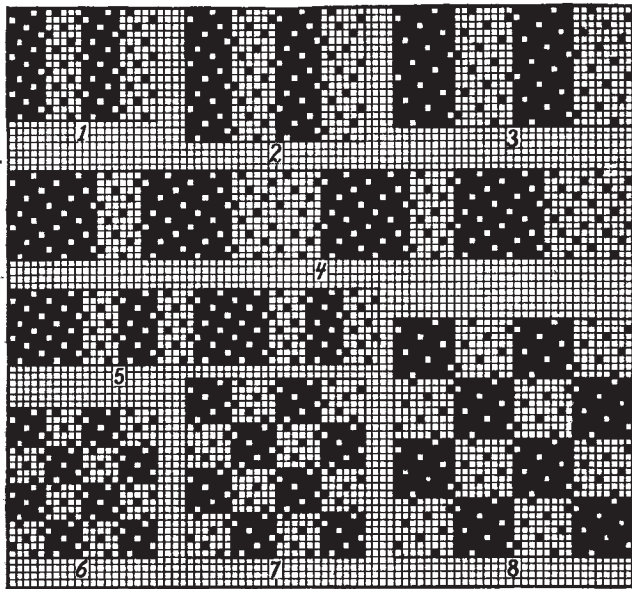


## DESIGNING AND FABRIC STRUCTURE.

### STRIPE AND CHECKER-BOARD SATINS.

This system of designing is, practically speaking, *figuring with warp and filling-effect satins*, and in connection with fancy motives and combinations is extensively used in the manufacture of figured cotton



fabrics. Some of the plainer effects are used for silk fabrics, and very small effects in the manufacture of worsted dress goods.

The weaves chiefly used are the 5, 6 and 8-leaf satins.

In designing these weaves, after laying out the motive for the combination of the two satin effects, care must be taken to always arrange sinkers opposite raisers at the junction where the warp and its corresponding filling effect joins, *i. e.*, the last thread in the one effect must always interlace opposite to that of the first thread in the joining effect, both warp and filling ways in the weave, provided the latter refers to a checker-board or figured effect, whereas in connection with stripe effects the cut-off from warp to filling effect, or vice versa, has only to be taken care of in the warp. This feature produces the required sharp cut-off from one effect to the other.

This subdivision of our satin weaves is best divided again into:

- (a) Plain and fancy stripe effects,
- (b) Plain and fancy checker-board effects,
- (c) Figured checker-board effects, and
- (d) Combination effects.

A few examples will readily explain the construction of these systems of weaves, indicating at the same time that weaves and effects of combinations possible to be produced are unlimited.

#### PLAIN STRIPE EFFECTS.

Weaves Figs. 1, 2, and 3 are given to illustrate

the subject. One unit of each weave is used, larger, *i. e.*, wider stripes calling for a certain number of repeats of each unit, previously to starting its mate effect, and vice versa.

Fig. 1 shows the combination of the 5-leaf satins, warp and filling effects.

Five ends of each effect are used in the repeat of the weave, which is 10 warp-threads and 5 picks.

Fig. 2 illustrates the combination of the 6-leaf satins, warp and filling effects, repeating on 12 warp threads and 6 picks, and

Fig. 3 that of the 8-leaf satins, warp and filling effects, repeating on 16-warp-threads and 8 picks.

#### FANCY STRIPE EFFECTS.

Weaves Figs. 4 and 5 illustrate the subject.

Fig. 4 has for its foundation the 6-leaf satin, arranged thus:

12 ends	warp effect
6	“ filling “
12	“ warp “
12	“ filling “
—	

42 ends repeat of pattern.

Fig. 5 has for its foundation the 5-leaf satin, arranged thus:

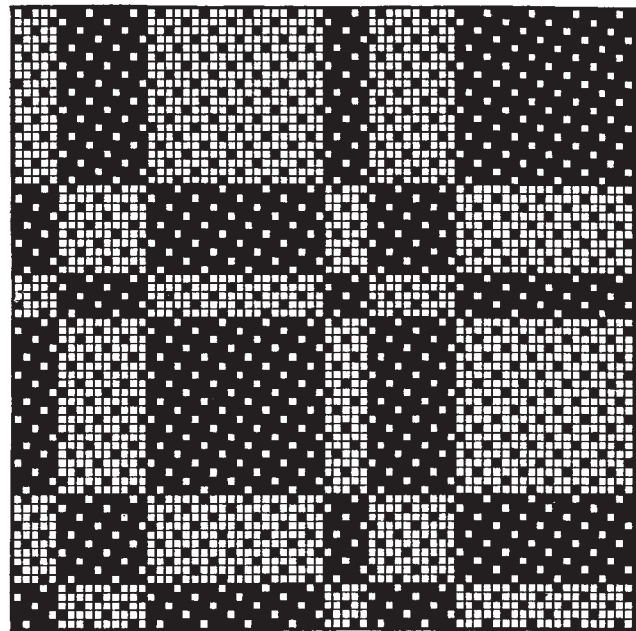


Fig. 9

10 ends	warp effect
5	“ filling “
5	“ warp “
5	“ filling “
—	

25 ends repeat of pattern.

## PLAIN CHECKER-BOARD EFFECTS.

Weaves Figs. 6, 7, and 8 explain the construction of these weaves.

In starting these combination of warp and filling satin weaves, exchanging the two effects both ways in

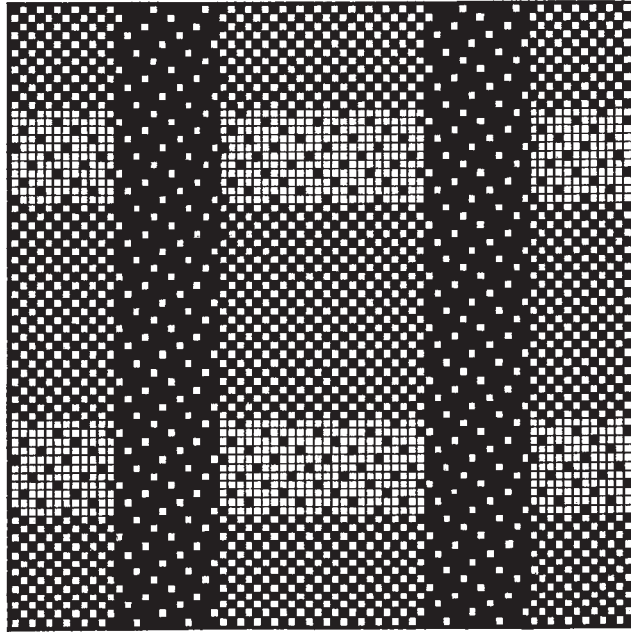


Fig. 10

the fabric in order to form the characteristic checker-board design, we must be careful never to start with the one raiser of the filling effect satin or the one sinker of the warp effect satin, in one of the corners of either effect, since this not only would produce extra tight weaving places in the fabric (for example, in connection with worsted dress goods) but at the same time, in connection with figured effects in any kind of fabric structure, it then would be impossible to obtain the clear cut-off of the fabric, both warp and filling ways, where the two weave effects exchange. For this reason it will be well to notice how each satin effect has been started in our weaves where the first warp thread and first pick in each effect meet. It then will be noticed that we have not been using a raiser or sinker at the meeting of the first warp-thread and first pick in any weave effect, distributing at the same time the raisers and sinkers of the unit of the weave effect as evenly as possible, considering all four corners of the check, and which, at the same time, also refers to a rectangle or other shape of a figure as may be called for by the design.

Fig. 6 shows the proper arrangement for placing the unit of the 5-leaf satin, warp and filling-effects; Repeat 10 warp-threads and 10 picks.

Fig. 7 shows how to start the unit of the 6-leaf satin, warp and filling effects; Repeat 12 warp-threads and 12 picks.

Fig. 8 illustrates how to place the unit for the 8-leaf satin, warp and filling effect, in order to be able to produce a perfect cut-off on all four sides of the check and at the same time a perfect fabric structure.

## FANCY CHECKER-BOARD EFFECTS.

Weave Fig. 9 is given to illustrate subject, *i. e.*, the 5-leaf satin, warp and filling-effects exchanged after the motive of the  $\frac{1}{2}\frac{4}{1}\frac{2}{4}$  14-harness fancy basket.

Using one unit of the 5-leaf satin for each square on the point paper of the motive quoted, results in a repeat of  $(14 \times 5 =) 70$  warp threads and 70 picks for the fancy checker-board weave. The same requires 10-harness fancy draw for its execution on the loom.

## FIGURED CHECKER-BOARD EFFECTS.

Weave Fig. 10 illustrates the subject in connection with the 5-leaf satin, warp and filling-effects, for foundation.

Repeat of weave 40 warp-threads and 40 picks. Examining this weave will show us three different changes in the motive used, hence  $(5 \times 3 =) 15$  harnesses required for its execution on the loom.

As will be readily understood, the unit of the 6 or 8-leaf satin can be treated in the same way, using any motive desired, and placing the starting of said satins as is shown in connection with the plain checker-board effect weaves, previously given.

## COMBINATION EFFECTS.

To explain this subject, weave Fig. 11 has been designed.

This method of constructing weaves, refers entirely to dress good fabrics, and is fully explained by means of weave given, which shows us a square of plain woven fabric structure over-checked in the warp with 6-leaf warp satin, and in the filling with 6-leaf

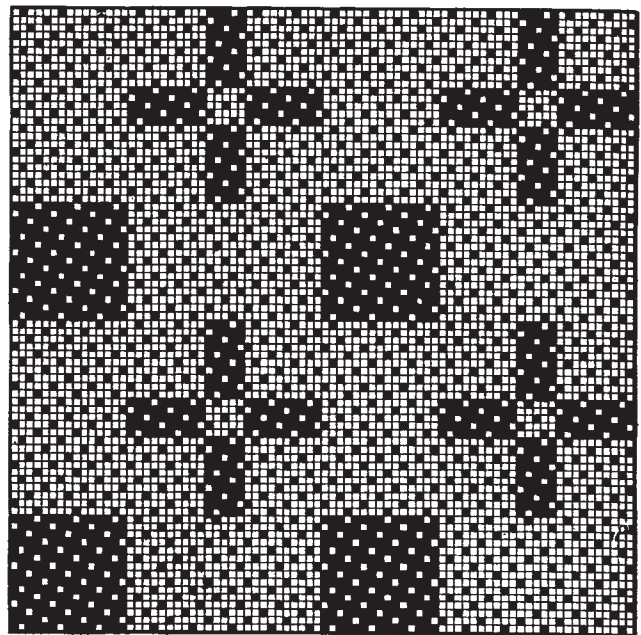


Fig. 11

filling satin, care being taken to keep the sharp cut-off where the plain and the satin weaves join.

Such combinations of weaves, as a rule, call for 2-beam work, *i. e.*, one beam for the warp-threads interlacing with the satin weave warp-effect only, and a second beam for such warp-threads as interlace with the plain weave and the satin filling effect.

The repeat of weave is:

24 warp threads plain weave,  
12 warp-threads 6-leaf warp satin.

—

36 warp-threads in repeat.

25 picks plain weave,  
11 picks 6-leaf satin filling effect.

—

36 picks in repeat.

The change of one end difference between warp and filling satin effect had to be made to produce the perfect cut-off of the end-threads, *i. e.*, where the different weaves join. The weave in question, by means of fancy draw, calls for 12-harness, *i. e.*, 6-harness for the warp satin stripe, and 6-harness for the filling satin and plain weave part.

### GAUZE OR LENO WEAVING.

Gauze, also called Leno, is the name given to a variety of fabrics characterized by their openwork effect, somewhat resembling lace. In these fabrics the warp-threads, in addition to interlacing with the filling-threads, are twisted with threads of their own system.

Gauze weaving is also practiced in connection with regular weaving to produce fancy effects, portions of the repeat of the design being then interlaced with gauze, the others by means of regular weaving.

In gauze we find two distinct divisions of warp-threads, *viz.*: the *standard* and the *douping* warp-threads, the latter, during weaving, twisting around the former. The douping warp-threads are also known as *whip-threads*, on account of their twisting (whipping) around their mate warp-threads.

Fig. 1 shows the structure of plain gauze. Threads indicated by *a* (shown in outlines) represent the standard-threads, whereas, threads marked *b* (shown in black) illustrate the whip-threads.

For the reason that we deal with two systems of warp-threads in gauze weaving, we must use two systems, or sets of harness for operating the warp-

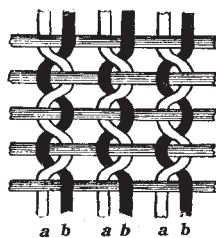


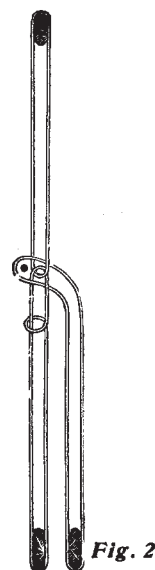
Fig. 1

threads. One set of the harness is known as the *ground-harness* (which we will indicate in our diagrams of drawing-in drafts by *A*) and the other as the *douping-harness* (which we will indicate by *B*).

We will now give an explanation of the douping-harness.

Two methods of working with douping-harnesses are in use. When placing the doup at the lower side they are then known as *Bottom Doups*, and the cloth

is then woven "wrong side up" in the loom. When the doup is placed at the upper or top side they are then known as "*Top Doups*," and the cloth is then woven "face up" on the loom. Bottom Doups are the ones mostly used, although Top Doups have their advantage, among which are that the fabric is woven right side up in the loom, hence any mistakes are readily noticed; again, broken doups are easier replaced.



We will consider Bottom Doups used in our article.

Fig. 2 shows a specimen of a complete doup. In the same, we find at the left a twine heddle, similar to heddles used in regular weaving, and which is known in gauze weaving as the *full-heddle*. To this heddle, at the right, the doup is adjusted. The same consists of a smooth, strong linen or silk thread which is passed through the upper loop of the full-heddle, and back through its eye, being in turn secured to the bottom rod of the harness frame. This arrangement connects the doup (movable) to the full-heddle. It shows the doup to be half a heddle only, hence the name *half-harness* or *skeleton-harness* for the harness frame having the doup secured to its bottom rod. Through the end of the loop of the doup (the portion shown to the left of the full-heddle in our illustration) the whip-thread is passed. (See black dot.)

Two movements of the doup and one of the full-heddle, contain the entire secret of gauze weaving. When these are understood, it becomes at once as simple as regular weaving.

In drawing-in the warp in the harness for gauze weaving, as mentioned before, we deal with two sets of harnesses, *viz.*, the ground and the doup-harness. Diagram Fig. 3 is given to illustrate the subject, *A* showing two ground-harness frames, *B* the doup-harness as is composed of its full and skeleton-harness. Warp-threads shown in outlines indicate standard-threads, the ones shown in black the whip-threads.

In gauze-weaving every warp-thread (standard as well as whip-thread) is drawn first, the same as for common weaving, in the ground-harness set (see *A*).