MULTI-BLOCK TURNED SWIVEL.

We have explained the principle of the Turned Swivel in MW, No.16, page 10. Therefore we are not going to repeat the theory of the weave, advising however the reader to have a look at the article in question.

The first problem in multi-block weaving is to establish the number of blocks in our project, and then figure out the number of harness-frames needed. Here each different vertical line, as well as each different horizontal line count as a block. If two horizontal lines overlap one another - it is another block. If there is plain ground such as borders in tabby or spaces between figures in the vertical direction, this counts as a block also. To the total number of blocks we add one, and this gives us the number of frames.

For instance in fig.1 (page 5) we have two different vertical lines (1 and 2), and two horizontal ones (a and b). Besides these we have plain ground all around the woven piece. This makes 5 blocks in all (2+2+1), and therefore it can be woven on 6 frames.

In fig.2 there are 3 vertical blocks (each of them of two lines), and 3 horizontal ones. But there is also tabby ground around the borders and between the figures. Thus we have: 3+3+1 = 7 blocks, and they can be woven on 8 frames.

Fig.3 presents a new problem. There are two vertical lines, and two horizontal ones; no ground. Then 4 blocks so far. But what about the solid squares "a" and "b"? Are they vertical or horizontal? They could be made both ways i.e. the colour could be either in warp or weft, but it is much more convenient to weave them in weft. Since a square or a rectangle in swivel is nothing else but a repetition of a line, then we shall have not 2 but 4 horizontal lines and two vertical or 6 blocks, which require 7 frames.

So far our patterns had only independent lines, i.e. two lines going in the same direction did not overlap each other. But in fig.4 the blocks in weft overlap from "a" to "b", and the blocks in warp overlap from "c" to "d". What does this mean? Unfortunately it means an additional frame for the overlapping in weft, and an additional treadle for the overlapping in warp. The total number of blocks is: 2 lines in weft + 2 squares (also in weft) + 2 vertical lines + 1 overlapping + 1 ground = 8 blocks, or 9 frames.

Fig.5 has "only" two squares and two lines, but since the sides of the squares are made in a different colour than the square itself, we must count: 2 vertical lines, and 2 horizontal ones, plus 2 horizontal ones to make the squares, plus ground = 7 blocks in all, or 8 frames. If we eliminate the projections at each corner of the squares, the pattern can be woven on 6 frames.

Finally fig.6 has 3 vertical and 3 horizontal lines, which gives us 6 blocks, but there are two overlappings, and one block for the ground which makes in all 9 blocks or 10 frames.

The above examples should have convinced us that the apparent simplicity or complexity of a pattern is very misleading. Fig.6 looks

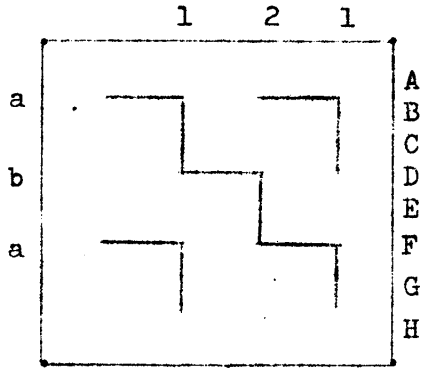


Fig.1

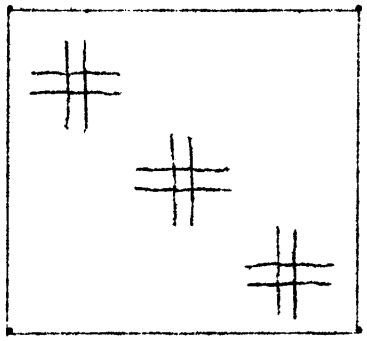


Fig.2

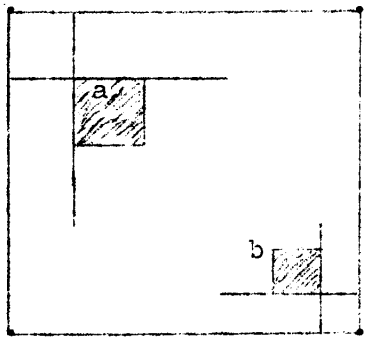


Fig.3

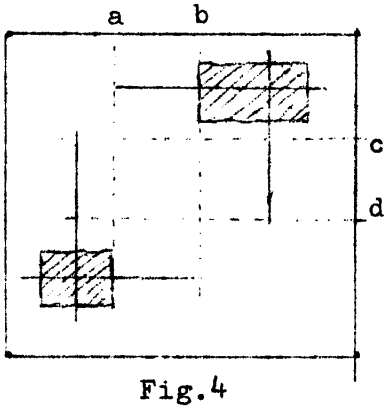


Fig.4

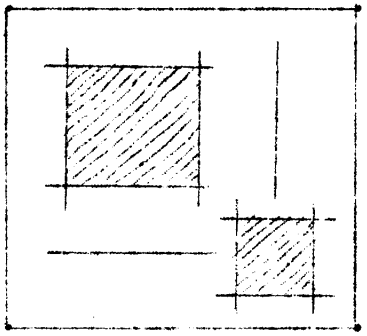


Fig.5

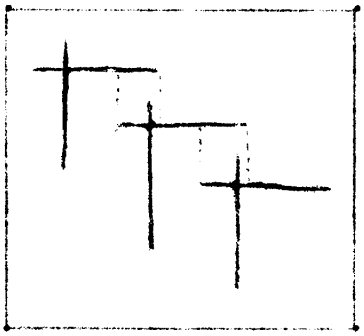


Fig.6

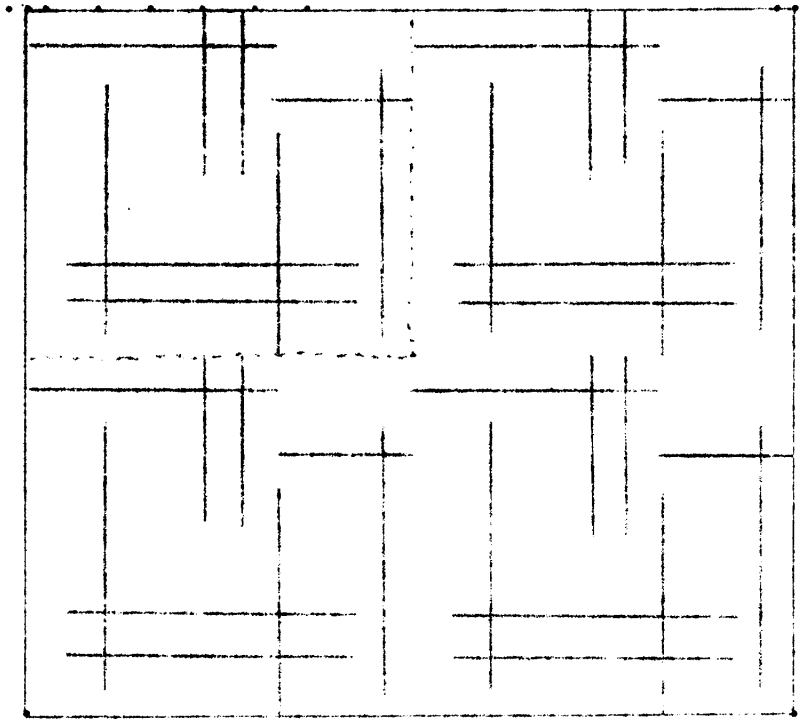


Fig.9

P A T T E R N S

in Multi-Block

Turned Swivel.

simpler than fig.1, but it requires 4 frames more.

Therefore, unless one wants to remember the rules about the number of vertical, plus the number of horizontal, plus overlappings, plus ground, plus one - the best way is to analise the pattern as explained in MW 3, page 1, or Vol.2 page 4. But it will help us here if in the profile we shall use a different symbol for the vertical lines since they contain only one thread, and not a whole unit of the weave. For instance the profile for the pattern in fig.1 will be as in fig.7, and it may be rearranged as in fig.8 to make it more practical for actual threading.

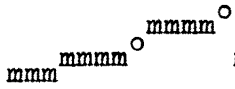


Fig.7

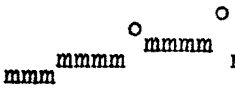
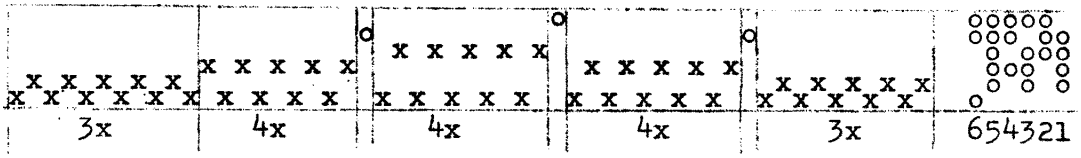


Fig.8

The threading draft developped from fig.8 will be then:



The most difficult part of the draft is the tie-up. To find it we must take into consideration all elements of the woven piece one after another. Thus we start with plain tabby in the ground (A, fig.1), but the coloured warp ends are not woven - they should remain underneath or on top of the fabric, whichever we like better. Let us suppose that all the floats in warp and weft will be left on top, and that we have a rising shed loom. Then our first tabby treadle (no.6 in the draft above) will be tied to frames: 1,5,6; and the second to: 2,3,4,5,6.

Then comes part B. It contains one shot of colour and two of tabby. The colour must correspond to the second line of the profile (frame No.3). Thus the pattern treadle (No.4) will be tied to the frames: 3,5,6, and the tabby treadles as before.

In part C we have tabby, but the colours in warp threaded on frame No.5 will weave also. The corresponding treadle No.3 will be tied to frames: 2,3,4,6, and used alternately with treadle No.6.

Part D has again only one shot of pattern weft, this time on frame 4. Then the treadle (No.2) must be tied to frames: 4,5,6. Tabby as in part B.

Part E is tabby with vertical line in colour on frame 6. Thus the treadle (NO.1) will be tied to frames: 2,3,4,5, and used alternately with treadle No.6.

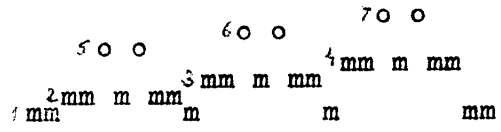
F is the same as B; G - the same as C; and H - the same as A.

The treadling is easy once the tie-up is figured out: A) 6,5 - 15 times; B) 4,6,5 - once; C) 6,3 - 20 times; D) 2,6,5 - once; E) 6,1 - 20 times; F) 4,6,5 - once; G) 6,3 - 20 times, H) 6,5 - 15 times. The shots of weft which are underscored are in colour.

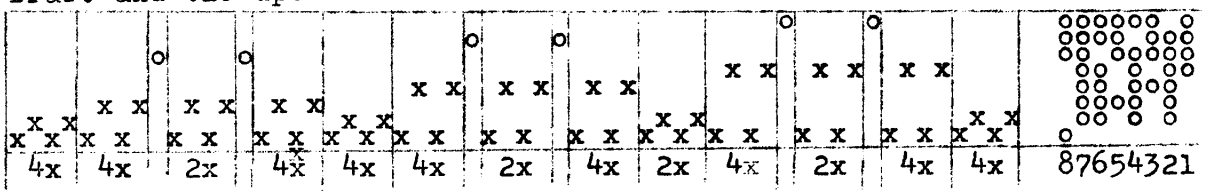
By the way, the sample will be rather small. To make it more practical in size we would have to double the number of warp-ends, and of picks of weft. As it is it is ideal for a smaple loom.

When figuring out the tie-up it is very important to realise which frames are rising and which are sinking in any particular shed. If in doubt the best thing is to experiment on a sample loom.

In the same way as described before, we shall find now the draft for the pattern in fig. 2. First the profile:

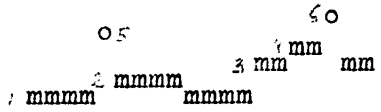


Draft and tie-up:

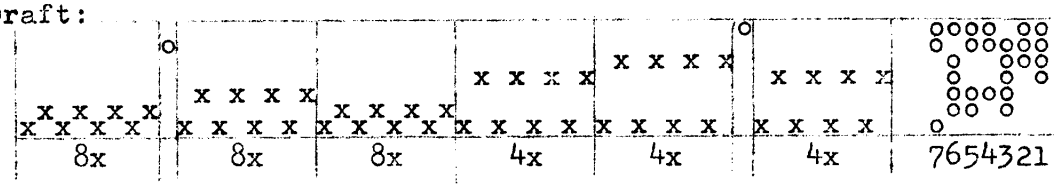


Treadling:
8,7 - 8x; 8,6 - 8x; 5,8,7 - once; 8,6 - 4x; 5,8,7 - once; 8,6 - 8x; 8,7 - 4x; 8,4 - 8x; 3,8,7 - once; 8,4 - 4x; 3,8,7 - once; 8,4 - 8x; 8,7 - 4x; 8,2 - 8x; 1,8,7 - once; 8,2 - 4x; 1,8,7 - once; 8,2 - 8x; 8,7 - 8x.

We shall take just one more example: the pattern on fig. 3.
Profile:



Draft:



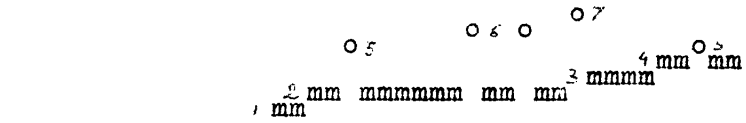
Treadling:
7,6 - 32x; 5,7,6 - once; 4,7,6 - 32x; 7,6 - 32x; 7,3 - 16x; 2,7,3 - 16x; 1,7,3 - once; 7,3 - 16x.

Since two colours are used here, treadles 1 and 5 will carry one of them (the darker), and treadles 2 and 4 - the other.

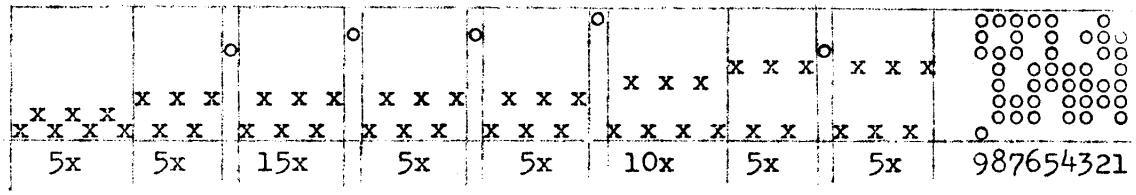
The above examples should be sufficient as an illustration of the method of finding out the tie-up and treadling. To understand them better, either small samples should be made, or a full scale draw-down on graph paper.

When making samples one should not limit oneself to the given treadling, but experiment as much as possible with all imaginable combinations of frames. The potentialities of multi-block turned swivel are quite high, and it would take a lifetime to explore all patterns which could be woven on one 8-frame threading.

Turned swivel may be very easily adapted to three-dimmensional weaving. All we have to do, is to replace the colours by very heavy yarn. In such a case patterns similar to figs: 3,4 and 5 should be avoided, because repeated shots of a very heavy weft would distort the texture of the fabric. The best are "crazy patterns" as in fig.9 (page 5). Such a pattern is quite easy to design, but one must be careful not to get involved into a too high number of frames. The pattern in fig.9 shows two repeats both in threading and treadling, and of course both will be repeated many more times in a practical project. The profile of this pattern is:



and the draft:



Treadling: 9,8 - 30x; 7,9,8 - once; 9,8 - 15x; 9,6 - 15x; 5,9,6 - once; 9,6 - 15x; 9,4 - 15x; 9,3 - 30x; 2,9,3 - once; 9,3 - 15x; 2,9,3 - once; 9,3 - 15x; 9,1 - 15x.

The contrast between let us say 16/2 cotton and candlewick may be not sufficient. We may try rug filler (e.g. 3 ply 1½). The colour of the heavy weft may be different from the ground, and several colours can be used, but the ground cannot be woven in stripes or squares. Colour patterns always kill the texture effect.

The technical difficulties of swivel weaving have been already described (MW 1/6, 5/5, 7/6, 11/5, 15/8 and 16/10) and we are not going to discuss them again. In the 3D weaving there is only one additional problem: how to thread and sley very heavy yarn? In threading cord heddles should be used for heavy warp ends. They can be tied on the loom exactly in the same way as correcting heddles. As far as the reed is concerned we must use very low numbers (e.g. No.8 reed for 32 ends per inch). We may also use a finer reed and slightly open the dents which carry heavy yarn, but it may be difficult to straighten them out later on

What is very important in case of turned swivel whether plain or 3D, is the sleying. The natural tendency is to leave more space in the reed for the heavy yarn, when actually we do not leave any space at all. The ground warp should be sleyed evenly, 2, 3, or 4 ends per dent, and the colour or heavy ends added in the same dents which already carry the ground. Otherwise we would have empty spaces whenever a block of pattern in warp is not woven.

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