

WEAVING WITH FOOT-POWER LOOMS

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CHAPTER IV

The Analysis of Woven Patterns

How to Make a Draft From a Woven Pattern

To analyze a woven piece of fabric and again reproduce it on a foot-power loom is one of the most interesting phases of elementary textile work. So often pieces of old coverlids and linen towels may be found in the most out-of-the-way places. The amateur weaver always has a strong desire to reproduce these most interesting old designs.

In order to do this it is necessary to secure a piece of checked paper consisting of four lines representing the four heddles to be used in the weaving. All four-heddle drafts are written in this way.

Before making a draft it is necessary to know the following principles which underlie all four-heddle weaving.

First—There are six possible combinations of the heddles: 1-2, 1-3, 1-4, 2-3, 2-4, 3-4.

Second—Of these combinations, 1-3 and 2-4 are usually reserved for plain weaving.

Third—The combinations 1-2, 1-4, 2-3, 3-4, make the pattern.

Fourth—The last thread under one block of color is usually the first thread under the next block of color.

Fifth—All blocks in vertical and horizontal lines are made by the same combinations of heddles.

Sixth—There is a row of plain weaving after each row of pattern.

It is well in the beginning to select a small pattern such as is shown in Fig. 193. From this pattern pick out the unit of design which is repeated over again from the first. This consists of a square which extends from A to B.

When this is decided, we are ready to represent our blocks of color, beginning at the upper-right-hand corner of the unit and working diagonally to the lower-left-hand end. Fig. 194.

Any one of the four heddle combinations may be chosen for the first block of color. Count the number of warp threads under the block. In this case there are eight. Suppose the first combination is 4-1; we then mark alternately on the lines representing the fourth and first heddles, using as many as will correspond to the number of warp threads needed.

According to principle 4, the next combination may be one that has in it the last number just used. In the diagram, the last number was 1, so the combination 1-2 must be used next. This is represented as before on the

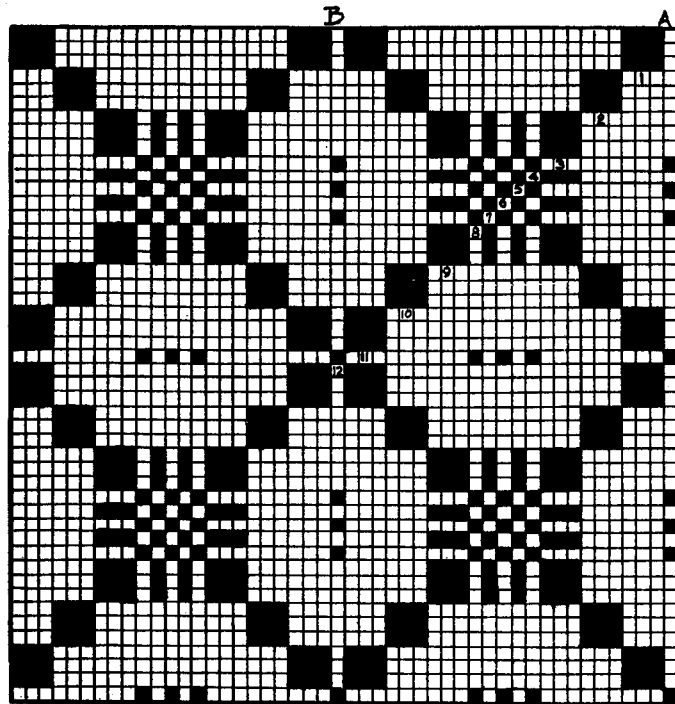


Fig. 193—Complete Pattern Repeated

lines representing those heddles, counting the 1 already there as the first number and using as many alternately, as there are to be warp threads under the second block of color—in this case 8.

Again according to principle four, the next combination (block 3) may be one that has in it the last num-

ber just used. In the diagram the last number was 2, so the combination 2-3 must be used next. This is represented as before on the lines representing those heddles, counting the 2 already there as the first number and using as many alternately, as there are to be warp threads under the third block of color—in this case 8.

Block 4 is the next to be considered.

This block may be one that has in it the last number just used. The last number was 3, so the combination 3-4 must be used next. This is represented as before on the lines representing those heddles, counting the 3 already there as the first number and using as many alternately as there are to be warp threads under the fourth block of color—in this case 4.

Block 5 is the next to be considered.

According to principle five, it is easily seen that block 5 is simply a repetition of block 3 and is represented by the combination 2-3. Here is the first difficulty. The last heddle used was 4, and our next block in order to be like the third, must be made with the combination 2-3. In order to have the last thread be the first in the next, 3 must be the last heddle used. This can be made right by adding another thread to the warp threads under the fourth block and putting it through the third heddle. We are then ready to use 3-2 two times, using the third heddle first.

Block 6 is to be next considered.

According to principle five, block 6 is on a line vertically and horizontally with block 4 and should be repre-

sented by the combination 3-4. In order to have the last thread the first in the next, 3 must be the last heddle used. This can be made right by adding another thread to the warp threads under the fifth block and putting it through the third heddle. We are then ready to use 3-4 two times.

Block 7 is to be next considered.

According to principle five, block 7 is on a line vertically and horizontally with block 5 and should be represented by the combination 3-2. The last thread used was 4. This can be made right by adding another thread to the warp threads under the sixth block and putting it through the third heddle. We are then ready to use 3-2 two times, using the third heddle first.

Block 8 is the same as blocks 6 and 4 and is represented by the combination 3-4. The last thread used in block 7 was 2. Another thread must now be added to the warp threads of block 7 and threaded through the third heddle. We are then ready to use 3-4 two times.

Block 9 is the same as block 3 and should be represented by the combination 2-3. Since the last thread of block 8 was four, it becomes necessary to add another warp thread to block 4 and thread it through the third heddle. We are then ready to use 3-2 eight times.

Block 10 is the same as block 2 and is represented by the combination 1-2. Since the last thread of block 9 was 2, we are ready to use 2-1 four times.

Block 11 is the same as block 1 and is represented by the combination 4-1. Since the last thread of block 10 was 1, we are ready to use 4-1 four times.

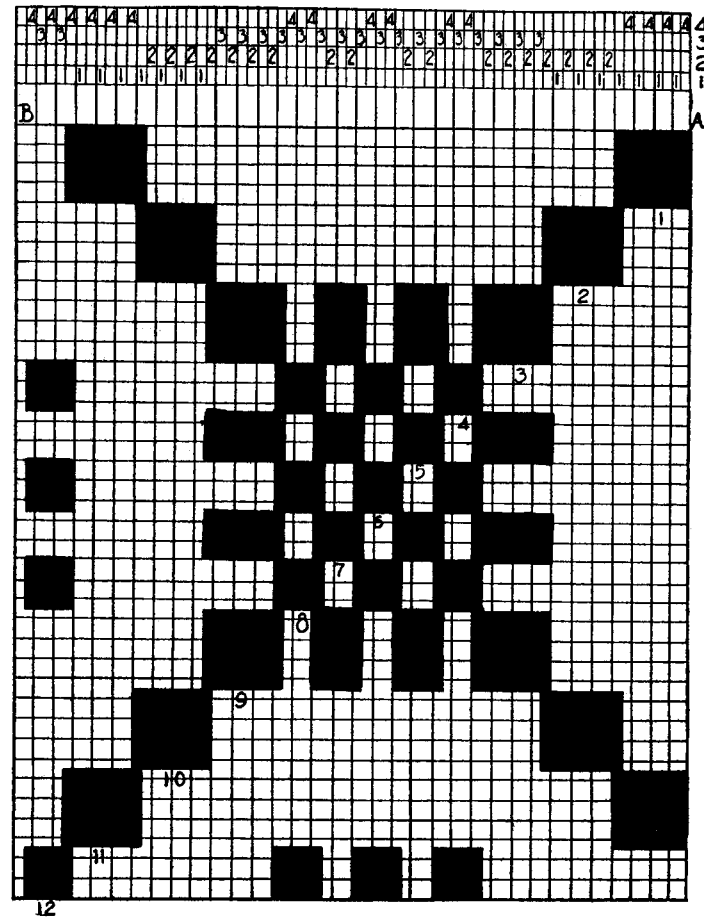


Fig. 194—Unit to be Analyzed

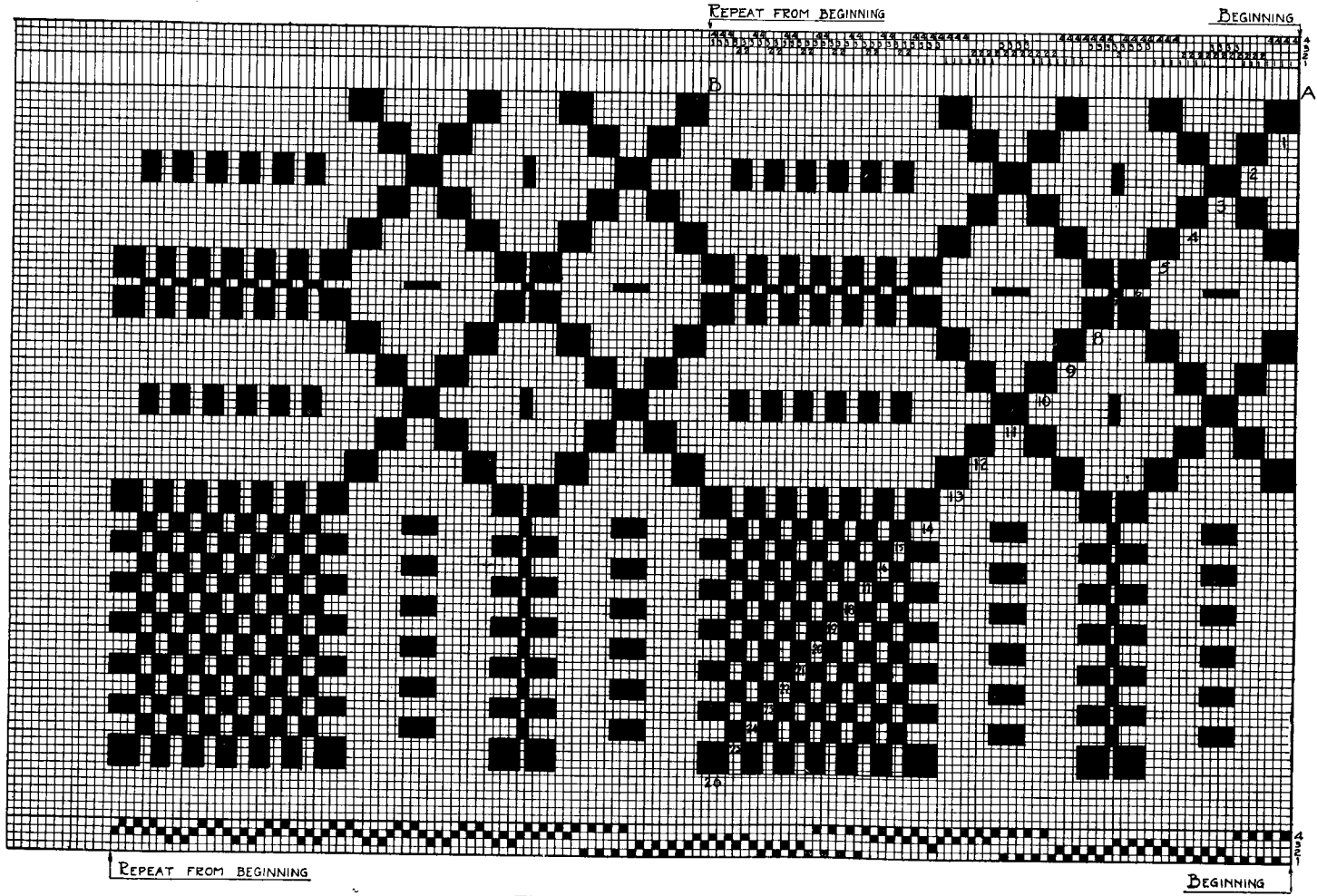


Fig. 195—A Pattern Analysis

Block 12 is the same as blocks 4, 6, and 8, and is represented by the combination 3-4. The last thread in block 11 was 4. We are ready to use the combination 4-3 two times.

The draft as written at the top of Fig. 194 when repeated several times makes a very interesting all-over pattern.

It will be observed that the draft ends with a "4". In repeating it the first "4" at the beginning must be omitted.

If both the last and first "4" are used it will bring two threads on the same heddle stick, thus causing two threads to go down or up, as the case may be.

Another Analysis

Always, before beginning any analysis, pick out of the pattern the unit of design which is repeated backward or over again to produce the all-over pattern.

Fig. 195 shows a more complicated pattern, consisting of two parts—a diamond and a square extending from A to B.

Number the blocks of color, beginning at the upper right-hand corner of the unit, diagonally to the lower left-hand end, as shown in Fig. 195.

Any one of the four heddle combinations may be chosen for the first block of color and for counting the number of warp threads under the block. In this case there are eight.

Suppose 4-1 is chosen for the first combination. This combination is then written as many times as will correspond to the number of warp threads needed, as shown above, block 1. (Fig. 195.)

Block No. 2 is represented by the combination 2-1.

Block No. 3 is represented by the combination 2-3

Block No. 4 is the same as number 2.

Block No. 5 is the same as number 1.

Block No. 6 is represented by the combination 3-4.

Block No. 7 is the same as block 3.

Block No. 8 is the same as block 6.

Block No. 9 is the same as block 1.

Block No. 10 is the same as block 2.

Block No. 11 is the same as block 3.

Block No. 12 is the same as block 4.

Block No. 13 is the same as block 1.

Block No. 14 is the same as block 6.

Block No. 15 is the same as block 3.

From here the blocks are the same as 6 and 3, alternately. It must always be remembered that all blocks in the same lines vertically and horizontally are represented by the same combination.

The draft at the top of Fig. 195 shows the combinations in figures. The draft below shows the same threading.

How to Block Out a Pattern From a Draft

Blocking a pattern from a given draft is no less interesting than making a draft from a woven piece of fabric.

Drafts may be had from various sources without the woven fabric.

It is a great satisfaction to the amateur weaver to be able to block out the draft at hand and thus know before the loom is threaded what sort of pattern a certain draft will look like when woven.



Fig. 196—Draft of Solomon's Delight

The draft shown in Fig. 196 is known as Solomon's Delight. To block out this draft, first secure a piece of paper ruled in one-eighth inch squares. Along the left edge write the draft as shown in Fig. 197. The first combination is 1-4. There are four threads in this combination, but as a matter of convenience only two threads are shown in Fig. 197. The 1-4 is written; the sign (") below indicates another 1-4. Each square represents a thread. The entire draft is written in this way. There is no objection to using the number of threads shown in the draft. This simply doubles the size of the blocks.

The draft is again written at the top of the checked paper. In Fig. 197 each vertical row of squares represents a warp thread.

To fill in the blocks as shown in Fig. 197 begin at the upper left-hand corner. The first combination at the left is 1-4, and the first combination at the top is 1-4. The four small squares are filled in with a colored pencil. Fol-

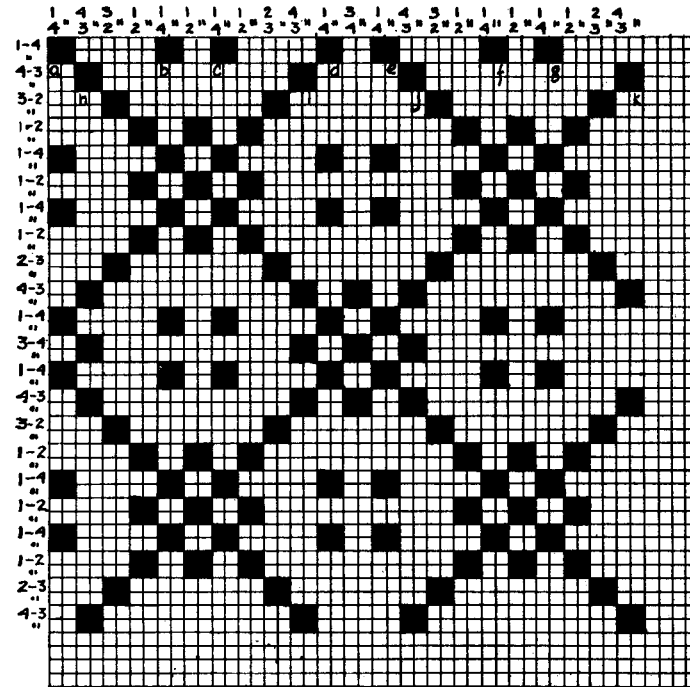


Fig. 197—Preliminary Blockout of Draft, Solomon's Delight

lowing across the paper each time that the combination 1-4 is reached a square is filled in as shown at a, b, c, d, e, f, and g.

The next combination at the left is 4-3 and the second combination at the top is 4-3. This means that where the

vertical and horizontal threads cross, the block is colored as shown at h, i, j, and k. In this way the entire pattern is blocked out on the squared paper and provides a means by which the weaver may get a good idea of the pattern without threading the entire loom.

It will be observed that the draft in Fig. 196 has been repeated along the left side and also across the top of the checked paper, in Fig. 197. This is done to give the weaver a better idea of the pattern.

Any four-harness draft may be worked out in this way and is a means of detecting mistakes so often made in copying drafts. Any mistake in a draft is easily found and may be made right by the one who is checking it over.

Another Method of Blocking Out Pattern

The method of Blocking out a pattern from a given draft, as described in the preceding paragraphs, gives a very good idea of what the pattern will look like when woven, but it is not the most exact method.

Figure 198 shows the result of the more exact method of blocking out the pattern, of Solomon's Delight, the draft of which is given in Figure 196.

Using squared paper and with the draft at hand, mark each vertical row of squares as representing one thread in the warp. Starting then with the first thread at the right hand end of the draft, mark the first vertical row of squares (starting from the right hand side of the squared paper) number "4" which represents a thread threaded through a heddle on the fourth heddle sticks. The second

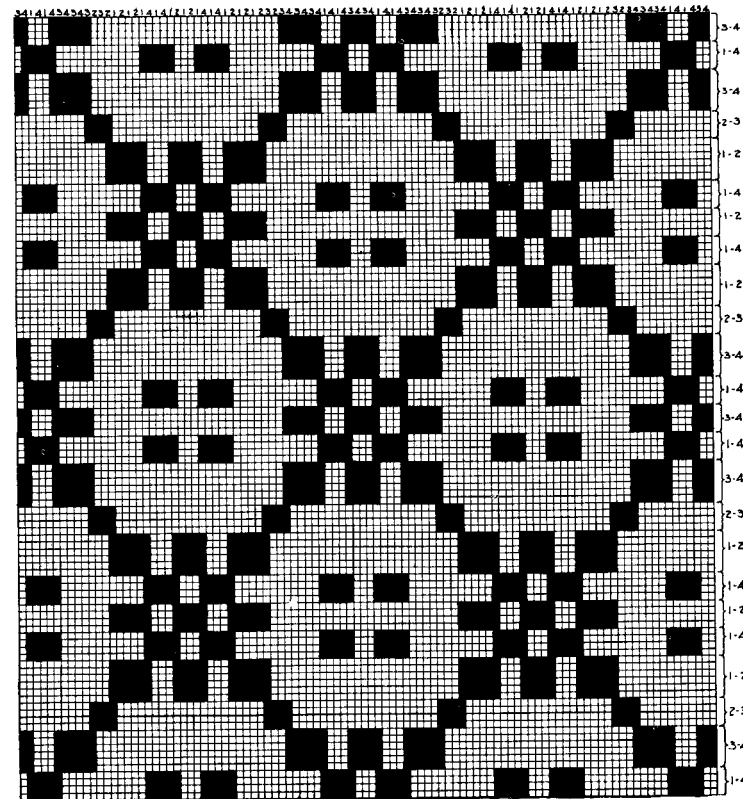


Fig. 198—Exact Method, Blockout of Draft. Solomon's Delight

thread in the draft is threaded through the third heddle sticks, so mark the second vertical row of square Number "3." Continue in this way until all the threads in the draft have been marked on the top edging of the squared paper, then repeat the pattern once more.

This completes the marking of the upper edge.

Going back to the beginning of the draft, we find the first combination to be three and four. There being three threads in this combination, mark off four horizontal rows of squares (on the right hand side of the squared paper beginning at the top) with a bracket and the Numbers "3-4." Now wherever two or more vertical rows of 3 and 4 are crossed by the combination "3-4," we will get a square or rectangle depending on the number of vertical rows of "3" and "4" that come together.

Referring back to the draft, the next combination is "1 and 4;" mark the combination underneath combination "3-4," enclosing four horizontal rows of squares in the bracket. Continue until pattern is complete as shown in Figure 198.

The foregoing directions apply only to patterns where the threading drafts are followed in the treadling, but often patterns are encountered, in the weaving of which, the threading drafts were not followed in the treadling. In the blocking out of such patterns, the threading draft is followed in marking the vertical rows of squares on the top edge of the squared paper, and it is not used further.

For marking the horizontal rows of squares on the right hand side of the squared paper, the treadling draft is used. The method of blocking out the squares and rectangles is the same as heretofore described.