POINTS ON JACQUARD DESIGNING.

To Produce a Well Balanced Design

A

Fig. 1

in connection with a perfect fabric structure, the designer must take the following data under careful consideration:

(1) The nature of the cloth. (*a*) The class of material employed; (*b*) the counts of the yarn; (*c*) the texture, *i. e.,* the number of threads and picks per inch; (*d*) the kind of finish.

(2) The style of the pattern, and the origination or selection of the form.

(3) The reproduction of the form on to the design or point paper: (*a*) Directly on to the paper; (*b*) from a sketch; (*c*) from a piece of cloth.

(4) The suitable development of the pattern on the point paper, so as to show the form to the best advantage, and the selection of a suitable ground weave.

Fineness of detail and intricate development of form, can only be obtained when high counts of yarns, with a high texture for warp and filling are used, and when the finish of the fabric tends to enhance the clearness of the pattern, rather than to conceal it.

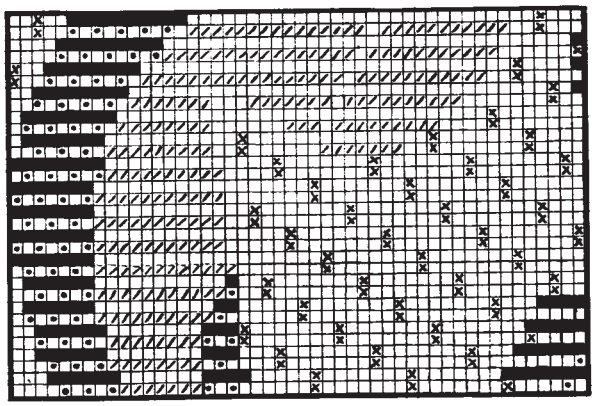

Fig. 3

Silk Fabrics,

owing to the fineness and the lustrous quality of the yarn, lend themselves, in the highest degree, to elaborate ornament by means of figure, and, though it is possible in these fabrics to obtain extreme fineness of detail, better results are usually obtained by treating the design boldly and varying the weave development which is put on the figure, whereby the lustrous quality of the material is displayed to the greatest advantage.

In the silk texture illustrated at Fig. 1, every detail of the ornament being clearly indicated at the same time that diversity of effect is obtained by varying the weave development of the figure in such a manner that the light is reflected in a greater degree from some parts of the design than from others. The fabric is woven with two shades of filling, for producing the figure, and one shade of warp, which forms a satin ground.

The particulars of the cloth are as follows:

WARP: All 100 deniers organzine silk, 160 threads per inch.

FILLING: 1 pick 6 dram tram silk, dark; 1 pick 6 dram tram silk, light; 160 picks per inch.

A simple method of putting such a design on point paper, which can be employed whether two or more kinds of filling are used for figuring purposes, is

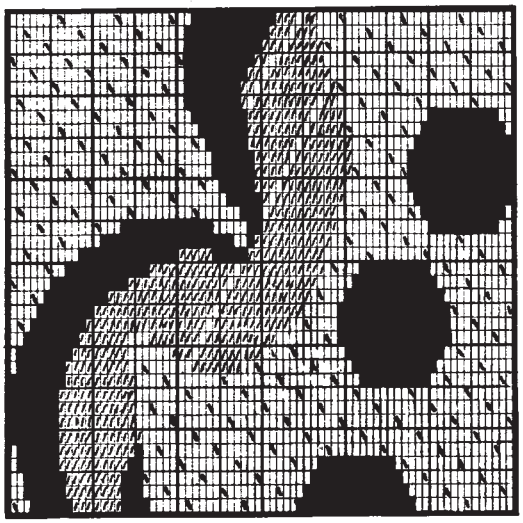

Fig. 2

illustrated at Fig. 2, which is the Jacquard design of section *A* of fabric sketch Fig. 1.

The figure in this instance is painted on to the point paper in the ordinary way, except that a different color is used to represent where each different shade of filling is on the face.

The counts of the paper is according to the number of ends per inch relative to the number of picks per inch of each color; thus, 8 by 4 or a 12 by 6 paper is required (according to size of Jacquard machine used, *i. e.,* rows deep) for Fig. 2, as there are 160 ends and 80 picks of each kind of filling per inch, *i. e.,* using an even texture 160 by 160 per inch.

As many cards are cut from each pick on the point paper as there are colors of filling employed. Thus, for cutting the cards from point paper design, Fig. 2, for practical work start card stamping at the bottom of the design, and (according to size of Jacquard machine used, *i. e.,* rows deep) cut cards thus:

1ST CARD: *Miss: black* squares and ground *dots; cut shaded* and plain *i. e.*, ground *dots.*

2ND CARD: *Miss* shaded squares and ground *dots; cut black* squares and miss ground *dots.*

By *black* we mean *red* color, by *shaded* either *blue* or any other color, by *dot green* or any other color used by the designer in his work.

Diagram Fig. 3 shows the *plan* how warp-threads and picks interlace in the formation of the fabric structure to produce a portion (see *A*) of the actual Fabric shown in Fig. 1, by means of (a portion of the actual) Jacquard Design shown in Fig. 2.

A comparison of the two plans — Figs. 1 and 2 — shows clearly the saving of time which may be effected by employing the first method when running out a large design.

(To be continued.)

Rusty Silk.

ITS TROUBLE TO RIBBONS.

There is a defect that is not infrequently met with in the manufacture of silk ribbons to which the name of *Rusty silk* has been applied.

It has given more trouble in ribbons than in broad goods, since owing to the peculiar nature of the defect, it is more concentrated in the narrow fabrics and therefore more conspicuous. In medium to dark shades it is not apparent, but in whites and delicate shades it is very perceptible.

The defect referred to is caused by a series of very small and fine brownish lines, or dashes, in the filling, varying in length from say $\frac{1}{32}$ to $\frac{3}{8}$ of an inch. It rarely occurs in the warp, in the filling it is usually found only in the lower grades of silk.

There are a number of ways in which silk may become spotted and so exhibit a defect of somewhat similar character. For instance, for certain purposes the thrown silk, while still on the reel fly, may be put in the steam box to set the twist. If the lining of this box is a rusty iron, there may occur a drip on the silk that subsequently appears in the form of stains.

At the dye-house, also, the silk may be exposed to influences that will spot it after it has been dyed, and similar damage may result if the dyed silk is improperly stored or looked after.

Then, in the mechanical processes of the mill, if the various metal parts of the machine, or the guide wires and friction bars, with which it comes in contact, have been allowed to become foul and rusty, trouble of the same sort may arise.

In all of these cases it will be observed, if the silk is examined under the glass, that most, or all, of the raw silk ends in the thrown silk, have been stained where the spots occur.

This however, is not so in the case of the *rusty* silk. This defect is very hard to detect in the dyed silk thread, or in the thrown silk before dyeing, and it is next to impossible — save by chance — to find it in the raw. In practice it is never seen until it shows up in the goods.

When a thread with this defect in, is picked out of the fabric and put under a good microscope, the interesting discovery will usually be made that but one of the filaments of which the primary raw silk thread is composed shows the stain. In ordinary tram stock there will have been five or six cocoons reeled together, and if the silk has been thrown, say, into four thread tram, the defect will only exist in $\frac{1}{20}$th to $\frac{1}{24}$th of the filaments in the thread. This is so trifling a part of the thread that it is no wonder that it escapes the observation when the raw and thrown silks are inspected.

We will now consider how the trouble originates.

After a silk worm has spun its cocoon it changes into a chrysalis and remains in a dormant condition for two or three weeks, at the expiration of which time it has changed into a moth and bursts its way out of the cocoon, tearing a hole through the end of it, to allow of its passage.

This, of course, destroys the cocoon for reeling purposes, owing to the mutilation of the filament, and it then has to find a use as material for making spun silk, though of very small value compared with its worth if unpierced.

To prevent this damage to the cocoons care is taken to see that the chrysalides are killed by exposure to heat before the time when the moths might be expected to emerge, but sometimes, owing to carelessness or circumstances, this is not attended to in time and many cocoons are destroyed for reeling purposes in consequence.

The cocoon envelope in hard and tough, the gum of the silk giving it almost a parchment like consistency, so, to enable it to tear its way through this covering, the moth ejects from its mouth a quantity of a dark brownish colored fluid which softens the end of the cocoon and allows the insect to work its way out. All pierced cocoons will be found to have a dark brown edging to the holes made by the moths.

Now, if a lot of cocoons had been kept too long for safety before the killing of the chrysalides, and were then put in the heating ovens or chambers, it would not infrequently happen that individual moths would have emitted this softening fluid but would have been killed by the heat before they had a chance to pierce the cocoon. Such cocoons might only be stained part way through, the defect being then not very noticeable, or the stain might, and generally would have gone clean through to the outside.

In addition to cocoons so stained there will be such as have been badly crushed before drying, while the chrysalis was yet soft and juicy, and a similar brown stain, but irregularly distributed, may be created in this manner.

Before being reeled, the cocoons that have been purchased by the establishment are carefully sorted into different groups, usually a first, a second and a third grade. All double, crushed, stained, pierced, and otherwise defective cocoons being thrown aside for spun silk stock.

In a well managed reeling establishment, or filature, making good qualities of silk, all stained cocoons would be rejected, but in mills where the management is less particular, and in which only lower grade silks are produced, such stained cocoons, either through carelessness or intention, might be reeled up into the lowest quality made by the mill, and the difficulty of detecting this abuse would favor its continuance.

The stains referred to, will be nearly circular in shape, about three-eighths of an inch across, and of an intense brown, which retains its color through the dyeing processes. As the length of the reelable silk in a cocoon will be many hundreds of yards, and as the thread is constantly crossing and recrossing the stained spot, it is evident that even one cocoon, so stained, can do a lot of damage. Thus, if a three inch ribbon were being made with one hundred picks to the inch, and if the moderate amount of four hundred