OUR TEXTILE SCHOOL.

LESSON XVII.

DIAGONALS OBTAINED BY MEANS OF FILLING DRAFTING.

These weaves find extensive use in the manufacture of woolen and worsted fabrics, for which reason a description of their construction will be of interest to the reader. It is a simple method of designing diagonals, for two reasons:

especially such as constructed on few harnesses, as for example, from 8 to 16 harness scope.

In order to simplify the affair to the reader, the accompanying six plates of weaves are given, representing an excellent collection of such diagonals, and by means of which any number of new weaves can be readily constructed.

We will now explain how to obtain these diagonals from the 45° twills, showing at the

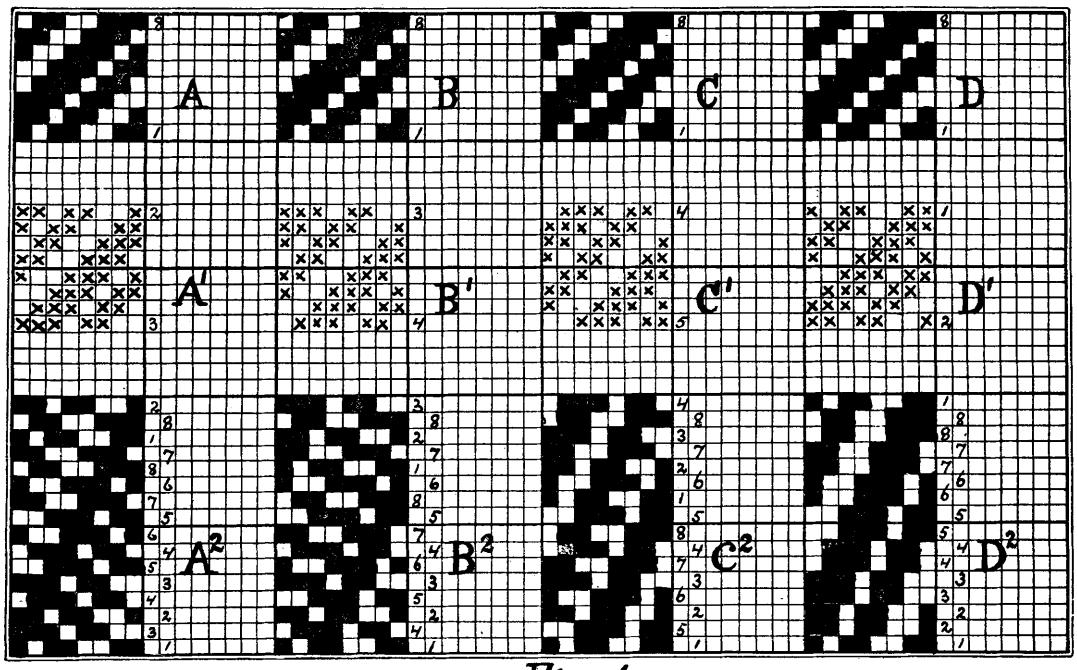

Fig. 1

First, we can use as a foundation for their construction any one of our numerous regular 45° twills.

Second, by means of filling drafting we then can obtain any number of new diagonals from any one of these numerous regular twills at our disposal. Although we may not be able to use every one of these diagonals thus designed, yet the majority of them are practical weaves, more

same time how any number of these weaves can be obtained from one foundation weave.

For example let us consider plate of weaves Fig. 1. In A we show one repeat of the $\frac{3}{2}\frac{2}{1}$ 8 harness 45° twill. In diagram A^1 one repeat of the same weave is shown, only in a different position with reference to starting the weave, beginning in this instance with pick number 3 if considering this weave with its position for

starting to weave Fig. A. We have indicated the starting of weave Fig. A^1 with reference to its corresponding picks in weave Fig. A, by means of numerals on the right hand side of the weave. In order to still further simplify matters, we have shown weave A by means of ■ type, showing weave A^1 by means of ⊠ type. Weave Fig. A^2 shows the diagonal as obtained by means of filling drafting from weaves A and A^1, using respectively one pick of one weave to alternate with one pick of the other; the new weave, i.e., the diagonal, consequently repeating on 16 picks, for the fact that it is a combination of two 8-pick weaves. Numerals shown on the right hand side of Fig. A^2 indicate the respective drafting of this weave from its foundation weaves, viz.:

First pick of diagonal=pick 1 of A.

Second pick of diagonal=first pick of weave A^1.

Third pick of diagonal=second pick of A.

Fourth pick of diagonal=second pick of A^1.

Fifth pick of diagonal=third pick of A.

Sixth pick of diagonal=third pick of A^1.

Seventh pick of diagonal=fourth pick of A.

Eighth pick of diagonal=fourth pick of A^1.

Ninth pick of diagonal=fifth pick of A.

Tenth pick of diagonal=fifth pick of A^1.

Eleventh pick of diagonal=sixth pick of A.

Twelfth pick of diagonal=sixth pick of A^1.

Thirteenth pick of diagonal=seventh pick of A.

Fourteenth pick of diagonal=seventh pick of A^1.

Fifteenth pick of diagonal=eighth pick of A.

Sixteenth pick of diagonal=eighth pick of A^1.

The new weave repeats on 8 harness × 16 picks.

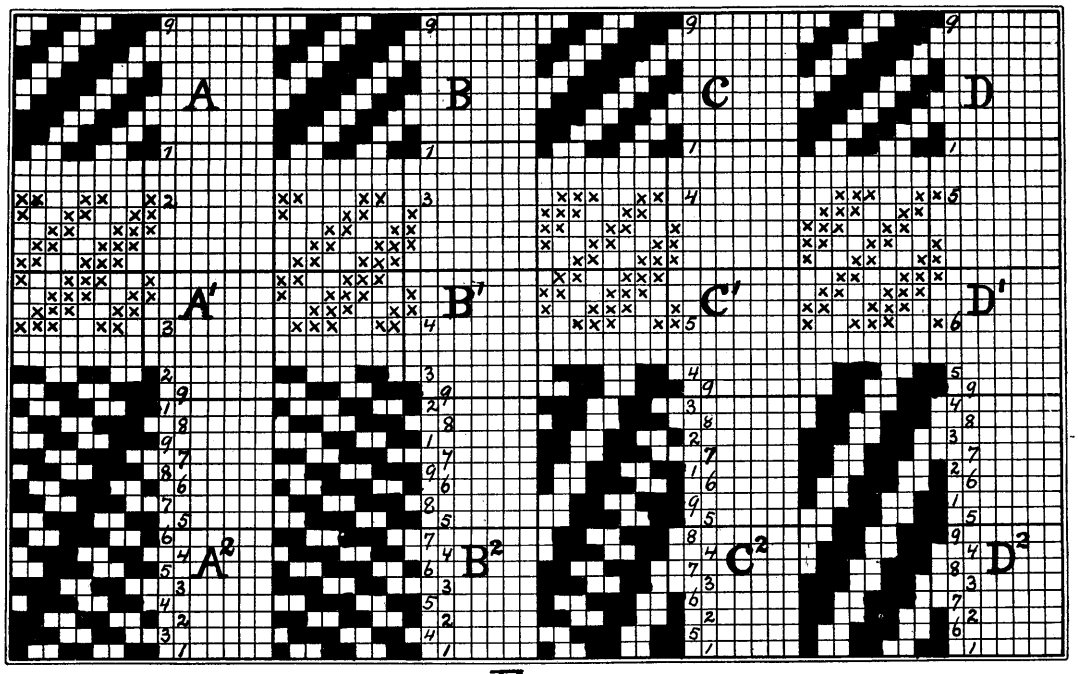

Fig. 2

Weave Fig. B is the same weave as given in A, i.e., the same position of the twill, whereas weave Fig. B^1, although the same 8 harness twill as thus far dealt with, has been started on a different pick compared to the former example. In other words, in this instance we started with pick 4 o veave Fig. B in the construction of weave Fig. B^1. Combining weaves Figs. B and B^1, alternately pick and pick, in the same manner as previously explained, in turn will result in the diagonal given in weave Fig. B^2, the same repeating again on 8 warp threads × 16 picks, and as will be readily seen is a different

weave than the one (A^2) previously constructed, although using the same foundation weave for its construction.

Diagonal C^2 in turn is the combination of arrangements of the 8 harness 45° twill, given respectively in Figs. C and C^1.

The same refers also to diagonal D^2 obtained respectively—by drafting alternately, pick and pick—from weaves D and D^1.

Examining our diagonals thus obtained from the $\frac{3}{2}\frac{2}{1}$ 8 harness 45° twill will at once indicate to us that in this instance we can obtain three new diagonal weaves from any one of our 8 harness 45° twills, the fourth weave obtained in this instance being nothing else but the regular 8 harness twill with two picks in a shed.

Plate of weaves Fig. 2 shows us examples of diagonals constructed in connection with a 9 harness 45° twill for the foundation, the latter being the $\frac{3}{2}\frac{2}{2}$ regular twill. Diagrams A, B, C and D show us, by means of ■ type, this 9 harness twill in one position, whereas diagrams A^1, B^1, C^1 and D^1 are the same weave, but in each instance starting the respective weave by means of a different pick; weave A^1 in this instance starting with pick number 3 compared to A, weave B^1 starting with pick 4 compared to B, weave C^1 starting with pick 5 compared to C, and finally weave Fig. D^1 starting with pick 6 as compared to Fig. D.

Besides showing these four different starting points of the twill by means of ⊠ type, we have at the same time indicated the various starting points as just quoted, by means of numerals placed respectively on the right hand side of the various weaves. Weaves A^2, B^2, C^2, D^2, are the four new diagonals thus obtained from the $\frac{3}{2}\frac{2}{2}$ 9 harness 45° twill, showing at the right hand side of each weave, by means of numerals, the respective drafting for each weave from said *one* foundation weave.

Plate of weaves Fig. 3 shows us two examples of 10 harness twills, as well as its respective diagonals obtained from it. Weave Fig. A is the $\frac{3}{2}\frac{2}{1}\frac{1}{1}$ 10 harness 45° twill. Weave

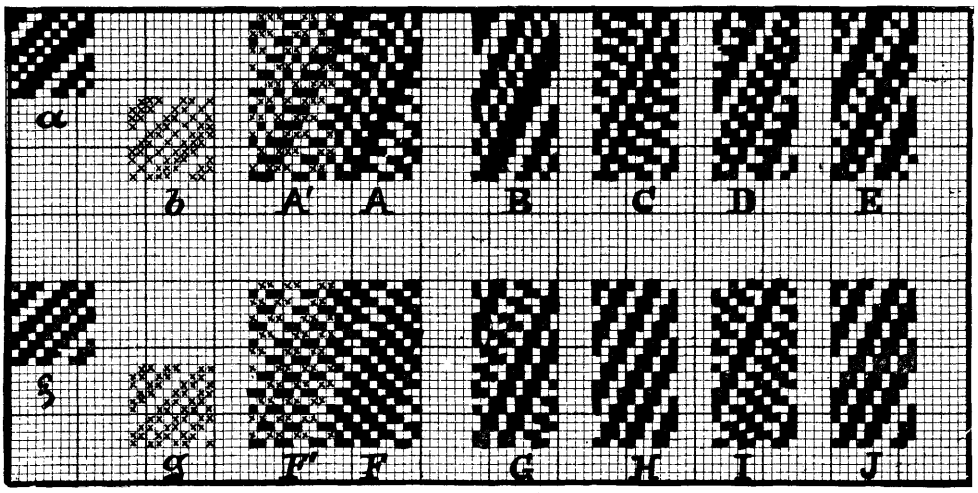

Fig. 3

B is the same weave, the only difference being that in this instance we started this weave with a different pick; pick 3 in this instance compared to weave A. Now taking alternately one pick from weave A, one pick from weave B, as shown in connection with the diagram A^1, in turn we get our new weave, i.e., the diagonal A.

Leaving weave A as shown, and starting this combination drafting every time with a different pick, will in turn produce us the diagonals B, C, D and E. Each of these five diagonals thus obtained has the $\frac{3}{2}\frac{2}{1}\frac{1}{1}$ 10 harness 45° twill for its foundation, requiring for its repeat 10 harness × 20 picks.

Diagram F shows us the $\frac{2}{1}\frac{2}{2}\frac{2}{1}$ 10 harness 45° twill, and diagram G the same weave, only

starting with pick 3, with reference to F. Combining these two weaves alternately, pick and pick (see corresponding type), will result in the new weave (diagonal) F^1, the same twill, leaving every uneven number pick identical in each diagonal, before starting to draft the foundation twill, from another pick in each instance, for every one of the even number pick

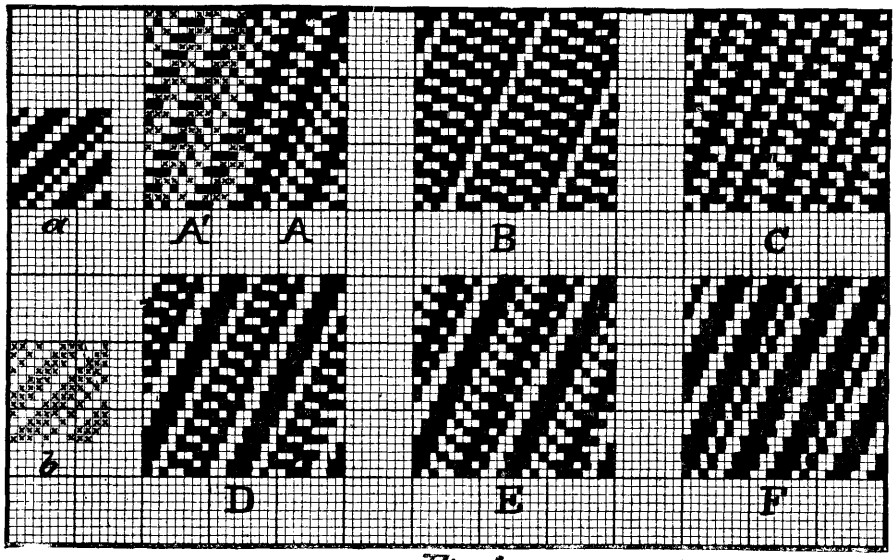

Fig. 4

being shown in diagram F in one kind of type, in order to show up the effect produced in the fabric more plainly.

of these diagonals. Weaves F, G, H, I and J. as will be readily understood, repeat on 10 warp threads $\times$ 20 picks.

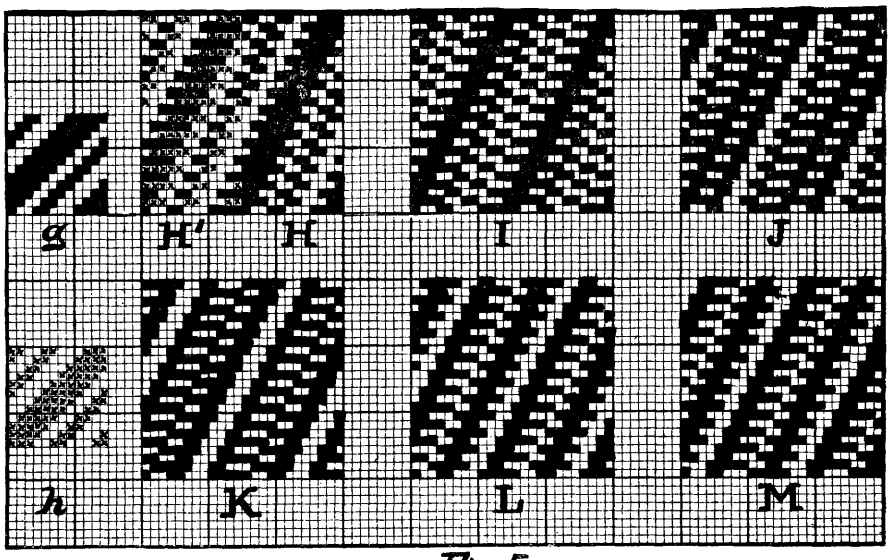

Fig. 5

Weaves Figs. G, H, I and J are respectively four additional diagonals obtained by means of filling drafting from the $\frac{2}{2}\frac{2}{1}\frac{2}{1}$ 10 harness 45°

Plate of weaves Fig. 4 shows us a collection of 12 harness diagonals obtained from the $\frac{3}{2}\frac{3}{2}\frac{1}{1}$ 12 harness 45° twill, as given in con-

nection with weave A. Diagram B shows the same weave, only started with a different pick; and combining the weaves A and B, alternately, i. e., pick and pick, as shown in diagram A¹, will result in the diagonal A, repeating on 12 warp threads × 24 picks. Diagonals B, C, D, E and F are the result of starting weave B every time on a different pick. Considering weave A only, we find that the drafting for this weave, in order to obtain diagonal A, has been thus: 1, 3, 2, 4, 3, 5, etc., until repeat is obtained, whereas in connection with weave Fig. B the following drafting has been done: 1, 4, 2, 5, 3, 6, etc., until repeat is obtained. For weave Fig. C use the following drafting: 1, 5, 2, 6, 3, 7, 4, 8, etc., until a repeat is obtained. Considering weave Fig. D, we drafted thus: 1, 6, 2, 7, 3, 8, 4, 9, etc., until obtaining the repeat 12 × 24 of this weave. Weave Fig. E has been drafted thus: 1, 7, 2, 8, 3, 9, 4, 10, etc., and weave Fig. F, 1, 2, 2, 3, 3, 4, etc., i.e., 2 picks in a shed of the regular 45° twill.

Plate of weaves Fig. 5 shows us another 45° twill for foundation weave, in order to obtain diagonals, the weave selected in this instance being the $\frac{5}{3}\frac{2}{2}$ 12 harness 45° twill, as shown in diagram Fig. G. Weave H shows the same weave, only executed in a different kind of type and starting with pick number 3 for its first pick, if compared to weave Fig. G. Diagram H¹ shows the combination of these two weaves, pick and pick, and H the diagonal executed in one kind of type. Weaves I, J, K, L and M show five additional diagonals obtained from $\frac{5}{3}\frac{2}{2}$ 12 harness 45° twill, only that in each instance we started to draft for the even number picks, every time beginning with a different pick of the foundation weave, hence the number of new weaves thus obtained. These diagonals call for their repeat 12 harness × 24 picks.

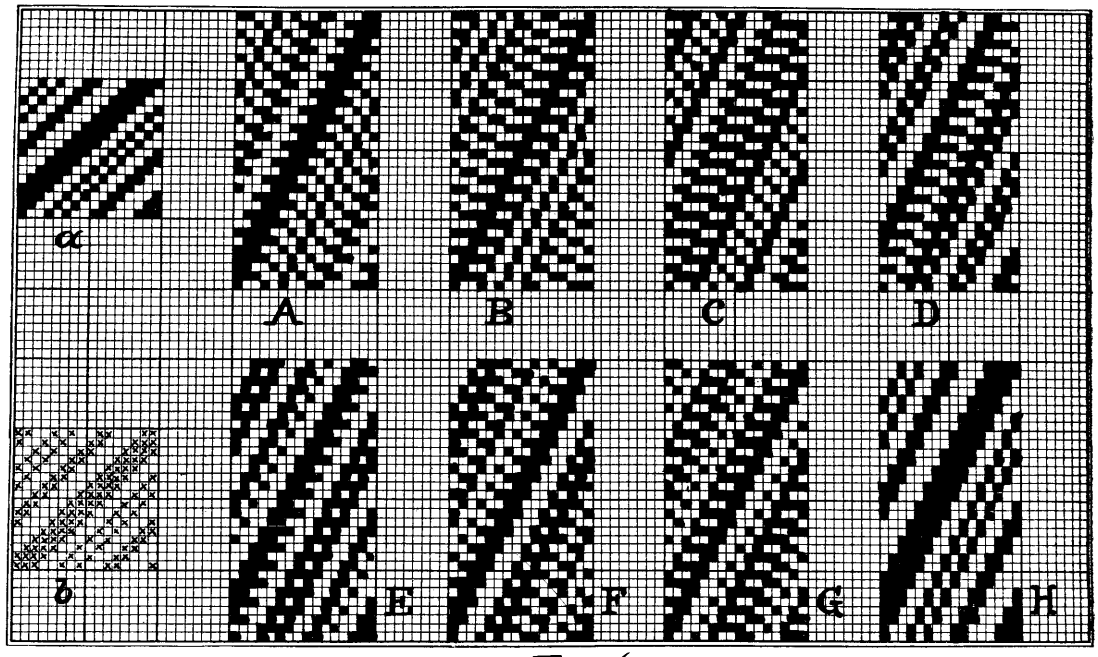

Fig. 6

Plate of weaves Fig. 6 shows us a collection of diagonals obtained from the $\frac{4}{3}\frac{2}{2}\frac{1}{1}\frac{1}{2}$ 16 harness 45° twill, as shown in weave Fig. A. Weave Fig. B shows the same weave, only that in this instance we started with pick 3, if compared to weave A. Combining weaves A and B, by draftlng alternately one pick from one weave and one pick from the other weave, i.e., one pick from a, one pick from b, until repeat is obtained, will result in the diagonal given in connection with Fig. A, repeating on

16 warp threads $\times 32$ picks. Weaves Figs. B, C, D, E, F, G and H show different diagonals, obtained in each instance by drafting the even picks of said diagonals different, beginning in each instance with a different pick of the foundation weave. The repeat of said diagonals is 16×32.

These few examples of diagonals quoted and illustrated will readily explain to the reader the immense chance of designing new diagonals in this way from any of our regular twills, resulting in many instances in some of the best weaves for woolen and worsted fabrics. It will also be readily understood by him that the larger the repeat of the foundation weave selected, the more diagonals can be obtained from this weave, as compared to a foundation weave calling for less harnesses for its repeat.