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DESIGNING IN GENERAL

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DESIGNING IN GENERAL

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DUTIES OF A DESIGNER

1. Picking out and reproducing a sample of cloth and originating new weaves should not be considered as all the requirements of a good designer, as there are many other things that must be understood before one can become competent in this branch of textile work. In fact, the more a person learns of all the branches of textile manufacturing, the better designer he will become, since if he understands the processes through which the fibers pass before becoming cloth, and the results of these processes, he will be better able to judge what combinations are best to form a fabric. By this it is not meant that to become a designer one must know the best methods of setting the different parts of all the machines in a mill, but that one should be able to judge whether or not the product of any machine is suitable for the purpose for which it is intended, and have some knowledge of the theory and principles on which the machine is operated.

In addition to this, a designer should be a constant student of the market, in order to know what effects and designs are especially salable, for although it is not usually the case that the designer has complete authority to manufacture any grade or quality of cloth that he may desire, his opinions in regard to these points are often sought.

It is a good plan for a student of designing to have a large sample book in which samples of cloth and their pick-outs may be kept. These will be a great aid when obtaining new weaves and new combinations of colors, for although the fashions of the previous season may not prevail

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the next year, many good points may be obtained from cloths kept in this manner. Designers of long experience are well aware that there is a cycle of fashions in textile fabrics; that is, after a period of years, certain styles of goods come into favor again. The fabrics of today may have been in vogue 8, 10, or 15 years ago and, in most cases, will be worn again in a similar period. Thus, the history of previous seasons' styles, as found in the old pattern books of the mills or in books or periodicals formerly published containing reproductions of fabrics then in fashion, are well worth the attention of a designer.

In addition to being conversant with the different kinds of yarn manufactured in his own mill, the designer will find it an advantage to understand yarns generally, as, for instance, those in which different materials are combined, since in many cases such yarns will be found in a fabric. Samples of cloth are often sent to the mill by the selling agent with directions to reproduce them in certain lines; that is, it may be desired to produce a fabric that will be similar to the sample in appearance and yet can be sold at a lower price; in other cases it may be desired to use a sample simply for its combination of colors, or for its weave; while in still other cases orders may be given to the designer to reproduce the sample exactly. In short, it may be said that the primary duties of a designer are to reproduce samples of cloth and originate new weaves, while, in order to do this correctly, it is advisable that he should understand all the processes involved in the making of perfect cloth.

DESIGNING DEPARTMENT

2. Different mills adopt different arrangements for their designing departments, since those that would be best for a mill arranged to make certain kinds of cloth would not be suitable for a mill that manufactured an entirely different class of fabric. However, if the processes explained are understood, one should be able to adapt oneself to any methods that may have to be dealt with.

The **designing department** of a mill usually consists of at least two rooms—one for the designer and his assistant, if an assistant is employed, and one termed the *weave room*, in which the samples are woven. In many mills, however, the designer has but one room, while the samples are woven in the regular weave room of the mill, although it is better to have a separate room for weaving these samples; the best plan is to have adjoining rooms with glass windows between, in order that the designer may have direct supervision over the weave room even while performing his other work. This department should be in a part of the mill where good light may be obtained, and it is also an advantage to have the walls painted white.

3. Equipment of Designer's Room.—To aid in measuring and folding the cloth samples, the designer should be supplied with a long, flat table, while he should have another table, known as an examining table, for use when inspecting the samples after they are woven. The top of the examining table should be inclined at an angle of from 30° to 40° ; one-half should be painted black and the other half white, in order to provide a dark surface for inspecting light-colored cloth and a light surface for inspecting dark cloth. This table should be situated in such a position that the person examining the cloth will have a good light on his work. The designer should also be provided with a yarn, or wrap, reel with which to obtain accurate lengths of yarn, as well as

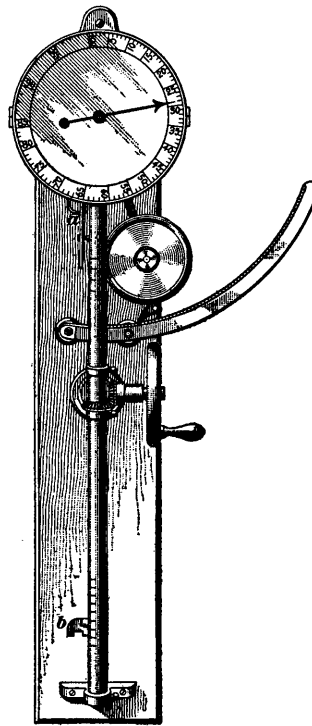


FIG. 1

yarn and cloth scales for weighing yarn and cloth when determining the counts of yarn or the weight of cloth.

4. A *yarn-testing machine* similar to that shown in Fig. 1 is necessary, in order to ascertain whether the strength of the yarn being used is up to the standard. To operate this machine, a skein of yarn—usually containing 120 yards

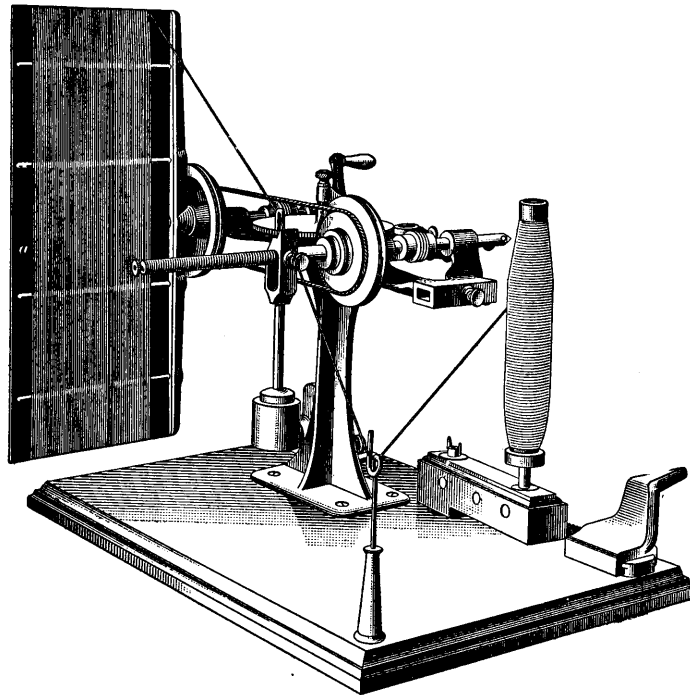


FIG. 2

when testing cotton and 80 yards when testing worsted—is first wound on the wrap reel, and then placed on the two hooks *a, b* of the yarn-testing machine; by turning the handle until the yarn breaks, its breaking weight is shown by means of the finger on the dial.

Another type of yarn-testing machine, which may better be termed a *yarn-examining machine*, is shown in Fig. 2. In this

machine, the yarn is wound from a bobbin or cop on to a card *a* in such a manner that there will be only one layer of the yarn. When thus placed on the card, any imperfections, such as thin places, specks, etc., will be readily noticed, since white yarn may be wound on a black card and black or dark-colored yarn on a white or gray card.

Various types of *cloth-testing machines* are employed for the purpose of determining the strength and elasticity of the fabric. In the manufacture of a large variety of cloths these items are an important matter, while in many cases orders placed with the mill stipulate the strength and elasticity that the cloth shall have; this is especially the case with the manufacture of army goods. Breaking tests afford a fairly accurate proof of whether the bleaching processes through which cotton and linen goods have passed have been rational ones; that is, whether the goods have been weakened or not. Although there are a number of makes of these machines, almost all are operated on the same principle. The cloth is held between two clamps and by turning a handle is distended until it tears, its strength being registered by a pointer on a dial, much the same as in the case of the yarn-testing machine.

5. A designer should be supplied with record books in which to keep samples of all the weaves produced, in order to have an accurate record. These record books, which may be considered another style of sample book, if carefully numbered and indexed, so that any style or pattern may be readily referred to, will be a good guide when making new samples.

Sample cards of yarns should be kept; these are simply strips of cardboard around which are wound samples of each color or counts of yarn that the mill is using. These cards are so arranged that they will enable the designer to see at a glance what colors are at his disposal; they are also of some aid when desiring to learn how the colors will look when arranged in the cloth. Yarns are frequently arranged in books, which, in this case, serve the same purpose as the cards.

In addition to the articles mentioned, there should be a supply of layout sheets on which to make out directions for warping the yarn for the cloth samples; also, pick glasses, pick-out needles, and design paper.

6. Equipment of Weave Room.—The designer's weave room should contain all the articles and machines necessary for making samples of cloth from the yarn. In many cases, the different counts and colors of yarn made in the mill are placed on bobbins, cops, or small spools that are kept in boxes or drawers in the designer's weave room. These boxes should be labeled on the outside, to show the colors and counts of yarn that they contain. They should be kept systematically and should be readily accessible, so that when it is desired to make a warp there will be no difficulty in finding the proper yarn. Almost every designer's weave room contains a warping arrangement by means of which the designer may have his own warps made. As these warps are not generally over 9 yards in length, the saving in expense and trouble when made in this manner will be apparent.

The weave room should also contain looms on which the sample warps may be woven. These looms should be capable of reproducing any kind of cloth made in the mill; that is, if the mill is running dobbie work, it is necessary to have one or more dobbie looms, and if running box work, it is necessary to have box looms. Each loom should be located near a separate window, in order to supply good light to the weaver.

Each loom in the weave room should be attended by at least one man, known as a pattern weaver. If the sample warps are made in this room, there should also be a man for this purpose. Although there should usually be a fixer for the purpose of putting in the warps, building the harness and box chains, and keeping the looms in good running order, in many cases, where only one or two looms are employed, a fixer may be dispensed with, as the weaver himself may be competent to look after this part of the work with the aid of the designer.

METHODS OF PRODUCING SAMPLES

ORIGIN OF NEW STYLES

7. It is very seldom that the designer has complete control over the class of goods that the mill makes, as in the majority of cases the selection of a new line of goods is dependent on the opinions of either the agent or the commission house.

In America today, the styles of cloth manufactured are to a large extent derived from the styles of Europe, and consequently it is an advantage to a person in this country to know, as soon as possible, what styles and fashions are selling in Europe. There are several French firms with headquarters in Paris and branch offices in the United States that make a business of selling foreign samples to the mills. In other cases, samples are sent direct from Europe; some of the larger mills keep agents there permanently for this purpose, while others send men there occasionally to obtain ideas. As many lines of goods that are fashionable in Europe one season are in vogue in America the next, the advantage of obtaining these samples is obvious.

In the cotton trade, rough sketches of desirable fabrics, accompanied by directions for producing samples, are frequently sent to the mill by the commission house. This is usually done where small striped effects are desired, such as satin stripes combined with other weaves. In such cases, the width of the different stripes is designated and the other details left to the designer.

TRIAL SAMPLES

8. When a line of samples is sent to the mill, the designer first looks them over and selects those that in his opinion it will be possible for the mill to make, each of which he then considers separately with a view to reproducing it as accurately as possible. The first step is to dissect the sample in order to ascertain the weave and the arrangement of the

yarns in both the warp and filling. Then, if it is found that the cost of manufacturing such cloth is satisfactory and that it is possible to obtain the necessary yarns for it—of the

STYLE *A.A.*

50^s Warp... *40^s* Filling... *72* Picks... *84* Ends... *3906* Reed... *4* Harness... *9* Yds. Slashed.

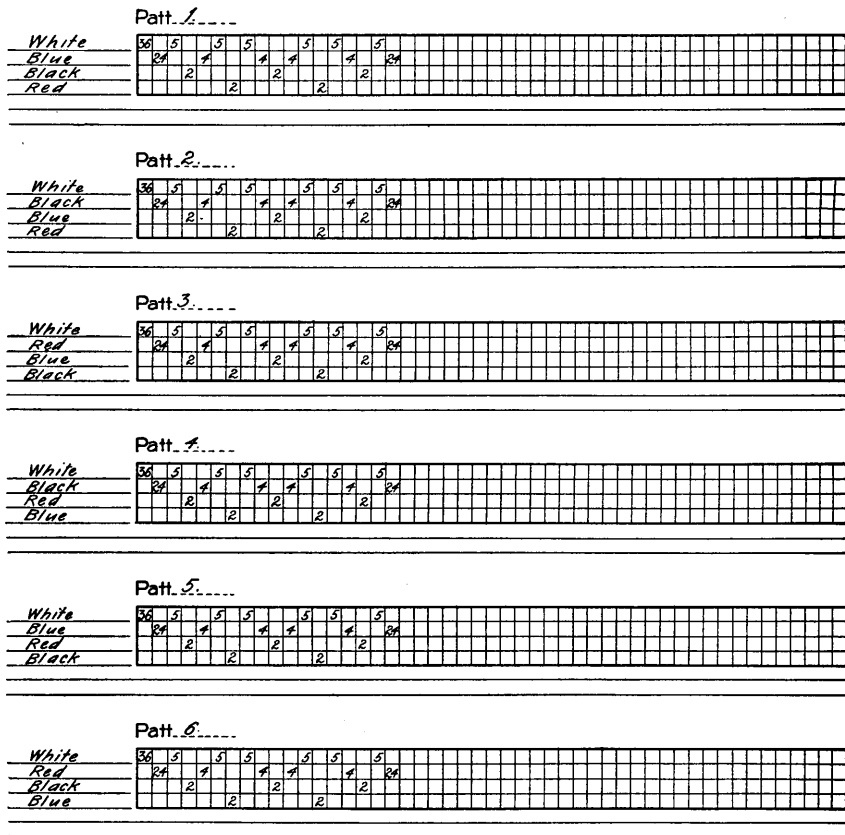


FIG. 3

correct color, counts, and quality—the necessary specifications are made out.

The samples to be made from these specifications are known as **trial samples** and are comparatively small,

sometimes not more than 6 inches wide. When this is the case, it is generally the custom to make up a number of samples in one warp, known as a *blanket warp*. For example, suppose that a number of patterns, each 6 inches wide, are to be made with the same warp. The first 6 inches in the width of the warp will consist of one sample, the next 6 inches will consist of another, and so on until the whole width of the warp is occupied. In Fig. 3, which gives the specifications for a blanket warp, there are six warp patterns of the same style that differ only in the arrangement of the colors. When all the samples in a trial warp are of the same style, all the ends have the same drawing-in draft and also the same chain draft. There are cases, however, in which different styles are placed in the same warp, and it then often becomes necessary to have more than one drawing-in draft, and often the chain draft is changed so that certain samples may be woven with a different weave.

9. Warping the Yarn.—After the specifications have been made out by the designer, they are given to the person who makes the warps. The spools, bobbins, or cops containing the yarn of the required colors and counts are then selected from the boxes and placed on a creel, similar to that shown in Fig. 4, in their proper order; that is, in such a manner that the ends may be taken from them in the order in which they are to be arranged in the warp. For example, suppose that a warp is arranged 4 white and 4 black. Then four spools containing white yarn will be so placed in the creel that they can be taken first by the person making the warp, and the four spools containing black yarn will follow.

Fig. 4 shows sufficient bobbins for a single repeat of a warp pattern arranged 4 ends black, 2 ends gray, 2 black, and 2 white. The first bobbin is placed on the back row of pegs, the second on the front row of pegs, the third on the back row, the fourth on the front row, and so on. The ends are then taken from each row in successive order; that is, the first end comes from the first bobbin on the back row, the second end from the first on the front row, etc. The

ends from the bobbins on the back row are passed behind a wire *b*, while those placed on the front row are passed behind a wire *a*. The ends are then passed to the top of the creel and threaded through eyes *c*. By arranging the ends in this manner, the person making the warp can easily form a lease so that the drawing-in hand may find the separate ends readily.

10. Fig. 5 shows a warping arrangement that is in general use. In many cases this consists simply of pegs inserted in the wall of the room, around which the yarn from the

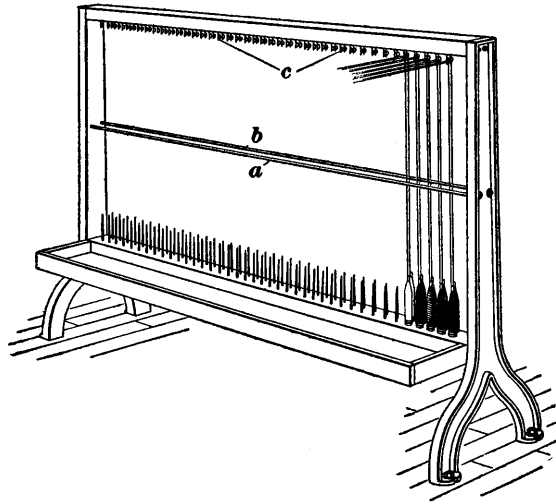


FIG. 4

bobbins can be passed, but in other cases it consists of a rectangular frame attached to the wall as shown. The person making the warp first ties the ends together and slips them over the peg *a*; he then selects the ends from the creel in their proper order, and makes a lease by passing the first end over the thumb and under the forefinger of the right hand, the next end under the thumb and over the forefinger, etc., in this manner separating the even-numbered from the odd-numbered ends. After the lease is made, it is passed over pegs *b*, *c* in the same manner that it was passed around

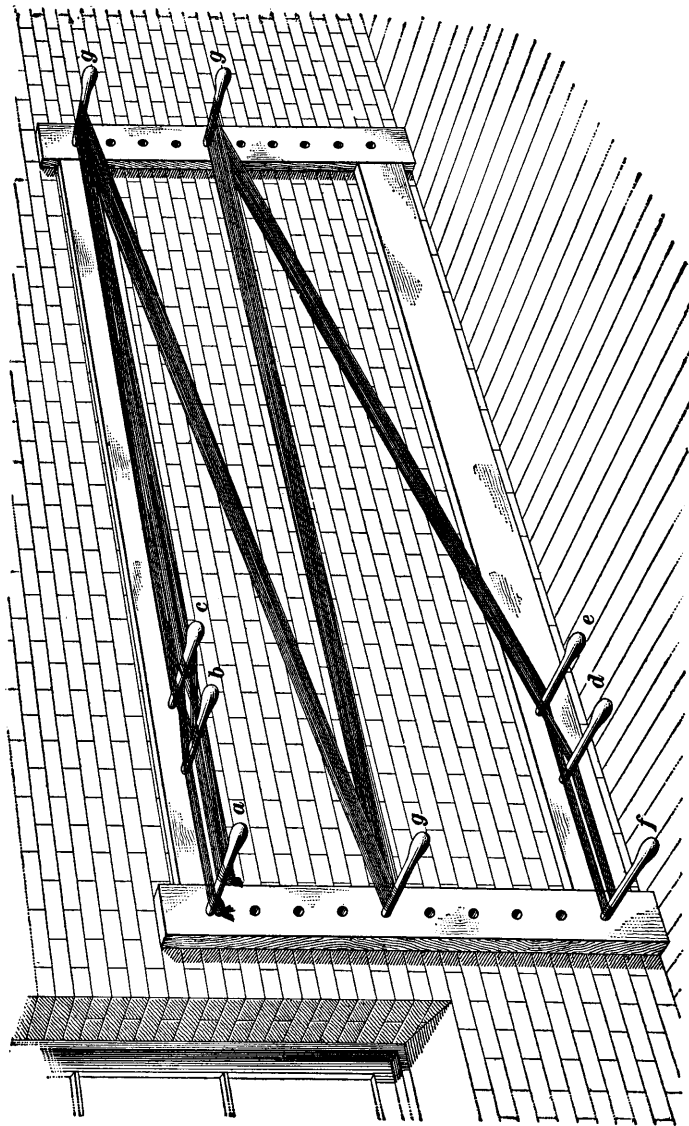


FIG. 5

the thumb and forefinger; as these pegs serve to hold the lease of the warp, they are termed *lease pegs*. All the yarn is then passed around the pegs *g* until it comes to the pegs *d, e*; here it passes under the peg *e*, over the peg *d*, then around *f*, back under the peg *d*, and over the peg *e*. By this means another lease is formed of sections containing a greater number of threads than in the case of the pegs *b, c*, which separated the yarn thread by thread. This last lease is formed simply for the purpose of spreading the warp more evenly on the beam. From the peg *e*, the yarn passes back around the pegs *g* in reverse order until it reaches the pegs *b, c*, where a lease is again formed and the ends then knotted around *a* and cut. The manner in which the warp yarn is wound around the pegs places twice as many ends on the warper as are taken from the creel each time that the yarn is passed back and forth, since it commences and ends at the same point. The length of the warp is governed by the number of pegs *g* that are used.

The number of bobbins shown in Fig. 4 is by no means the limit of the number that can be used at once, as several repeats of the warp pattern may be placed on the creel at one time. Suppose, for illustration, that the warp for one sample is to contain 480 ends and that one pattern is arranged as shown in this figure, containing 10 ends; also, that four of these patterns are taken from the creel at one time. 40 ends are therefore first passed around the pegs together and then brought back, which gives 80 ends of the warp. The person making the warp then selects the ends for the four patterns the second time and passes them around the pegs and back again, which gives 80 more ends, or 160 altogether. This is repeated a sufficient number of times to give all the ends in the warp. As in this case there are to be 480, the ends from the cops must be passed around the pegs six times in order to give the required number.

If another sample consisting of different colors, or a different arrangement of the same colors, is to be warped on the same beam, it will be necessary to rearrange the spools or cops for this sample. This operation is repeated until the

different samples are warped. In some cases a special thread, such as a double and twist, is inserted between each two samples in the same warp in order to designate the point where two samples join.

11. Beaming the Yarn.—When taking the yarn from the warper, the regular lease rods used in drawing-in should be inserted in place of the pegs *b, c*. The warp is then taken from the pegs and wound on the loom beam. In case the warp is not to be beamed as soon as it is taken from the warper, a string, or lease band, may be inserted in place of the lease rods, thus allowing the warp to be wound in the shape of a ball. The loom beam generally rests on stands in such a manner that it can be turned by hand; the end of the warp is spread out, and the ends of yarn thoroughly straightened, after which it is wound on the loom beam. Sometimes as an aid to straightening the ends, a coarse heckling comb is used, the ends being spread evenly in the comb and drawn through the dents as they are wound on the beam.

12. Drawing In and Weaving.—After the warp has been beamed, it is taken to the drawing-in room, where it is drawn through the harnesses and reed, according to the specifications. In some cases, the warp may be drawn in the designer's weave room, although no expense is saved by adopting this method, as the drawing-in of the sample warp is as much a regular process as the drawing-in of any regular warp for the weave room.

After being drawn in, it is sent back to the designer's weave room ready to be woven. The beam is then placed in the loom and the harnesses tied up ready for weaving, after which the necessary chains are built and placed on the loom and the first sample woven.

In case several samples with different fillings are combined in a warp, it is necessary to weave one sample at a time. Suppose that one sample contains a filling pattern of 4 black and 4 white, and another a filling pattern of 8 white and 8 black; it is not possible, of course, to weave both of these

patterns at the same time, since each has a different arrangement of filling. Therefore, when one pattern is being woven, the rest of the patterns in the warp will be of no use. These are termed *hybrids* and are generally thrown away; in some cases good samples are obtained from them, but this is the exception rather than the rule. After the first sample has been woven with the necessary filling, the second is woven. This necessitates at least the changing of the filling and, in some cases, the building of a new box chain, while in very rare instances, where the sample warp contains different styles, a new harness chain is also necessary.

13. Tying Over.—Suppose that there are six patterns in a sample warp and that each is woven with its own filling pattern; then six regular samples will be obtained. In many cases, however, it is an advantage to change even the warp yarn in the sample warp; that is, after the six regular samples have been woven, it may be left to the discretion of the designer to arrange different combinations of colors, using the same weave. When this is the case, it is much cheaper to simply tie over the warp ends that it is desired should be changed rather than make and draw in an entirely new warp.

To illustrate this point more fully, suppose that a certain pattern in the warp is arranged 4 black, 2 gray, 2 black, and 2 white and it is desired to change the 2 ends of gray to a different color. The manner in which this is accomplished is as follows: The harnesses through which the ends of gray are drawn are raised, while all the others are lowered, thus allowing the ends of the gray to be readily accessible. A spool of the yarn to be substituted for the gray is placed on a wire rod over the loom. Two ends of gray are then broken out and the end of one of them that is connected to the woven cloth is attached to the end from the spool. This new end is carried some distance from the back of the loom around any suitable object and then back again to the other end of gray, to which it is attached after being broken from the spool. When all the gray ends have

been tied in this manner, the loose ends of gray that were broken out are drawn down under the beam and a weight attached to them, in order to prevent their passing up over the whip roll into the lease rods. The operator, after detaching the new ends from the object around which they were passed at the back of the loom, picks up the ends of gray in front of the reed with a wire rod, and draws them through the harnesses and reed until the new ends that have been tied to them reach the fell of the cloth. These new ends are then fastened at the front of the loom by means of 2 or 3 picks of filling, while at the back of the loom a weight is attached to the ends to keep them tight during weaving.

In some cases the ends of the warp are tied over at the front of the loom instead of at the back. When this method is adopted, the ends to be tied over are broken out in front of the reed and the new ends attached to the ends coming from the beam, after which they are drawn through the reed and harnesses to the back of the loom, leaving a sufficient length of yarn in front of the reed, however, to allow the new ends to be attached to the cloth by a few picks of filling. After the ends have been tied over, the desired pattern of filling is placed in the loom and another sample of cloth woven. Other samples may be readily produced in the same manner, and thus a large number of trial samples obtained from one warp. For example, suppose that a sample warp contains six original patterns and that each pattern is tied over three times; then twenty-four regular samples will be obtained from the one warp.

14. After the entire warp has been woven in this manner, the cloth is taken from the loom and carried to the designer's room, where it is measured and weighed. It is then taken to the finishing room and after passing through the necessary processes is brought back again to the designer's room and again measured and weighed. All the items obtained should be inserted in a book where they can be readily referred to, in order that information regarding the effects of the different processes may be readily accessible.

The cloth is then cut up into samples and the best of them selected to be sent to the commission house. Several samples from this lot may be selected by the commission house as being suitable to put on the market.

SELLING SAMPLES

15. After a certain number of trial samples have been selected, it is necessary to make what are termed **selling samples**. These selling samples are generally woven the same width as the regular cloth, and should pass through the same processes, since only by this means can there be obtained the necessary information in regard to the appearance of the finished cloth and the cost of manufacture. From these selling samples the agents' sample books are made, and it then remains with the selling house to place orders for the different samples of cloth.

16. After an order has been obtained for the mill it is the designer's duty to make out all specifications that may be necessary for the reproduction of the desired cloth. Those relating to the warping, beaming, and drawing-in departments of the mill should be sent to their respective overseers; while all the specifications regarding harness drafts and chain drafts should be sent to the overseer of the weave room. When the cloth is first started in the weave room, the designer should see that the first pieces taken off are correct in every particular, after which it may be safe to assume that his duties regarding that special line of goods are completed.

CONCLUSION

17. Designing is by no means a modern art. The textile museums of world-wide renown, such as those in Florence (Italy), Crefeld (Germany), or the Museum of Fine Arts in Boston, contain fabrics manufactured centuries ago that exhibit skill in designing, taste in coloring, and knowledge of cloth structure equal to most modern fabrics. It is not possible for every designer to visit such museums,

but in many of the public libraries in the larger cities there are books on decorative art or historic ornament in which many of these fabrics are reproduced; an examination of these often leads to the formation of new ideas and is certainly a part of the education of a designer.

Textile designing is an art that has been developed to a high degree in Europe, and the products of English, French, and German designers are justly esteemed. It is therefore advantageous to designers in American mills to keep in touch with what is being done in Europe; a knowledge of the French or German language often aids a designer in this, by enabling him to study French or German textile-designing publications. This, however, is secondary to securing a thorough knowledge of the manufacturing conditions. A designer should never cease to study these—from the raw material to the finished fabric—so that he may have a knowledge of all the processes that lead up to the production of the fabric, and thus learn how to obtain the most artistic effects in the most economical manner.