is a decided advantage ; it gives a softer appearance to a colour scheme, and prevents harshness, and the hardness and coldness that can arise out of machine-like uniformity. At the same time, there is something to be said against an excess of patchiness. The whole *tout ensemble* should be pleasing ; and undue patchiness of colour may well produce irritation. Do not, however, get it fixed in your mind that the only perfect end to strive for is to get an absolutely uniform shade of colour on your leather.

Staining.

To avoid unpleasant patches, proceed as follows—

Choose the shade you desire to use and pour some out into a shallow vessel ; an empty potted meat pot will do admirably. Dilute it with spirit or water, as the case may be. It is better to approach the desired colour by degrees than to try to get the shade at one application. This method has another advantage inasmuch as it helps a good deal if it is desired to have two shades of one colour on the article.

Use a fine sponge for large surfaces, and use it with a circular motion, or a soft brush for smaller surfaces. For large surfaces it is well to damp the surface of the leather well before starting to

STAINING ; POLISHING ; BLIND AND GOLD TOOLING. 51

stain. This can be done with water, even if it is spirit stain that is to be used.

For smaller parts, the stain can be put on in a less dilute form.

Spirit stain is probably better than water stain. It is supplied generally in small boxes in powder form, which requires dissolving in methylated spirit. These stains are usually supplied in sets of ten to twelve colours. It is as well to prepare all of them at once and store in glass bottles. These are cheap enough, and a good deal of trouble and mess is saved by doing this at the commencement. Mix them strong ; and they can be diluted afterwards at will. It is always well to wait until each coat of colour is dry, whether it be water or spirit stain, before proceeding to put the next coat on. Spirit stain has an advantage here, because it dries much more quickly than does water stain. Spirit and water stains can both be mixed to produce any desired shade of colour. Sometimes this mixing can be done on the leather itself. A wash of one colour can be followed by a wash of another to produce the required third shade.

When all the colours desired have been put on, a thin wash of colour (of the ground colour usually) is put on over the whole to tone all the colours to a harmonizing point.

Polishing.

After the stain has been successfully put on, a finish has to be given to the surface of the leather to make it wearable. The quickest method of doing this is to apply directly a polish of the type of "Ronuk." With the aid of "elbow grease" a good surface can be produced.

Another method consists in first of all paste-washing the stained leather. This "paste wash" is just paste thinned down with water. It should not be so thick that it leaves the white marks of the paste on the leather. Its purpose is to fill the grain, so that any polish applied to the leather will not sink in quickly. A brighter polish will result.

A further addition that will result in a still brighter polish is that of "glair." This substance is really white of egg beaten up and diluted with water and a little vinegar and a little salt.

Take a teacup, and break into it the white of one egg. Half fill the cup with water, add a little vinegar and a pinch of salt. Beat this up well and leave for 24 hours. Again beat up and leave for 24 hours. Do this again, and then leave for a day. The next day it is ready for application.

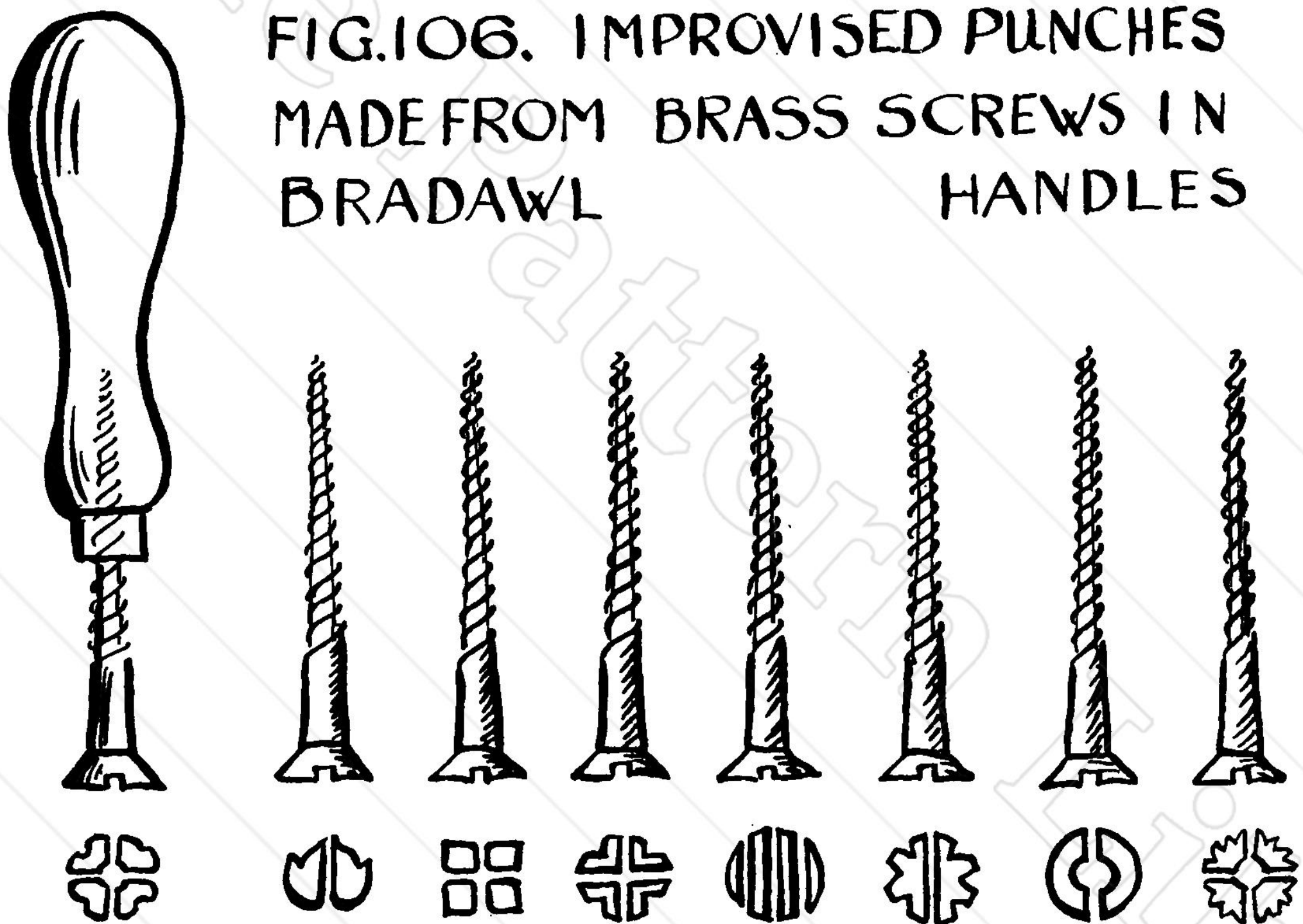
It is brushed on after the paste wash, and the "Ronuk" applied afterwards. If it is desired to have the leather a very bright polish, after the "glair" use bookbinders' varnish.

White paraffin wax dissolved in turpentine is a useful polish—used with plenty of energy.

It must always be kept in mind that a dull "egg shell" polish is much to be preferred to a bright varnish polish.

Blind and Gold Tooling.

Most schools are not able to afford an expensive equipment ; and it is not my intention to describe one. But much equipment for this purpose can be easily evolved, and, within the limits of such equipment, it is possible to do much decorative work.



Blind Tooling consists of making impressions in leather by means of punches or tools when the leather is wet, or when the tool is hot

The Tools.

The tools may be made from odd ends of metal. Brass is the best ; and pieces of $\frac{3}{8}$ in. brass rod about 6 in. long will do admirably. Shorter pieces will do if they can be fitted into a wooden handle. The end of each piece is filed level, and then a pattern is filed or drilled into it. Such patterns are shown in Fig. 105. Punches can also be made of ordinary flat head brass screws, fixed into bradawl handles (see Fig. 106). A wheel tool is useful for making straight lines, and one can be made from a broken compass as shown in Fig. 107.

Bookbinders' punches which, besides pattern punches, include all kinds of letters and numbers, are as shown in Fig. 108. If you wish to do lettering you will have to purchase a set of numbers and letters.

You can buy, through the usual trade channels, pattern punches of varied design also.

The Process.

(a) WITH COLD TOOLS ON WET LEATHER.

The design is made first and it is then laid over the damp surface of the field of ornament, being pasted in two places to keep it from moving. The appropriate punches and tools are used to press the pattern into the leather.

Then the paper is taken off, and the leather damped to the

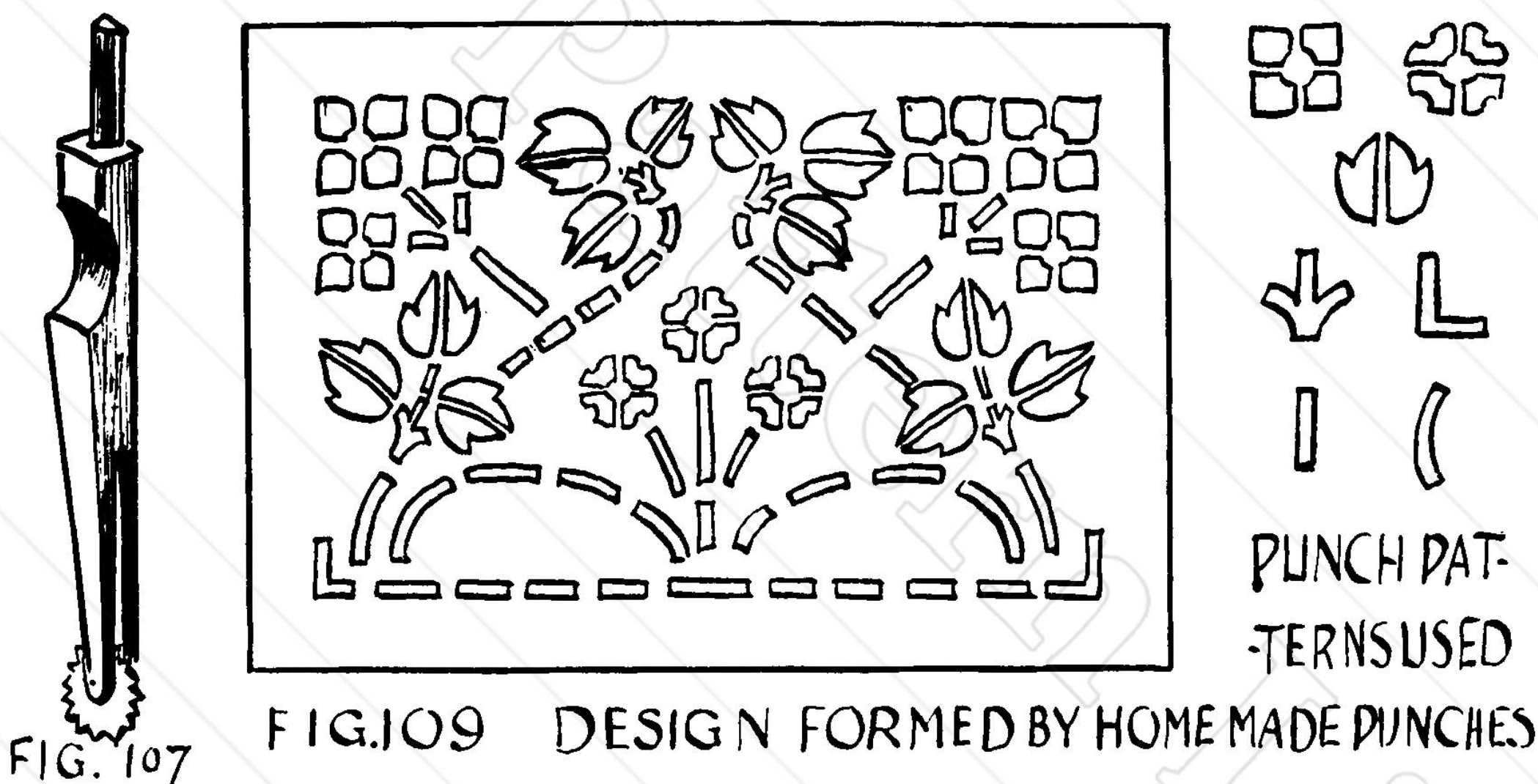


FIG.109 DESIGN FORMED BY HOME MADE PUNCHES



FIG.108. TYPICAL BOOKBINDER'S PUNCH

right state of wetness ; the tools are now taken over the design and pressed in, either by hand pressure or with a mallet or hammer. The wheel tool can be used for straight lines ; and it will be found now how much better a wheel tool is than a tracer for this purpose. A fixed tool pulls the leather up ; in a wheel tool the pressure goes chiefly downwards at the point where the wheel impresses the leather.

Take care to have an even impression, and it is well to watch the leather during the drying process, and to strengthen any impressions that appear to be weak.

(b) WITH HOT TOOLS ON DRY LEATHER.

The design is made on paper and a tracing made to place over the leather. The tools needed are placed side by side in the probable order in which they may be used.

A bright fire, or a clear gas jet or gas ring will heat the punches,

It is not a great heat that is required. A wet rag, or piece of damp cotton wool, will be used on which to test the heat.

Fix the tracing paper or cloth tightly on the leather. Then heat the first tool; place it on the wet rag, and when it is just ceasing hissing it is the right heat. Place it carefully on the part of the design that it fits and gently press it into the leather. Hold it there for a moment or two, and then take the next tool, which will have been gently heating, and so proceed to complete the whole design. Now take off the paper, and go over the design again in the same way. Often the design is such that the tools can be applied directly without the medium of the paper design. When this is so the work is more easily done, and is stronger and brighter in effect.

Gold Tooling.

This is always done with hot tools on dry leather.

Proceed as for Blind Tooling with hot tools. After the first impression has been made with these, the design and surface has to be prepared to enable the gold leaf to stick. The design can be painted over with gold size, if it is of large texture and the brush can be fine enough; or it can be gone over with "glair." In any case, the leather should be "paste-washed," i.e. sized to fill the grain. Whilst the gold size is getting to the "tacky" stage, the gold leaf can be prepared.

Gold leaf is purchased in books of 25 sheets. It can be obtained fixed to a piece of thin paper, and in this state can be cut with scissors; otherwise each leaf, as required, will be laid on a leather pad and cut with a palette knife into the sizes and shapes needed.

To pick the gold leaf up, a thin flat soft haired brush is passed over the hair (which greases it) and it will then pick up the gold leaf. The surface of the leather is now very lightly rubbed over with a rag that has been greased; this prevents the gold adhering to any part of the surface except that which has been sized.

Lift the gold leaf on to the size and press in with a soft brush, or a wad of cotton wool. Leave to set.

The superfluous portions of the gold leaf will be brushed off easily when the permanent portions are set.

Sometimes it will be found necessary to go over the surface again with the gold leaf to get it uniform. Slight heat applied to the first coat will sufficiently soften the size underneath to enable the second application of the gold leaf to adhere. Very often grounds, or larger parts of the design, can be so treated; or gold leaf can be placed over colour to get a red gold, or a blue, or a green gold effect. Tooling can be effected directly.

To do this, decide where the impressions shall be, and cut the gold leaf to the size of the punch end; or, if you are lining, a long narrow strip should be cut. After paste-washing and sizing, with the soft flat brush gently greased, pick up the gold leaf and lay it

on the place marked ; you can by gently blowing on it, spread it as you need. Then take the hot tools and apply pressure. Brush off surplus gold leaf ; a second coat may be necessary.

Other Enrichments of Leather Goods.

RUSKIN STONES.

These are pottery shapes of many kinds, with glazed and enamel colours on one surface. They are very beautiful in colour and

FIGS. 161 to 163



FIXING RUSKIN STONES

iridescence, and are often used in brooches and for metal boxes ; and they can be used for leather goods. At the same time it is not often that these stones can be used with advantage on those leather goods that are in constant use in the same way as

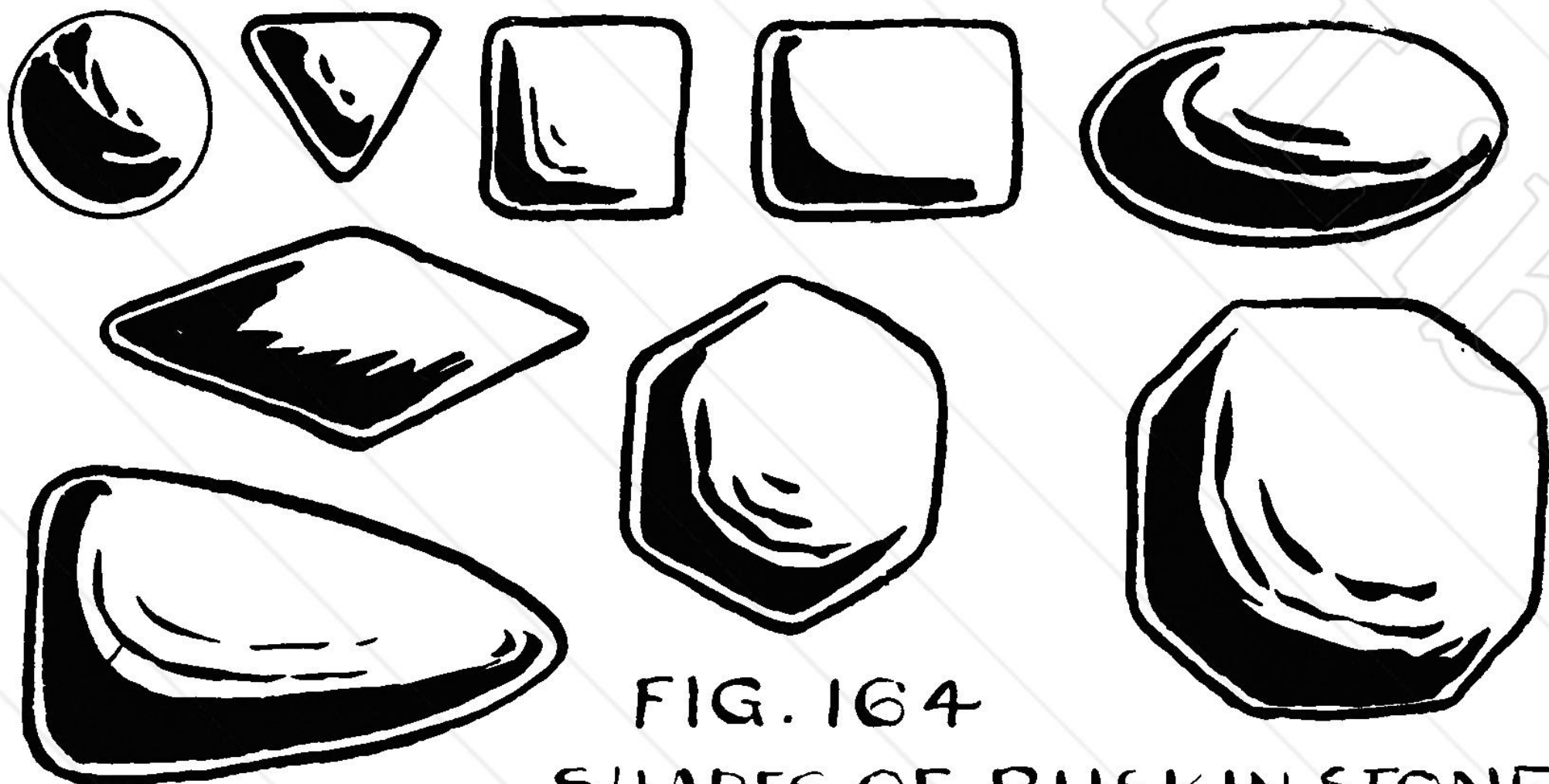


FIG. 164
SHAPES OF RUSKIN STONES.

are bags and purses, because of the possibility of breaking them. Fitness for the purpose must be the guiding principle first to be considered. Figs. 161-2-3 show various ways of fixing these stones. They are of various shapes, as shown in Fig. 164.

From the aesthetic point of view it is the colour values of the stones that are of importance. A spot of colour, shining and

iridescent, is helpful ; and if we can choose a safe place for the stone and can fix it securely, and yet without giving a clumsy or an artificial effect, it is quite reasonable to use the stones.

A hole can be cut in the leather, just smaller than the stone. The stone can be glued to a backing, which, in its turn, can be glued or thonged to the leather from the back. Another way is to glue the stone to the front, and cover it with a shaped piece of leather thonged to the main article. This gives opportunity to use the thonging as a decorative agent.

SECTION II.

EXAMPLES OF CONSTRUCTIONAL AND DECORATIVE LEATHER WORK.

CHAPTER V.

CONSTRUCTIONAL WORK.

THIS section will concern itself with suggestions for articles that can be made in school. It is earnestly asked that these should be looked upon as suggestions, and not altogether as things to be copied line for line. They are each one example of the expression of a real need ; and *one only*. There can be, and this should be insisted upon, many expressions of the same need. A purse, for example, is a need ; and one expression of the need is given in Fig. 110, suitable for a child commencing the work ; but this is not the only form a purse can take ; there are probably scores of shapes, varying in size and proportion, all being equally effective.

Children should be shown the need, or made to recognize it in all its bearings, and then encouraged to meet the need by their own inventiveness and planning.

It cannot be said that the terms " constructional work " and " decorative work " represent two distinct and separate aspects of any craft. If constructional work is not decorative in some way, we have not realized the fact that useful articles are, by their very perfection of adaptation to use, inherently decorative. If they are not decorative they are not truly fulfilling their purpose. Nevertheless these terms can be used to describe two main divisions of the work. Some work has no added ornament ; whatever decorative value it possesses comes entirely from its constructive necessities, and its proportions. Such articles will come within the first category (Chapter V). Others, in which some added form of decoration, such as modelling and stencilling, has been used, will form the subject matter of the next chapter. The drawings explain themselves, and few notes will be needed.

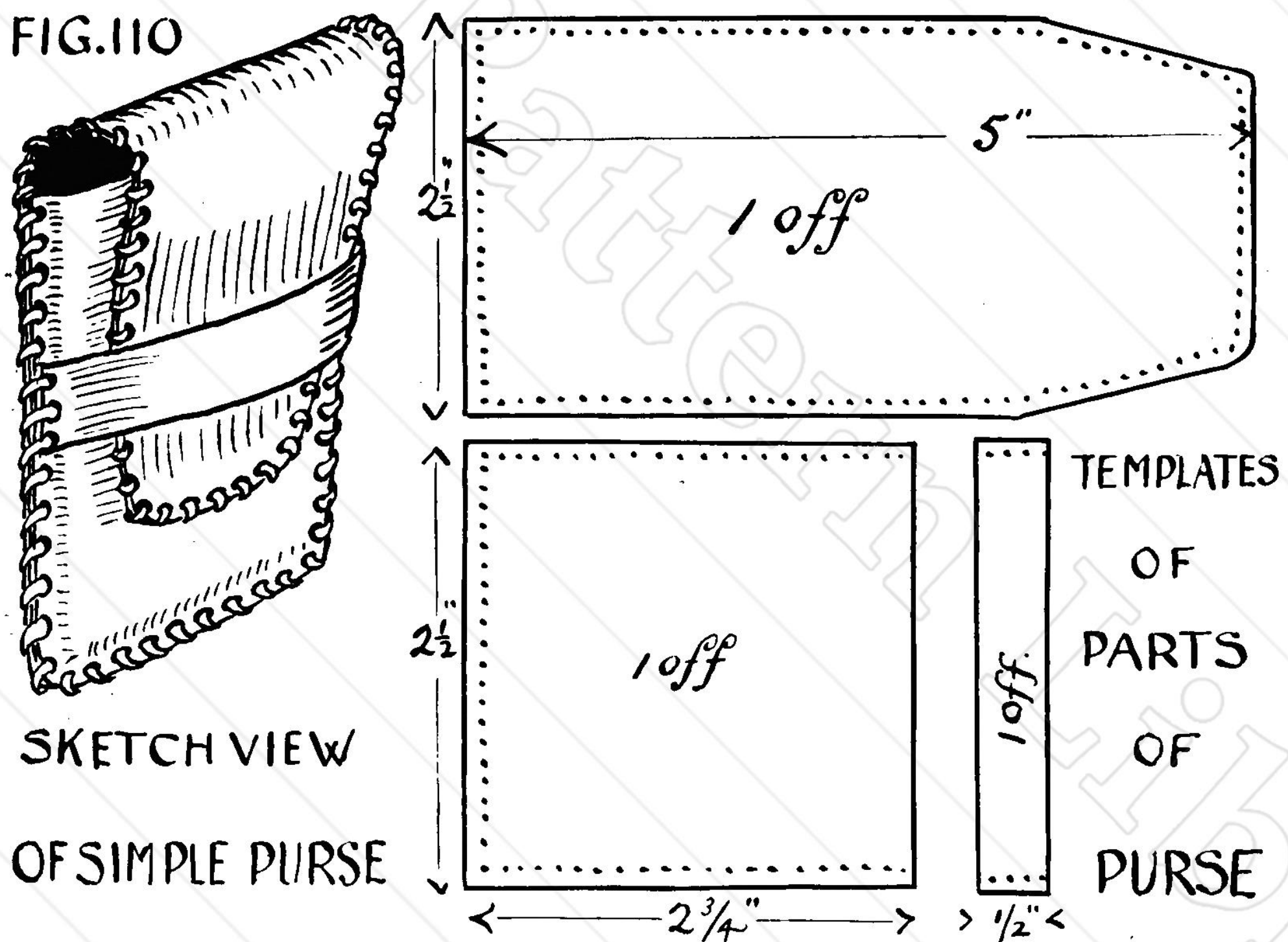
The drawings are to scale and the scale is indicated. Thus, the separate templates need only be enlarged by the square method, or by co-ordinates. All these are shown on page 60, Figs. 113-114.

In Chapter V the objects shown are non-decorative in the sense that no extraneous ornament has been applied ; nevertheless, a very great amount of ornamental treatment can, and should, lie in the character of the object itself. Its proportions, colour of

materials, and the matchings and contrasts possible, and the kind of thonging, will all make decoration without the addition of anything extraneous.

The Illustrations.

Figs. 110 to 130 give illustrations of articles that can be made entirely in leather, without applied ornament, and will thus come under the heading of this chapter as entirely constructional work. They are all objects that are entirely suitable for work in schools. They arise out of present-day human need, and may be considered



as types which can be varied in size and shape to fit the varying requirements of each individual.

It is not to be inferred that these articles are not decorative; far from that; but the decoration arises entirely out of construction, and consists of balancing of parts, colours, and proportions. There is no applied ornament that is not connected with construction.

Fig. 110 gives a sketch and templates of a simple purse, suitable for commencing the elements of leather construction. The front strap may be made $\frac{1}{8}$ in. longer to allow of the flap being inserted when the purse is full. Short ends of leather can be used from which to cut this and similar work. Fig. 111 gives illustrations of a larger and more commodious purse in which press studs are used. The purse is made in two parts and these parts are fixed together either by means of leather thongs, in which case the space between

can be used as a stamp pocket ; or by means of glue and four boot eyelets. Only two pieces of leather are needed for this.

FIG. III. PURSE

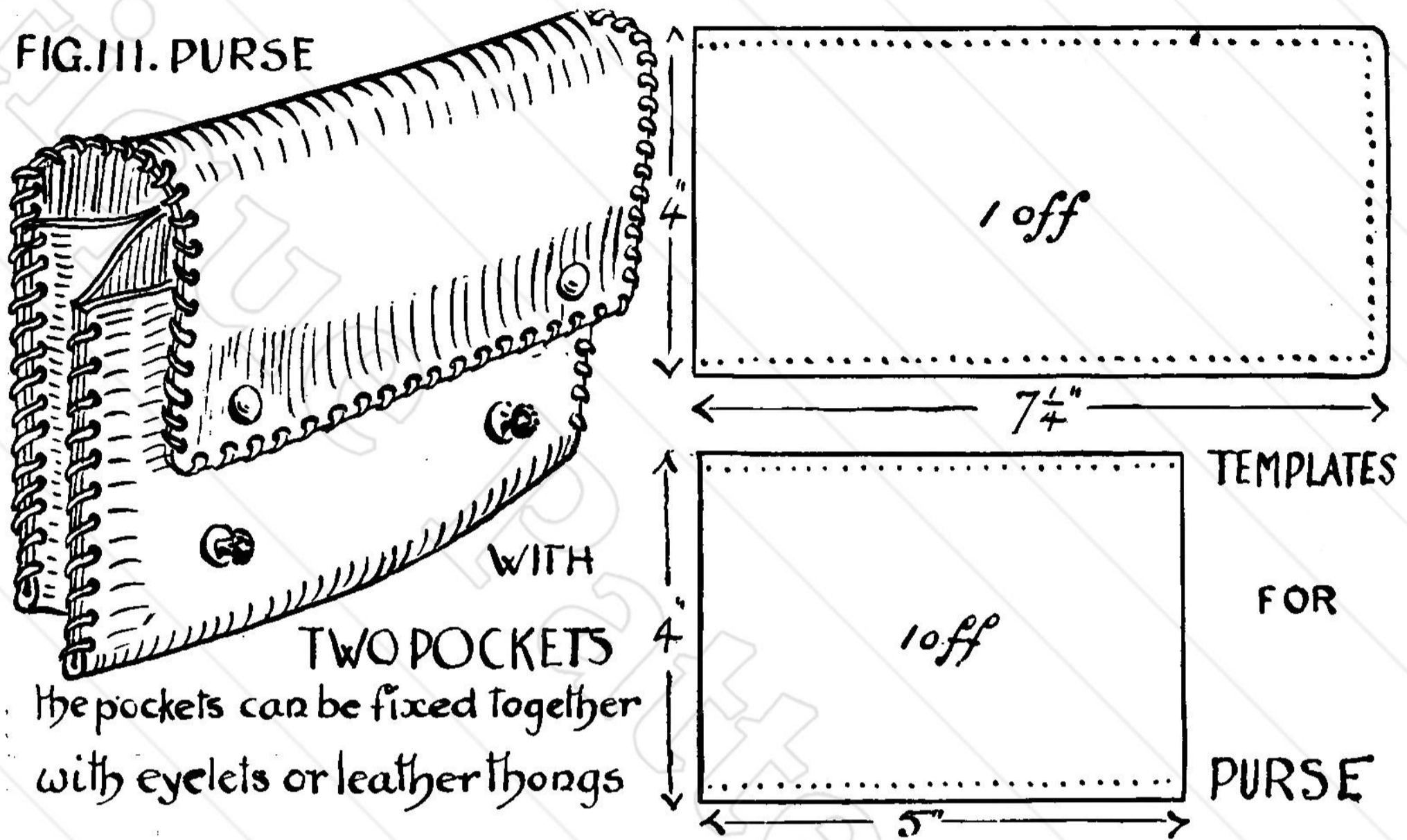
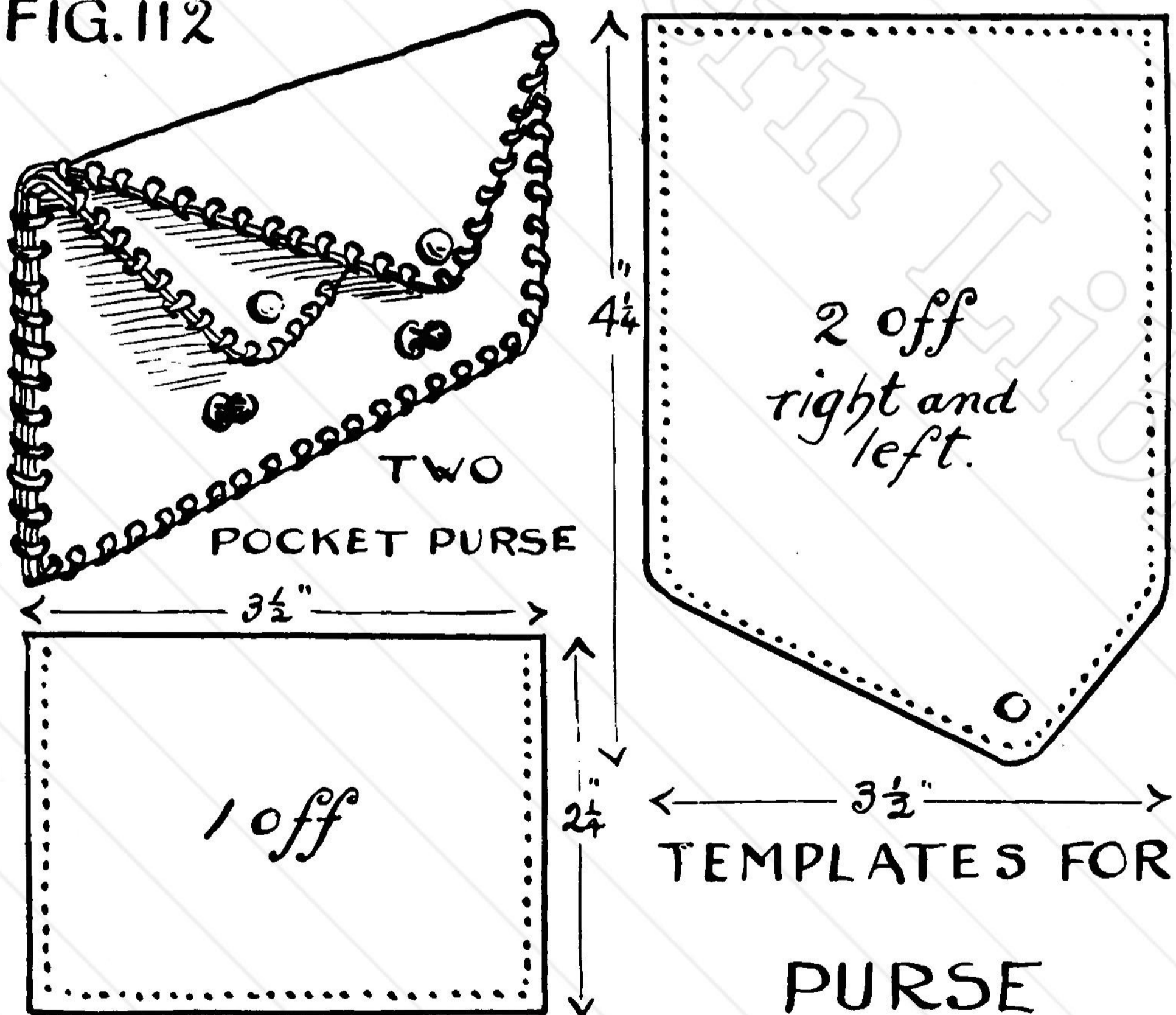


FIG. II 2



Another purse is shown in Fig. II 2. It contains two pockets, each with a flap.

Enlarging Illustrations.

The matter of using designs that are reduced to a small scale, as are many of the illustrations in this book, to fit the full sized object, is often considered to be a stumbling-block, especially to those who think they are unable to draw.

FIG.113. THE METHOD OF ENLARGING BY SQUARES

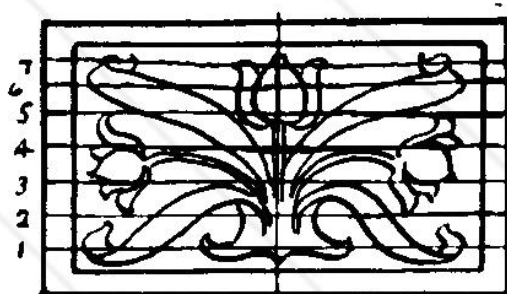
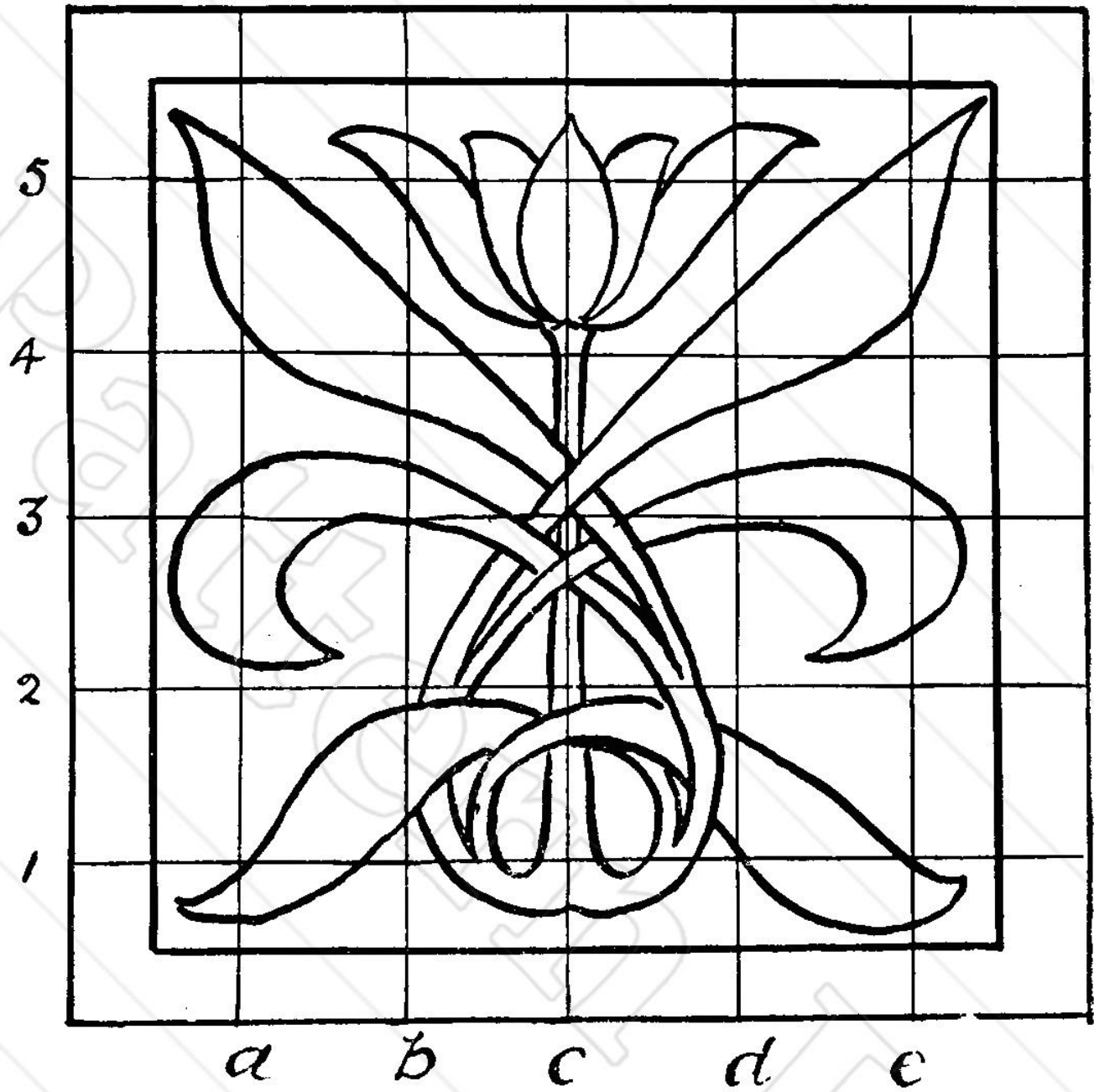
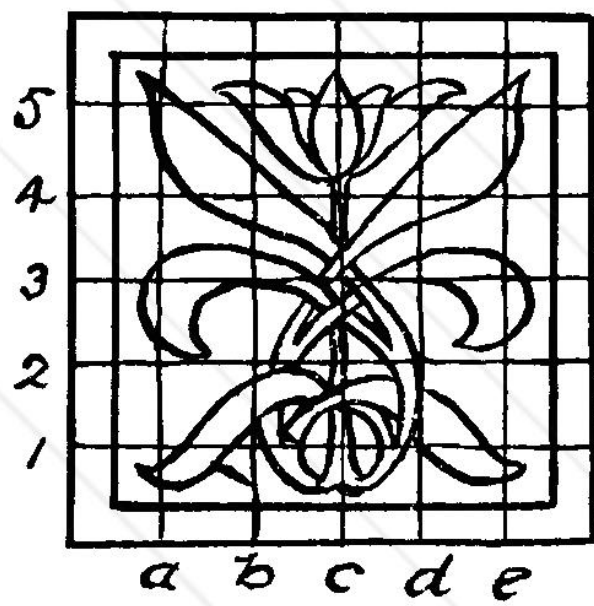
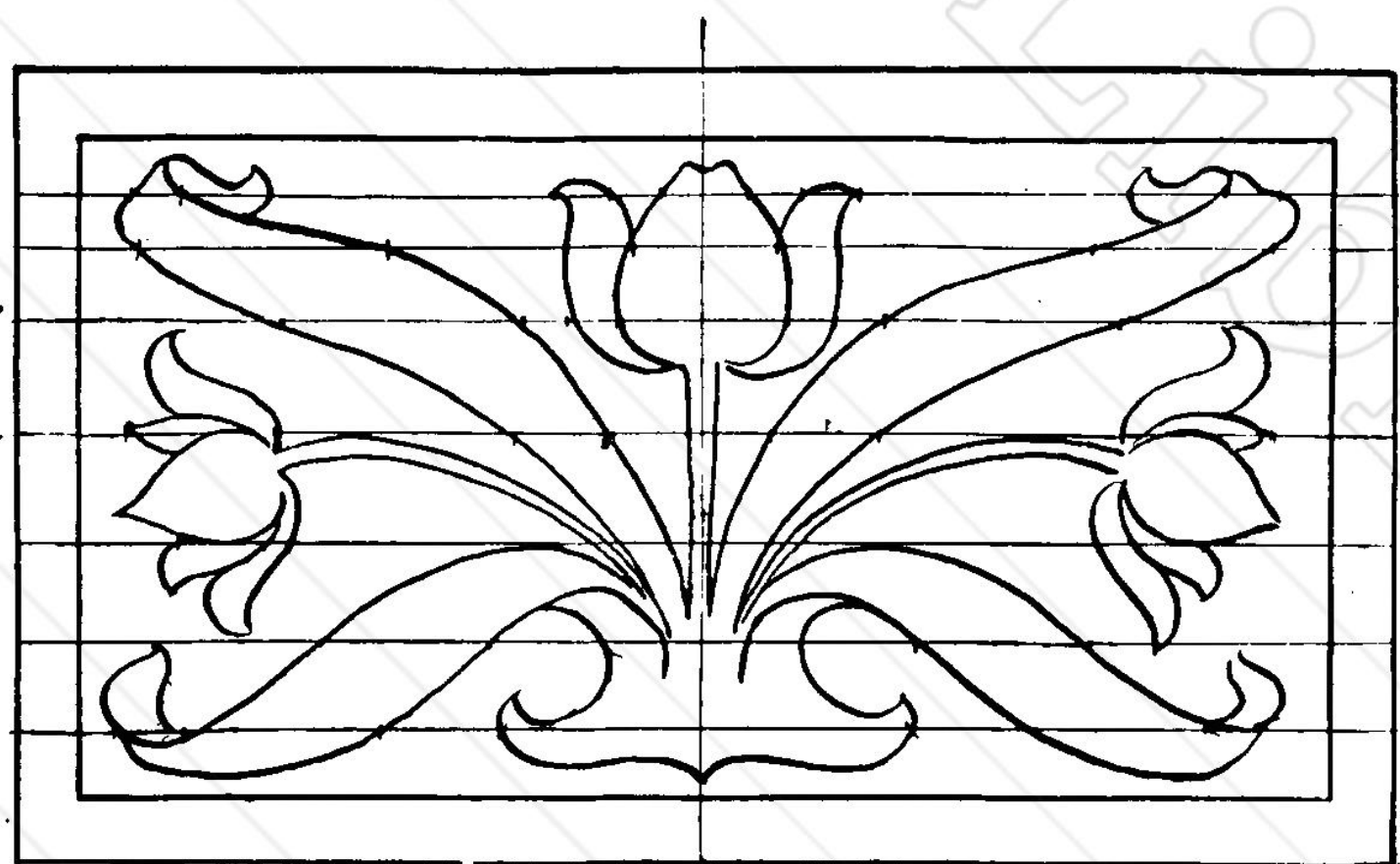


FIG.114. THE METHOD OF ENLARGING BY CO-ORDINATES



For this reason two methods of enlarging illustrations are given, by means of which any sketch in the book may be drawn to full size.

The first is the method of enlarging by squares, as shown in Fig. 113, and the second is the method of enlarging by co-ordinates, as in Fig. 114.

The diminished drawings are surrounded with a boundary, and are then divided into squares, as in Fig. 113, or are lined as in

Fig. 114. The full-sized space is now drawn and is divided into the same *number* of spaces as cover the smaller drawings. It is as well to number and letter the spaces. By measurement and comparison, it is not difficult to get the lines to correspond.

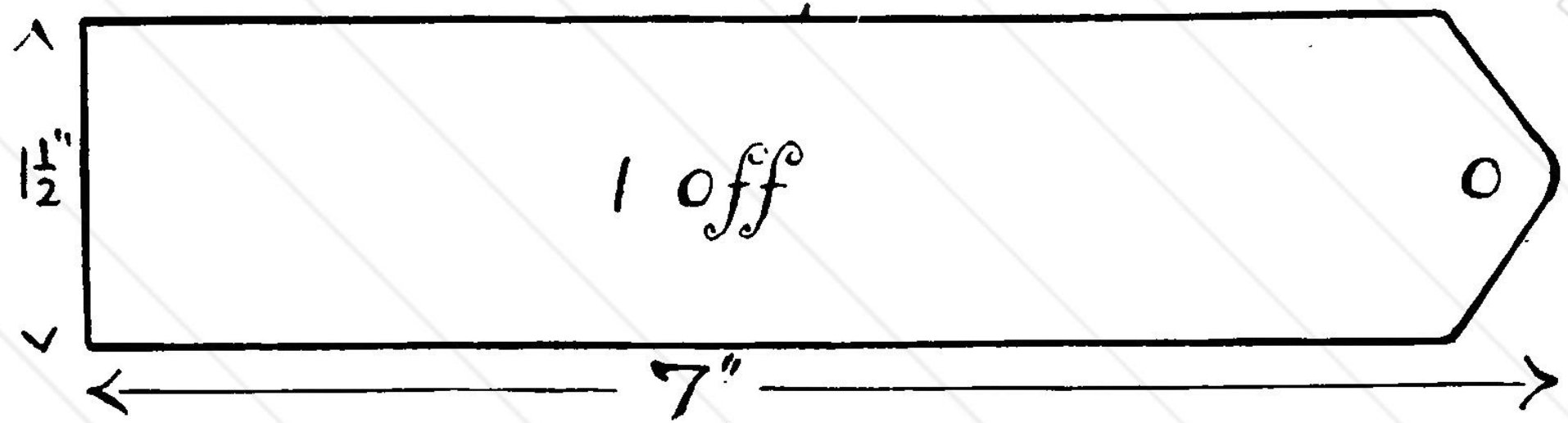
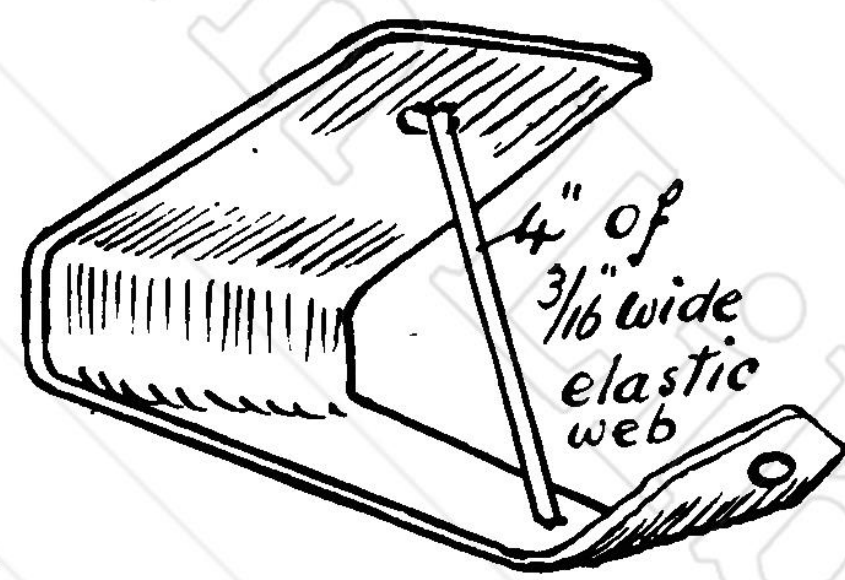
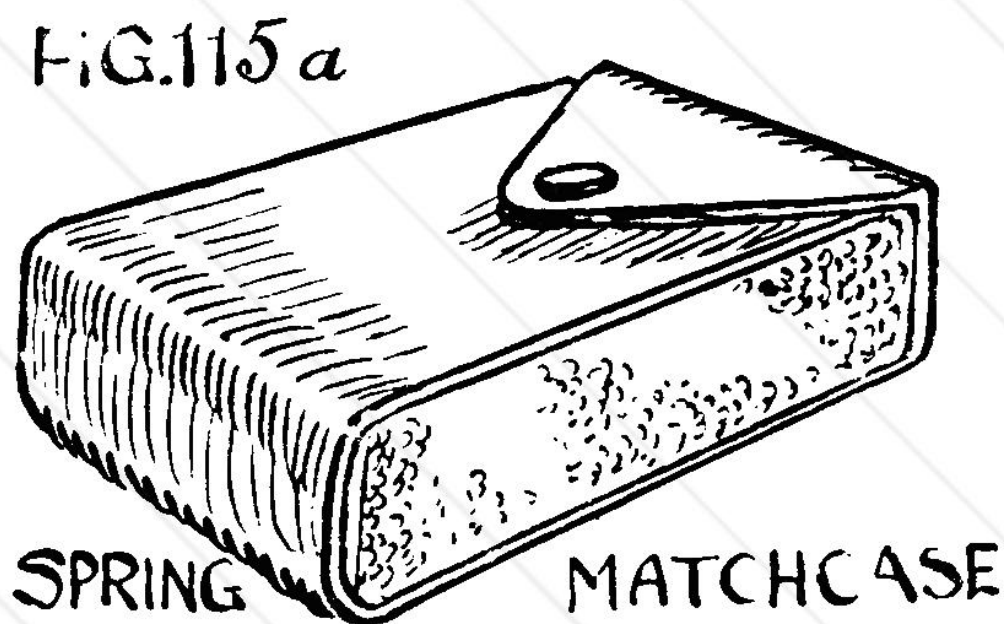
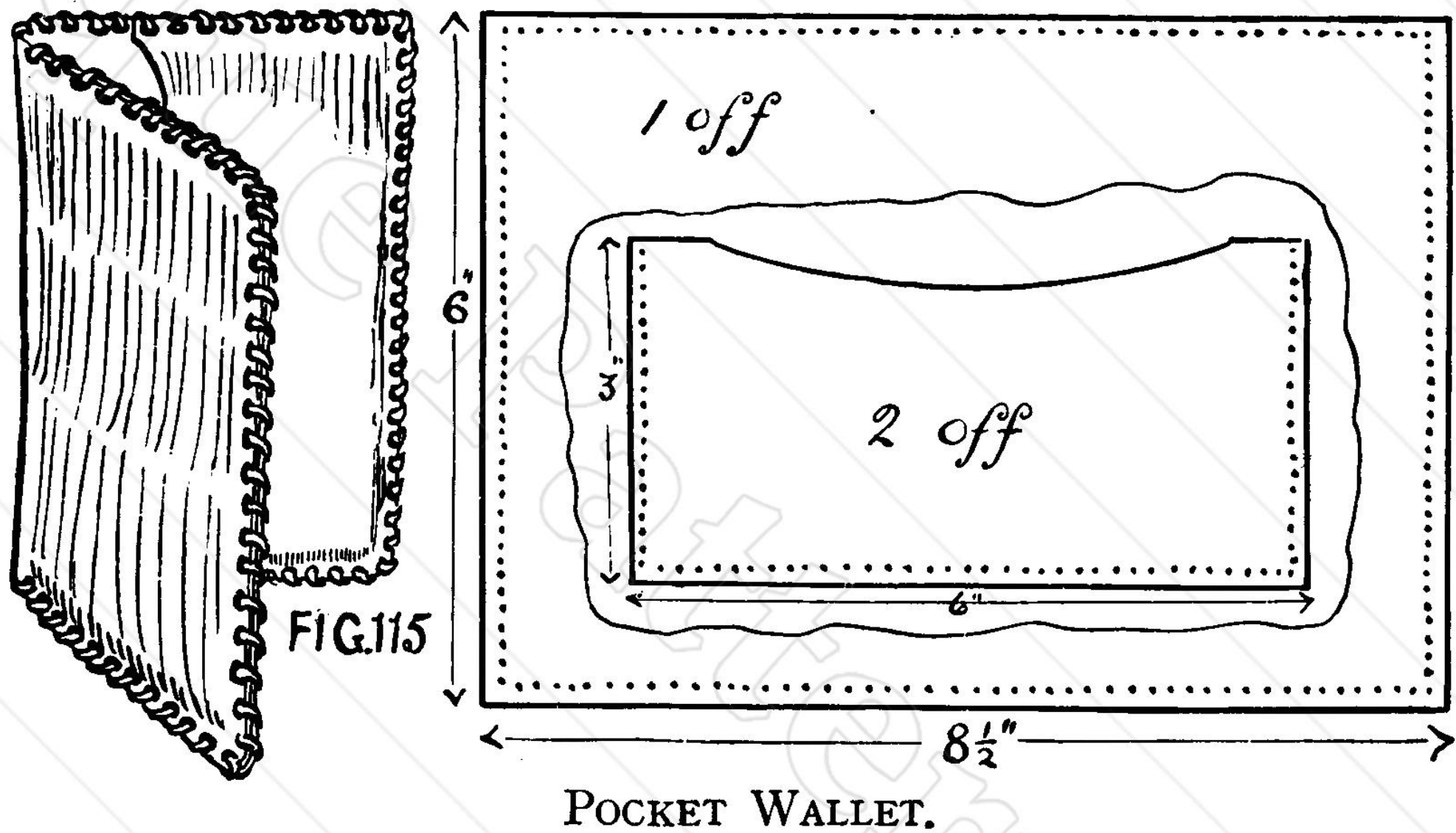


Fig. 115 shows a simple pocket wallet with two interior pockets ; and Fig. 115a gives a sketch and template of a matchbox case with an elastic spring which pushes open the box as soon as the press stud is released. This is an object that will use up small pieces of leather, and is a very useful article. The elastic is sewn at each end, and its exact position will need some experimental fitting.

Fig. 116 is a small treasury note case that will fit the waistcoat pocket. The dotted lines on the template show the positions of the straps. This will be found to be a very convenient type of note case, as the notes can be counted and extracted quite easily.

The moccasins shown in Fig. 117 are simple in construction, and

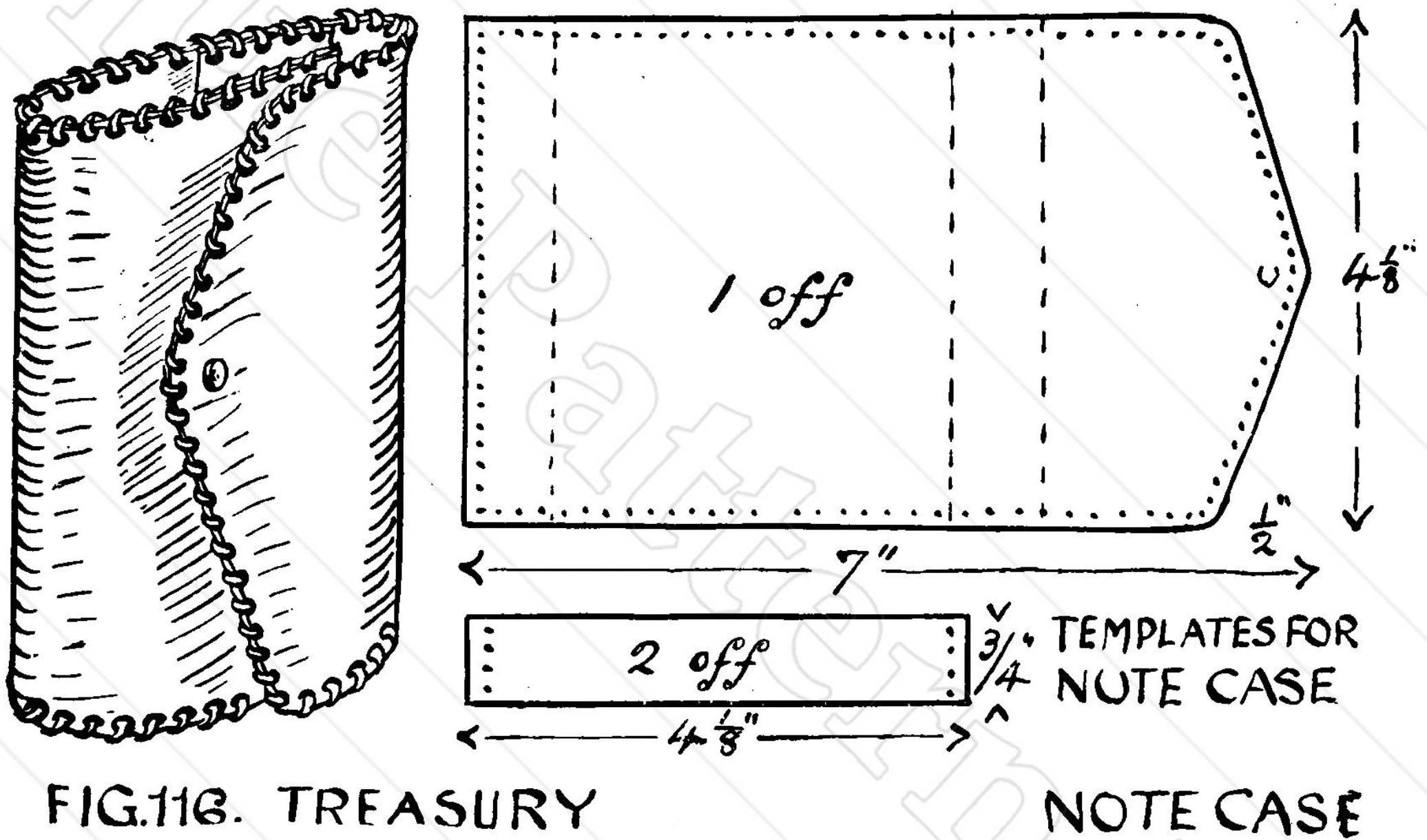


FIG. 116. TREASURY

NOTE CASE

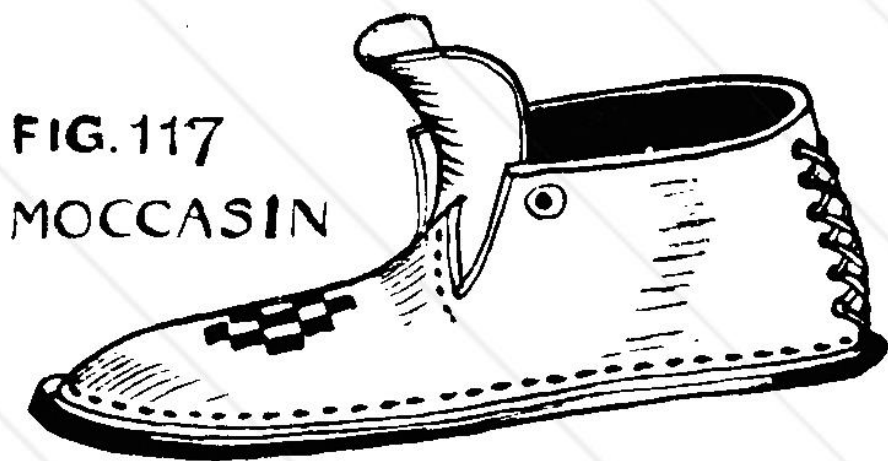
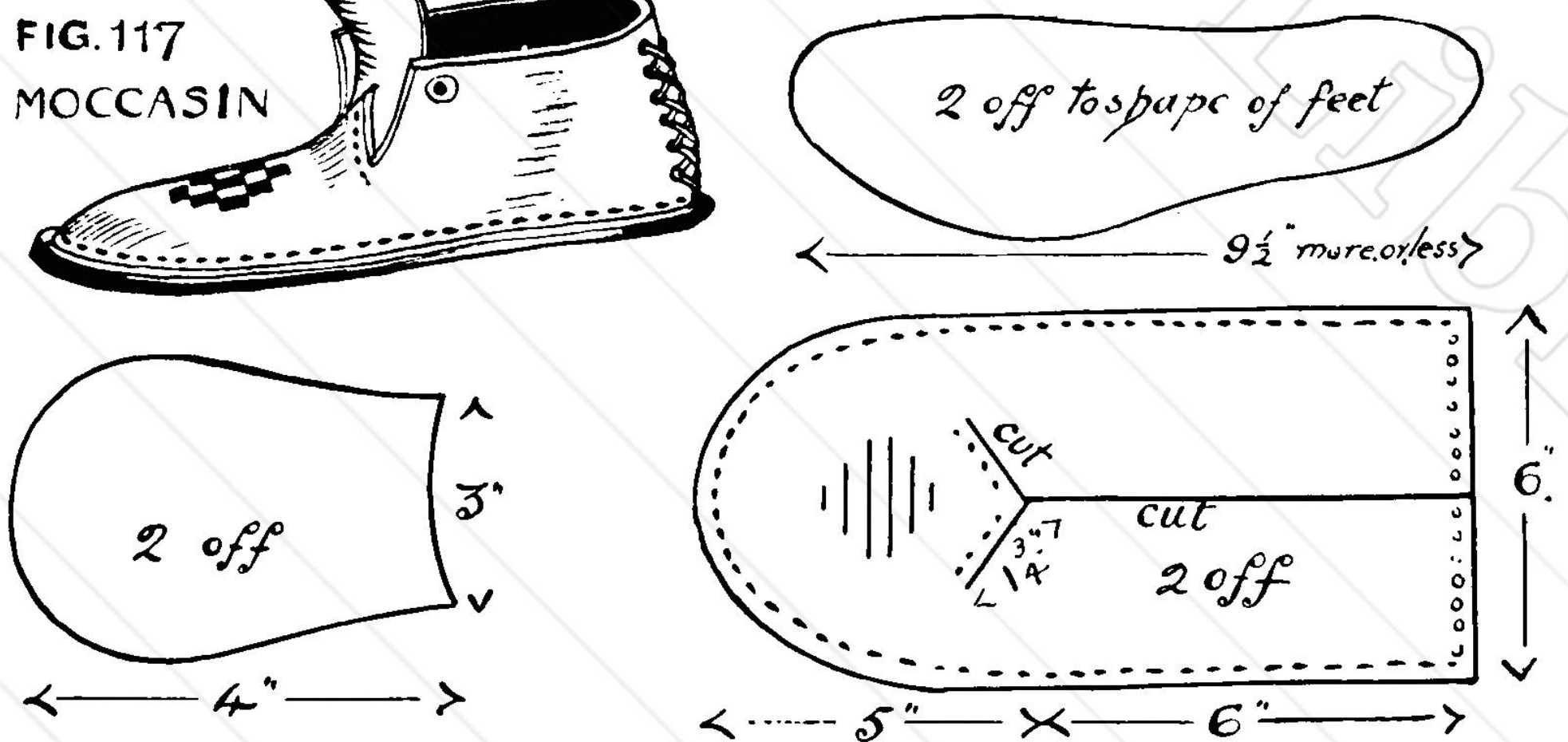


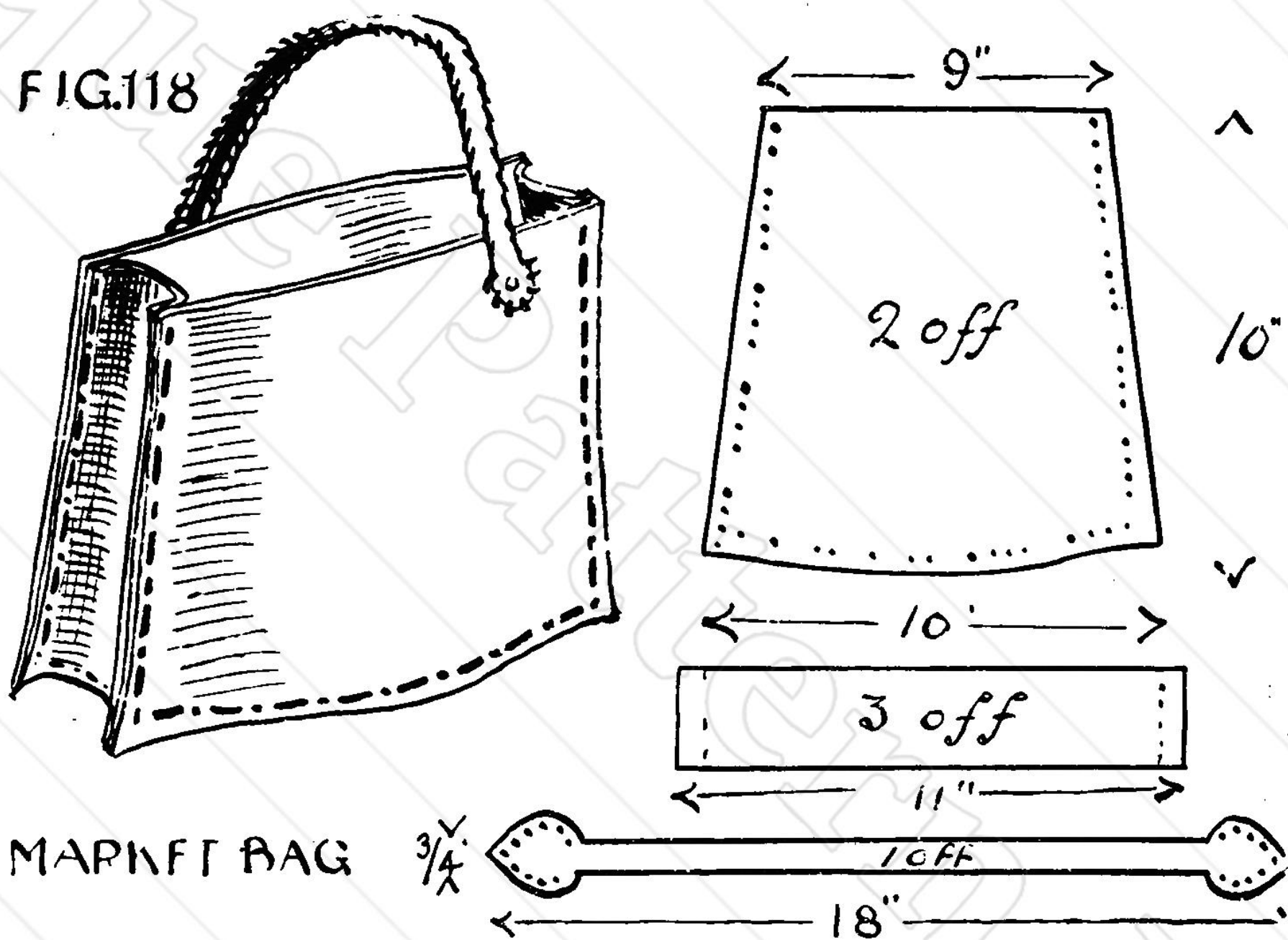
FIG. 117
MOCCASIN



are useful examples of craft work possible for schools, inasmuch as they are made from the shape of any individual foot. The sole pattern is obtained by drawing around the stockinged foot on a piece of paper, its true shape and size. Cut outside this about $\frac{1}{4}$ in. all round to allow for thonging. The upper pattern can be altered as regards size and shape to fit feet and taste. To fasten, thread a shoe lace through the holes and tie; or, attach a strap and fix with

a press stud ; *or* make a strap with a roller buckle. The sole can be made from cow-hide, the upper from suede.

Fig. 118 shows a plain marketing bag, with one handle. If the bottom is made of two pieces well glued together, it will be found it



MARKET BAG

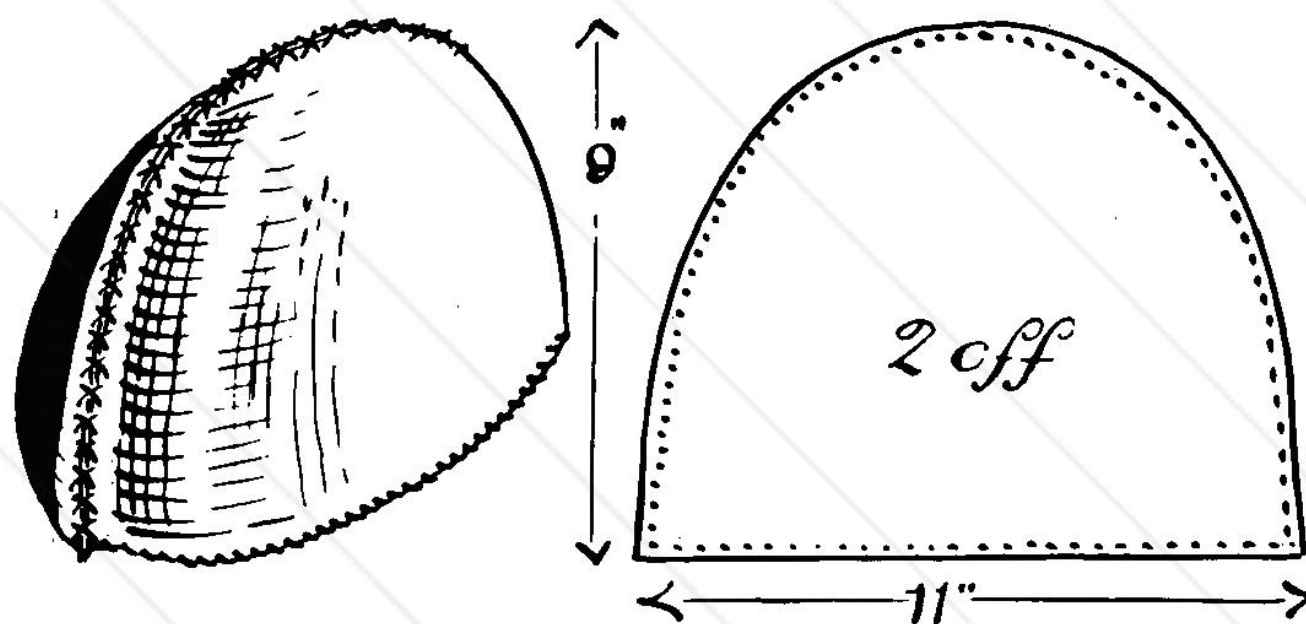
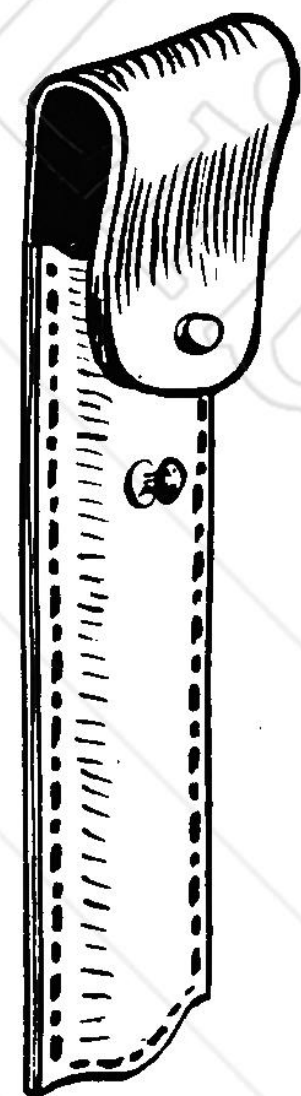
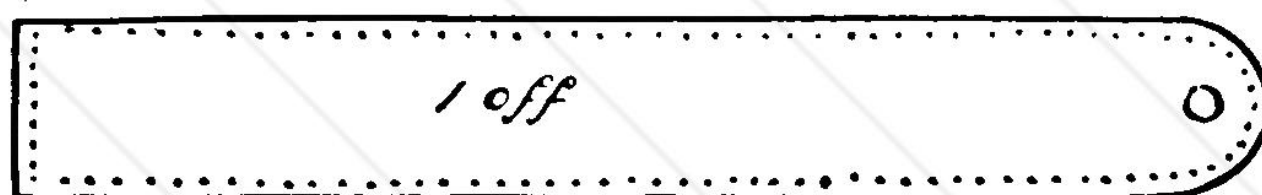


FIG. 119. A TWO-PIECE TEA COSY



FIG. 120

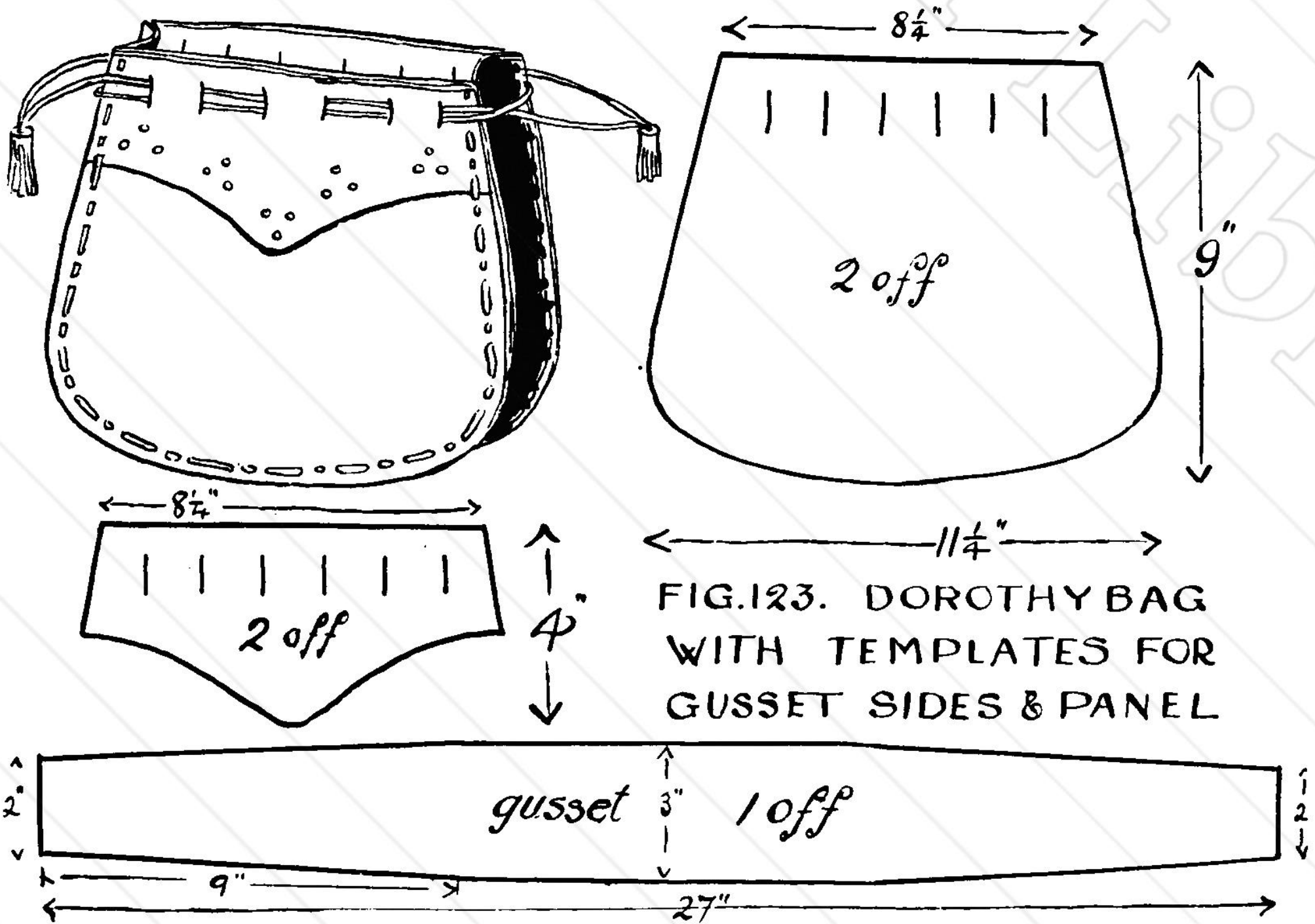
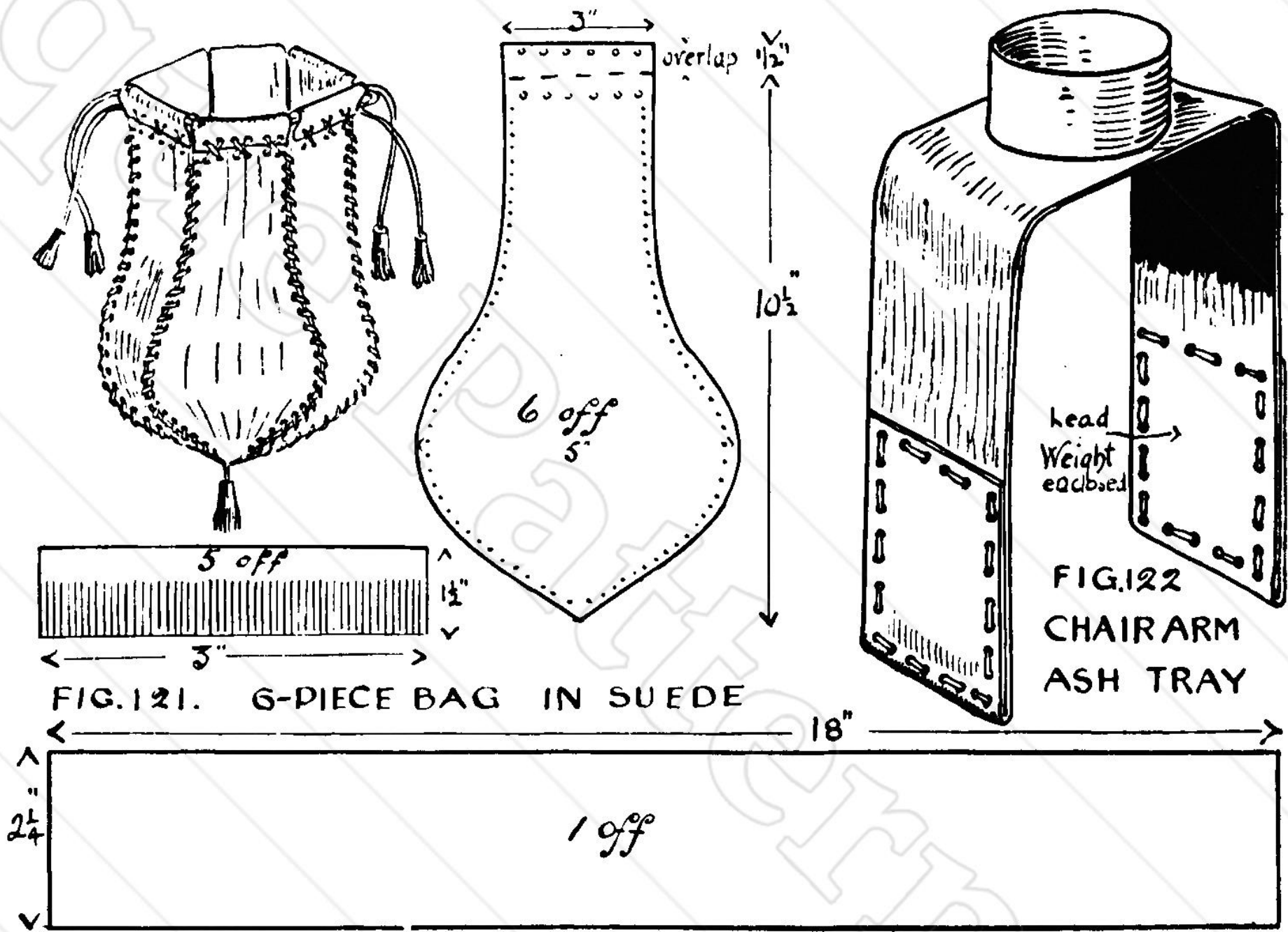
FOUNTAINPEN CASE



will not only wear better, but will be stiffer in use and will enable the bag to retain its shape.

A two-piece tea cosy is shown in Fig. 119, and Fig. 120 gives the necessary particulars for a fountain pen case.

A six-piece bag with draw-in cords, is shown in Fig. 121. Each piece is made to bend over at the top to allow the cord to slip through.



Note that a double row of holes should be punched below the bend, and not one only, as shown on the template. The fringe for each

knot at the end of the cord, and for the bottom end of the bag, is cut as shown in the template, and then wrapped round the knot and glued.

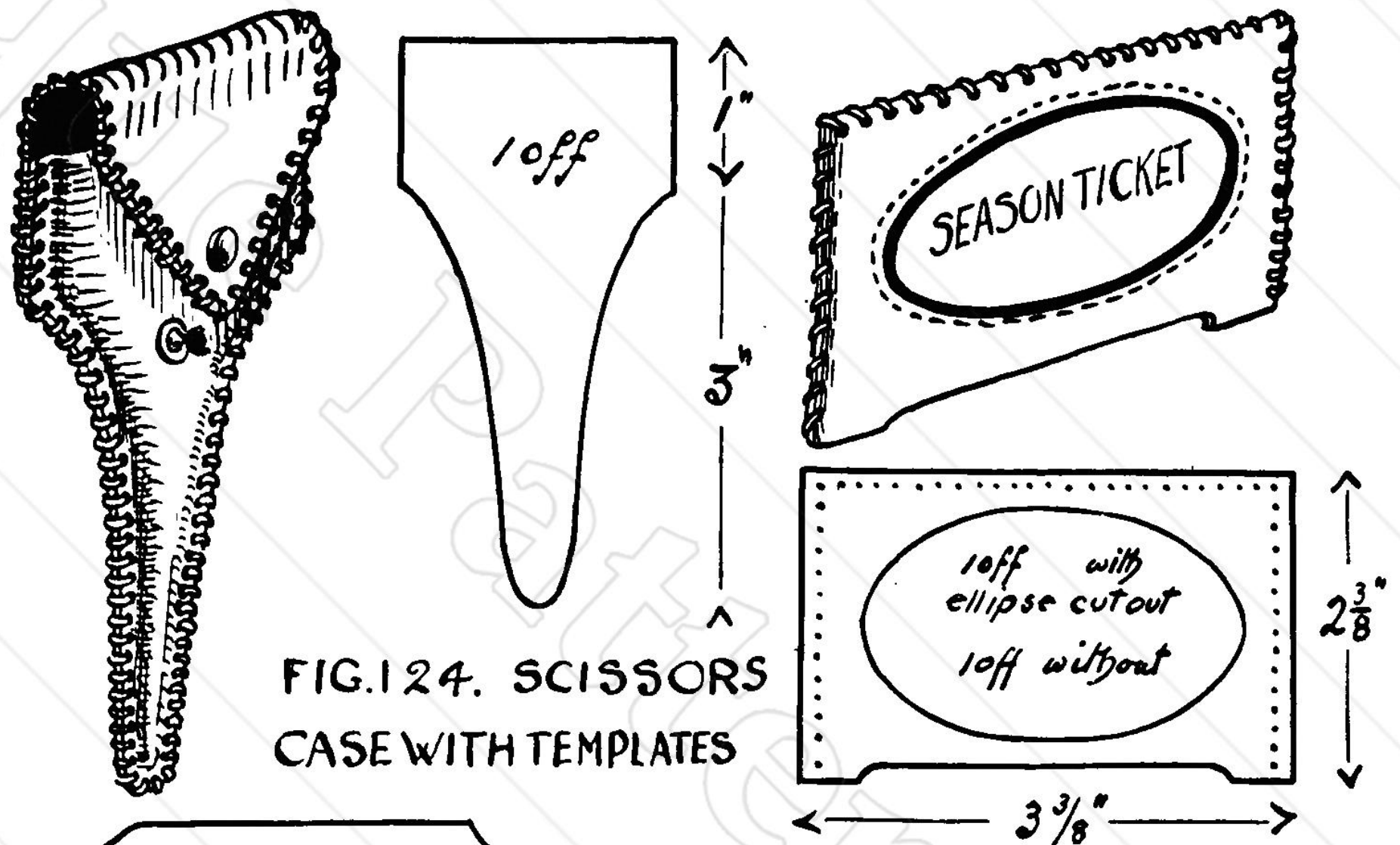


FIG. 124. SCISSORS CASE WITH TEMPLATES

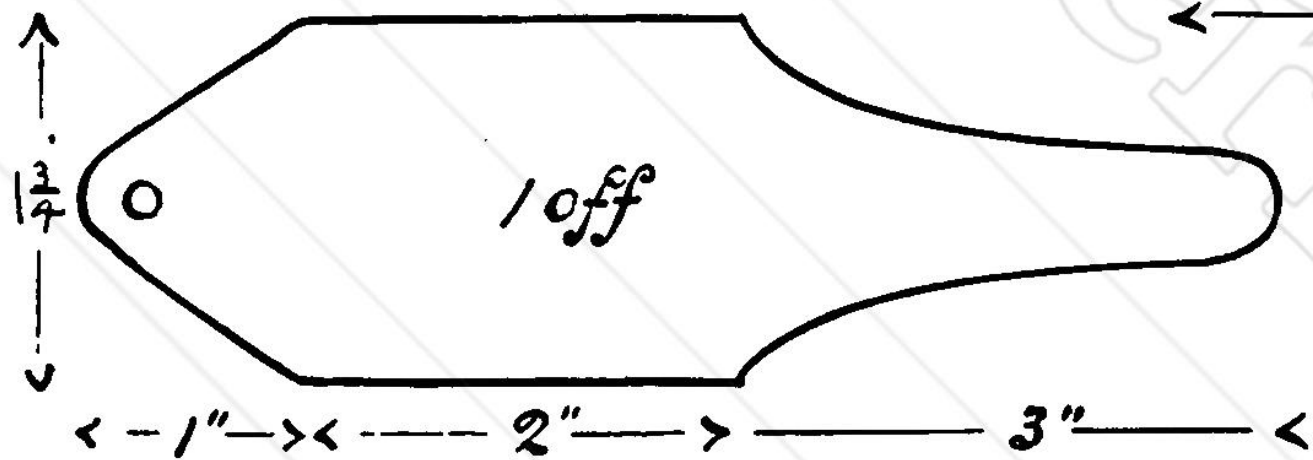


FIG. 127 SEASONTICKET HOLDER WITH TEMPLATES.

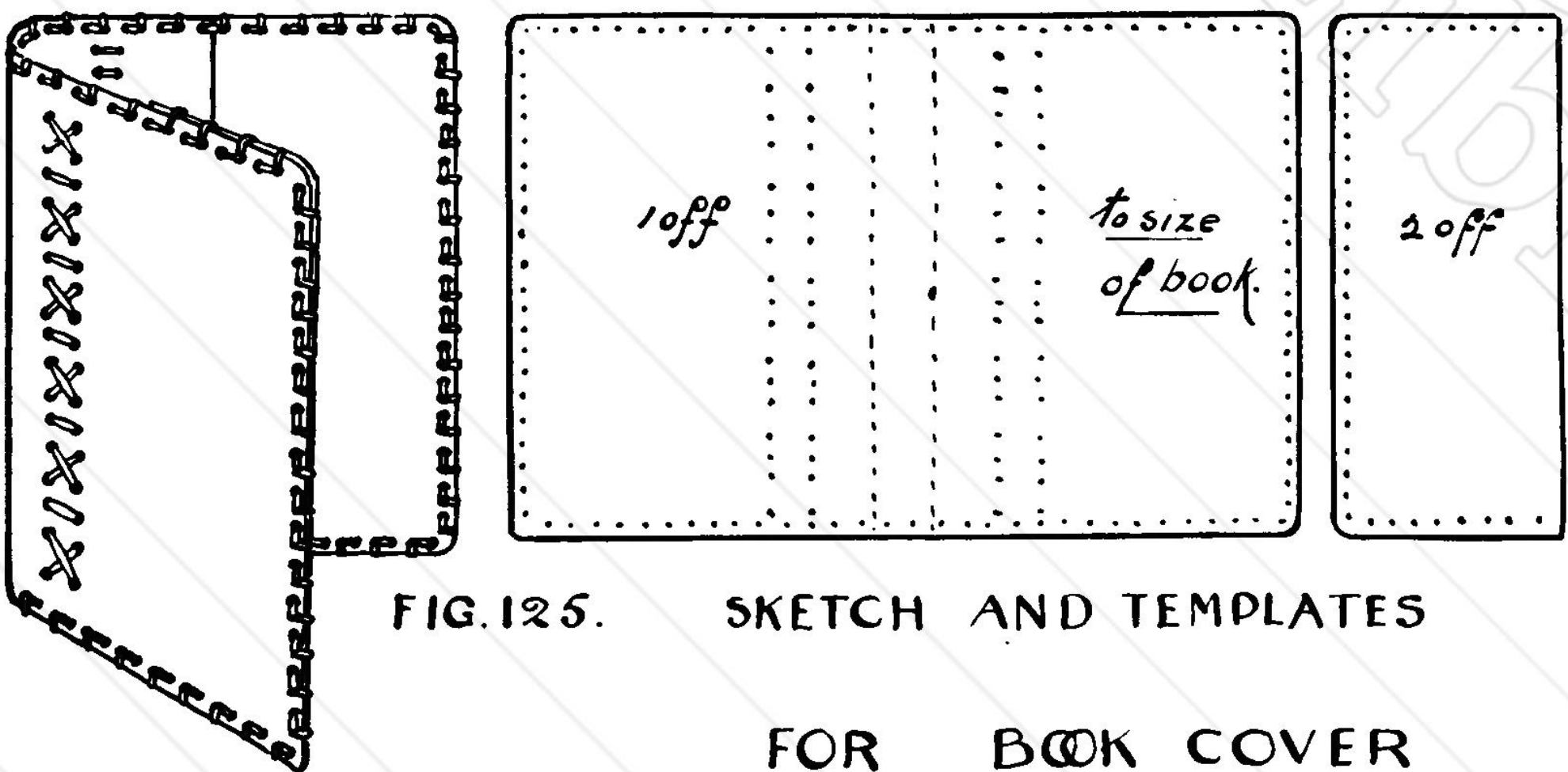
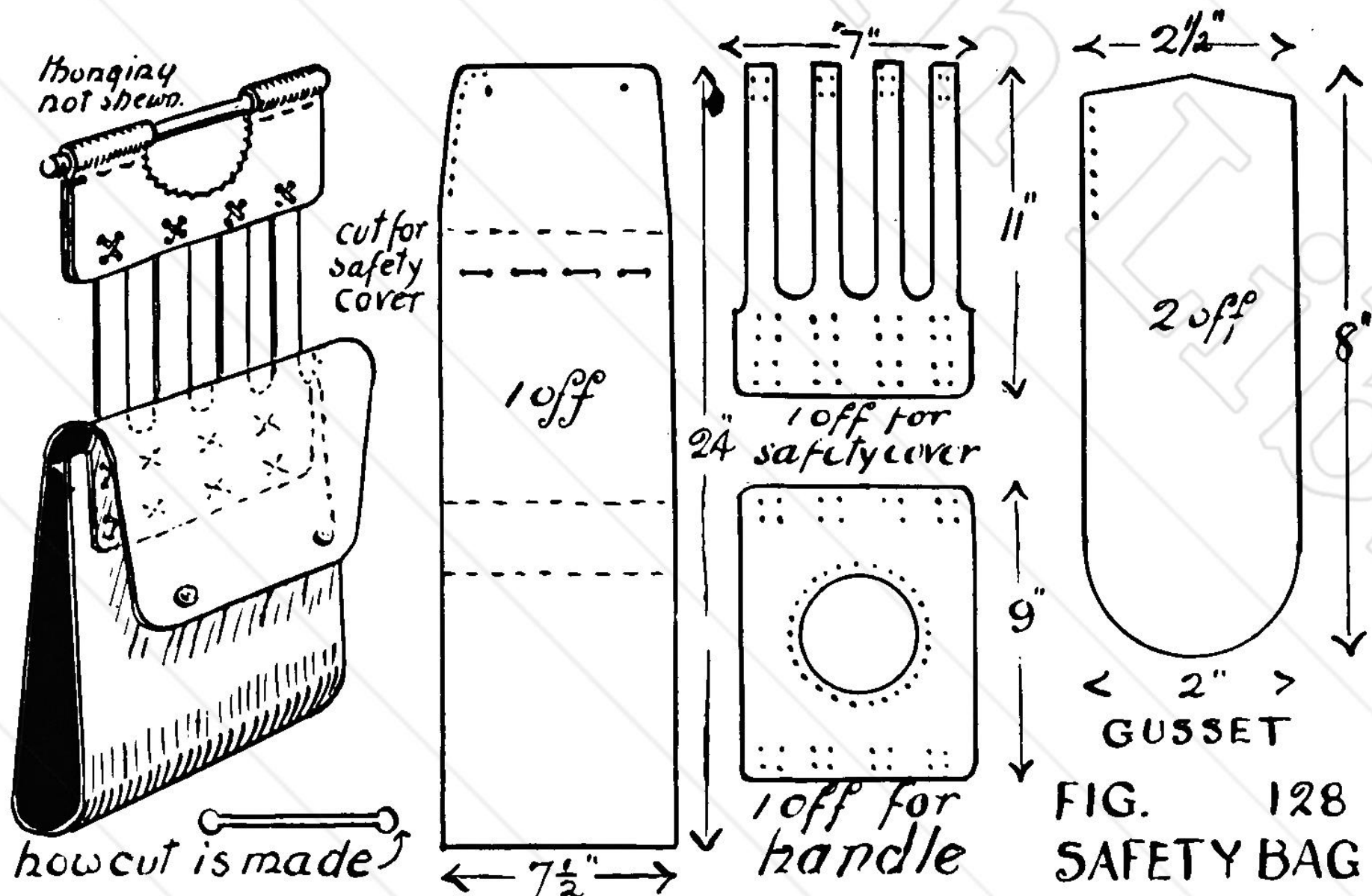
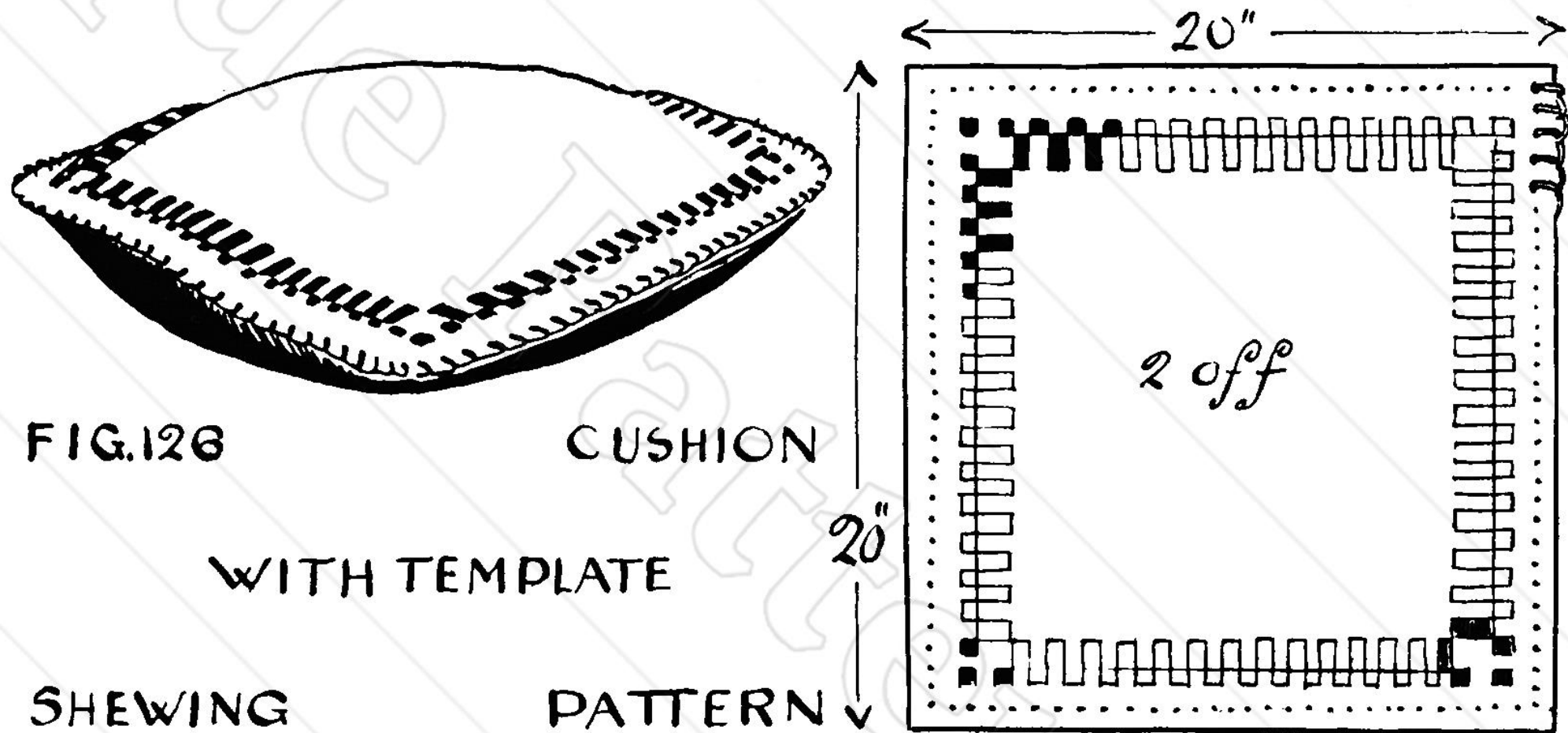


FIG. 125. SKETCH AND TEMPLATES FOR BOOK COVER

A chair-arm Ash Tray is the subject of Fig. 122. Only one piece of leather is needed ; it is turned up at each end, and a piece of sheet lead inserted. The ash tray can be the painted lid of a tin can, or it can be beaten out in metal. To fix it, three or four rivets

can be put through, or it can be glued to the leather. A bag for occasional use is shown in Fig. 123. It is closed by means of cords also. The gusset is in one piece, and is wider at the bottom, and tapers at the sides. Two small articles are shown in Figs. 124, and 127. The season ticket holder will have a piece of transparent celluloid fixed behind the front.



A Book Reading Cover is shown in Fig. 125. The size will be that of the book it is to hold. Note the suggestions for thonging. A cushion is a very satisfactory thing to make. The one in Fig. 126 is arranged to have a woven pattern. A split suede, or "flesh" skin is very serviceable for a cushion. The safety bag shown in Fig. 128 is novel, and not too difficult to make. It prevents pilfering and keeps a guard over the bag mouth. The holes for the guards

to slip through are done with a punch and a chisel. The gussets fold up. Fig. 129 shows a three-fold note case. It is in one piece, and thonged on each edge, after folding as shown in diagrammatic

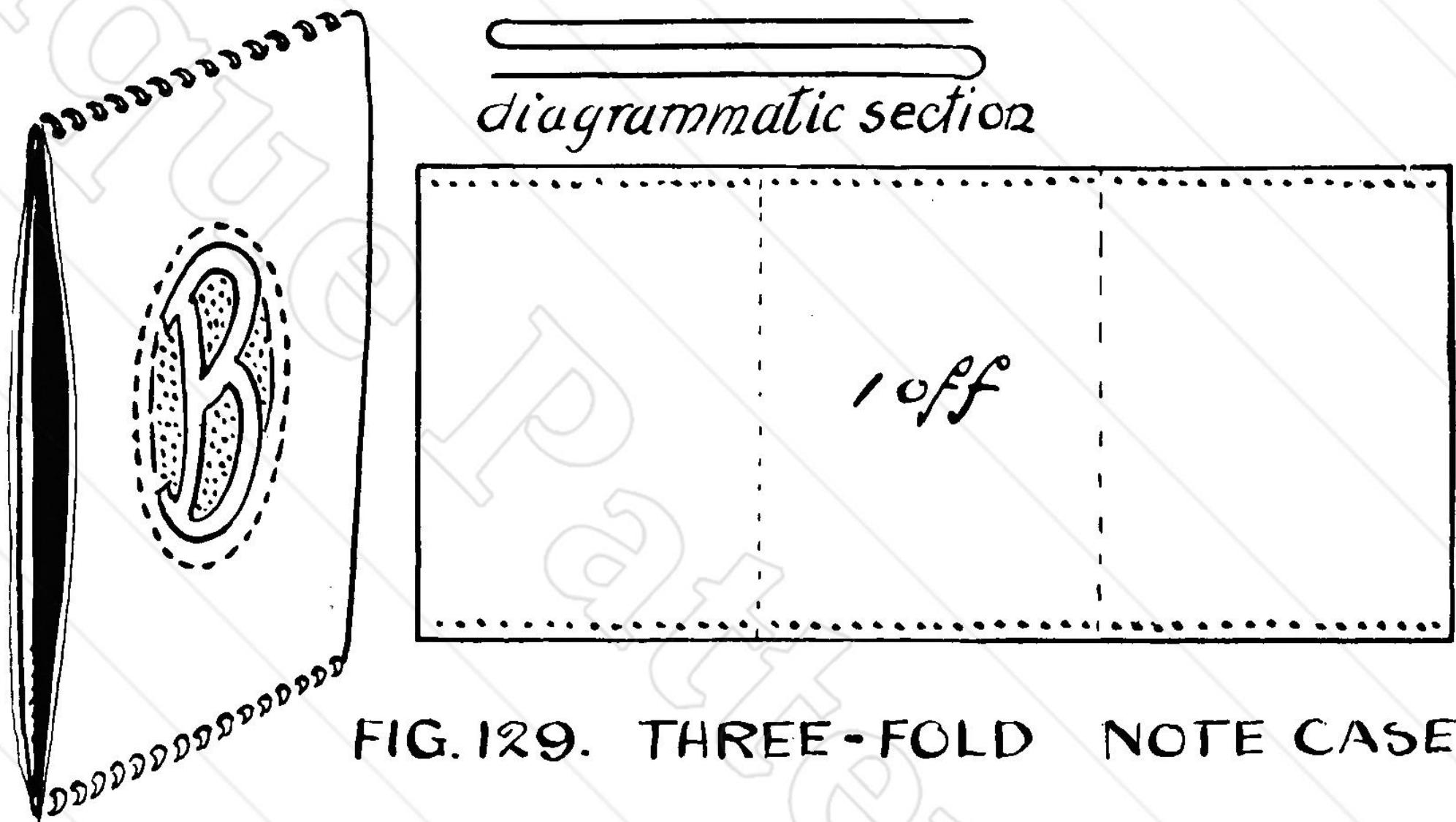


FIG. 129. THREE-FOLD NOTE CASE

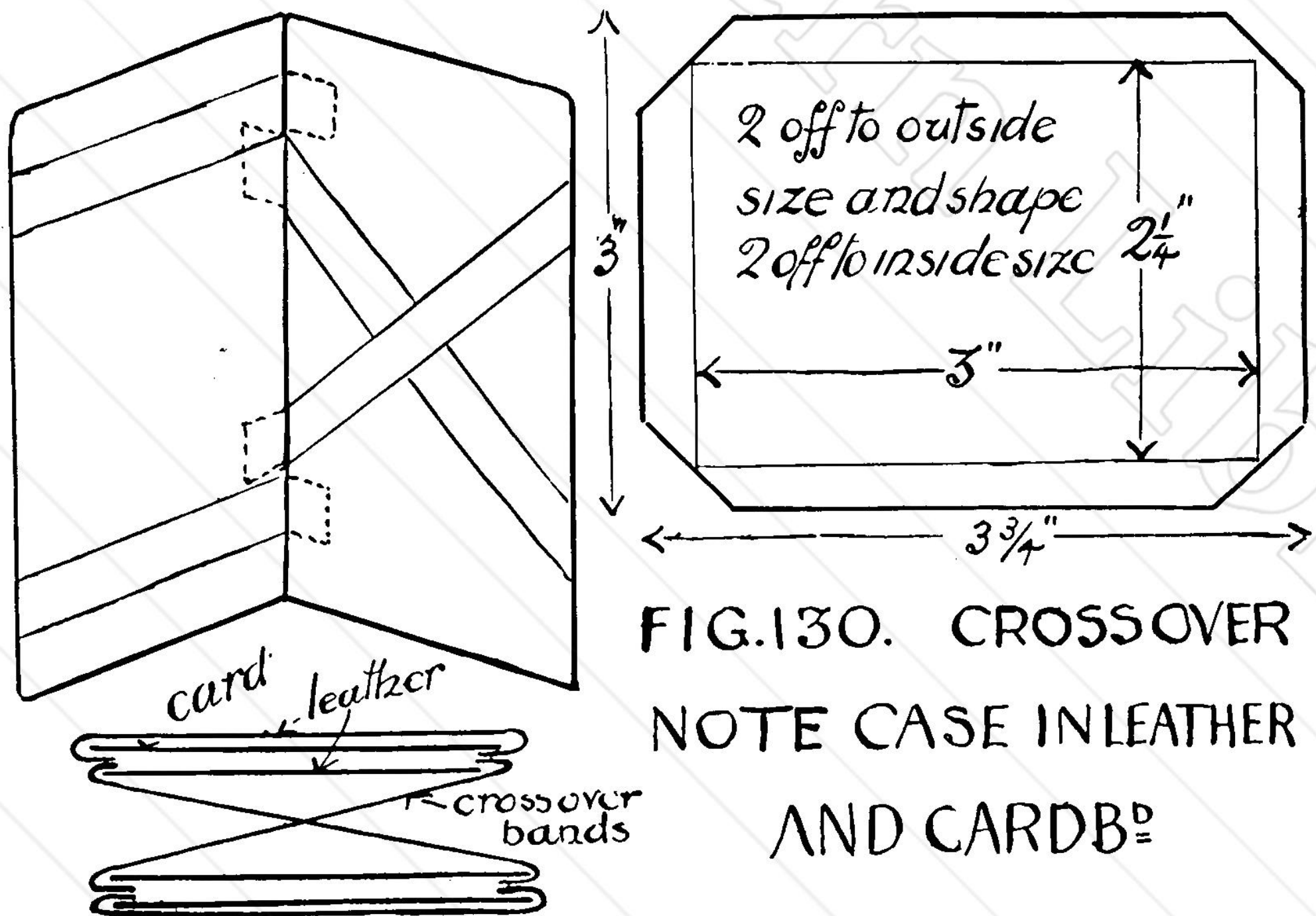


FIG. 130. CROSSOVER
NOTE CASE IN LEATHER
AND CARDB

section. Fig. 130 shows the familiar folding card and note case. The section shows how the tapes are fixed to get the cross-overs.

Leathers suitable. Suedes, fleshes, Persian calf, goat skin, thin calf, are suitable leathers for most of the articles described in this section. It is desirable to do without staining, so the leathers used will be already finished before working.

CHAPTER VI.

DECORATIVE LEATHER CRAFT.

THE designs shown in this chapter are for articles that are to have added ornament. A few words are needed here. It is often said by students and teachers, "Oh, I can't draw or design to save my life." This has been occasioned by the idea that design is a very difficult thing that is to be reserved for experts only; and that the ability to design well is only arrived at after great striving, and the expenditure of a great amount of time. It is quite possible to produce patterns that are effective in themselves; that suit the material admirably, and that are well within the ability of any intelligent student to produce. It is largely a matter of the composition of simple elements; and pattern making depends on repetition to a very large extent. A simple element that is not of much interest in itself can be, by repetition, made into attractive pattern. This is further illustrated on pages 87, 89, 90, 94.

The Illustrations.

These, from Fig. 131 onwards, give suggestions for the ornamentation of articles that it is possible to make in leather. The ornamentation covers a wide field, and especial attention is called to the simpler forms of ornamentation that it is possible to put on the leather, such as in Figs. 140, 141, 142, 149, 150, 151, 152, and 160. Especially is the attention of those readers who believe themselves unable to make designs called to this type of ornament. Creation in its earlier stages consists of the composition of simple elements into pleasing combinations. The operation of combining such simple elements as are shown in the illustrations mentioned is well within the capacity of every one, even of those who believe themselves to be unable to produce any design at all.

Fig. 131 shows a four-piece tea cosy with a stencilled ornament. Inside the cosy are thonged four pieces of leather to which can be attached the padded lining. This will enable the lining to be renewed when worn out, with the least trouble. Interlaced design is most effective, and certainly fascinating to evolve.

A simple element like the diamond shaped punch is capable, by repetition, of producing an effective design, such as is shown in Fig. 132.

In the tobacco pouch shown in Fig. 133, the size is made to fit a rubber interior. This interior is stuck in on its edges, by a rubber solution such as Batson's solution.

Fig. 134 gives the construction of the Lady's Bag shown in the

photograph on page 74. The interior centre pocket is thonged by four stitches only to the sides of the bag, to avoid a thick edge all the way down. For the handle two pieces are cut to the template shown, and are thonged together on the edge ; the handle may be made thicker by putting another thickness of leather inside. This bag was made in natural goat and left to colour naturally. It is now a particularly fine golden colour that is more pleasing than stained leather.

In Fig. 135 is shown a convolvulus design (which can easily be enlarged by either of the methods shown in Figs. 113, and 114), for a modelled bag in calf, together with the template. No linings are shown for these on these templates, so that if it is desired to line the bag, all the parts will need duplicating. The bag, however, will be quite good without, if the interior is made in good suede or Persian calf. A bag for occasional use is given in Fig. 136. It is intended to be made in calf and the design modelled. It may, or may not, be lined, but no lining is allowed for on the templates. No suggestion is made for the stitches ; but a cross-stitch is suggested as being ornamental and strong.

The interlaced design shown in Fig. 137 is quite mechanical, but effective enough ; the sketch explains the construction of the carrier, and the handle is thonged so far as it acts as a handle, and the part that is acting as a carrier strap, goes right through ; the book thus rests on the handle.

Calf is recommended ; sheep skin of good quality will do, but does not always retain its stiffness and shape. The reading case shown in Fig. 138 has an interlaced design, and it may be done in calf, or sheep, or goat. Calf is always recommended, although a good sheep skin will make a good job. The wallet shown in Fig. 139 is very similar to the reading case. In Figs. 140, and 140a, a simple Lady's Bag is shown with a design made of punch patterns. Notice the effectiveness of the back, with the punch patterns combining with the stitching of the handles. No template is given for either the gusset, or the handle, but their sizes are shown. Fig. 141 is another example of the use of punch patterns. Stencilling may be quite well used for leather work. Suede is very suitable indeed for a stencil design in oil. The pen painting colours are useful for this purpose, as well as the stencil paints obtainable at the artists' stores. A stencil design like this can be put on in various colours to give a "jazz" effect if desired. In Fig. 143, a design, using elliptical ivy as an element, for a modelled table mat in calf is given, together with the templates. The interior can be made of card to give extra stiffness ; or it may be of leather glued to the bottom which can be a skiver for lining purposes. The leaves of the design may be embossed, as well as modelled ; a "scale" not otherwise obtained is thus given to the object. A very effective form of ornamentation is that of pierced work. The design is cut out

of the leather, which then looks like a stencil plate ; and it is backed up with a leather of contrasting colour. This leather is glued on the inside, and well pressed under a heavy weight. The two bands are woven. The lower edge is cut to a fringe pattern.

A design for a blotter is given in Fig. 145, suitable for modelling. This would be done in best calf, thin strength. The templates for cutting out are given also. The blotter part can be done separately, consisting of cardboard covered with skiver, and triangular corners ; the whole will be glued to the right-hand side of the calf. The left-hand side will have a pocket. Another method of fixing the corner pieces is to thong them to the back ; the two interior pieces will thong as usual on one edge, and for the vertical edges holes to correspond will be punched through the back, and an in-and-out thong laced in ; or a double row of holes can be punched, and the cross stitch used. When stitching, place a piece of thick cardboard under the corner pieces, so that room will be left for the blotting paper. The pattern for the gusset is not shown but the sizes are given. Fig. 146 shows a pochette, the drawings for which are self-explanatory. The design is to be modelled, and stained, if preferred.

The front covers for Autograph Albums of two differing shapes and sizes are shown in Figs. 147 and 147*a*. Note the value of space in these designs. The modelled ornament bears a small proportion to the whole space ; and it is enhanced in value by the contrast thus afforded. The covers are shown with thonged edges, but they may be pasted on the album boards and left with plain edges. The designs should only be modelled, and not embossed. Fig. 148 gives the particulars of a cushion that is full of work, and is very decorative. The ornament is pierced and backed up with leather of a contrasting colour. The fringes are cut on the curve so that when the inner edge is straightened the outer edge falls into a crinkled surface. The interior will be a separate cushion in a cover ready to slip in just before the fourth edge is thonged. The materials most useful for this cushion will be either a split suede (flesh), or a thick suede.

Simple Punch Patterns.

Attention has already been called to the composition of simple elements, by the process of repetition, into design or pattern.

In Fig. 149, some examples of borders constructed on these lines are given. Analysis of these patterns will show that their component parts are the simplest of elements ; consisting of impressions made by punches which can easily be made by any intelligent worker. One great value possessed by this method of ornament is that although the units of the designs are so simple, yet the combinations of the units that can be made are practically infinite. In Fig. 150, are suggestions for filling spaces which can be applied to fit spaces of any size.

Figs. 151, 152, and 153, are similarly built-up designs in which lines form a skeleton, and the punch impressions fill in. In Fig. 154, is given a design for book cover based on the rose, and capable of good modelling. In Fig. 155, a suggestion is given for the lid of a playing card case; or it may be the front panel of such a case. Fig. 156 gives a suggestion for a panel in modelled leather. Inter-lacements form a basis for good ornament very suitable for leather, and in Figs. 157 and 158 are shown some suggestions of this kind. Fig. 159 is a design for a blotter, using the hop vine as *motif*; and on page 94, Fig. 160, are given many suggestions for designs specially applicable to leather.

The Photographs.

The frontispiece gives a few examples of work that are suitable for school handicrafts. Most of the examples given are described in the text. On page 75 is a reproduction of a Lady's Bag modelled in goat skin, the construction of which is described in Fig. 134. On page 83 is shown a market bag in suede with a pierced design. This bag is not lined and is quite suitable for light shopping. Its construction is described in Fig. 144. On page 91 is shown a Lady's Bag in modelled calf. The conventional roses in this design are embossed. The bag is left unstained, and is finished with Ronuk or with a wax polish. It is gradually turning a very fine natural colour. The interior may be one of the several that are described in the text.

THE ILLUSTRATIONS.

(See Chapter VI.)

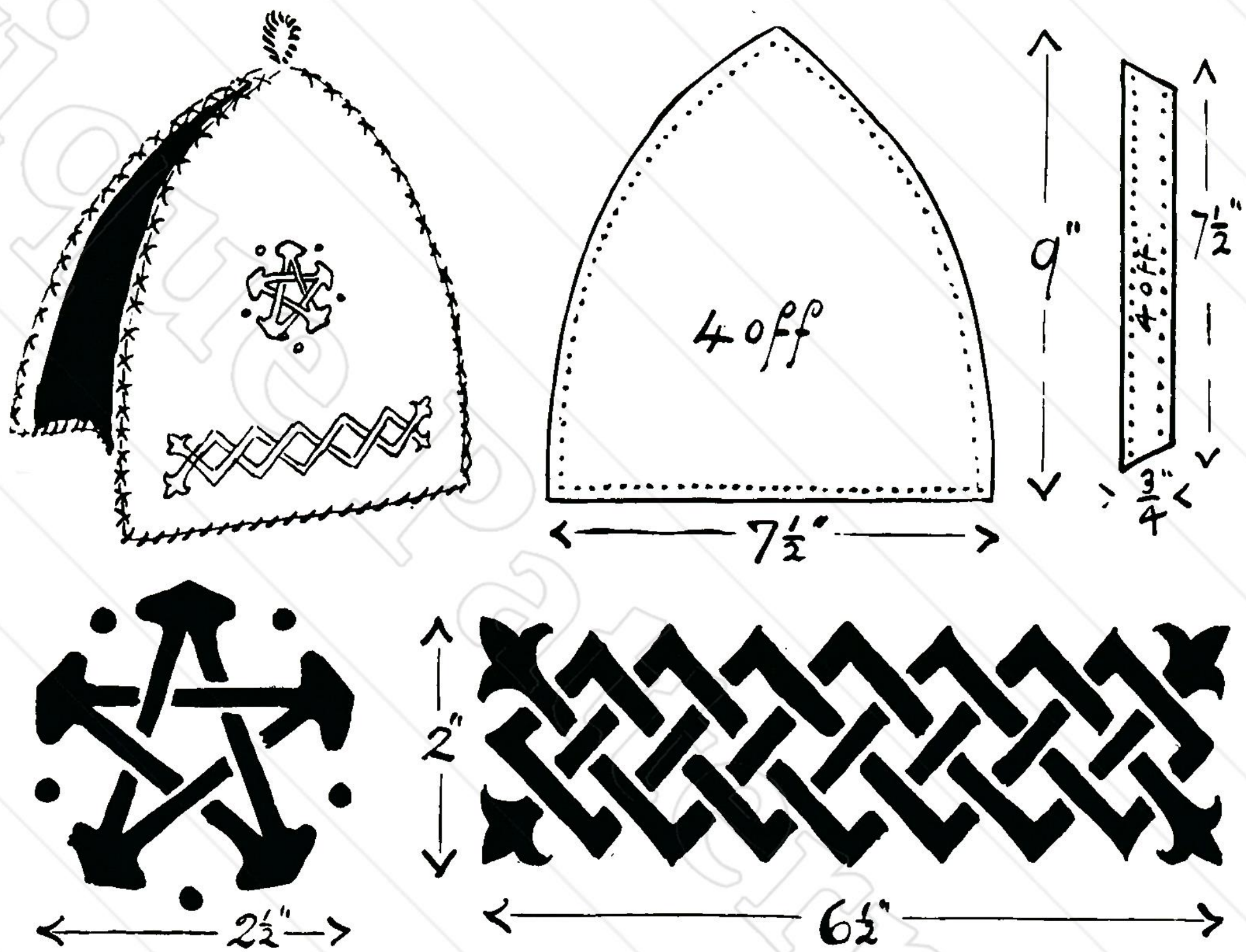


FIG. 131. 4 PIECE TEACOSY STENCILLED.

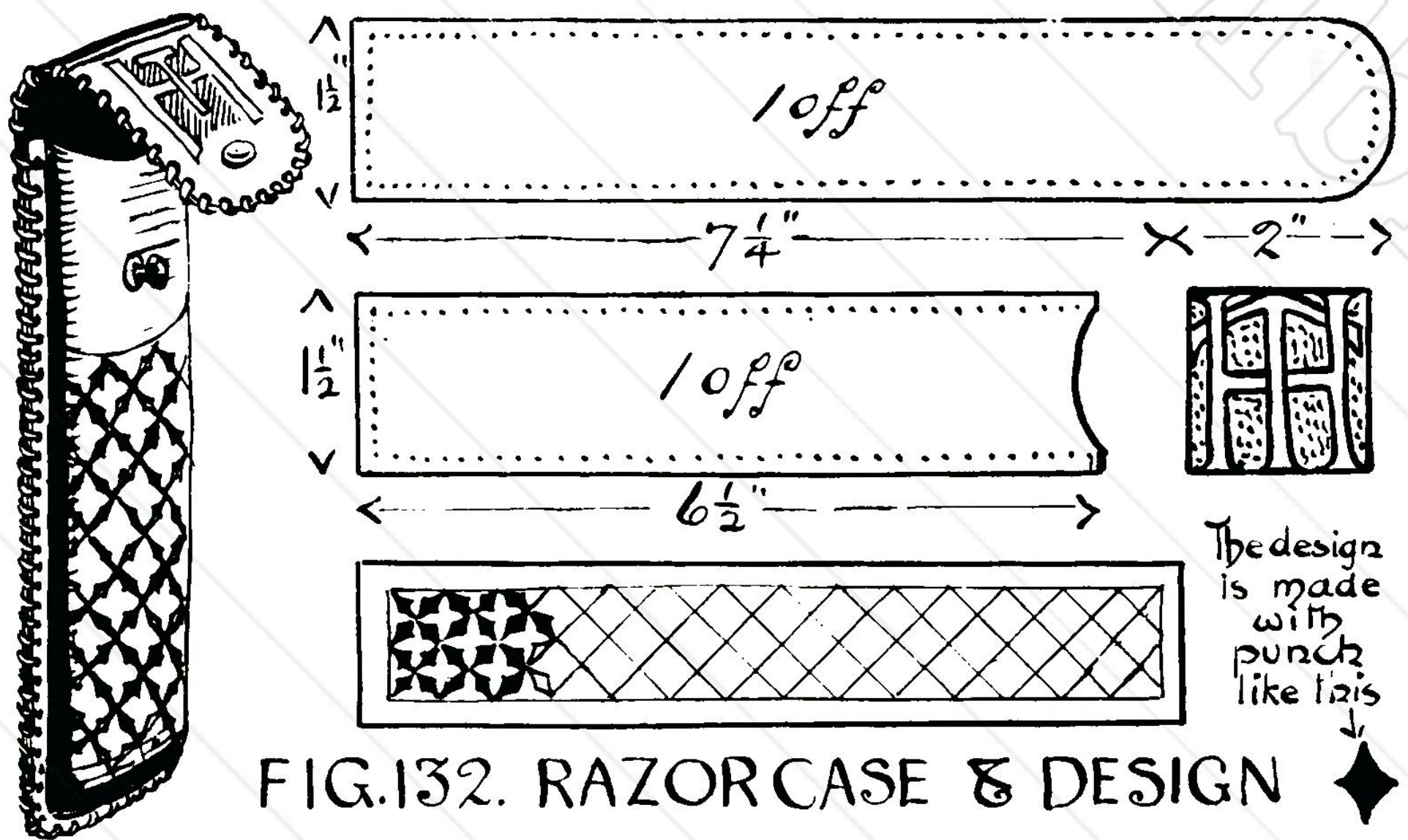


FIG. 132. RAZOR CASE & DESIGN

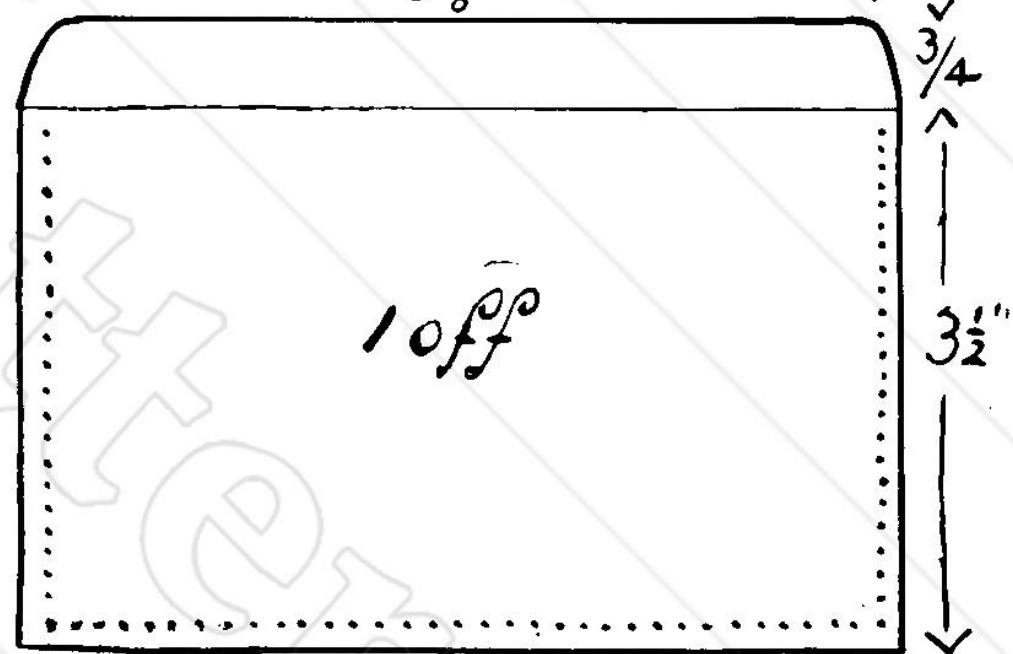
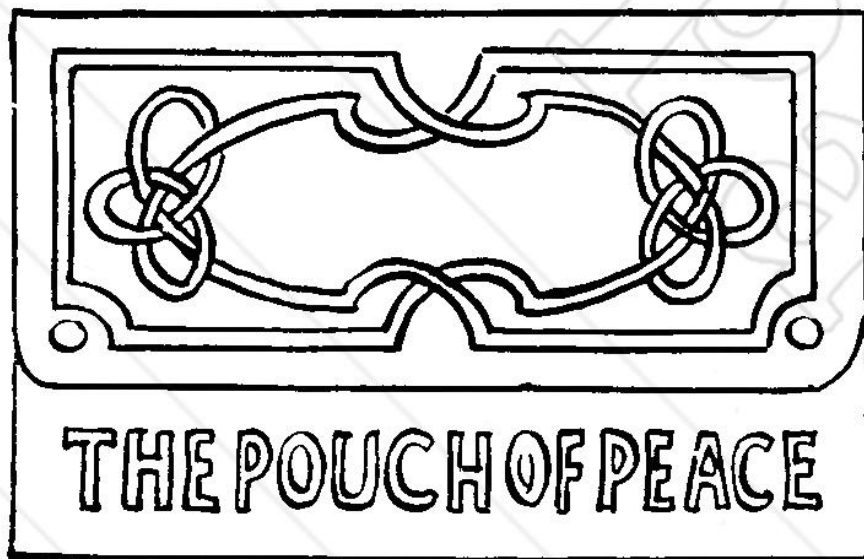
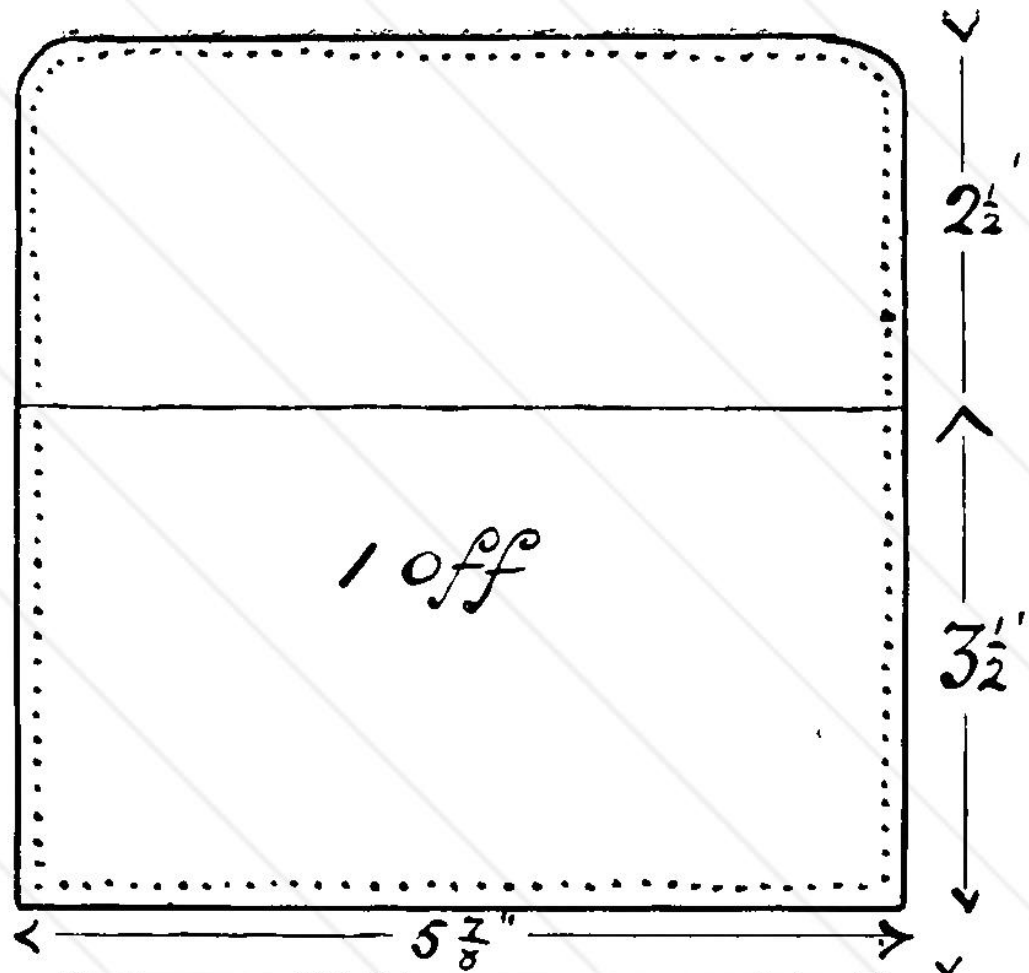
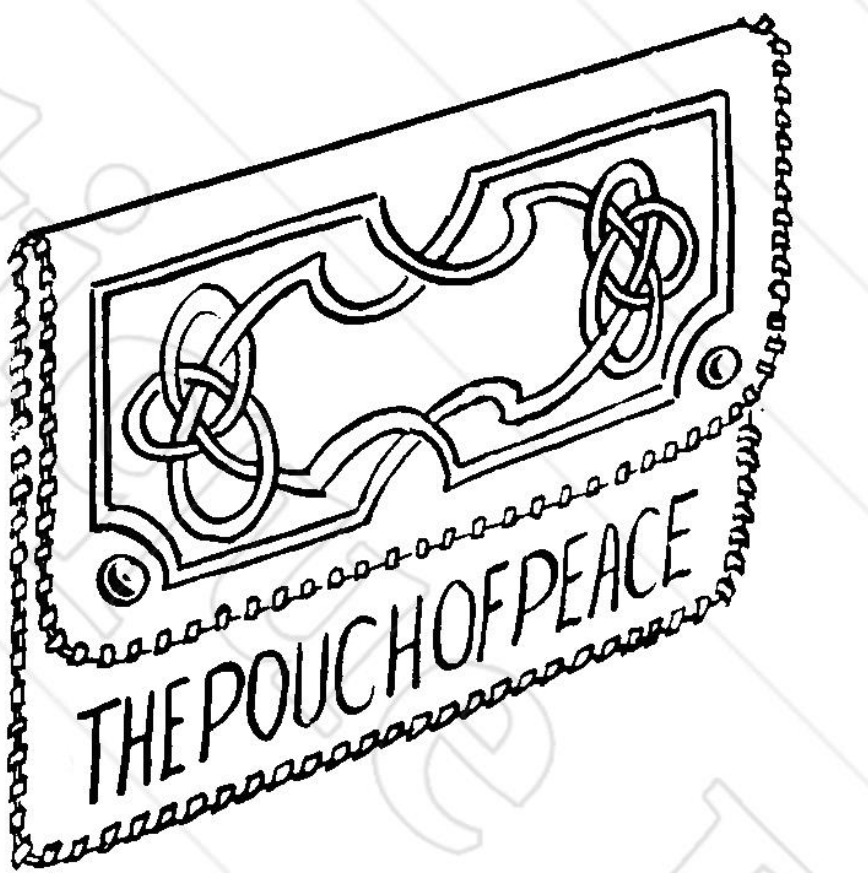


FIG. 133 TOBACCO POUCH

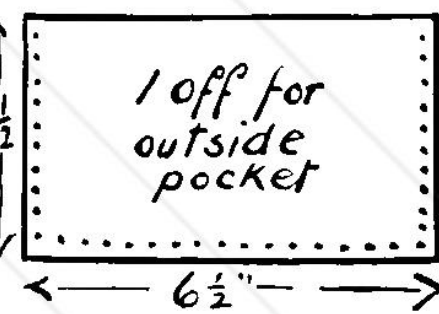
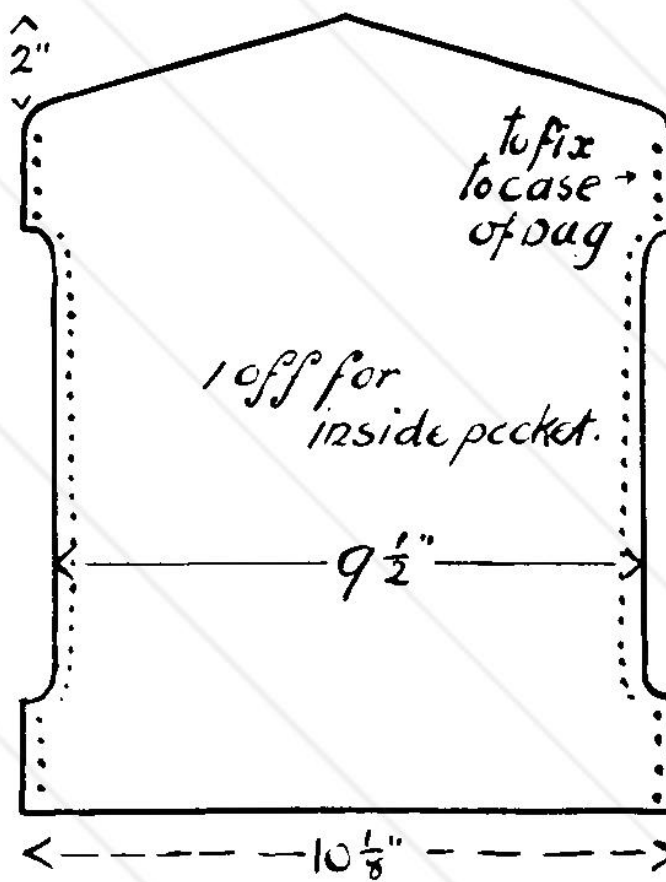
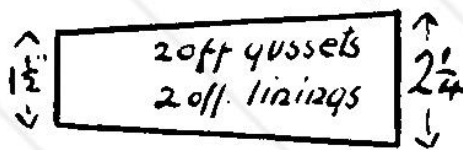


FIG. 134
TEMPLATES
FOR LADY'S
BAG



SECTION OF BAG



SEE PHOTO
FIG. 134.



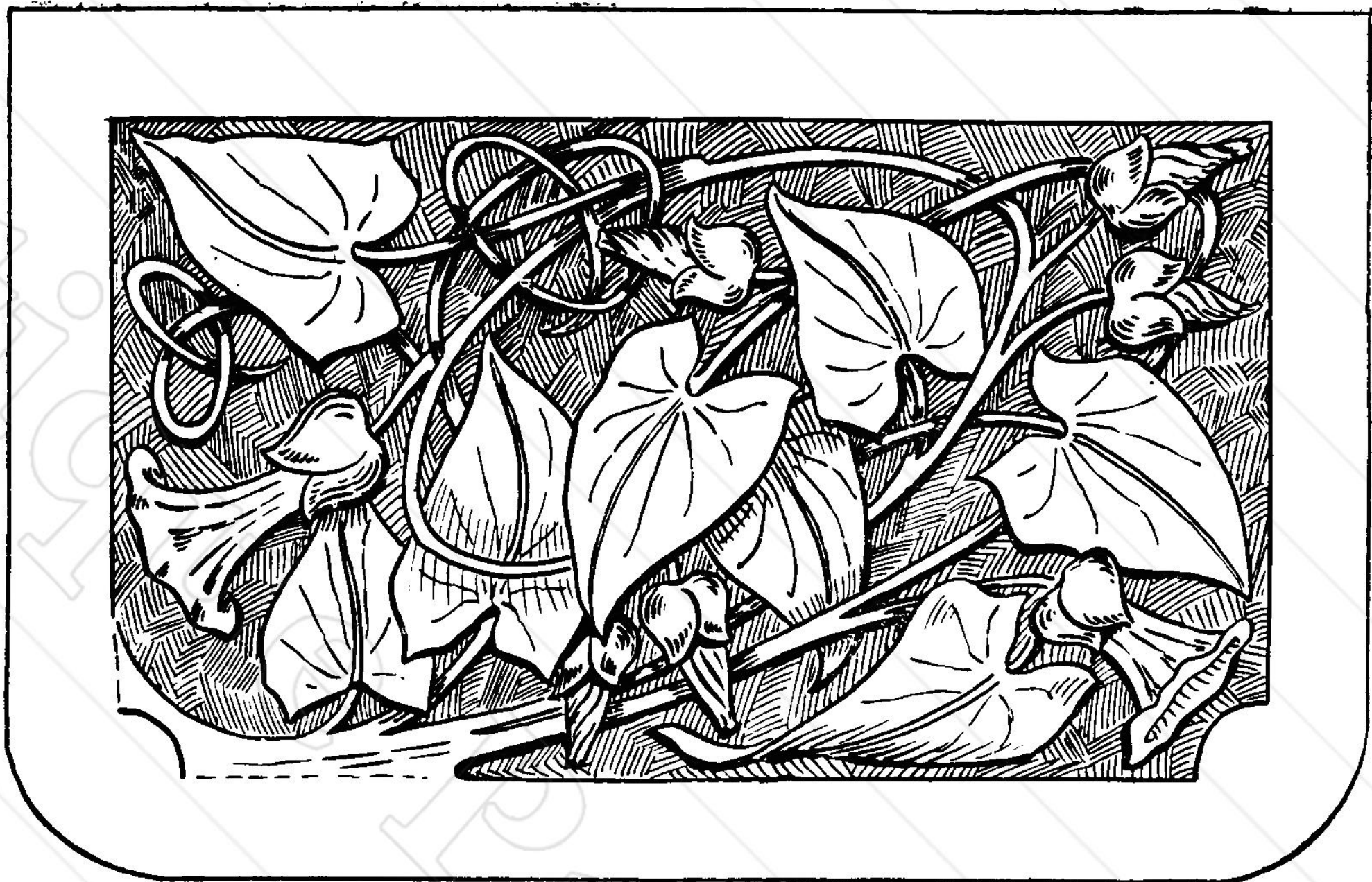
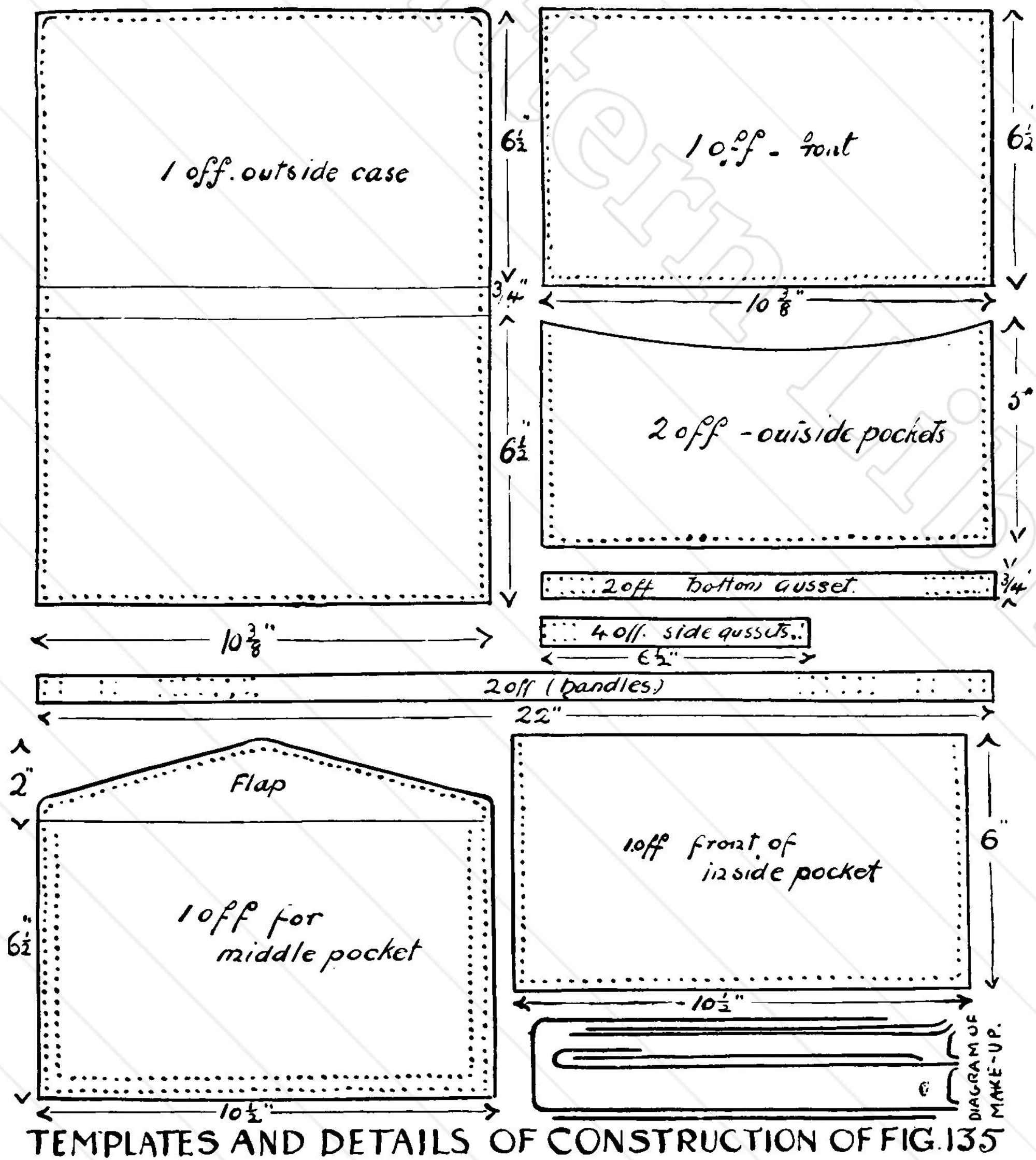


FIG.135. CONVULVUS DESIGN FOR LADY'S BAG IN CALF.





**A LADY'S BAG IN NATURAL GOAT SKIN WITH MODELLED DESIGN,
THE FLOWERS OF WHICH ARE EMBOSSED.**

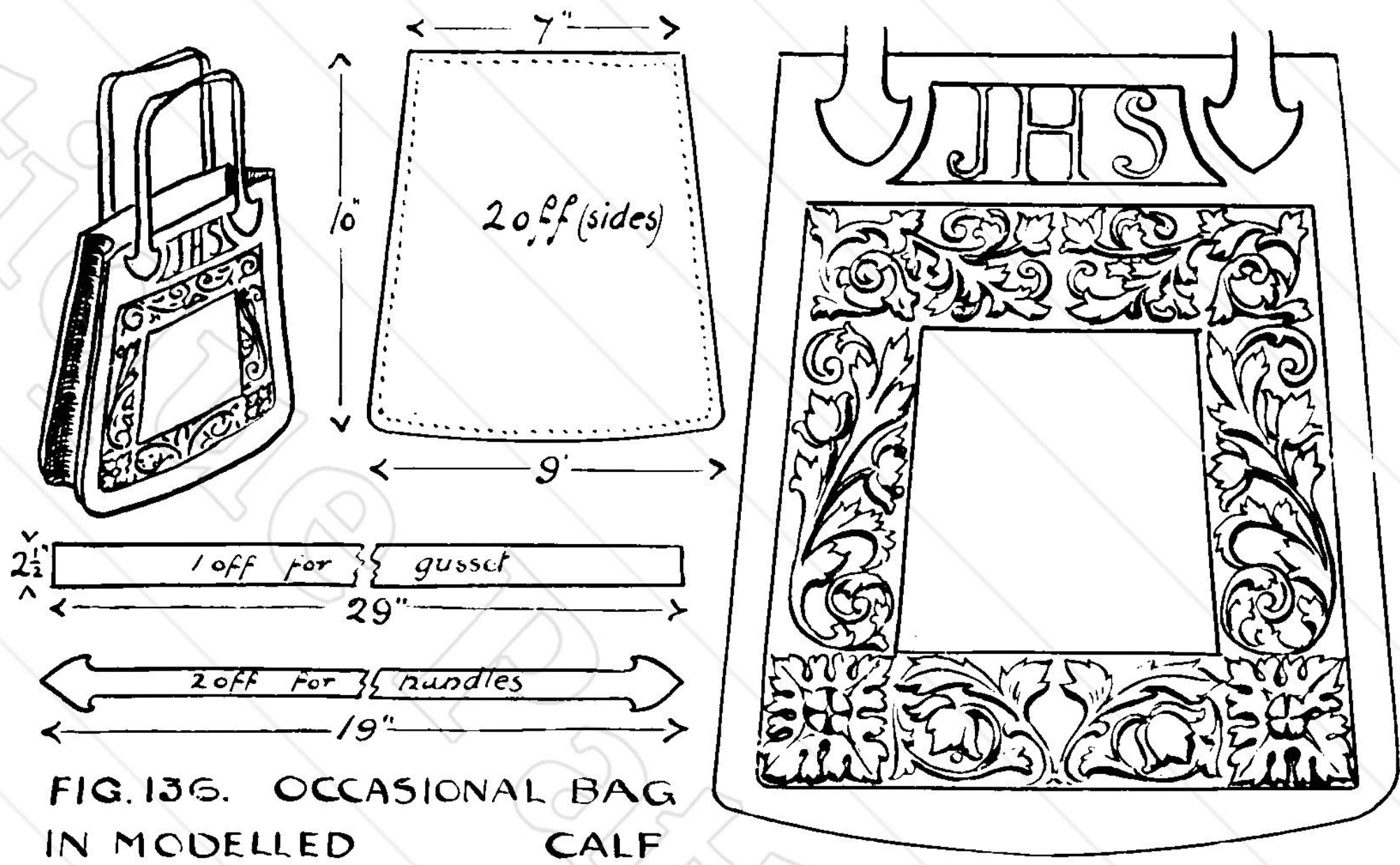


FIG. 136. OCCASIONAL BAG IN MODELLED CALF

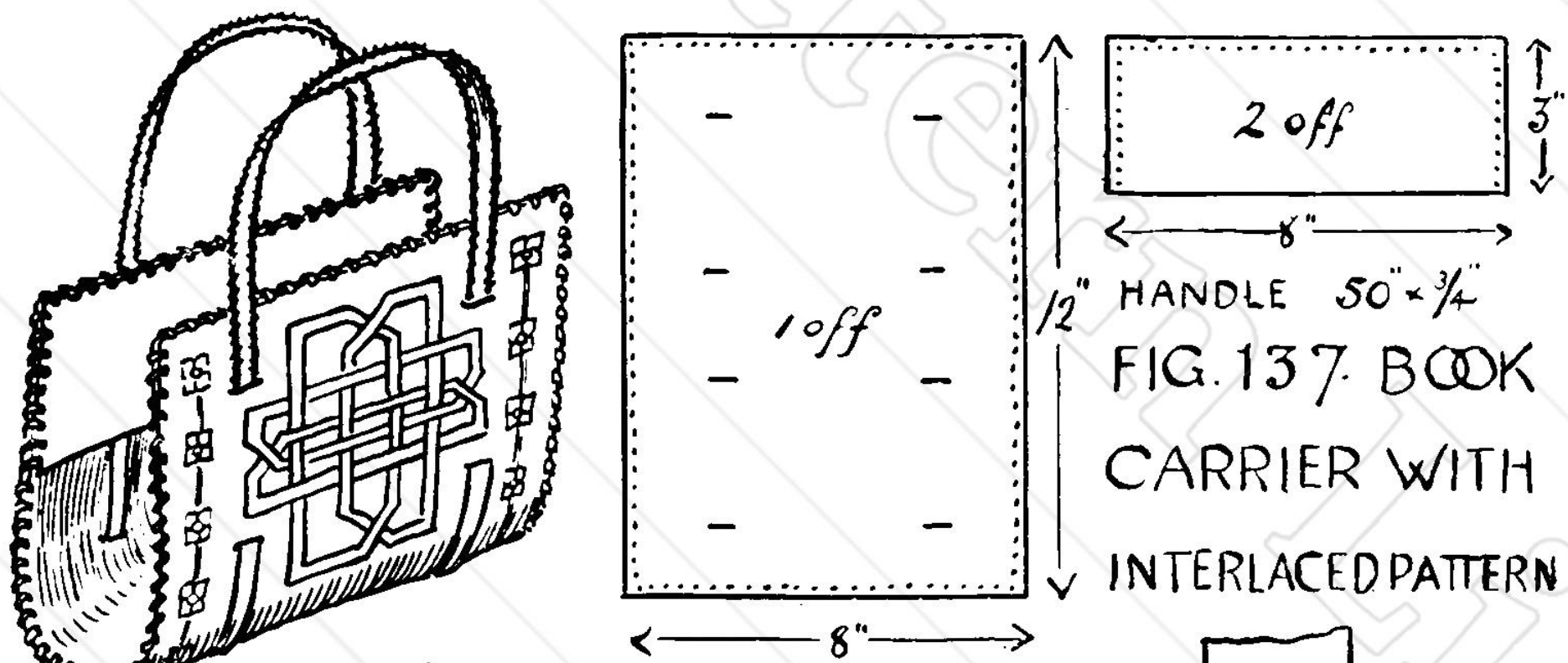
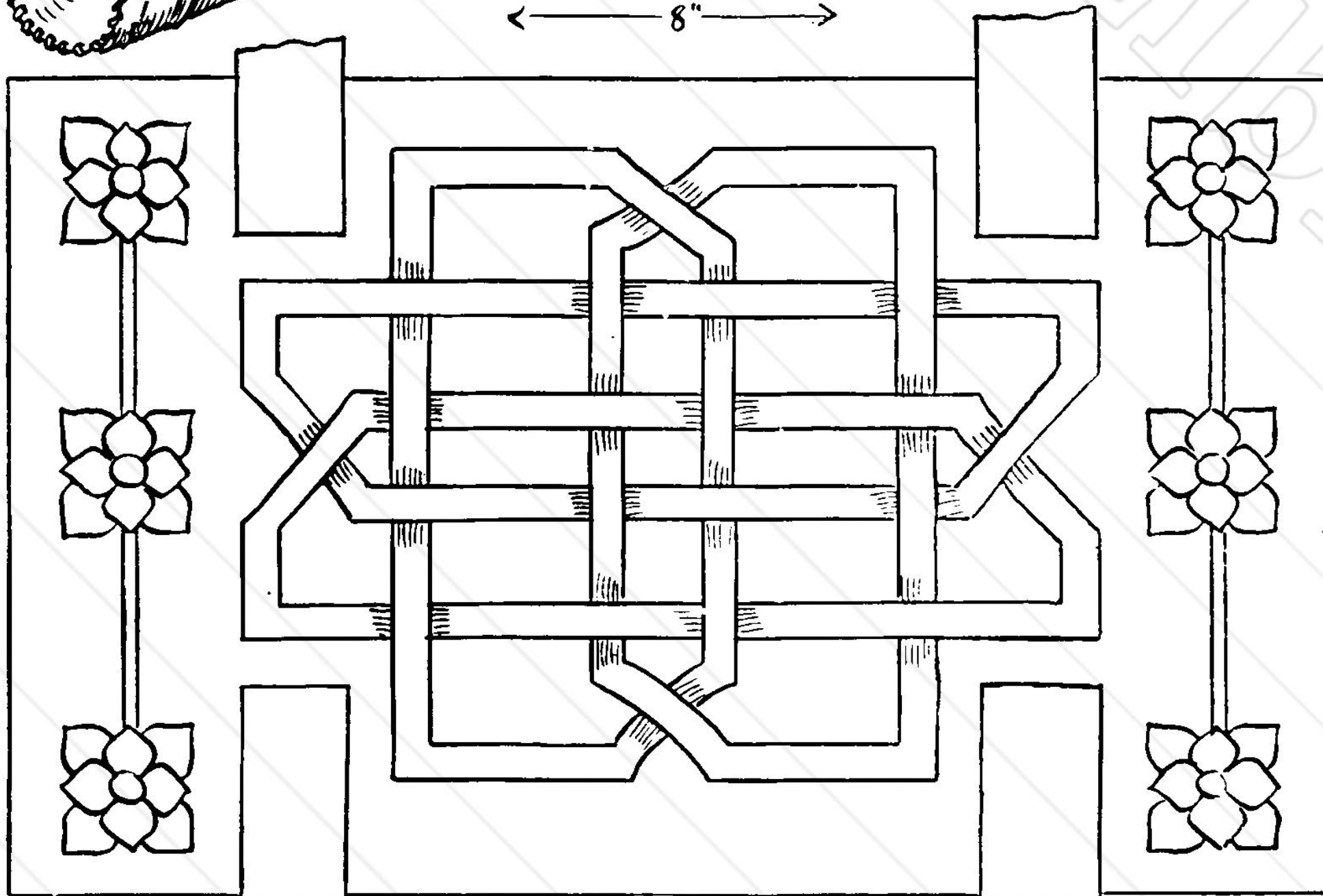
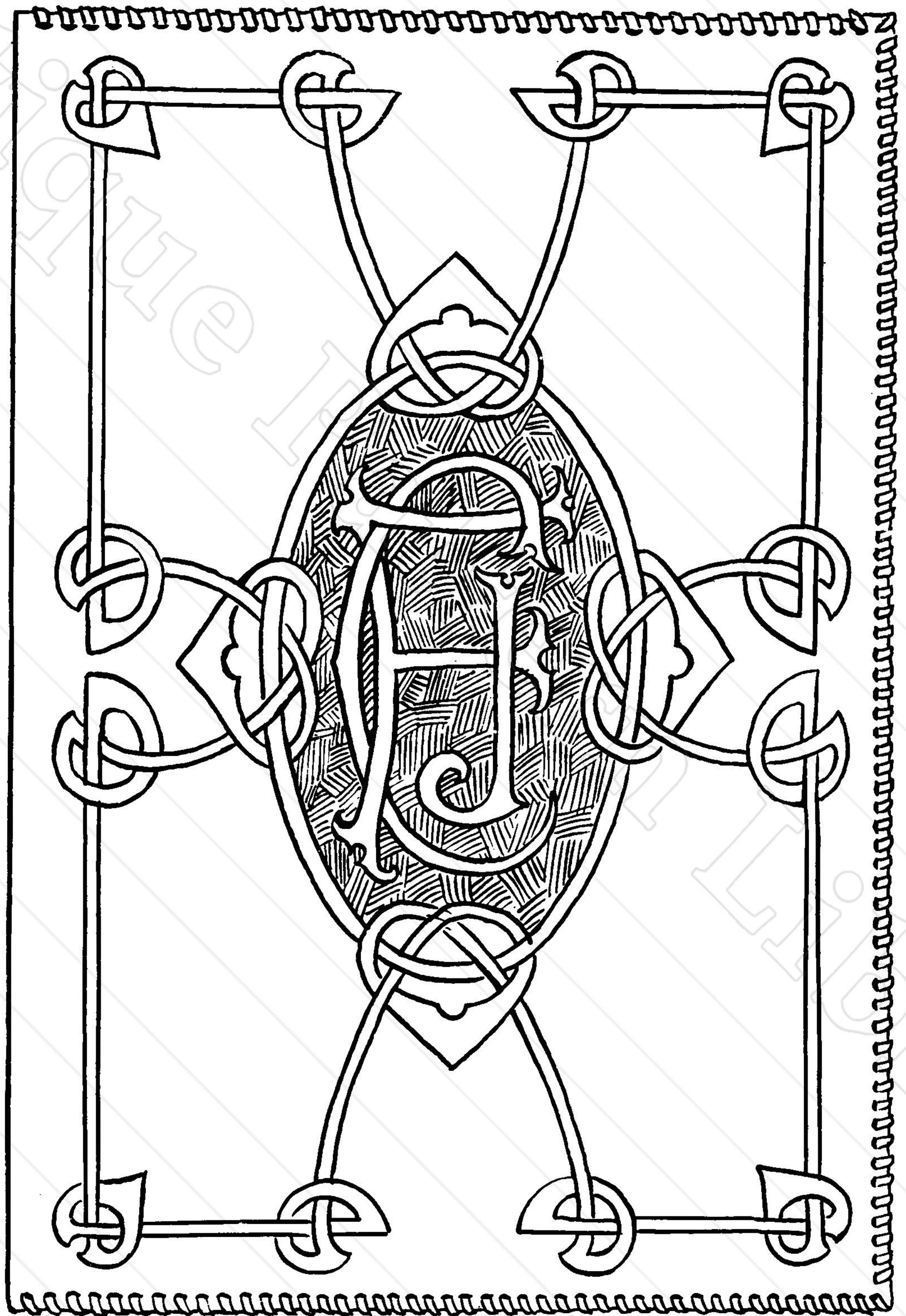


FIG. 137. BOOK CARRIER WITH INTERLACED PATTERN

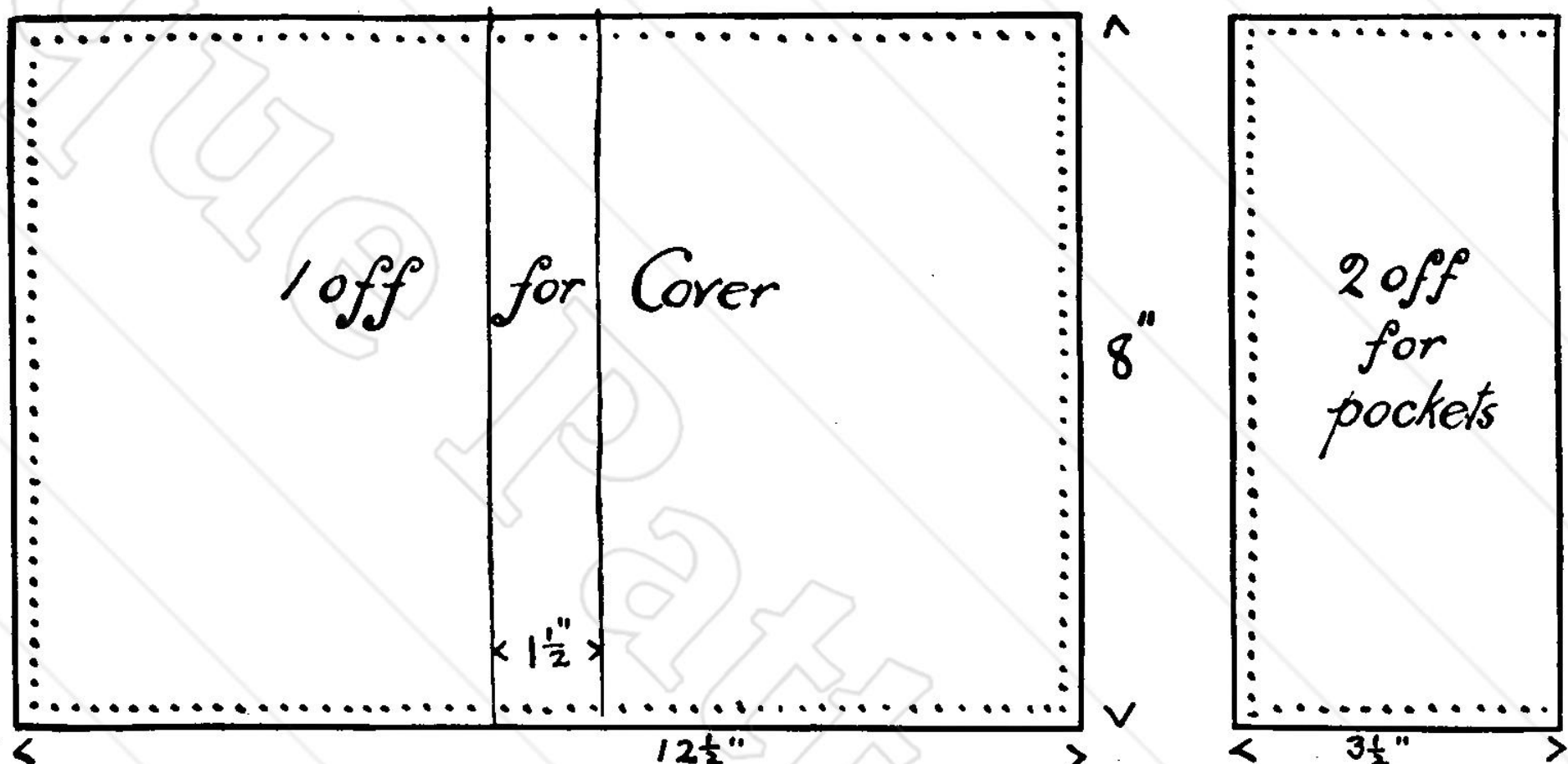




DESIGN

FOR

FIG.138



TEMPLATES FOR READING CASE FIG.138

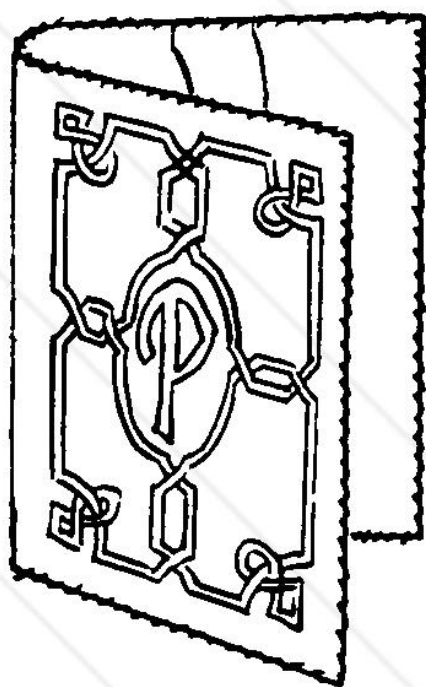
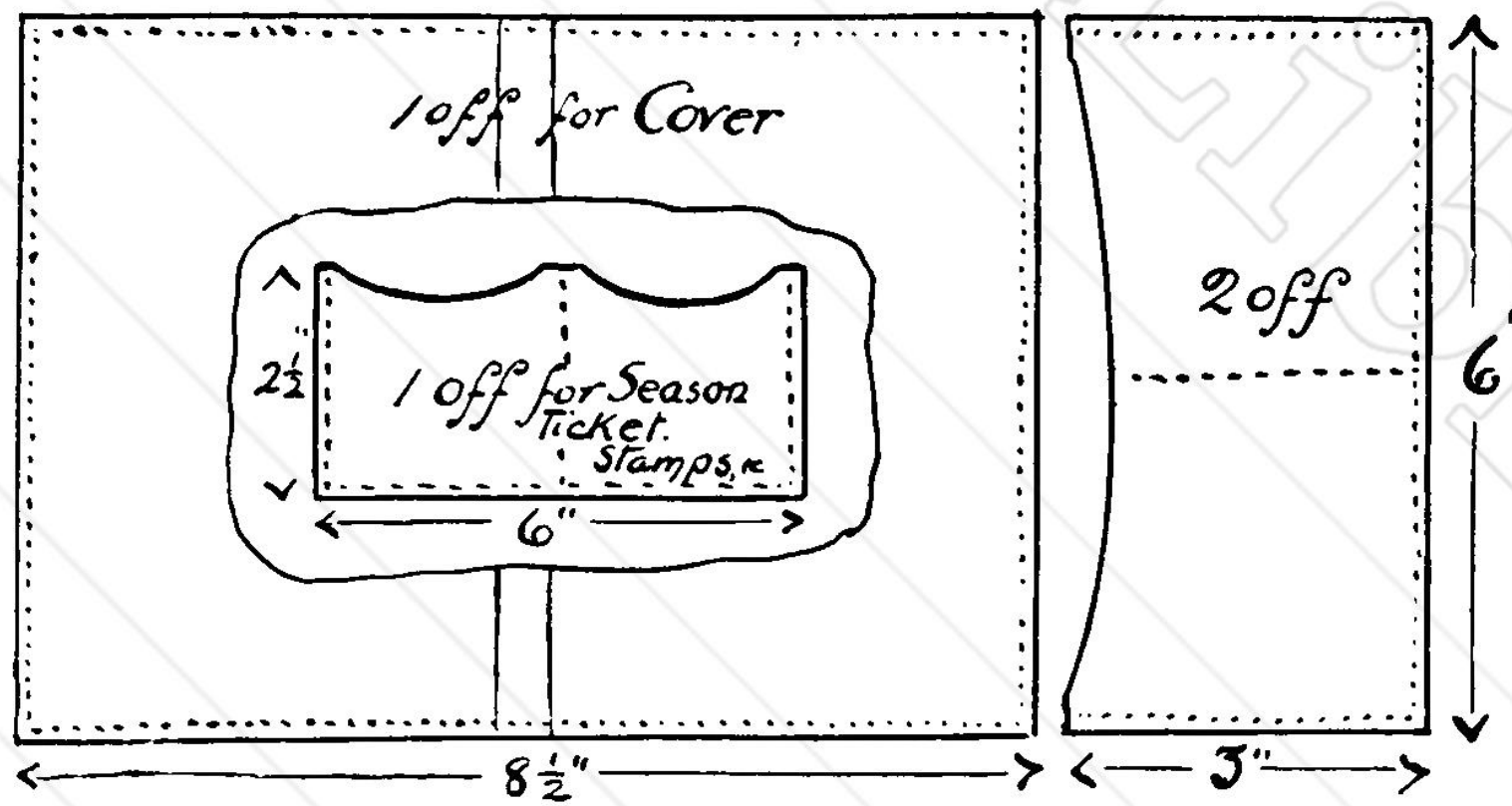


FIG.139.WALLET



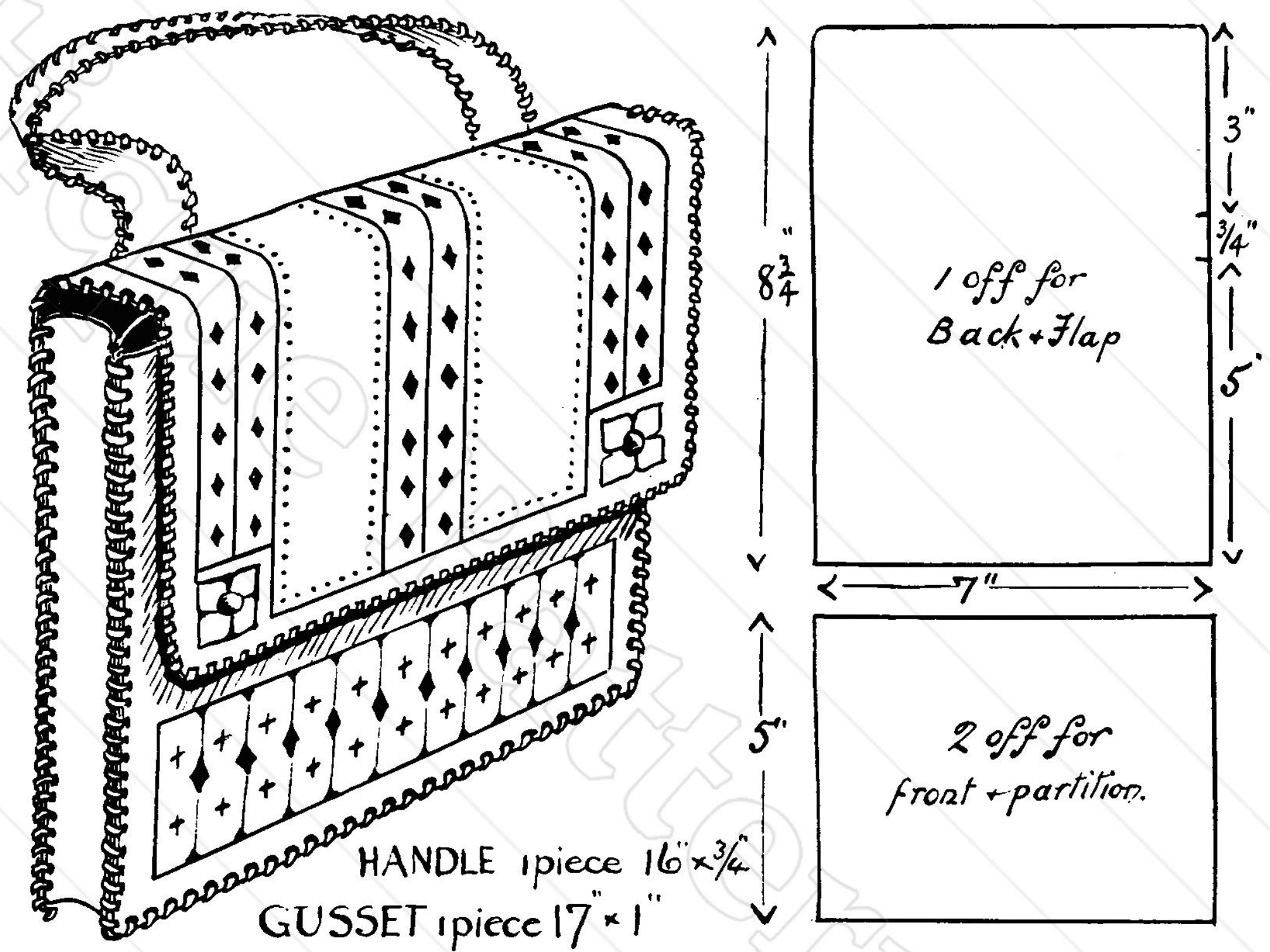
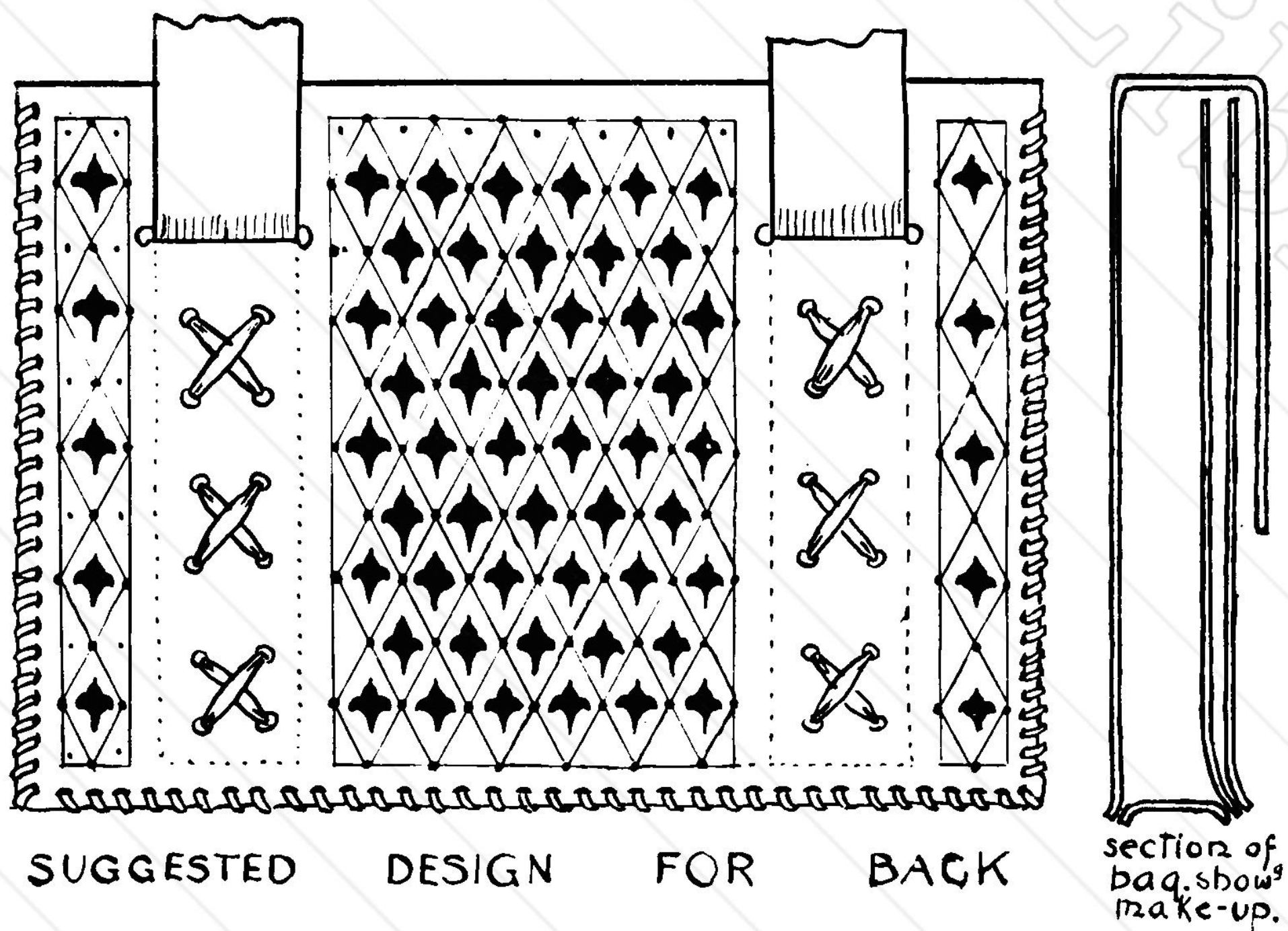
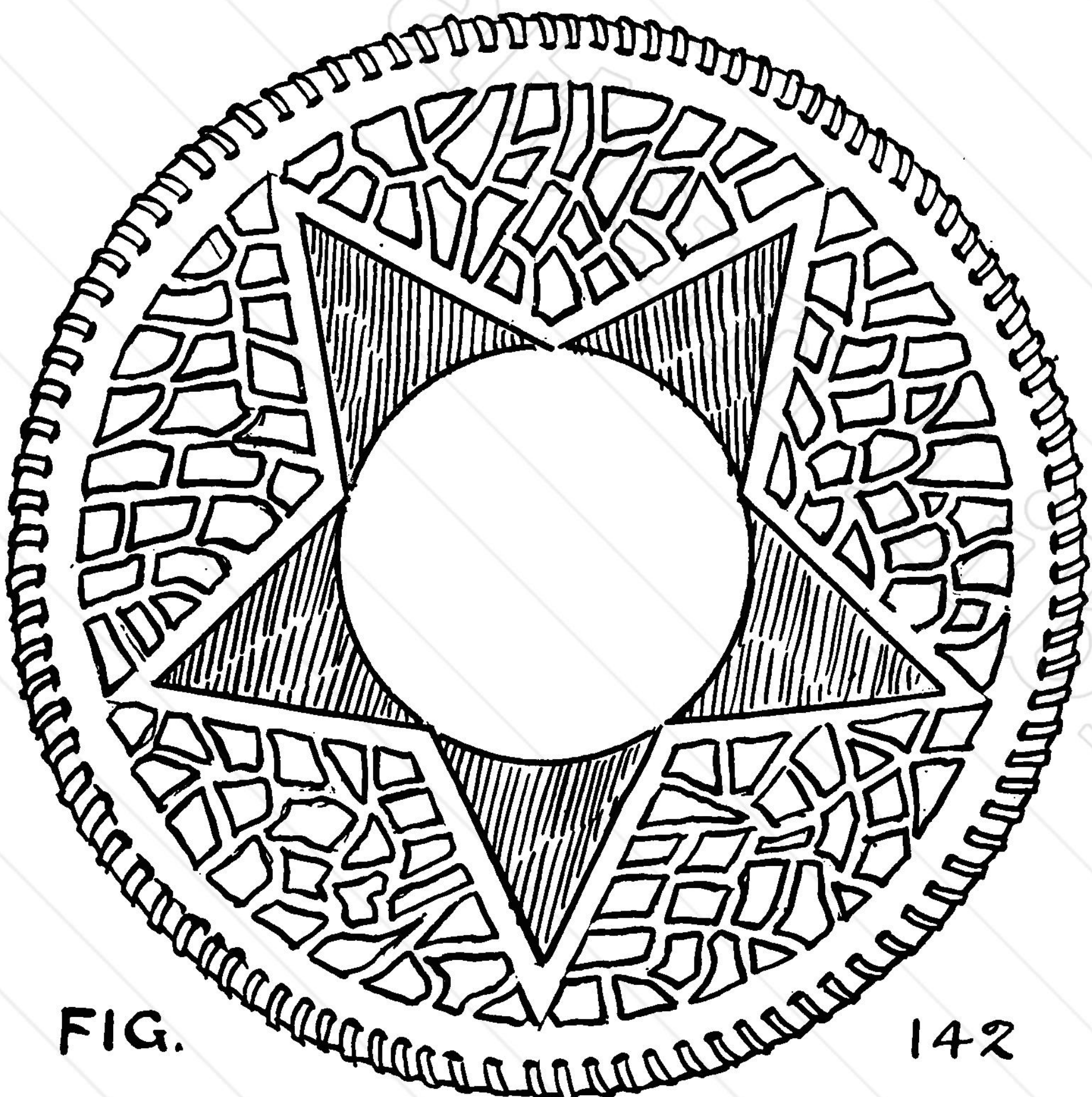
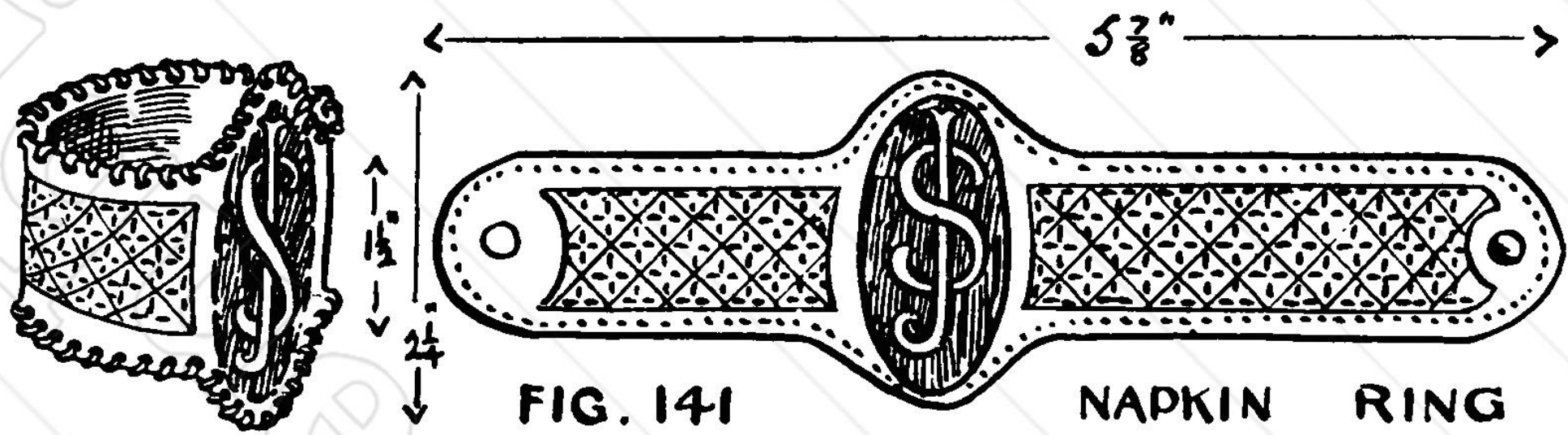


FIG. 140. LADY'S BAG with PUNCHED PATTERN





STENCILLED TABLE MAT.

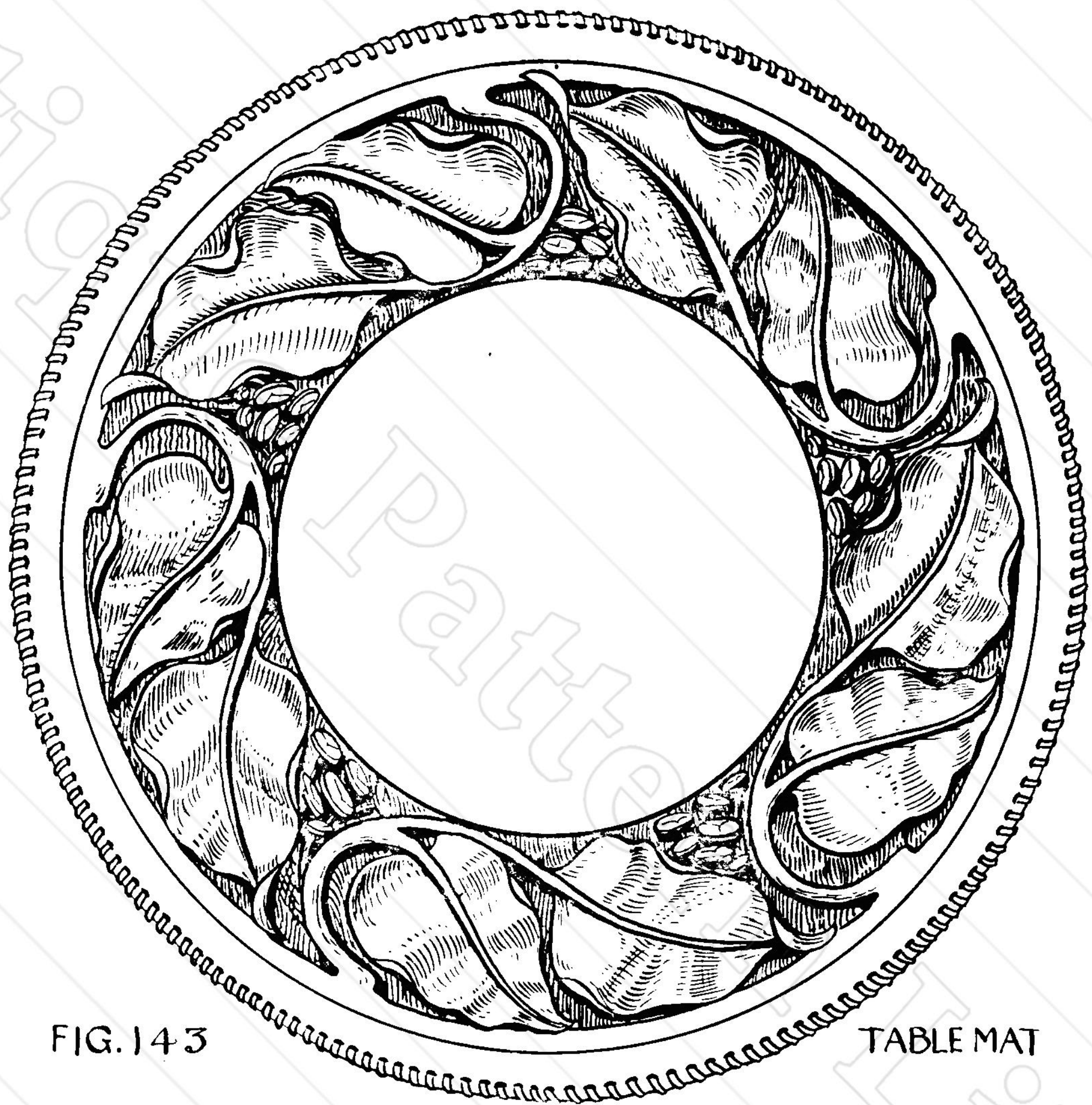
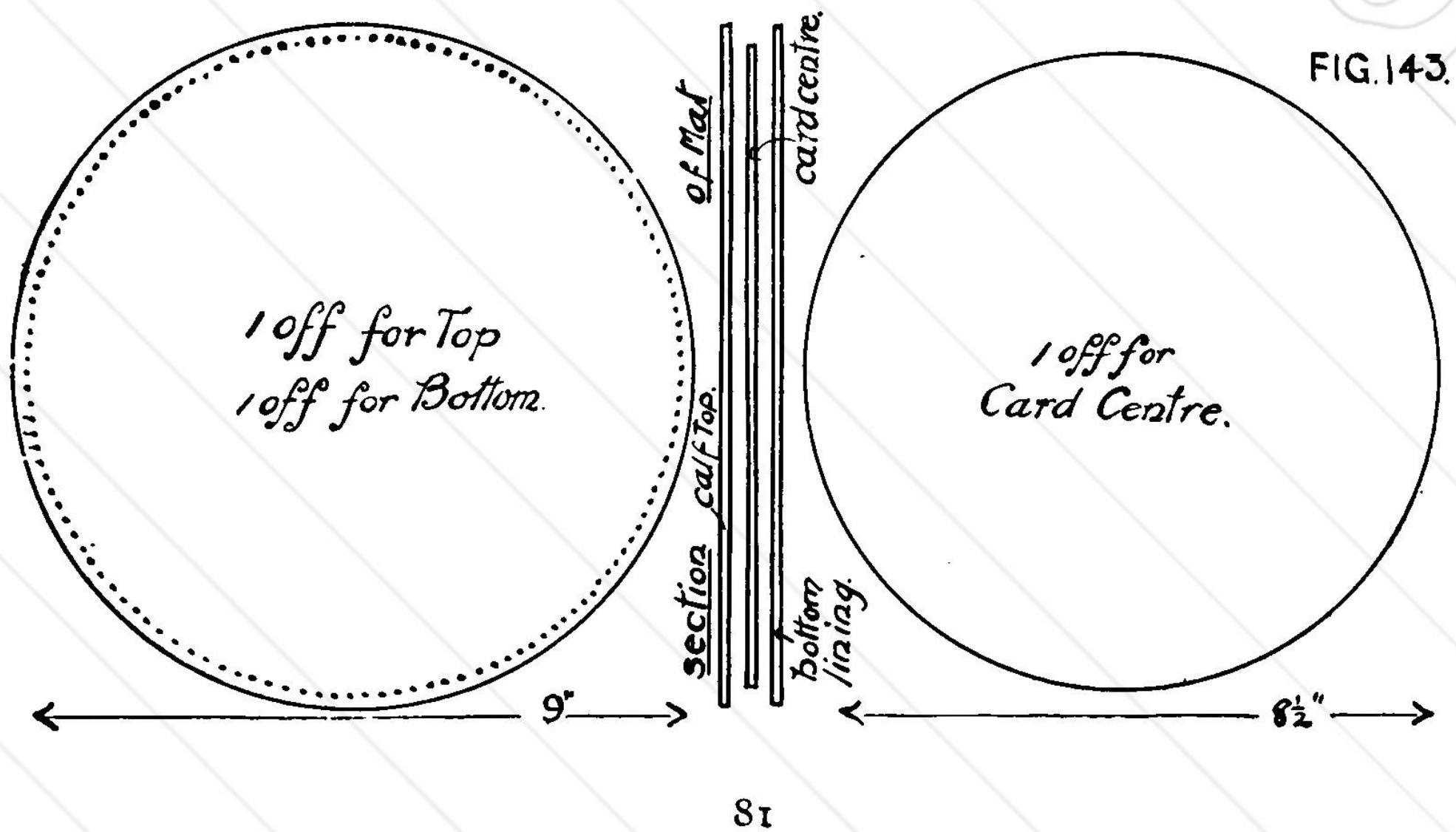


FIG. 143

TABLE MAT



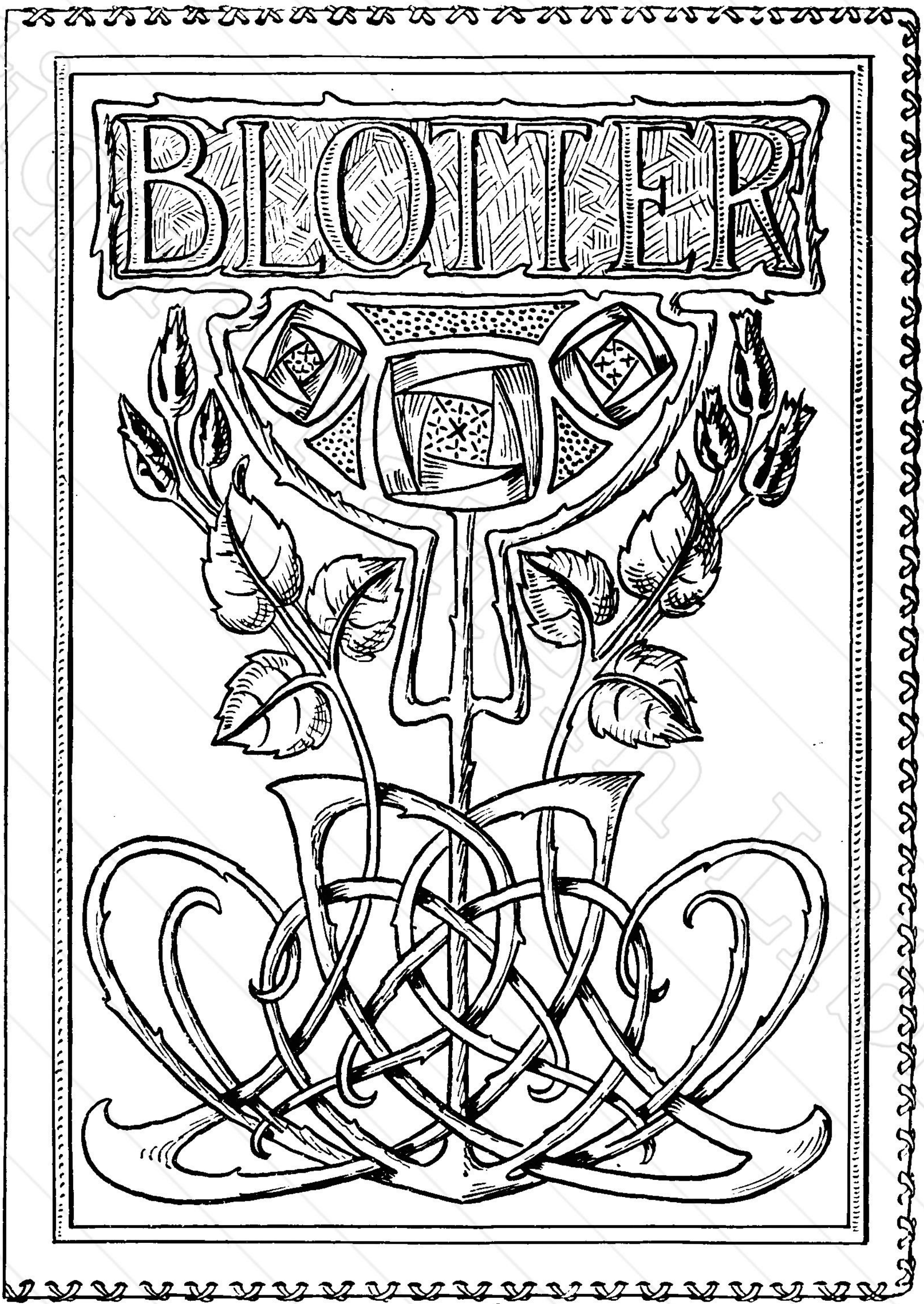
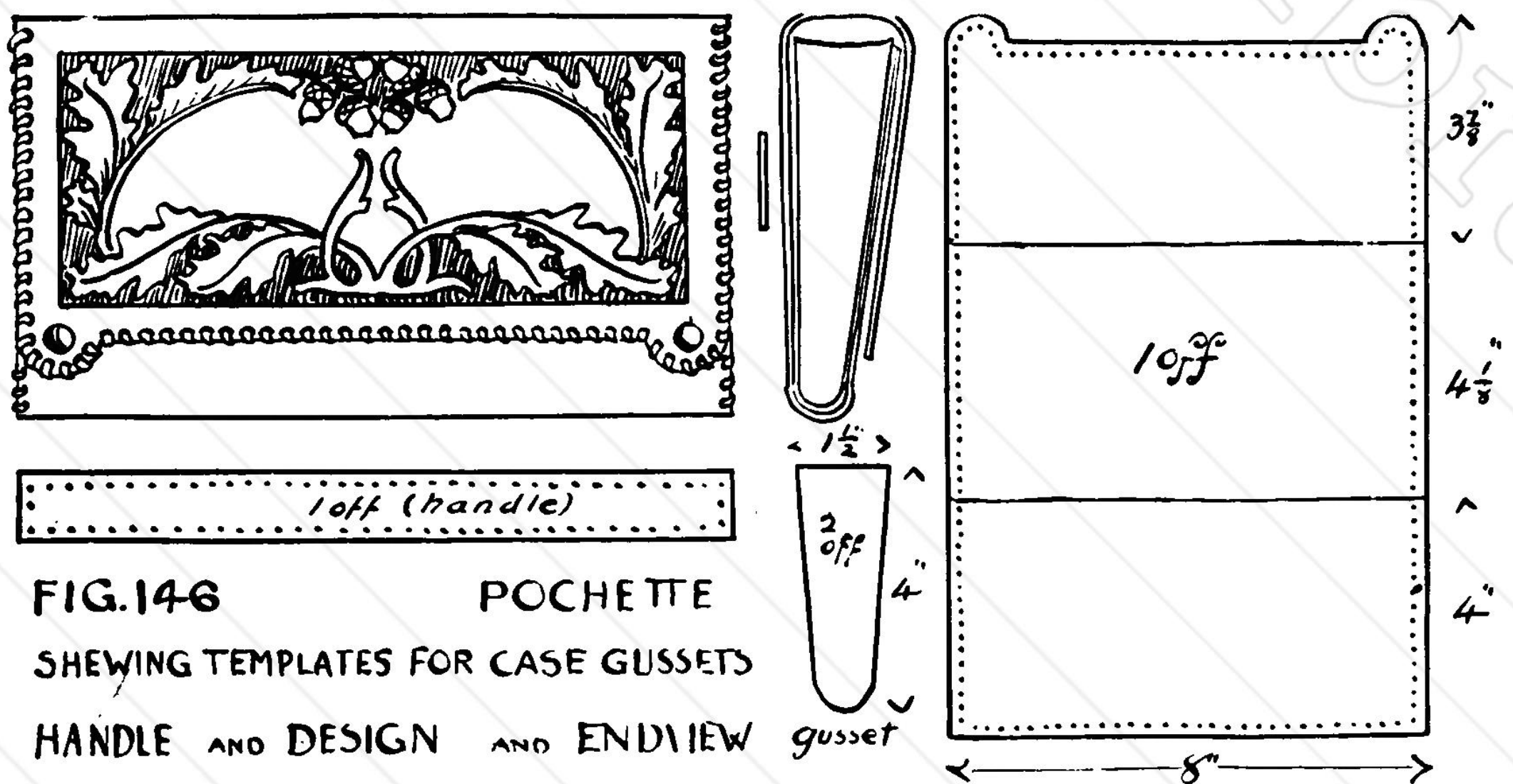
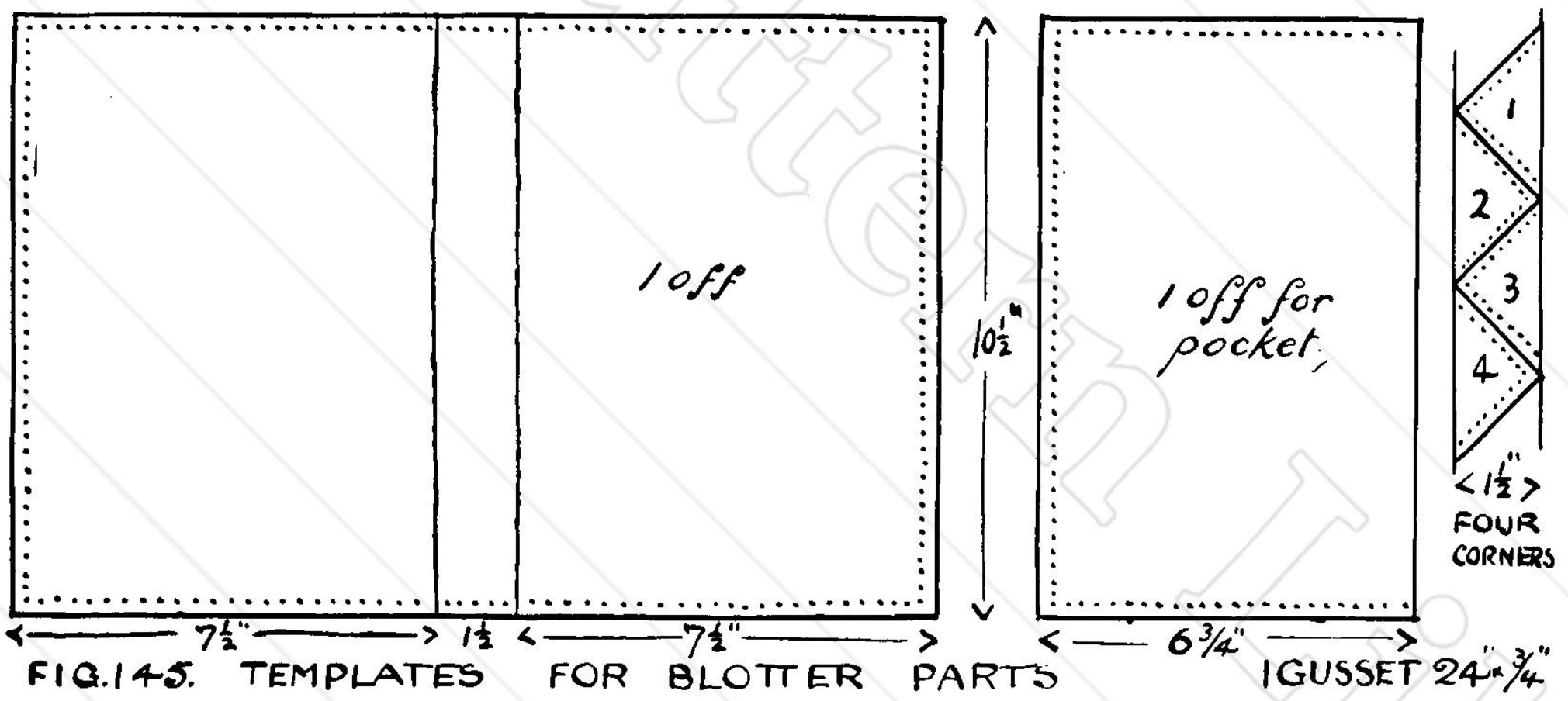
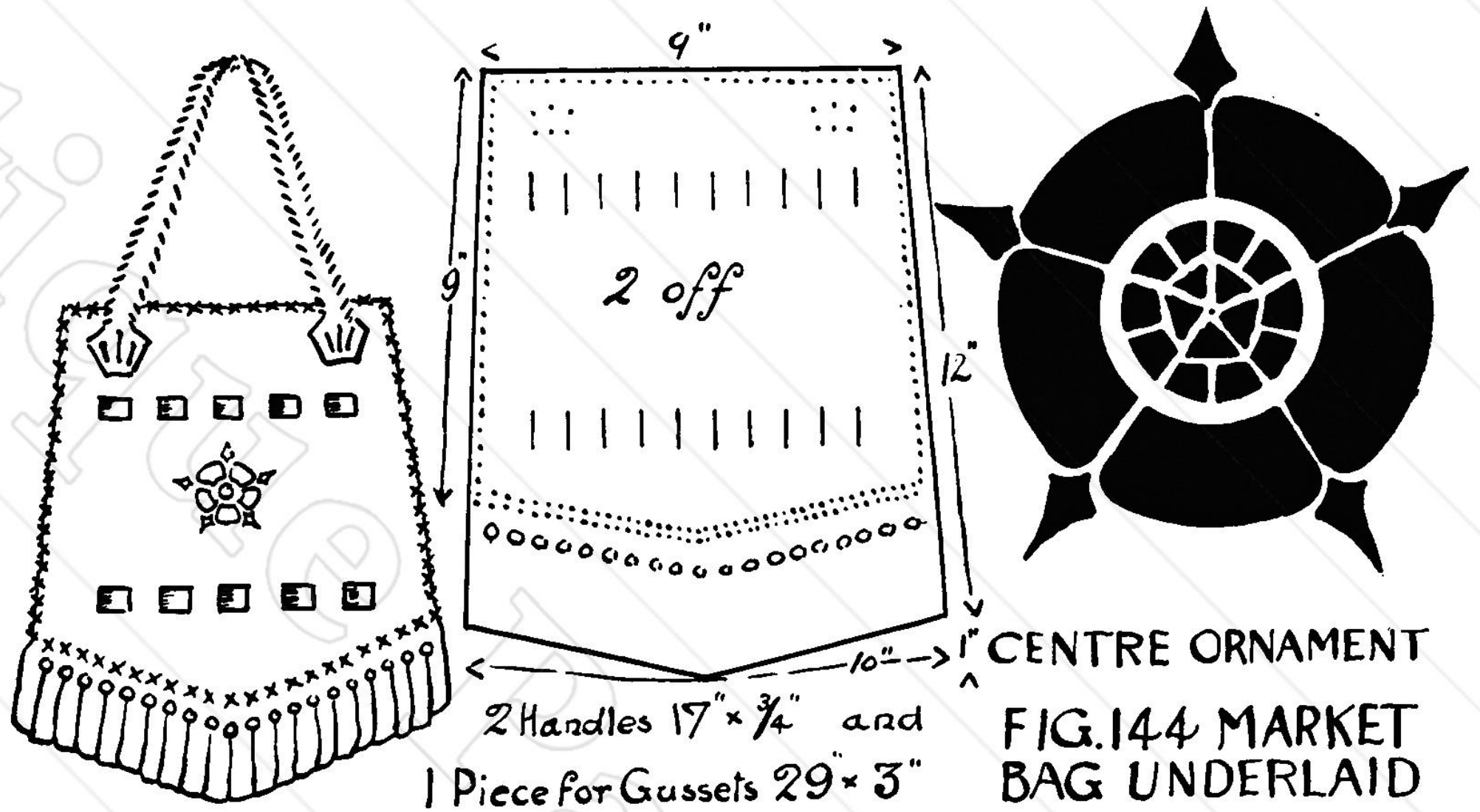


FIG. 145. DESIGN FOR BLOTTER



**A MARKETING BAG IN NAVY BLUE SUEDE, ORNAMENTED WITH PIERCED
WORK BACKED UP WITH ORANGE LEATHER.**



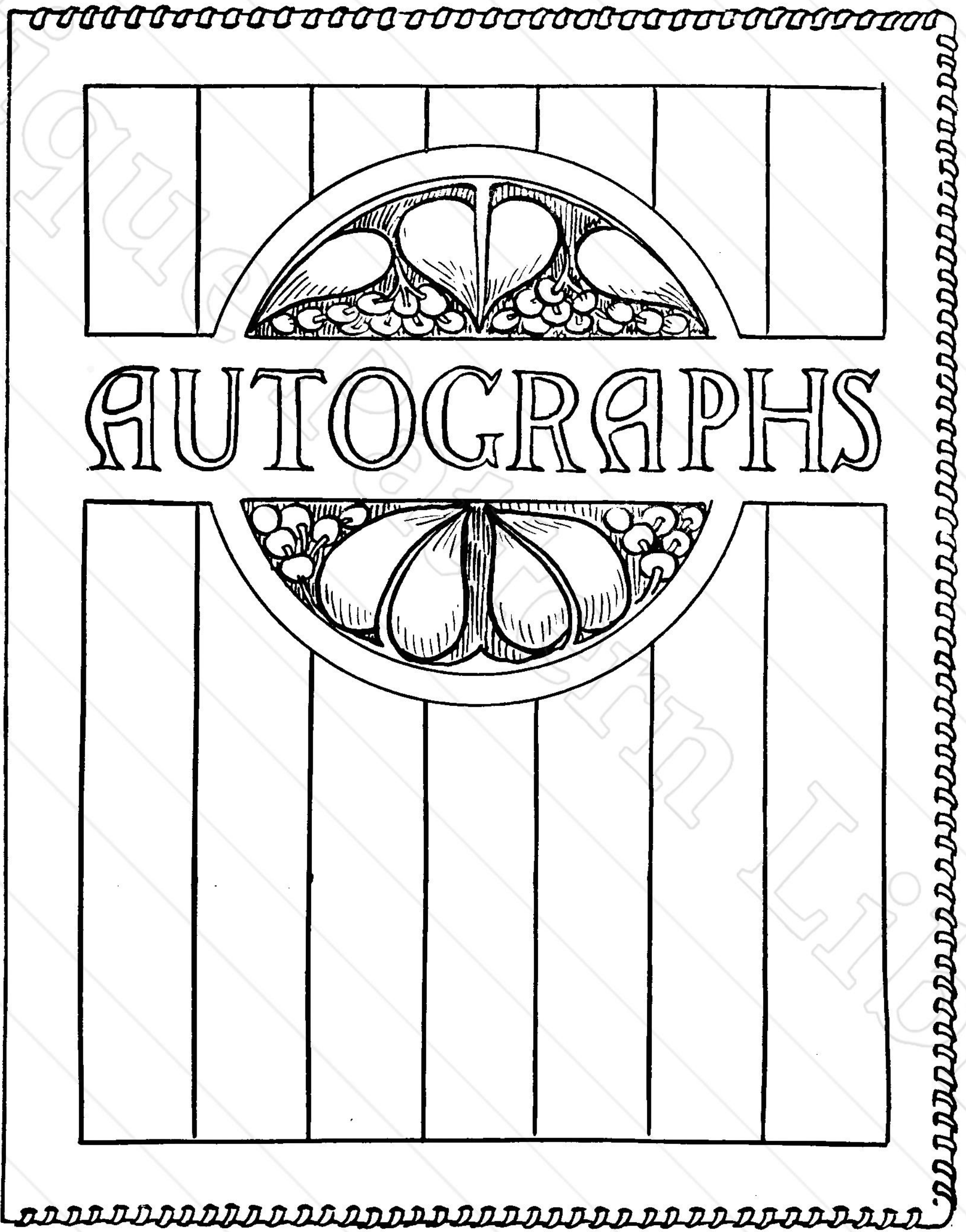


FIG. 147. MODELLED AUTOGRAPH ALBUMS

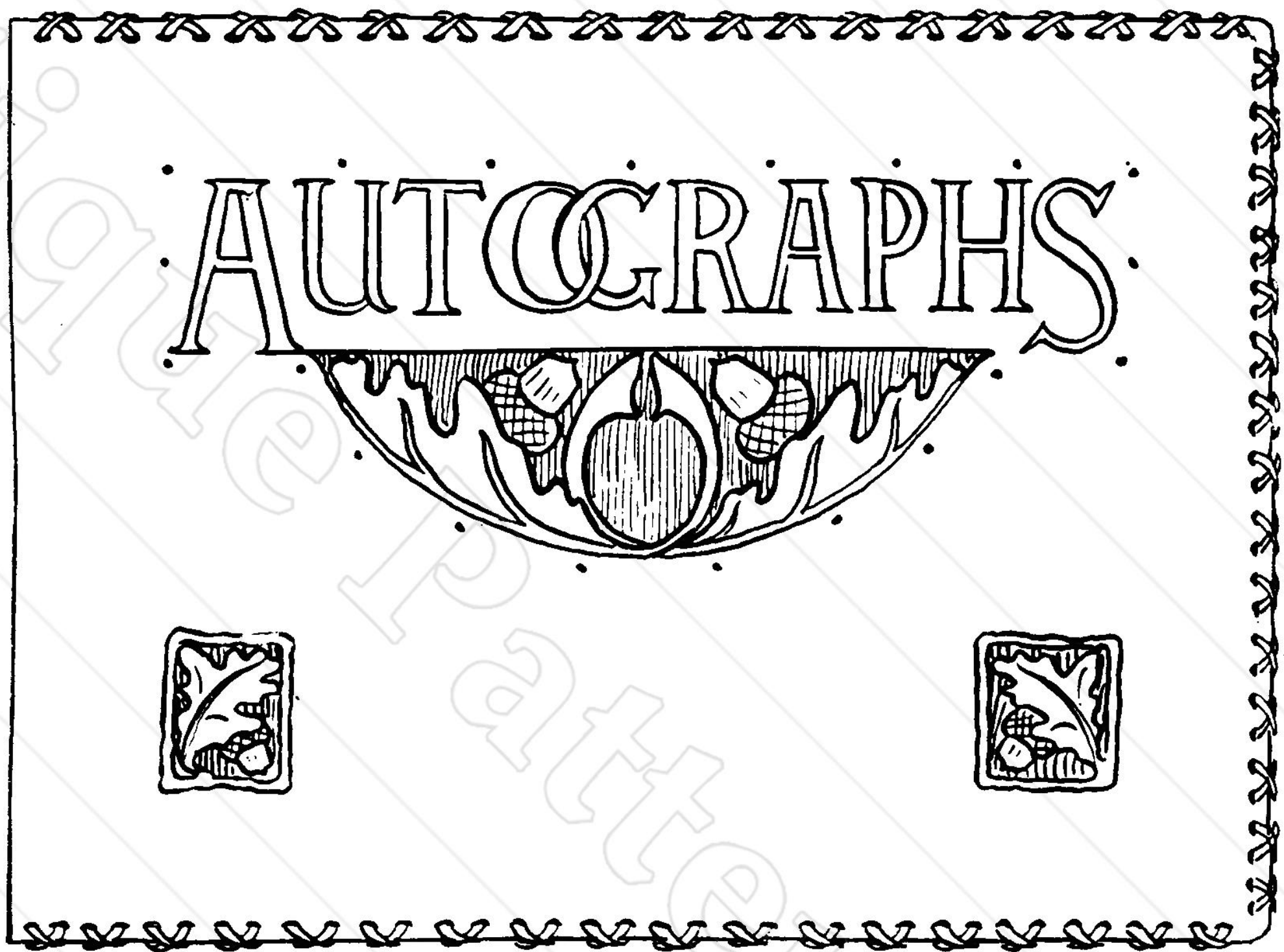
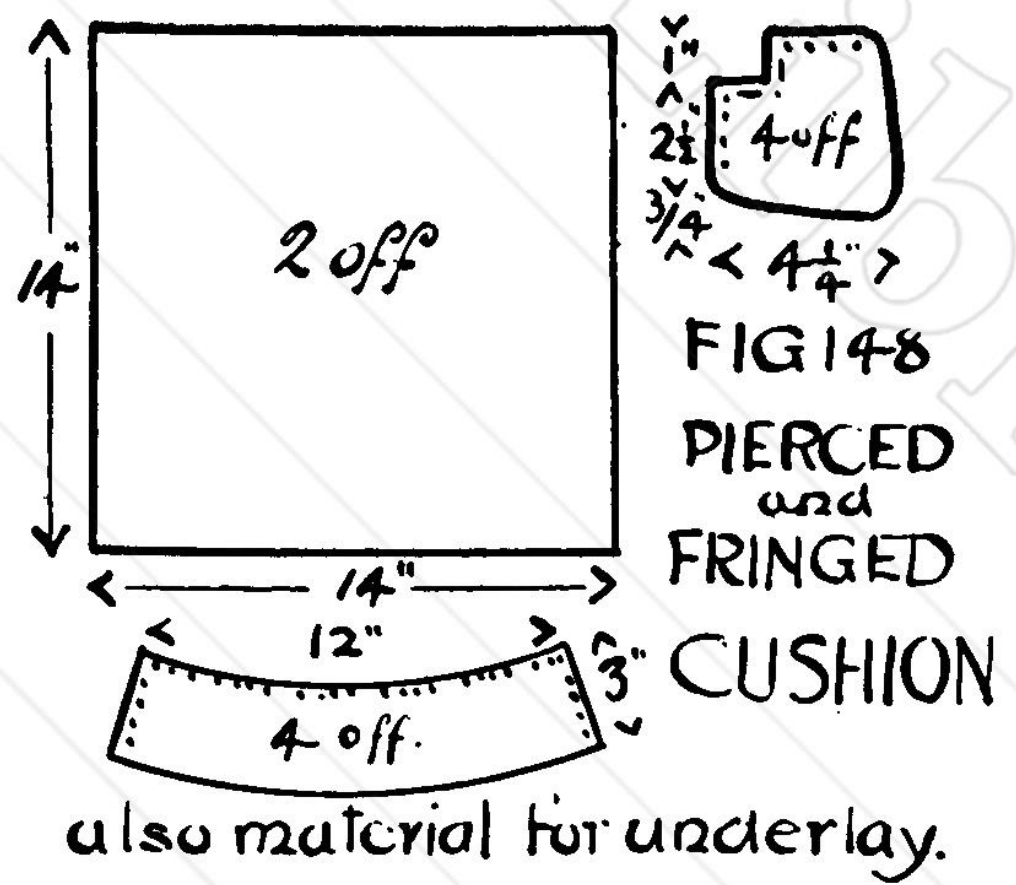
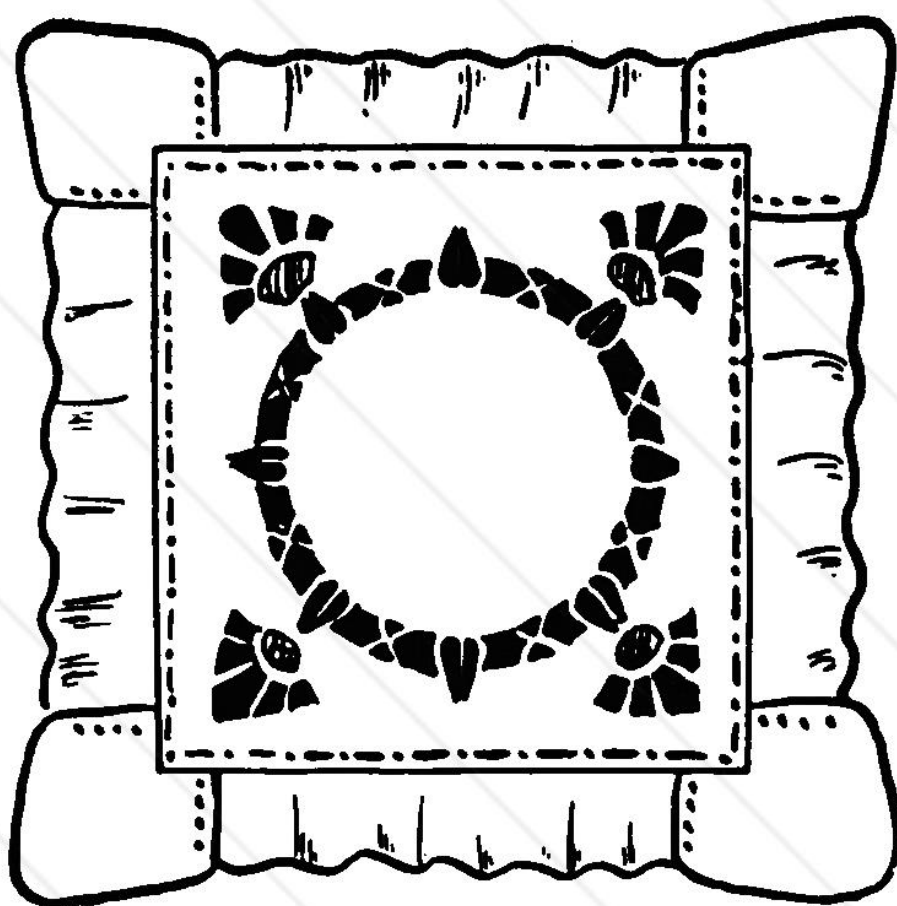


FIG. 147A. MODELLED AUTOGRAPH ALBUM.



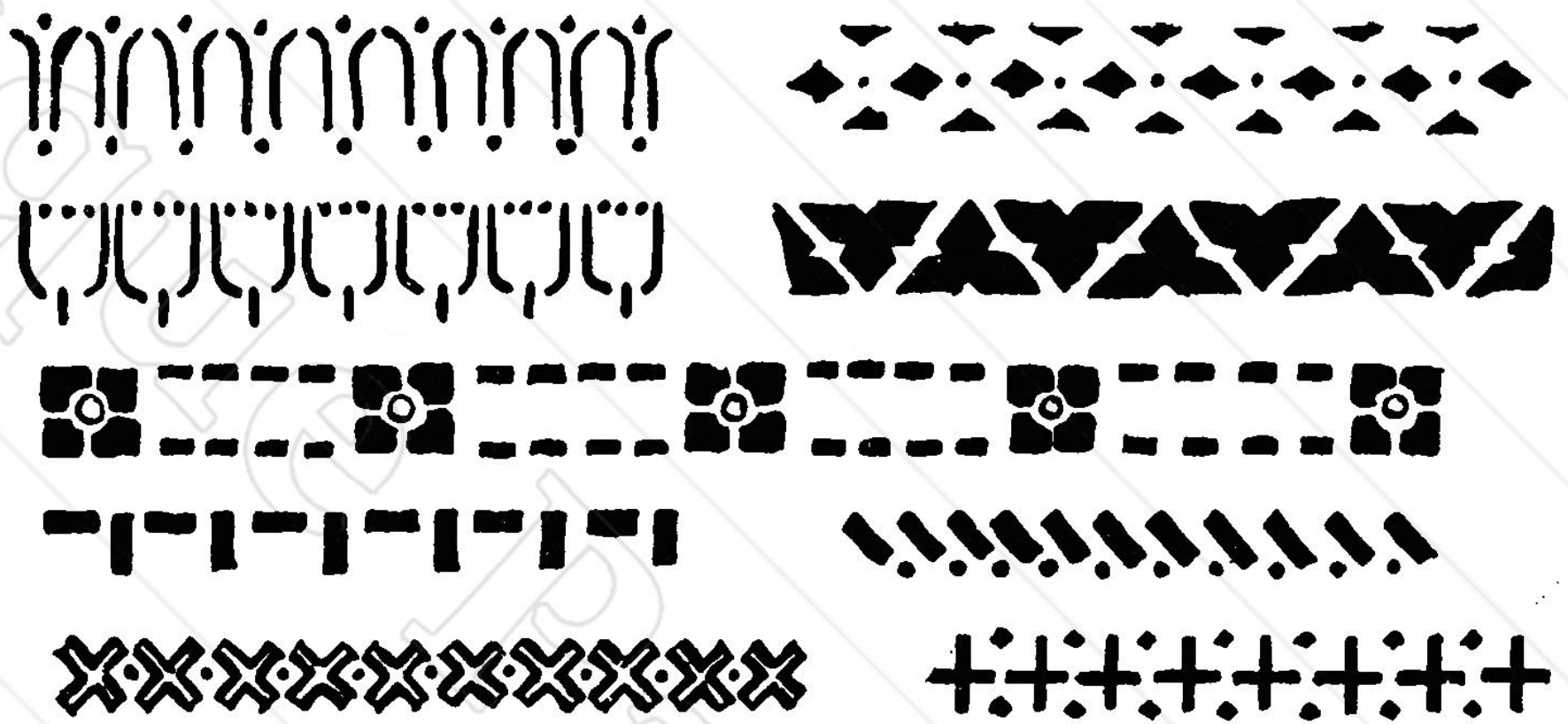


FIG.149. SIMPLE PUNCH PATTERN BORDERS

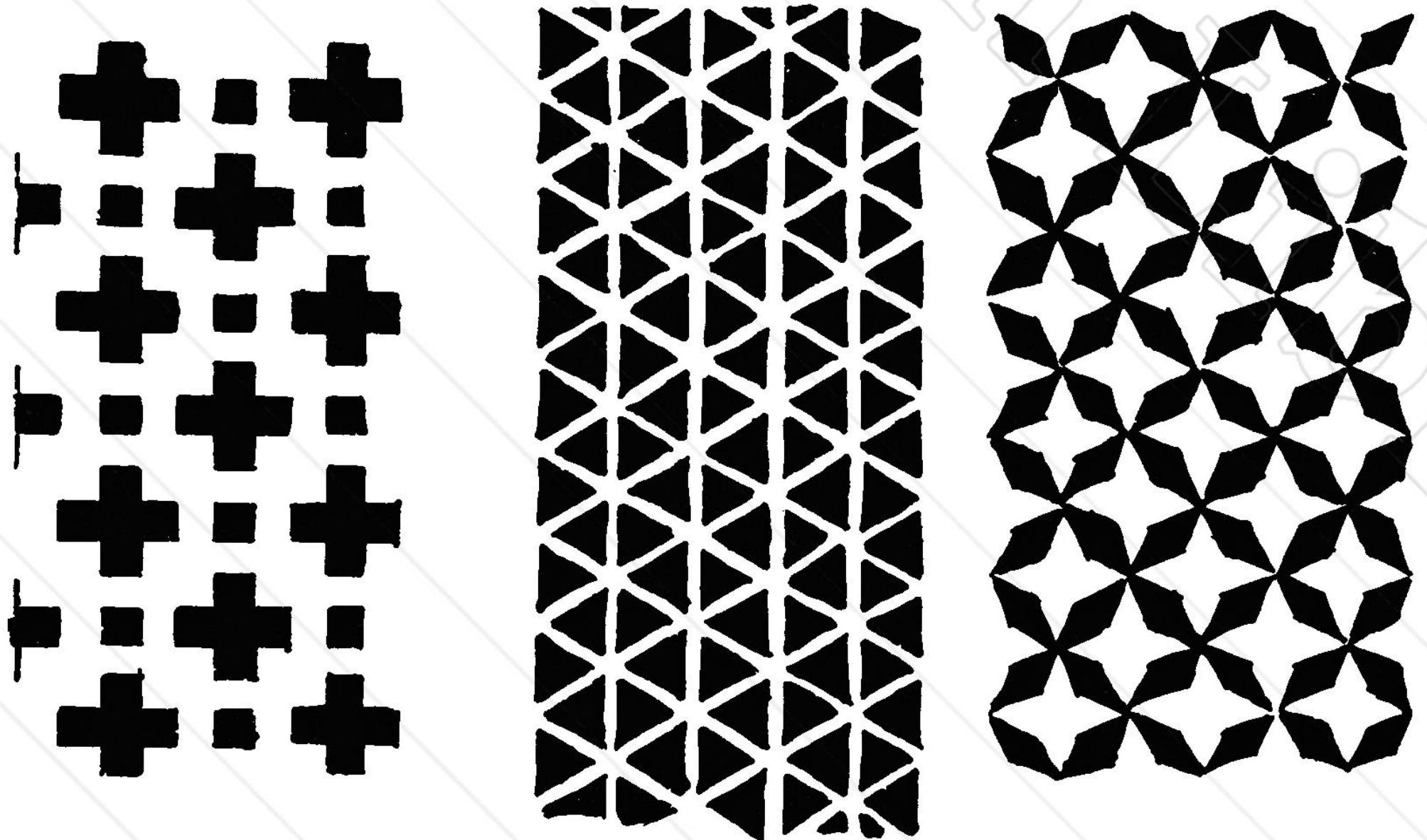


FIG. 150. FILLING PATTERNS MADE WITH PUNCH.

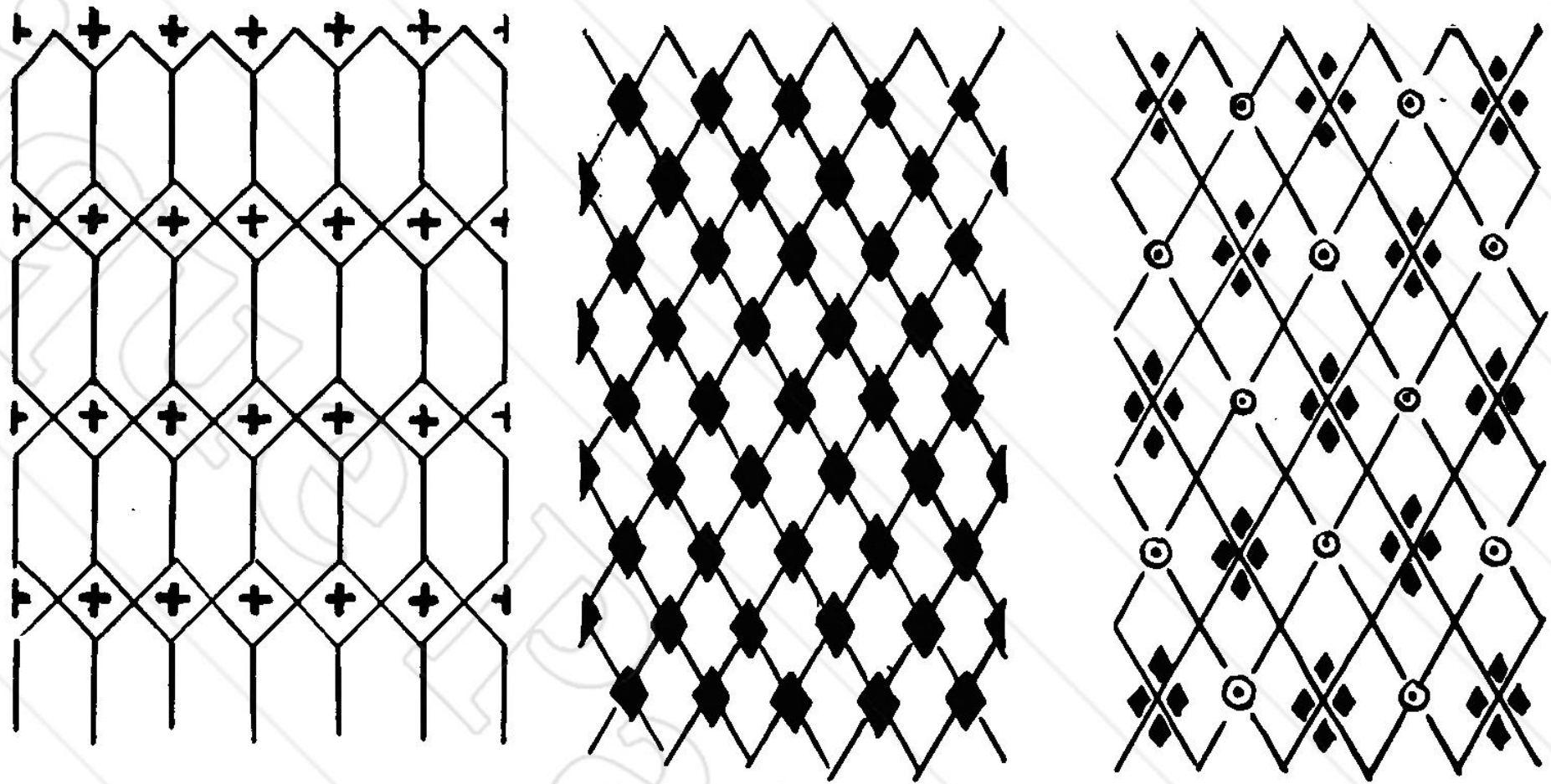


FIG.151. FILLING PATTERNS WITH PUNCH & TRACER

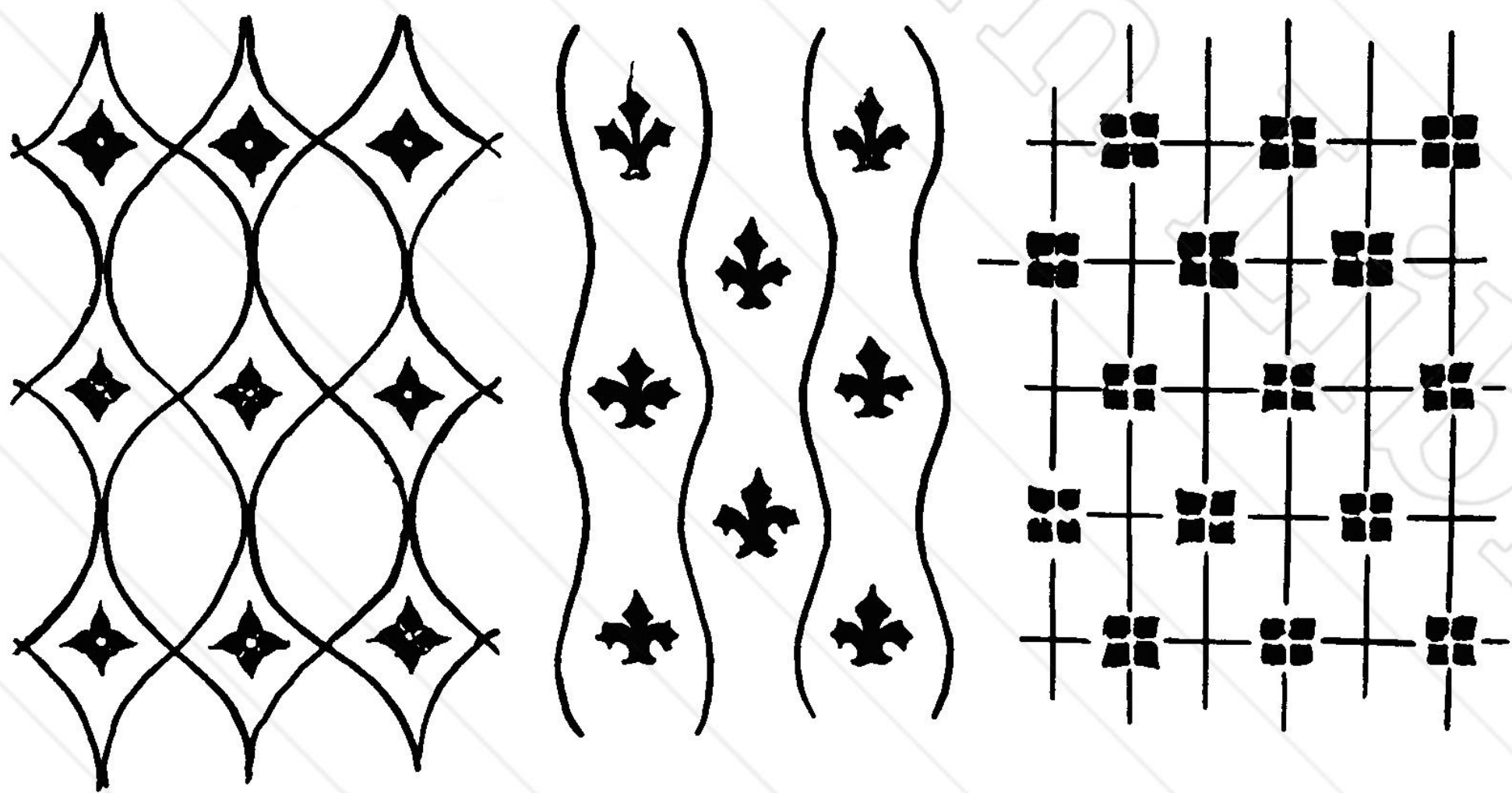


FIG.152. PUNCH & TRACER PATTERNS FOR FILLING

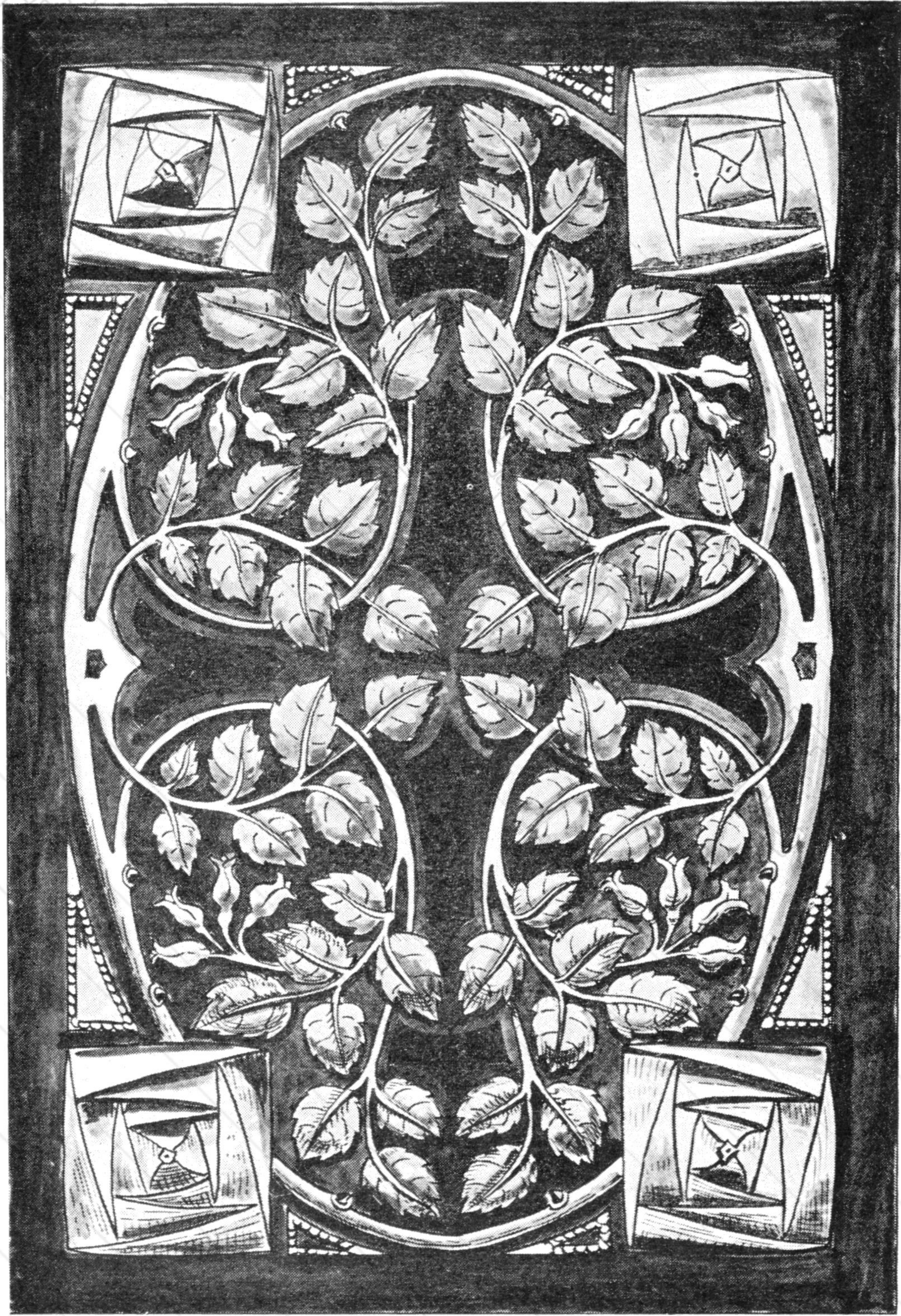


FIG. 154 DESIGN FOR BOOK COVER

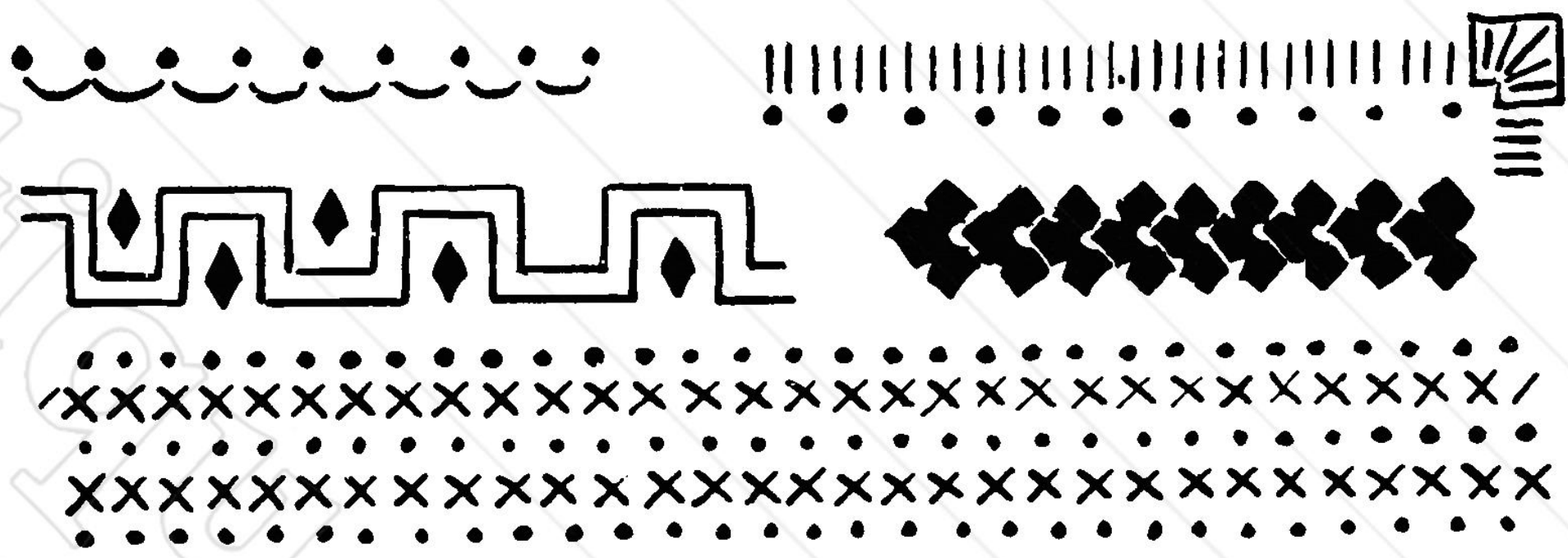


FIG.153. A FEW MCRE LINE & PUNCH PATTERNS

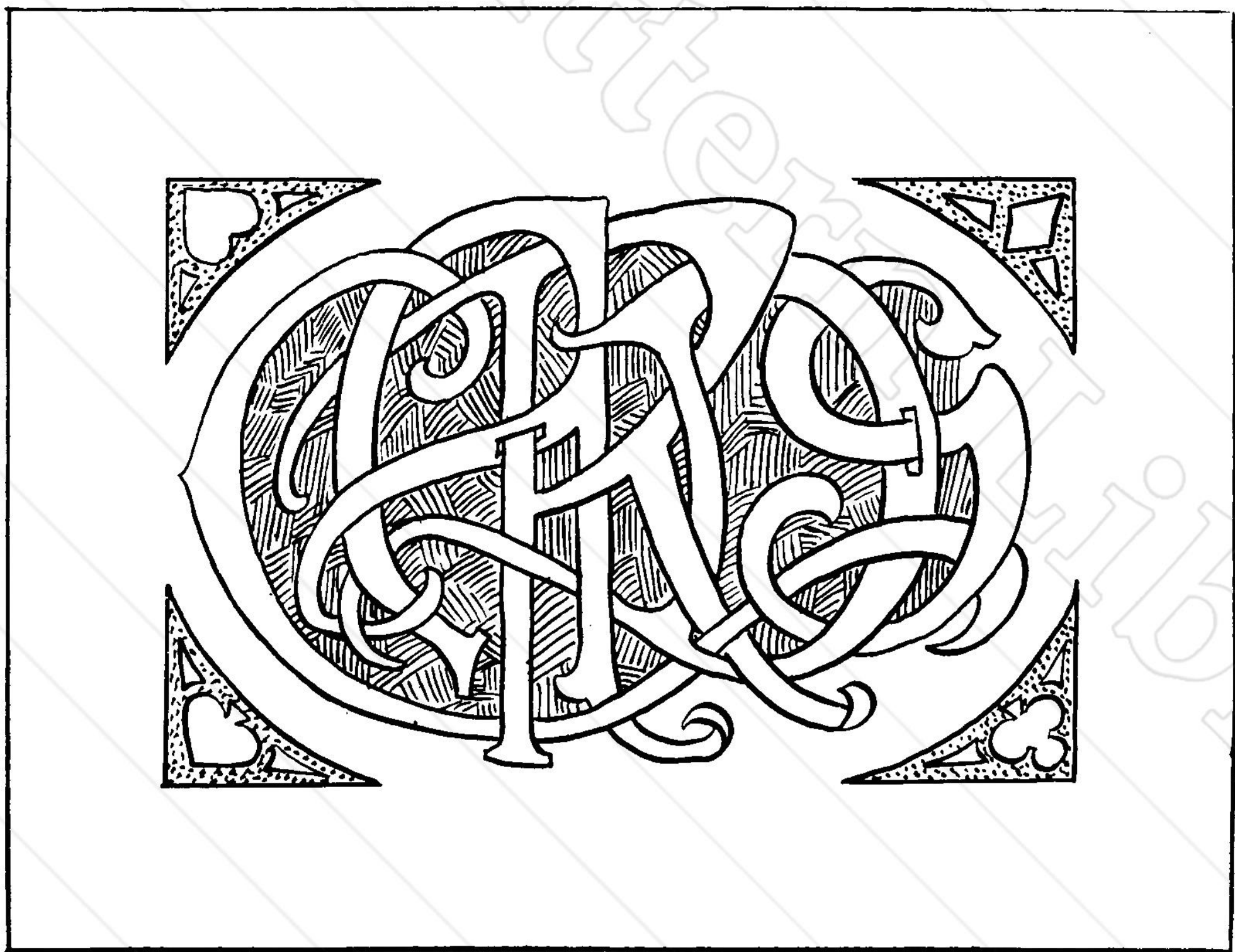


FIG.155. DESIGN FOR PLAYINGCARD CASE



**A LADY'S BAG IN MODELLED CALF. THE LEATHER IS LEFT
NATURAL COLOUR.**

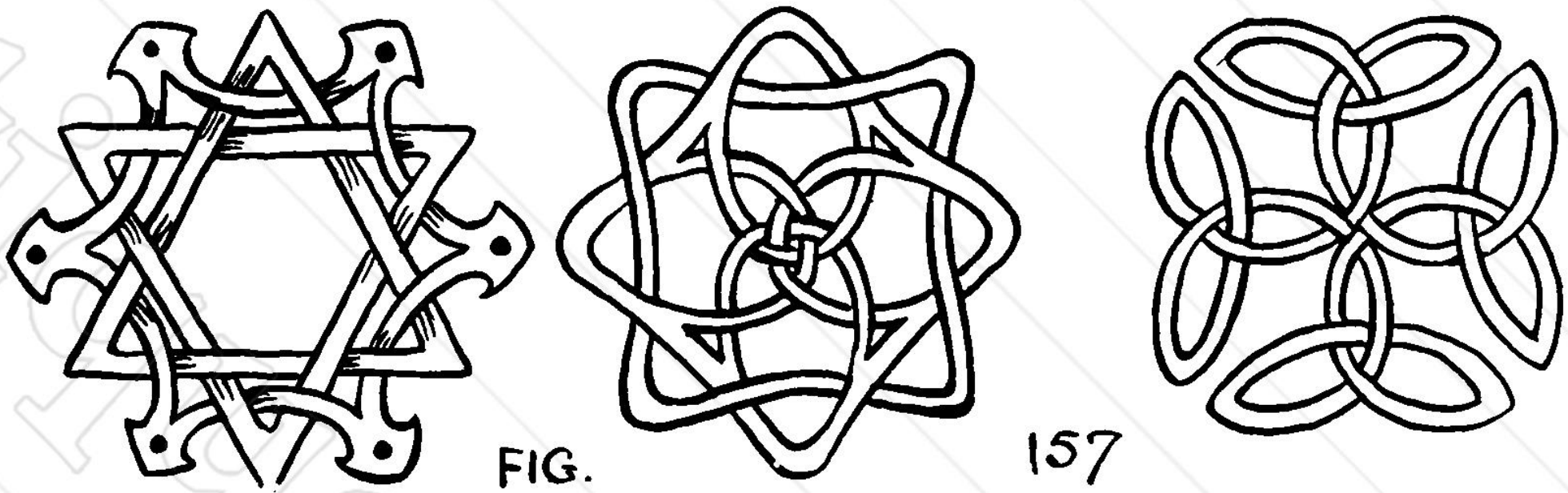


FIG. 157

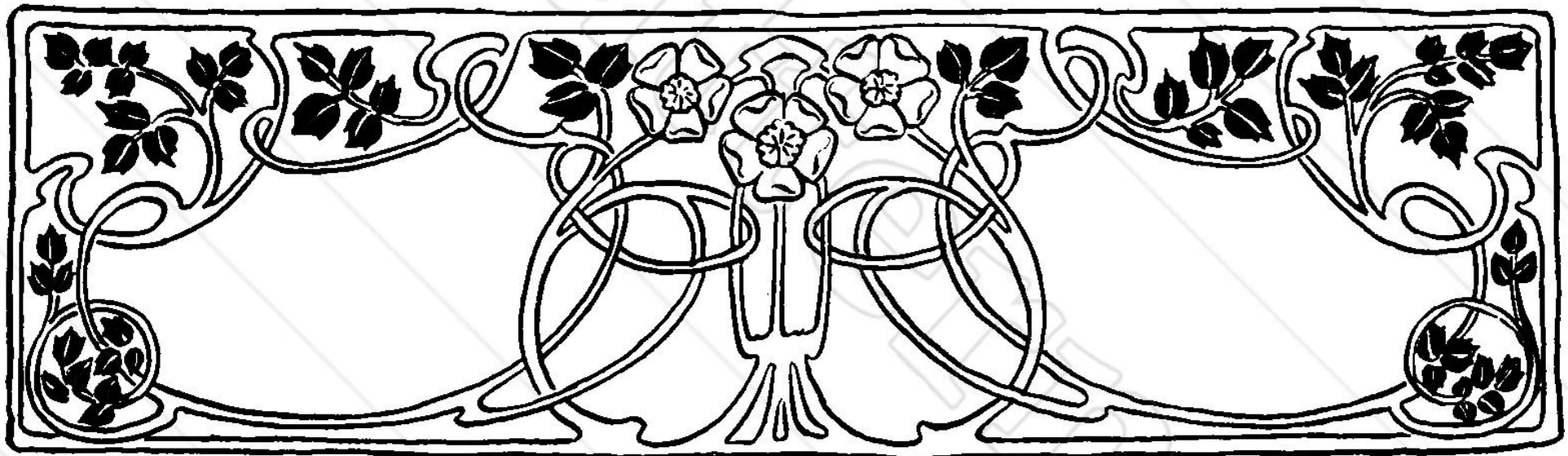


FIG. 156. SUGGESTION FOR MODELLED PANEL

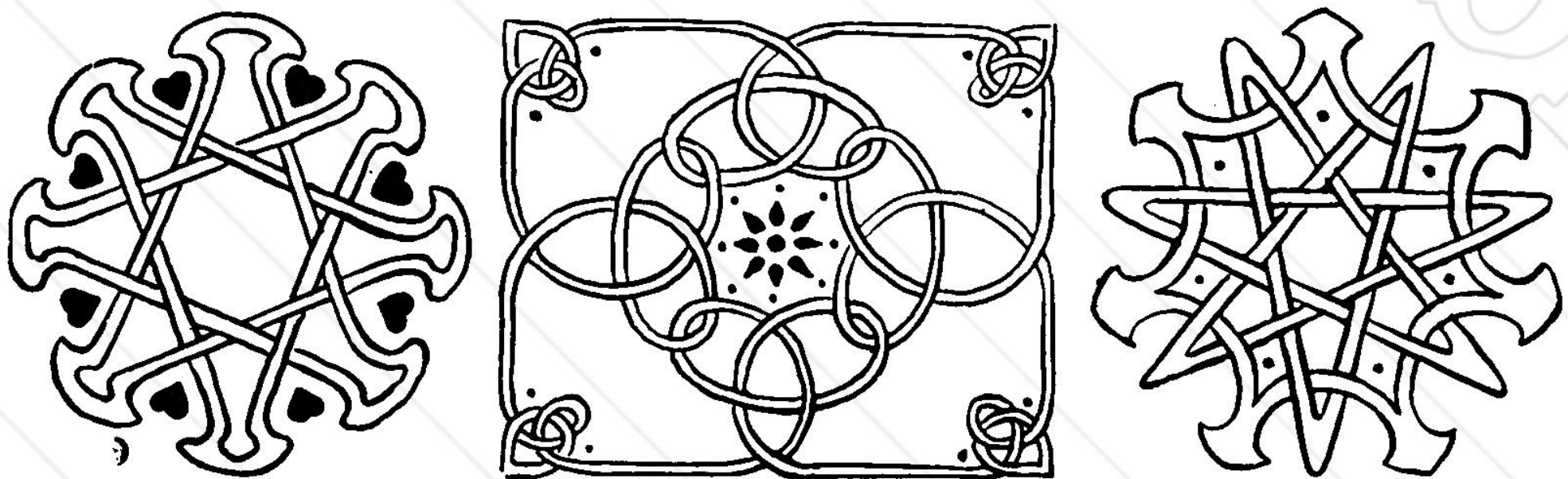


FIG. 158. SOME INTERLACING PATTERNS

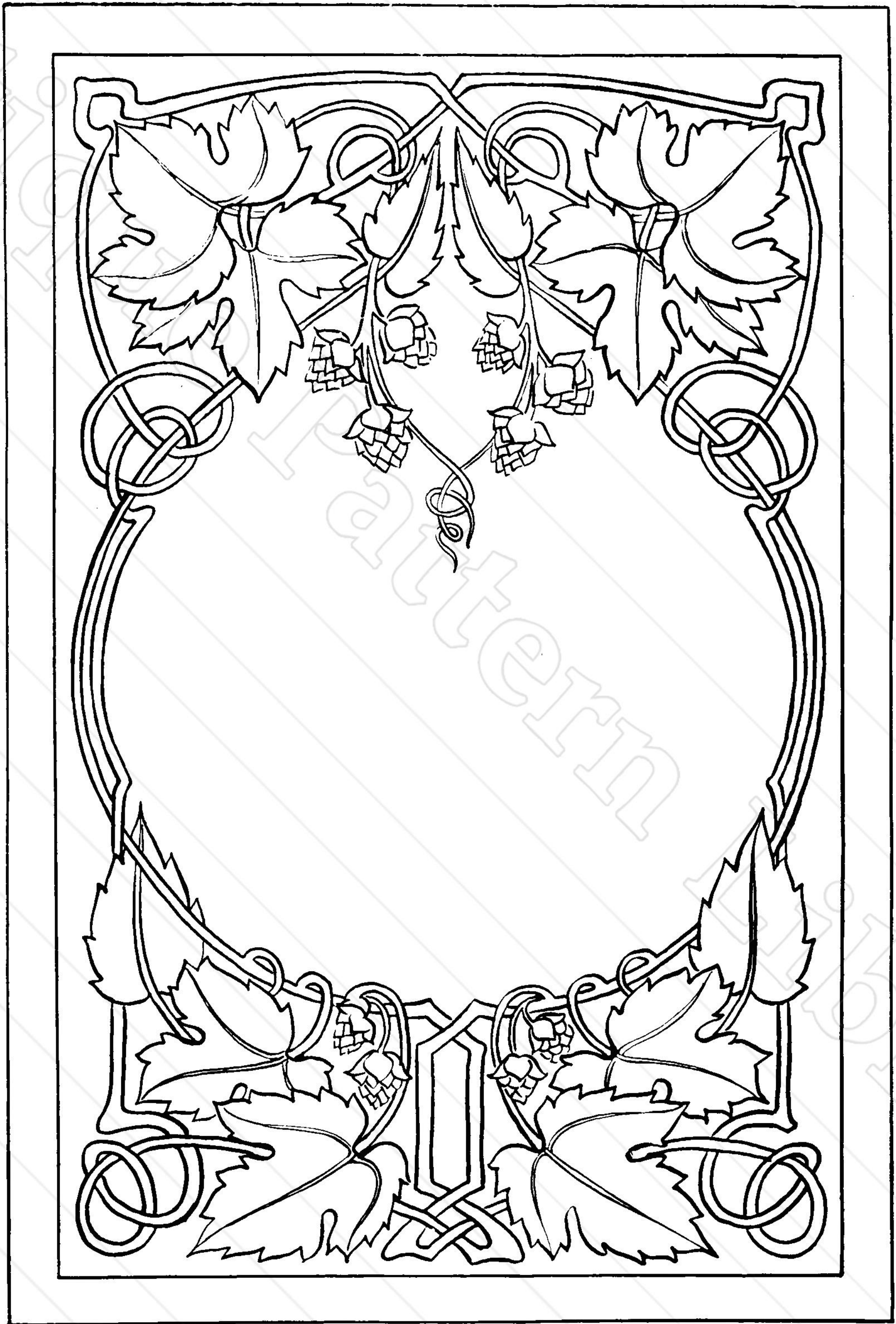


FIG. 159. HOP VINE DESIGN FOR BLOTTER

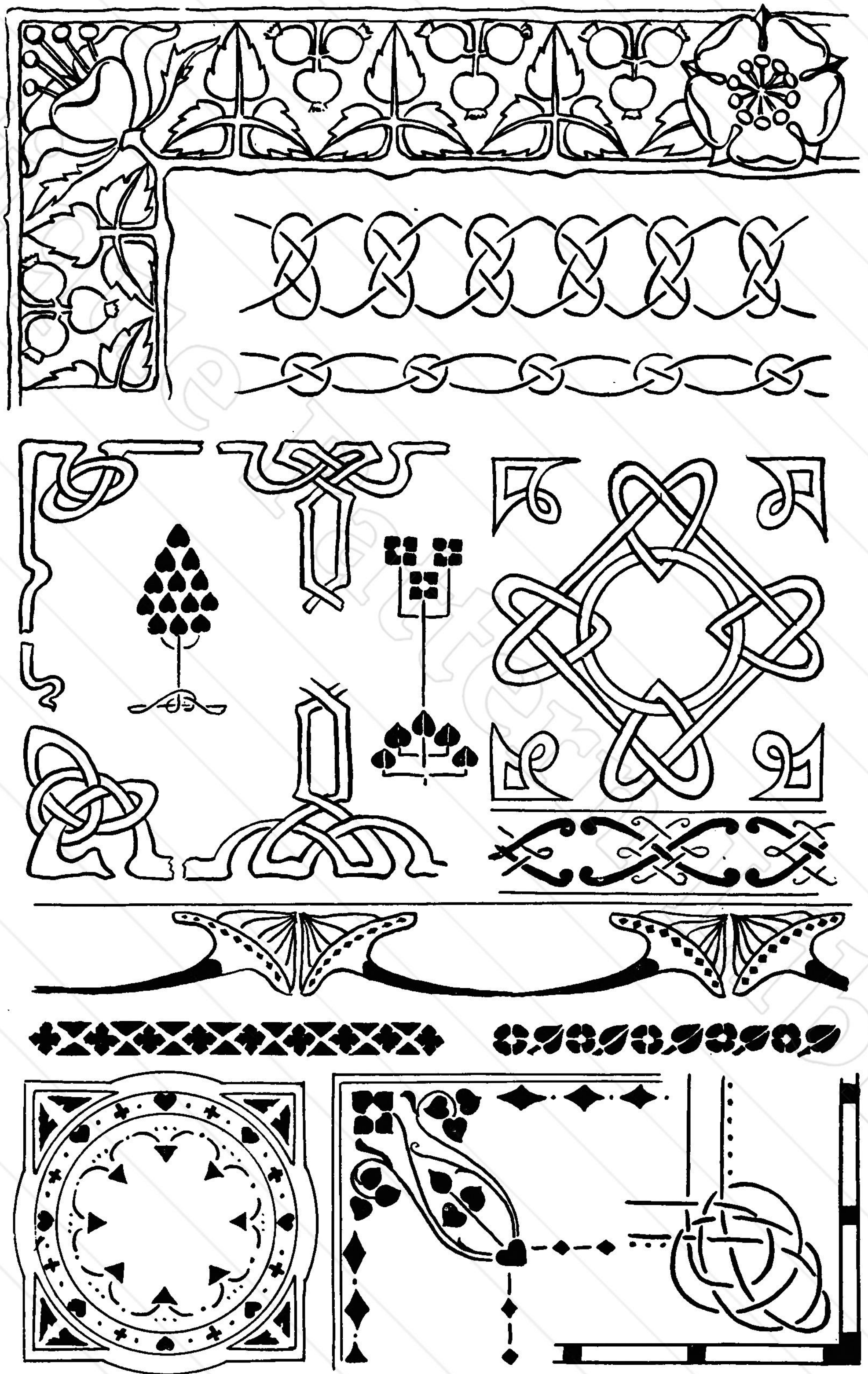


FIG. 160. A PAGE OF MISCELLANEOUS DESIGN

SECTION III.

THE MATERIALS, AND THEIR COMMERCIAL GEOGRAPHY AND CHEMISTRY.

CHAPTER VII.

THE MATERIALS.

WHEN a child (or a grown up, for that matter) is seen to be vitally absorbed in any particular pursuit, it can be taken for granted that its perceptions in that particular direction are keenly alive. The "window of its soul" that looks out in that direction is open wide, and so gives the indwelling spirit the power of vision over the prospect commanded by that window. When this is the case we find it a comparatively easy matter to transform facts of environment into perceptions. Bergson's teaching is that "the facts of environment only tend to become perceptions when the self recognizes these to be intimately and vitally connected with its life." It is our business as teachers to take advantage of the power our practical work has to open these "windows of the soul," to extend the child's perception of the facts of its environment.

This can be done so well by attaching the appropriate academic subjects to the central interest to which they are related.

This attachment to a central interest that is vital to the child, has an advantage in another way. All practical subjects are concerned with materials. This fact brings us into the region of Commercial Geography. In taking the Commercial Geography of any craft we find ourselves concerned intimately with the lives and the development of peoples. So many materials are necessary in the production of which the peoples of the whole world are involved. This makes it possible, in fact necessary, to take a wide survey of the lives of peoples. The lives of peoples are largely the outcome of their occupations, and the latter are dependent upon the geographical conditions that govern the country in which they live.

History.

Taking leather as a material, the study of its production and manufacture brings us into close touch with History. Leather has been used through the Ages in agriculture and other industries, in War, in Art and in Science; and words like "Morocco" used in relation to leathers conjure up fascinating pictures of past History.

Morocco leather, for example, was originally produced by the Moors in southern Spain and Morocco. It was of a fine red colour, and is the material with which much of the sixteenth century bookbinding and other leather work was done.

Such contacts as these constitute true and human history.

Geography.

The supply of skins opens up a wonderful field of research which takes the student over the known world, and is part of a true conception of geography. It brings the student into a real contact with life in other countries. Its study begins with geographical conditions, such as land and sea configuration; climatic conditions; water supply; raw materials needed for preparation and manufacture of leather; land transport; ports; and sea transport.

The field is too vast and too widely distributed to do more than mention here, and reference must be made to the Bibliography for further research. A few interesting items, however, may be mentioned, because of their significance in geographical science, and their suggestiveness in geographical research.

(1) The various values of the hides of animals possess a close relation to their lives, and to their uses when alive. For instance, the hides of the ox and heifer, cow, bull and calf all differ very much in toughness, solidity, thickness, size and fibre; and these differences decide the use to which each may be the more usefully and economically put.

(2) The geographical conditions under which animals live exercise a dominating influence upon the value and uses of their hides. Thus, the shorthorn breed of cattle grown in Scotland gives the best hides, because the climate, being more variable, causes the hides, by adaptation, to be thicker and more compact.

(3) Hides from hilly districts, being subject to strong winds and a wide range of temperature, are stronger than those grown in the lowlands. Thus, the hides from the Alps, Pyrenees, the Bavarian Highlands, and the Italian hills are very fine.

(4) Selective breeding affects the skins to a very large extent. The wool-bearing sheep are specially selected and bred for the excellence of the wool, which is the most valuable part of such sheep. The value of the "pelt" or skin is in inverse ratio to the value of the wool. Thus, the Leicester breed of sheep is very valuable because of the excellence of its wool, but the "pelt" is very poor.

(5) The lives of the peoples of different countries, and the uses to which they put the domestic animals, markedly influence the character of the skins. This very intimate relation between leather and its production on the one hand, and industry and the life of the peoples in other countries on the other hand, is apparent

when the values of the hides from different countries have to be appraised. For example, the hides we obtain from various parts of the Continent are marked by defects in certain places. In many of them occurs a thick patch on the neck where the yoke has rested, showing that oxen are used in agriculture as beasts of burden. Others, especially those from Portugal, have defects on the rump, caused by the goad that is used to prod the animal on during its working life. Again, such a festival as Christmas influences the skins, because the cattle fed specially for the Christmas market have thin stretched skins, filled with fatty cells, caused by the special feeding ; these skins make poor leather.

What Leather Is.

Leather is a material derived from the skins of living creatures. In their natural state skins are decomposable, and if disintegrated by chemical or bacterial agencies become harsh, horny, and intractable. What the leather manufacturer has to do is to overcome this putrefying tendency, and to treat the skins so that they become supple ; impervious to the attacks of water ; strong and tough. As skins have been used from the earliest times, our prehistoric ancestors must have discovered some method of curing the skins to bring about these results. Probably, at the first and for a long time, the skins had their original wool or hair left on them, just as furs are nowadays ; but, perhaps by accidental discovery, it would eventually be found that a skin would serve many purposes better without the wool or hair.

It is interesting to reflect how many of our essential amenities of life and methods of expression have their roots in this far away past of humanity's youth. Clothing, for example, either as a one piece garment, i.e. a single skin, or a two or more piece skin sewn together with sinews, had its commencement in those prehistoric days.

Out of this, too, do we get evolved Art Needlework and Embroidery ; because where two skins are sewn together with sinew, a pattern is at once formed by the stitches.

The Structure of the Skin.

Skin consists of two distinct layers, which are different in structure, and are in fact of different origin. There is the outer skin, sometimes known as the scarf skin, epidermis, or cuticle. This is of cellular structure, and is more or less horny or waterproof ; it is not supplied with nerves or blood vessels. This and the hair, wool or bristles must be removed before the real skin can be tanned. The hair grows in the real skin, but as a layer of the outer skin surrounds each hair bulb, both outer skin and hair can easily be removed when treated with lime and water. The real skin or cutis, the inner skin, has nerves and blood vessels, and it is this

which is subjected to the various processes that eventually result in leather of various kinds.

The Preliminary Treatment of the Skins.

They are first cleaned. Then the hair and outer skin is taken off. This is done by treating with lime and water. The skins are soaked in this for at least a week, and for some leathers, longer. For tough leather, a shorter time is needed ; but for soft leathers a longer time is needed, and for specially light leathers, from three to six weeks. After the skins are limed, the hair and outer skin are removed quite easily because the outer or scarf skin has become soft and easily soluble. The actual removal of hair and outer skin is effected by means of a two-handled knife that scrapes the skin whilst the latter is held on a sloping beam of rounded shape. At this stage the flesh side of the skin is cleaned. The skins are now washed in water, and squeezed clear of dirt, hair sacs, soluble hide substance and lime, and any other undesirable substance. The heavier skins, such as cowhides, are now ready for tanning ; but the skins needed for finer and softer leathers need further treatment to free them from impurities that still remain. This further treatment consists of placing them in a wheel like a paddle-wheel, with a solution of the excrement of birds or of dogs. They are soaked and paddled for from a few hours to two or three days in this. The solution of dog's dung is the stronger and shortens the process. This appears to be a somewhat unpleasant process, but centuries of use lie behind it, and the experience of these centuries tells us that up to now no other materials are so efficient. Recent years have, however, seen a substitution of solutions containing pancreatic enzymes for the usual bird excrement and dog manure. Naturally, however, it will take a long time before the process is abandoned. These processes remove the lime, and make the leathers soft ; whilst allowing for the removal of short hairs, hair sacs, and other impurities. They are now cleaned to receive the tan. This is done by washing in a bran bath, and by being worked with the two-handled knife across a beam ; then they are washed clear of the bran. These lighter and softer skins are now ready, together with the heavier skins that did not need such prolonged treatment, for the further process of tanning.

The Making of Leather.

The skins are now ready to be made into leather. If they were left as they now are, one of two results would follow. If kept wet they would putrefy ; or if left dry they would become hard and quite unpliant. There are three processes whereby these soft, white and clean skins can be rendered into a material that is tough, durable and pliant.

These are they—

(1) **TANNED LEATHER.** In this process the skins are treated with tannic acid. From the barks of trees and from other vegetable sources comes "tannin." This substance is present in a large number of plants, and is found in many parts of them, such as in the bark, the wood, roots, leaves and seed pods. It is of two kinds, known as Pyrogalls and Catechols, and a mixture of the two is the best for tanning purposes.

(2) **TAWED LEATHER,** in which mineral salts are used, such as alum and salt; and glove leathers, for example, are also treated with flour and egg yolks to get the softness and fullness that is an essential feature of these leathers.

(3) **CHAMOISED LEATHER.** In these the skins are treated with oils and fats, the actual tanning agents being their decomposition products. Nowadays, chrome tanning is superseding these processes. Chrome tanned leather is softer, stronger, stouter, and waterproof, and can be washed after wear.

Tanning.

Most of us have been told that tea brewed too long produces tannin which will have an injurious effect on the stomach. It is a similar process that goes on in tanning the skins that have been treated and cleaned.

The skins are suspended in pits containing liquors weak in tannin. They are at first moved from one pit to another, and this takes about eighteen days. They are then passed through stronger liquors, and laid flat in deep pits in stronger liquor. They are kept apart by means of the solid ground material being dusted in between them. The process is gradual, and the skins get tanned by degrees.

The conversion into leather comes about by the absorption of tannin out of the liquors by the skins; the gelatine combining with the tannic acid. Moving the skins about in the liquor hastens the process of tanning; and to get this done more effectively the skins are put in paddle-wheels that revolve in vats.

When the tanning process is completed, the leather is "finished." The thicker hides are hung in drying rooms, until about half dry, and are then treated with a "striking pin," and rolled under a heavy brass roller to make them solid. They are then dried off.

Some of this heavier leather is used for harness and straps, boot uppers and other purposes, for which it must be pliable and greasy and waterproof. Leather so intended is scoured before drying, and then well charged with "dubbing"—which is a mixture of fish oil and tallow—and dried off in a warm room. This is known as "currying." This process is often done by the currier, who takes the tanned dry skins and, after wetting, scours and curries them. The skins that are to be coloured are also dried after they have been tanned, and stored. Then when ready for dyeing they are soaked

in water, scoured and dyed. Then they are stretched on a board and nailed down, so that when dried in a warm room they dry smooth. At this stage a process called "boarding" raises the grain.

Tawed Leather.

Some forms of leather, e.g. the white leather used for whiplashes, is tanned or "tawed" with mineral salts, such as alum and salt, chrome and iron; and glove leathers are treated in the same way, but with the addition of flour and egg yolks and other vegetable and animal fatty and albuminous matter.

Chamoised Leather.

Chamois or "wash leather," which is the flesh side of the skins, is not tanned in the usual way. As we have already seen, in the lighter leathers the tannage is shorter, the liming longer and mellow, and the liming is followed by the "dung" treatment. But with wash leathers, after the skin is limed and split, the flesh side is charged with fish oils and kneaded with heavy hammers until it is quite saturated. Then it is left in heaps, when fermentation takes place. This gives it a yellow colour. After this it is washed out with soda, and dried. It is now ready for use, and, because by this treatment it will bear hot water without being injured, it is known as "wash leather." Cod oil is the oil used in making wash leathers, and the tanning that is done is caused by the chemical changes that take place during the period of fermentation.

Splitting the Skin.

When tanned the skins are ready for splitting. This is done with a machine that has a moving blade, and the skin is cut into thin layers.

When a sheepskin is intended for chamois or wash leathers, it is split before tanning along the middle of its thickness—where its structure is loosely built up, and the outer side is called "grain" and used for skivers, and the inner side for the wash leather. The "paste grain" leathers are made from the outer layer.

The Tanning Agents.

What these agents are that so effectively change the skins into leather; how they were originally found to have their properties; where they are grown, and how they are marketed are questions that provide opportunity for research in the field of Commercial Geography. The chief agent in tanning is the material known as "tannin." This is found in the barks of trees, and in other vegetable forms.

One of the best known is oak bark; the barks of the willow, larch

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and birch, the mimosa or wattle, the hemlock pine, are other sources of tannin. The leaves of the sumach bush; the acorns of evergreen oak, and the dried fruits called myrobalans also provide useful tannin.

Some woods, such as oak and chestnut, the quebracho, and the cutch tree yield it also, and a tannin known as gambier is extracted from the leaves and twigs of an East Indian shrub. It will be seen that the products of trees provide most of the tanning agents, and that every part of trees can be called upon.

CHAPTER VIII.

COMMERCIAL GEOGRAPHY OF THE MATERIALS.

Where the Tanning Materials come From.

IN tracing the sources of the supply of tanning agents, we find we can range over the whole world. Europe, Asia, Africa, Australia, and the Americas supply tanning agents of varying qualities ; and the value of these lies in the fact that it enables us to tan leather for many more purposes than otherwise we should be able to do. Some make the leather tough and hard wearing, others make it beautifully soft and pliable ; some tan it yellow, and some white.

We will study each Continent separately in finding out from where they come.

EUROPE.

Oak Bark. All the countries in Europe below the pine belt grow oak, and its extensive use in both modern and ancient times is connected with its wide distribution.

Larch, Willow and Birch Bark. The same remarks apply substantially to these.

Evergreen Oak Acorns. These come from a variety of tree growing in Greece and the countries at the east end of the Mediterranean.

Inner Bark of Cork Oak. This is a valuable tanning agent, and comes from Spain.

Sumach. Probably this is the best and most useful tanning material known.

It consists of the ground leaves of a Sicilian plant, containing about 28 per cent of tannin. It tans fine, soft and beautiful leather of a nearly white colour. It is used for tanning the best morocco and fine leather.

The plant grows in many of the countries surrounding the Mediterranean.

Various Timbers. European woods such as oak and chestnut give tanning extracts by rasping the wood, soaking these in water, and then boiling down the infusions.

Galls. Turkish leather tanners use tannin obtained from galls.

ASIA.

Wherever oak, willow, birch and larch grow, tannins are to be obtained from their barks. These woods are to be met with all round the North Temperate belt, and Asia claims a large share of this.

Myrobalans. These are hard dried fruits, and are of Indian origin.

Various Woods. The wood of the cutch tree in India, and the leaves and twigs of an East Indian shrub give off, when infused, a tan ; that of the latter is known as gambier.

AUSTRALIA.

Mimosa bark gives a powerful extract which is increasing in use. In Australia it is often known as wattle.

AFRICA.

In recent years mimosa has been grown in South Africa, and its use in the supply of tannin has grown to such an extent that this country is now the chief source of supply. It usually contains about 40 per cent of tannin ; whilst that grown in Natal contains about 60 per cent. It is valuable enough to compete successfully with quebracho from South America.

AMERICA.

The tanning agents found in the North Temperate belt are similar in North America to those in Europe and Asia. Thus, oak, larch, willow and birch are used for tanning in North America as well as in the Old World. The bark of the American hemlock pine is also used for tanning, and is found in North America.

From South America come the pods of the divi-divi plant, and the algarobilla ; and the quebracho from Brazil and the Argentine.

These are the chief agents containing tannin. There are other materials used such as fish (cod) oils, eggs, flour, alum, salt, dung, tallow, and others, most of which have already been mentioned in the text. These are not given as being a complete list with all the auxiliary information needed, but as suggesting the chief items of knowledge, and the line of research needed to get a glimpse of the world-wide range of the materials used in preparing leather.

CHAPTER IX.

OTHER FORMS OF TANNING, AND THE MORE MODERN DEVELOPMENTS.

Chrome Tanning.

THIS is a very important method of dressing light leathers. The leather produced by it is much stronger than other leathers, and will stand boiling water. Vegetable-tanned leather is destroyed at 70° C. and alum-tanned at 50° C. The method consists of treating the pelts with potassium bi-chromate and hydrochloric acid ; or with chrome, alum and washing soda, and common salt. For glove leathers chrome-tanning has almost superseded the alum, salt, flour and egg methods in their preparations. The leather is softer, stronger, stouter, and waterproof, and can be washed after wear.

Chrome-tanned "box," and "willow" calf leathers have almost superseded the old-fashioned "wax" leathers which were impregnated with grease for use as boot uppers

Russia Leather.

This was originally made in Russia ; but now the best leather of this kind is made in Austria. The genuine old Russia leather was obtained by tanning with willow and white birch bark, which contains an oil that gives Russian leather its characteristic odour.

Basils. These are sheepskins and are tanned in various ways Scotch basils are tanned with larch bark ; Australian and New Zealand basils with mimosa bark, and Turkish with galls.

Roans are sheepskins tanned with sumach—from the leaves of the sumach plant, whose home is in Sicily.

Other Sources of Leather Supply.

Other animals than sheep and calves and cows yield leather. The skins of seals, alligators, crocodiles, kangaroos, wallabys, snakes, and frogs are used for this purpose.

Suede Leathers.

These are finished on the flesh side. They are from East India tanned sheepskins, often known as "Persian." These skins, after the usual preparation, are dried, nailed, stretched on boards, and then buffed on the flesh side to get the desired "nap." They are then dyed ; treated with sulphonated oil ; and afterwards dried and rebuffed.

Graining.

The surface of the "grain" leathers (i.e. the leathers prepared from the outside portion of a split skin) is often mechanically prepared to give an appearance different from the plain, smooth surface of the natural skin. This is known as "graining." It is done by a machine which stamps the pattern on the face. "Crocodile" skins are thus stamped, and often an "electro" of the real skin is made, and the skins stamped with it are indistinguishable from the real crocodile skin. The leather is good, sound, and strong, and the marking is that of a crocodile; but the skin is not a crocodile skin.

The leather known as "paste-grain," used for albums and wallets, is a sheepskin. The skins are split before tanning, and the "grain" leather is tanned. It will not take the impression of a grained skin readily in the usual way, but it is pasted on the back with thin glue which, as it dries, shrinks, and in drawing up the skin forms a grain.

One way of producing a grain is by folding the leather. It will be apparent to most users, that crumpling the leather marks it in the region of the crumple. This fact is taken advantage of. When the skin is dried off it is slightly damped, laid on a table, and the edge doubled over. The fold so made is rubbed backwards and forwards with a cork-covered board, so that every part of the skin is creased and flattened out again. This gives the skin a grain which, whilst not altogether natural, is yet produced by hand and is more natural than machine-made imitations.

Dyeing.

Dressed skins are dyed in various ways. In one method flat wooden trays are used; in another, a semicircular paddle contains the skins, which are moved backwards and forwards in the dye tub; a third method consists of using a drum. The latter method is considered to be more advantageous. Sometimes the softer glove leathers are dyed on a zinc table, a brush being used to put the dye on. The table is washed after each skin is done.

The use of natural vegetable dyes is now going out, and coal tar dyes are being used very largely.

After drying, the leathers are treated with a substance that will enable them to take a glaze, which is put on by means of glass slabs, agate, and hardwood rollers.

Recent Improvements.

In the last ten years improvements have been effected, and several new methods have been discovered. One very encouraging feature has been that these improvements have followed the widespread employment of trained industrial chemists in factories. The improvements are due to the more accurate adjustments of chemical

quantities, combined with a chemical control of the tanning processes. Greater progress has been made in the development of synthetic tannins. They make the leather lighter in colour and in weight, besides acting more quickly and permeating the skin more rapidly.

Wood pulp contributes to the preparation of the leather. What at one time was a waste product in the treatment of wood pulp is now found to assist very much in the preparation of leather. It is used as a "wood pulp extract."

In liming the skins to remove the hair and outer skin, stronger solutions of sodium sulphide are now used, and the earlier processes take less time, so that, in the case of some leathers, as many days are now required for these preliminary stages as weeks were occupied formerly. Instead of the hides lying in a saturated solution of lime in a pit for a long period, they are now suspended, and either the liquor is agitated by mechanical power, or the hides themselves are moved to and fro. This quickens the process.

CHAPTER X

THE CHEMISTRY OF LEATHER AND TANNING.

THE chemical elements present in raw hide—de-haired and purified—are carbon, hydrogen, oxygen, nitrogen and small quantities of phosphorus, sulphur, and certain metallic elements. The approximate proportions of the chief constituents are carbon 50 per cent, hydrogen 6·5 per cent, nitrogen 18 per cent, and oxygen 23 per cent.

Tannins.

The members of this class of chemical bodies differ widely in both constitution and reactions, but have the common property of precipitating gelatine from solution and forming insoluble compounds from gelatine yielding tissues, as in the case of skins. Tannins usually give deep coloured solutions or precipitates with ferric chloride; when tannins are boiled with mineral acids, sugars are very often found in their decomposition products. The method of separating the tannin from gall nuts is to digest with ether containing water and alcohol. After standing the liquid separates into two layers, the lower containing the nearly pure tannin, while the upper contains gallic acid in ethereal solution. The lower layer is separated and the solvents evaporated off if so desired.

The natural tannins are all compounds of carbon, hydrogen, and oxygen only, probably containing one or more benzene nuclei. All the present known natural tannins yield on decomposition catechol, or phloroglucinol, or pyrogallol. The only tannin of which the constitution has been definitely settled is gallotannic acid, which is extracted from galls and sumach.

Liming.

The action of lime in removing the epidermis is purely solvent. The hardened cells of the epidermis swell up and soften, the hair sheaths are loosened and dissolve so that on being scraped with a blunt knife the hair, etc., is removed easily. The fibres of the true skin swell and absorb water; probably due to some weak combination of the solid substance with water. A great advantage of using lime is that it combines with the fat of the hide, forming an insoluble soap and so minimizing the injurious effects of the fat in subsequent processes, and on the finished leather. The use of strong acids has to be avoided in later operations, since they would set free the fat from the soap. Considerable quantities of ammonia are set free

during the liming process, together with amino-caproic acid, $C_5H_{10}NH_2.COOH$. A de-hairing process now used on the continent depends on the action of alkaline sulphides, e.g. sodium sulphide, which actually attack the hair, forming a sort of paste. Arsenic sulphide has also been employed for the same purpose. A minor objection to this process is the objectionable smell of sulphuretted hydrogen which is evolved.

Action of Dung.

Animal dung serves the purpose of removing lime by virtue of the ammonia and phosphates it contains. The reaction is also bacterial, the bacteria acting on the organic constituents of the dung and of the hide, producing amongst other substances tyrosin, leucin, and other weak organic acids which neutralize and remove the lime.

Chrome Tanning.

The leather is treated with acidified dichromate, and the chromic acid set free is absorbed by the hide. The chromic acid in the fibre is now reduced by means of sodium thiosulphate and hydrochloric acid, the resultant colour, hardness or softness, etc., of the leather depending to a great extent upon the quantities of acid and sodium thiosulphate employed.

When, for example, a large quantity of chromic chloride is produced by the inter-action of the chemicals, the skins are brighter, since chromic chloride is green; when free sulphur is liberated in the reaction this adds to the softness of the resultant leather. The action of other metallic tanning agents is very similar to the above.

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