PLAIN, TWILLS AND SATINS

The Foundation Weaves for Textile Designers.

These three systems of weaves form the basis for all weaves met with in practical work, whether of a plain, derivation, or mixed *i. e.*, combination character.

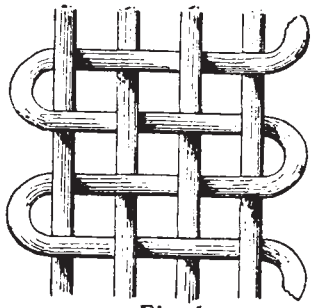


Fig. 1

To guide the student in mastering these foundation weaves is the purpose of this article, a clear understanding of their construction and application in the textile art facilitating a clearer understanding of the more complicated fabric structures and designs appearing regularly in Posselt's Textile Journal, the present article being more particularly prepared by a request of a great many new subscribers to the magazine.

Repeat or Unit of a Weave.

This no doubt is a rather complicated subject for the novice, although the practical man in the mill may take it for granted that anybody should by instinct be familiar with such a question. This however, is not the case, and the first rudiments to master, after knowing what is warp and filling and their relation to our point paper, is to know what is meant by the repeat of a weave.

By the repeat of a weave, we must be sure that a perfect uninterrupted joining in the design of the fabric must take place between the first and the last thread in the repeat of a weave, both warp and filling ways, in order that no matter at what place in the fabric the interlacing of warp and filling is taken into consideration, its repeat will always represent a proper duplicate of the joining repeats on either one of its four sides. To master the subject, it will be well for beginners to always paint more than one repeat of a weave until experience will do away with this work. With complicated weaves, however, the experienced designer himself may paint more than one repeat of a broken-up fancy weave, so as to make sure of the general effect of the weave in the fabric, *i. e.*, the effect produced by its repeat.

THE PLAIN WEAVE.

The same is also known as cotton weave, or taffeta, the latter name being more particularly used for it by the silk trade.

It produces a balanced effect, *i. e.*, warp and filling show up equal on face and back of the fabric, and as indicated by its name it is the most simple weave, requiring for its repeat 2 warp-threads and 2 picks only. One or the other of the two threads of each system (warp or filling) in the repeat of the weave is either up or down with each change of threads in the other system, as clearly shown in Fig. 1, representing the interlacing of four warp-threads and four picks, showing four repeats of the plain weave.

Fig. 2 shows the plain weave on point paper, with its fabric structure below it. Connecting lines drawn between the two diagrams make a further explanation unnecessary. As seen from the illustration, the plain weave produces the closest possible interlacing of warp and filling for a given texture, hence the strongest possible fabric structure to be made. This frequent interlacing of warp and filling will at the same time impart to the fabric a more or less perforated character as compared to other weaves, said perforations depending upon the counts and the amount of twist in the yarn. Cloth woven with the plain weave has a finer appearance and harder feel and is smoother, but possesses less elasticity, than fabrics woven with other weaves.

Fig. 3 shows the section of a fabric interlaced with the plain weave. Black circles indicate the warp-threads; the two picks called for by the repeat of the weave are shown respectively shaded and in outlines.

Fancy effects in the construction of fabrics interlaced with the plain weave are oftentimes produced by using two or more different counts of yarn in the

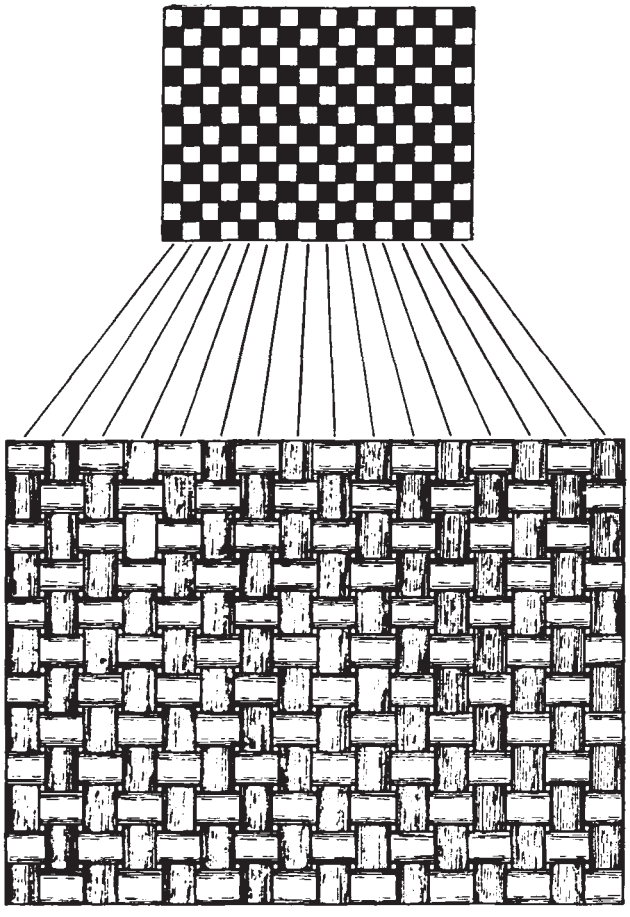


Fig. 2

warp or the filling, or in both systems at the same time. For instance, using in the warp one end of a fine count of yarn to alternate with one end of a heavy count of yarn and using one kind of filling, will produce a cord effect, running in the direction of the warp in the fabric. Fig. 4 shows the section of such a fabric. Using 2 different counts of filling with one kind of warp will run cord or rib stripes filling ways in the resulting fabric structure and which

is then technically known as a repp fabric. Handkerchiefs, and which means the plain weave, have frequently borders formed by heavy counts of yarns

Fig. 3

inserted, warp and filling ways, to form a pleasing design. These cords *i. e.*, heavy counts of yarn used

Fig. 4

to produce a fancy fabric structure is also made use of in the manufacture of fancy shirtings, dress goods, etc.

TWILLS.

The characteristics of a twill are that the float of each pick is always set one warp-thread to the right or left of the float of the preceding pick, in turn producing the characteristic twill line to run either towards the right or the left hand, the first direction being the one most often met with.

Twills are again subdivided into uneven and even sided twills; the first can be made on any number of harnesses, the latter on an even number of harnesses only.

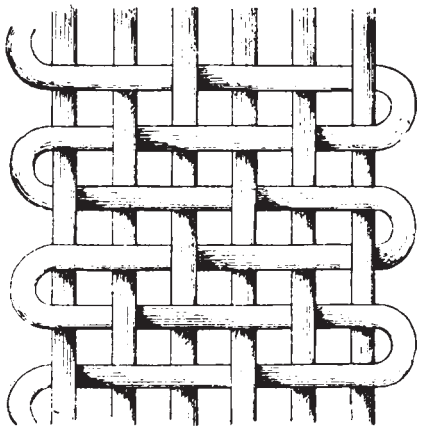


Fig. 5

The lowest number of threads that a twill can be made with is 3 warp-threads and 3 picks, after which they can be made with any number of threads. Two twills are possible to be made with 3 warp-threads and 3 picks for the repeat of the weave, *viz:* 1 *up*, 2 *down*, known as the filling effect, and 1 *down*, 2 *up*, the warp effect.

Fig. 5 illustrates the interlacing of 6 warp-threads and 6 picks with the 3-harness twill filling effect. An

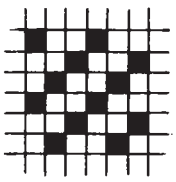


Fig. 5ª

exaggerated loose texture is made use of in the diagram to more clearly show the interlacing of the threads. Fig. 5ª shows the weave on point paper for the fabric thus explained.

Fig. 6 shows in its upper diagram the weave plan and in the lower diagram the fabric structure inter-

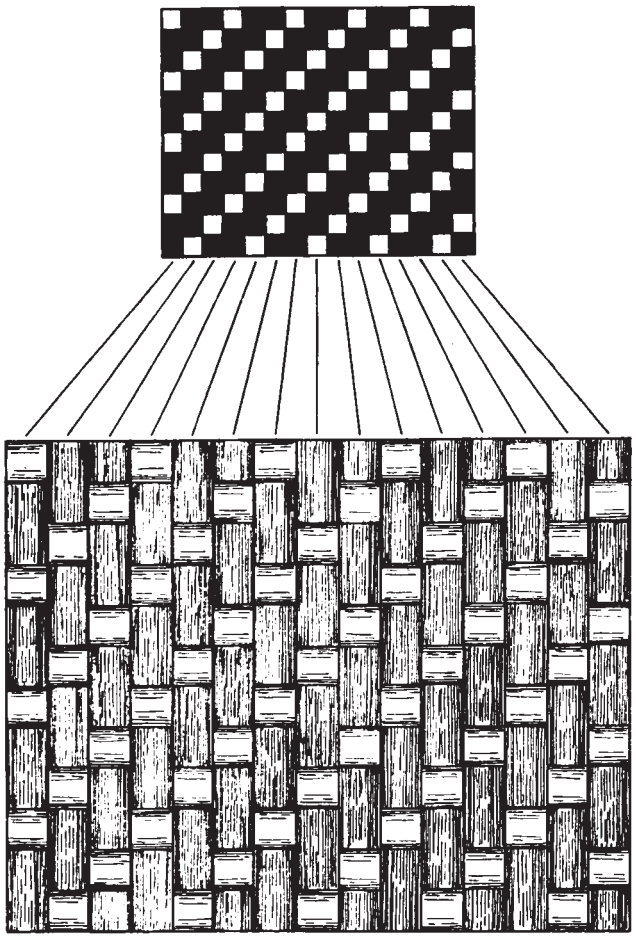


Fig. 6

laced with the 3-harness twill, warp effect. Lines drawn between the two diagrams connect warp-threads in fabric structure with their corresponding rows of vertical squares on the point paper design.

Fig. 7 shows a section of the fabric, cut in the direction of the filling, and corresponds to pick 1 in weave and fabric shown in Fig. 6.

Fig. 7

On 4-harness, three twills are possible to be made, *viz:* the warp and the filling effect of the uneven sided twill and the even sided twill, the latter being known more often as the cassimere twill, a weave more frequently used in the textile art than any other weave, except the plain weave.

Fig. 8 shows eight warp-threads and eight picks interlaced with this cassimere twill, showing again exaggerated perforations between the threads in order to more clearly show the interlacing of warp and filling.

On 5-harness, three different uneven sided twills are at our disposal, *viz:*

4 *up*, 1 *down* (Fig. 9) and its mate.
3 *up*, 2 *down* (Fig. 10) and its mate.
2 *up*, 1 *down*, 1 *up*, 1 *down* (Fig. 11) and its mate.

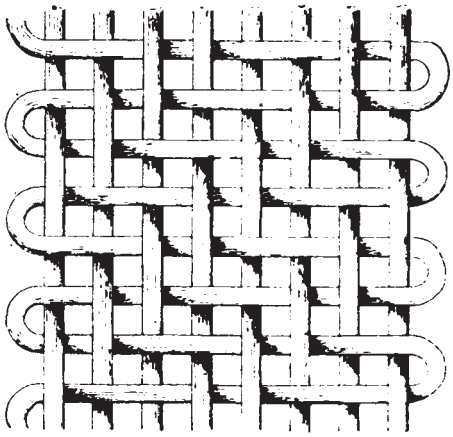
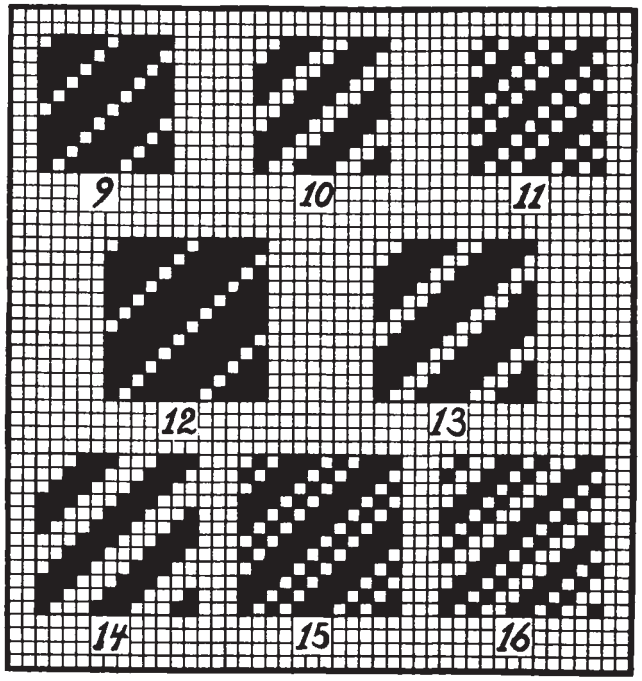


Fig. 8

The three interlacings illustrated by its weaves are what we term warp effects, its mate effects are the corresponding filling effects, risers for sinkers and vice versa.

On 6-harness, five different twills are possible to be made and of which three are uneven sided and two even sided twills, *viz:*

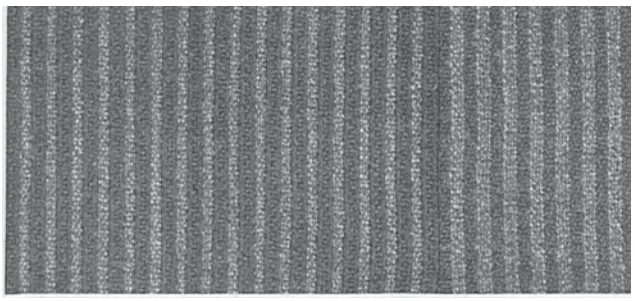


5 up, 1 down (Fig. 12) and its mate.
4 up, 2 down (Fig. 13) and its mate.
3 up, 1 down, 1 up, 1 down (Fig. 15) and its mate.
3 up, 3 down (Fig. 14) even sided.
2 up, 2 down, 1 up, 1 down (Fig. 16) even sided.

Following instructions given, it will be an easy matter to construct any twills possibly to be made on any given number of harnesses. The larger the repeat at our disposal the more the number of twills possible to be made for such a repeat.

(To be continued.)

Worsted Trousering.
(Reversible Stripe Effect.)

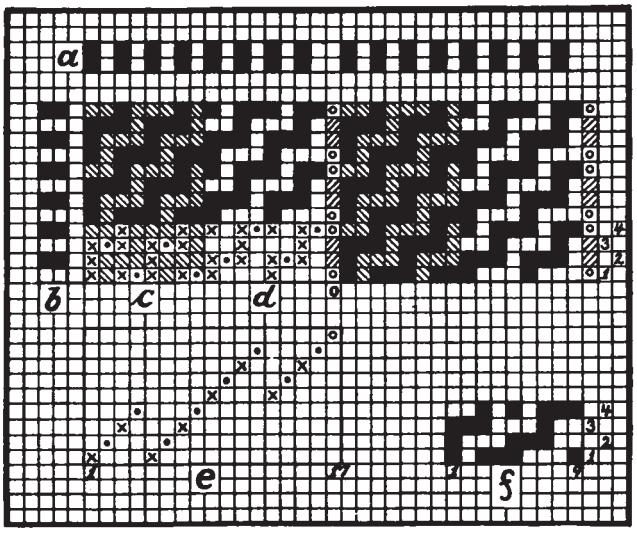


Face | Back

ACTUAL REPRODUCTION OF FABRIC

Warp: 7140 ends; draw on 17-harness straight or on 9-harness, fancy draw.

Dress: 14 sections, each containing 30 patterns @ 17 ends, or 510 ends total.



DETAILS OF FABRIC STRUCTURE:

Weave for Face and Back structure, the plain weave.
a: Color Scheme for Warp.
b: Color Scheme for Filling.
c and *d:* Construction of the two effects, dark and light.
o: Single cloth weaving warp-thread. Repeat of weave 17 warp-threads and 4 picks.
e: Drawing-in Draft for 9-harness, fancy draw.
f: Harness-chain for draft *e*.

Arrangement of Warp:

1 end 3 fold, hard twisted 2/50's worsted, black.
1 end 2/50's worsted, lt. and dk. gray tw.
1 end 2/50's worsted, black. } × 2
1 end 2/50's worsted, lt. and dk. gray twist.
1 end 3 fold, hard twisted 2/50's worsted, black.
1 end 2/50's worsted, lt. and dk. gray tw.
1 end 2/50's worsted, black. } × 4
2 ends 2/50's worsted, lt. and dk. gray twist.

17 ends, repeat of pattern.

Reed: 12¾, using one dent with 8 ends to alternate with one dent with 9 ends; 66.1 inches, width of warp in reed, exclusive of selvage.

Filling: 82 picks per inch, arranged thus:
1 pick 2/48's worsted, black.
1 pick 2/48's worsted, lt. and dk. gray twist.

2 picks in repeat.

Finish: Worsted finish, clear face, 56 inches wide.