

MASTER

WEAVER

BI-MONTHLY BULLETIN FOR HANDWEAVERS

HANDICRAFTS

SEPTEMBER 1953

FULFORD • QUEBEC • CANADA

A NEW ATTACHMENT WHICH MAKES
A DRAW-LOOM FROM ANY "LECLERC" COUNTERBALANCED LOOM

PATTERN HARNESS.

The Pattern Harness is placed in front of the heddle-frames, and operates on the same principle as a double-harness draw-loom. It has several dozen pattern heddles (the exact number depends on the size of the loom) which can be used individually. It can produce patterns with as many as one hundred blocks. The pattern harness does not interfere with the normal operation of the loom, even when the pattern is already selected.

The following weaves can be used with our Pattern Harness:

1. Dropped Tabby (Paper Spots),
2. Dropped Twill (2:1, or 3:1),
3. Plain Spot Weave,
4. All Over Spot,
5. Lace,
6. Swivel,
7. Embroidery Weaves,
8. Pattern Twills combined with Dropped Weaves.

In most cases the threading is very simple. The weave depends on the tie-up and treadling, and the pattern is selected as the weaving proceeds, and does not need to be figured out in advance.

For further information and prices write to us or to our agents.

NILUS LECLERC INC.



L'ISLET STATION, QUE.
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MASTER WEAVER

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September, 1953

No. 11

PROBLEMS IN TEACHING

WORKSHOPS

What we call "workshop" in teaching, is a form of condensed instruction given by one (or more) weaver to a small group. It is usually of a very short duration - few days to two weeks. Its program contains three factors: theory in form of lectures, demonstration of weaving techniques, and supervised work of the students. The latter contains both theoretical and practical problems.

The success of a workshop depends both on the lecturer and on the organizers. Even the best instructor cannot do much if the workshop has not been well prepared, and vice versa.

The first step in planning is to decide on the subject or subjects. This is done by discussing the program with the weavers who would like to take part in it. Note all the suggestions and requests, and then eliminate all but a few in which everybody seems to be interested. Then check whether you have necessary equipment for the chosen subjects. If not try again. If the list of subjects is too long, the workshop is doomed from the very beginning to be a failure. The lecturer should resist all attempts to cram a lot of material into a short time. Unfortunately there are no rules as to the choice of subjects, except that if possible the different topics should be somehow connected one with another, and that the theory should find application to the practical problems taken during the same session.

Supposing that the workshop has two meetings of two hours each - a day, one hour may be taken by a lecture, if possible illustrated with samples, slides etc. Another hour is reserved for demonstrations of weaving operations. For the remaining two hours the students do the weaving, warping, or theoretical problems, when the instructor supervises their work, discusses the mistakes, and points out better methods of work.

An ideal group for a workshop would be composed of of students of about the same level, as far as their knowledge of weaving is concerned. If such a selection of students is impossible, the sub-

jects chosen should be adapted to the weakest members of the group, never to the most advanced.

Whatever the level, the students should be advised to get all information available on the subjects of work well before the workshop starts. If a discussion meeting can be arranged a week or so before the workshop, it may help quite a lot. In any case the students must be requested to bring to the workshop note-books graph-paper, etc., and to make notes not only during the lectures, but during the demonstrations and their own work as well. This precaution may seem to be superfluous, but it is not.

Once the program of work is made, it is transmitted to the instructor, who supplies the group with data for setting up the looms, and with the list of equipment which he may need for demonstrations.

Now the organizers must secure as large a number of looms as possible, even if it means one loom per student plus a few for demonstrations. One loom per two students is a minimum.

It does not matter so much what kind of looms we use, provided that they have sufficient number of heddle-frames, and treadles for the projects discussed. The only exceptions are looms for demonstrations. These should be of the best quality and best adapted for the weaves demonstrated. For 4-frame weaves, counter-balanced looms are best. If the tie-up is unbalanced (not the same number of frames tied to each treadle) they should be provided with shed regulators. For higher number of frames the double-tie-up jack type is the best. As a second choice: plain single tie-up of sturdy construction (not a folding model). Table looms, portable models and so on, are entirely unsuitable for this purposes

The looms should be threaded well in advance according to the instructions given by the lecturer, tied-up, and checked. The length of warps should be sufficient for each member of the group to make a sample of each weave.

If the subjects of the workshop involve warping, there should be at least enough warping equipment for demonstrations. Horizontal warping reel, and a warping frame, bobbin rack, or stand are the minimum, but it would be better to have a warping mill and sectional warping equipment as well.

In all cases for all kind of lectures or demonstrations there must be a rather large blackboard. It helps if one side of the blackboard has permanently marked vertical and horizontal divisions.

From now on the success of the workshop depends on the lecturer. After the workshop is over it would be advisable to have another discussion meeting for the whole group, to compare notes. If there has not been enough time during the shop to make all the samples - this could be arranged in the days following the course.

WHAT TO DO WITH TOO MANY FRAMES?

By "too many frames" we mean more than the weaver really needs. There are many photographers who buy expensive cameras convinced, that they will make better pictures that way. There are many weavers, who buy multi-harness looms to become "advanced". Then they often discover that they are stuck, and that they cannot use more than four frames anyhow.

On the other hand there are very advanced weavers who had never worked with more than 4 frames, and some only with two.

Then what are the multiharness looms for? How many frames one should have and use? What can be done with a small number of frames?

The last question is the easiest to answer, and it partly covers the other two. Here is the list of weaves which can be produced on two frames: 1. Tabby, 2. Colour patterns in tabby (see MW 5), 3. Stripes and plaids, 4. Basket, 5. Corded fabrics (two-block patterns in rep weave), 6) Turned-rep (two-block patterns in weft), alone or in combination with 5, 7. Locked Weft (Clasped Wefts - MW 4), 8. Chenille rugs (twice woven), 9. Texture weaves, 10. Nearly all free weaves, tapestry, knotted rugs, etc., 11. Lappet Weave.

Two heddle-frames plus a pattern harness hung in front (MW.7) give such additional weaves as: 1. Paper Spots, 2. Plain Spot Weave, 3. All-Over Spot, 4. Lace, 5. Swivel, 6. Embroidery Weave (Dukagang).

We can skip the three frames, since there are practically no looms on the market so equipped. But the list of weaves which can be done on four frames is too long to be printed here. It may take a lifetime to explore all the possibilities of a four-frame loom. Just to mention a few techniques not usually associated with 4 frames: turned overshot (borders on all sides), dropped tabby (plain and turned), single block summer-and-winter, turned lace (both spot, and huck), three-colour swivel, patterns in velvet weave, crossed warp (pickets and riddles), two-block patterns in stitched double weave, cannelé (diagonal floats), quilt weaves.

Then what weaves require more than 4 frames?

The only basic weave which cannot be woven on 4 frames is satin (the nearest to it is satinet or broken 1:3 twill). The simplest satin can be done on 5 frames, but 2 or 3 more frames will be required for selvages, which makes it an 8 frame weave.

Turned twills (dimity, dornick, damask) require at least 6 frames (turned 1:2 twill), 8 for dornick, 10 for damask. For more than two block patterns we shall have 9, 12, 15 and even more frames.

Double Weaves proper (i.e. with at least a two-block pattern) need 8 frames for plain tabby, and 12 for the simplest twill.

Quilt weaves with pattern in stitching can be woven on 6 or more heddle-frames.

Compound weaves, or rather compound drafts require quite a number of frames, sometimes astonishingly large number. Such a combination as tabby and satin woven in horizontal stripes asks for 10 frames, and if the stripes go in both directions - 12 frames.

Then all simple pattern weaves ask for more frames if the pattern becomes more involved. Thus diamond twill, overshot, summer-and-winter, swivel, spot-lace, huck-lace, plain spot, and paper-spot weaves can be woven on any number of frames.

Thus any of the above mentioned weaves is a solution of our problem. However if, as we supposed at the start, the weaver is not very experienced, and couldnot design fabrics in technically difficult weaves such as double cloth, satins, damasks, there is still the last described group of simple pattern weaves with a large number of blocks - which are comparatively easy to make.

When in the "higher" weaves the success depends not only on the proper drafting, but as well on the proper selection of yarn, sett of warp, number of reed etc, with simple pattern weaves the only difficulty is in drafting. Other factors remain the same whether we make a two-block or a ten-block pattern. Thus anybody who can weave and understand summer-and-winter woven on 4 frames, can do the same with 8 frames. The "difficulty" in drafting is usually limited to the tie-up, which only too often requires too many treadles. The direct tie-up is not always the answer, and the only solution is the combination of direct and compound tie-ups.

The pattern weaves which are the easiest to weave, even with a large number of frames are: crackle on S+W threadings, all kinds of spot weaves, swivel, huckaback and its derivates, overshot (plain and on opposites), and pattern twills.

We shall give one example of each of these weaves for an eight-frame loom with 10 treadles.

Summer-and-Winter woven as crackle requires only one treadle per block of pattern, or combination of blocks. Fig.1 shows an example of pattern which can be woven on 8 frames and 8 treadles.

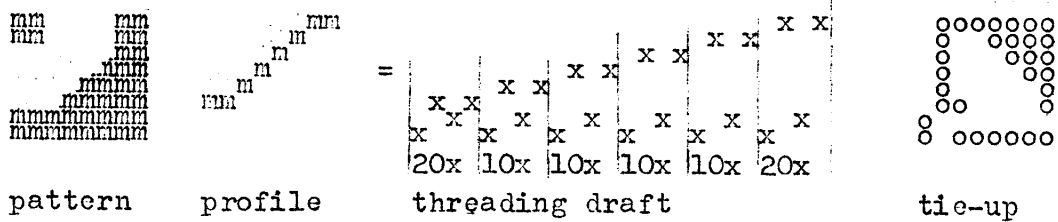


Fig.1

Plain Spot Weave will give a similar effect to multiblock crackle and may even have the same length of floats. The number of blocks will be one more than in the former case, but the blocks cannot be combined (fig.2) into larger ones except by skipping one block between each two to be woven simultaneously. For instance we can weave 1+3 or 4+6, or even 3+5+7.

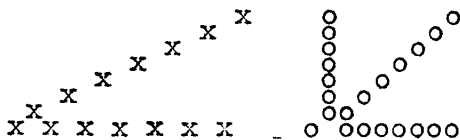


Fig.2

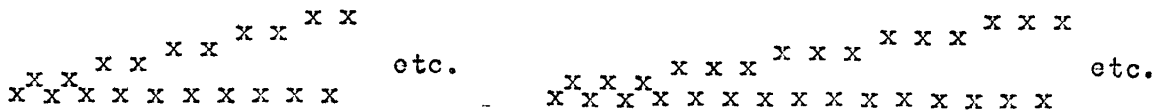


Fig.3

The same tie-up as in fig.2 can be used for floats of 5 or 7 (fig.3) Combinations of floats of different length may be used in the same piece of weaving (fig.4), and 2 or 3 blocks may be woven simultaneously on the condition that they do not overlap (fig.5).

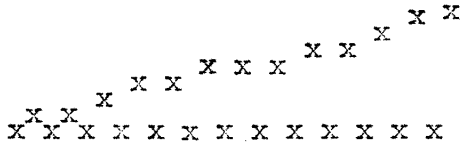


Fig.4

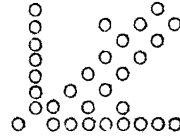


Fig.5

Spot weave with tabby in the borders or between blocks of pattern requires two frames for the ground, and consequently gives only 6 blocks of pattern on 8 frames. The blocks can be combined here without any restrictions. Again the floats can be of any reasonable length, and the pattern can be either in spots (fig.6), cover the whole fabric (all-over spots), or give the lace effect by repetition of blocks (fig.7).

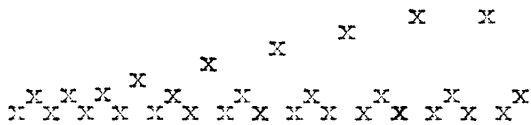


Fig.6

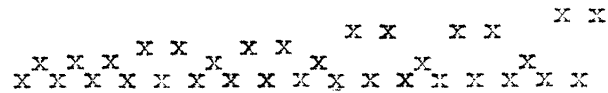


Fig.7

Paper Spots will give only 3 blocks of pattern on 8 frames (compare the article on Dropped Weaves in the 10th issue of MW). An example of this weave is shown in fig.8.

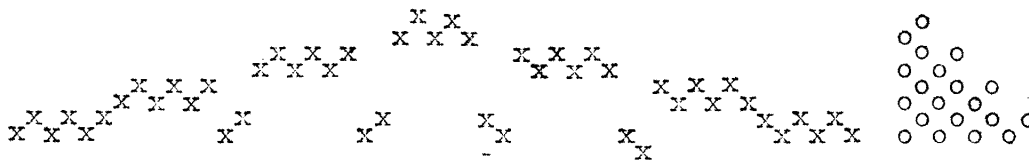


Fig.8

Swivel belongs to the same group of weaves (see MW No.1 "Spot Weaves"). It will give 6 blocks of pattern plus ground with 8 frames. The blocks can be combined (fig.9).

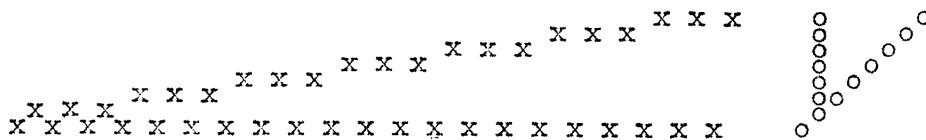


Fig.9

Huckaback takes two frames for the ground, and two for each block of pattern. The same draft with different tie-ups will give either plain huck, or huck-lace. For other derivatives of huck additional two frames will be required. The draft in fig.10 is for 10x10 huckback, but the same tie-up may be used for 6x6 or 14x14 huckaback.

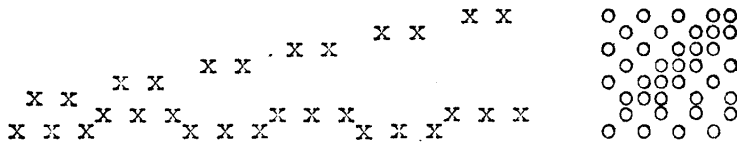


Fig.10

Overshot will give 8 blocks with 8 frames, or only 4 blocks if the draft is written on opposits. In both cases there is a problem how to avoid long floats on the back of the fabric. These must be stitched to the fabric by additional ties (see fig.11, and 12).

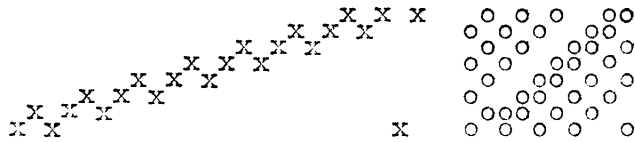


Fig.11.

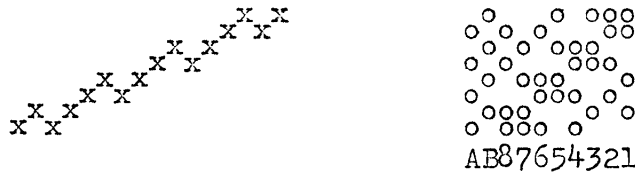


Fig.12

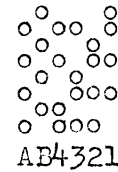


Fig.13

AB87654321

AB4321

In fig.12 treadles 1 and 2, 3 and 4, 5 and 6, 7 and 8 weave the same blocks, but they should be alternated to avoid diagonals in the half tones. So the treadling would be: 1212343456567878 with the binder on A and B between the shots of pattern. This principle cannot be applied to fig.11 without using as many treadles as 18. If the shadows in the background are not particularly objectionable a simpler tie-up shown in fig.13 can be used.

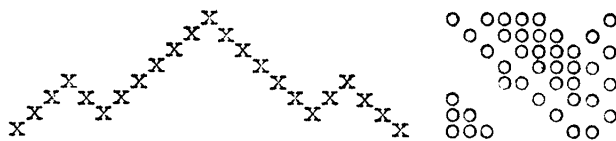


Fig.14

Diamond Twills, or fancy, or pattern twills are not difficult to weave and even to design, if they are woven with a binder. Otherwise the designing is not easy at all, since the properties of the fabric depend on the pattern used.

It is not enough to avoid long floats in the pattern. Even reasonably short floats of different length may produce uneven tension in warp, and thus wrinkles or crêpe effect. Binder helps to get a more uniform texture. Eight block twills can be woven on 8 frames, and 10 treadles (Fig.14).

If we limit our first experiments to the weaves described above, and thus get familiar with a multi-harness loom, we shall find it much easier later on to work with "higher" weaves, which could not be produced on a smaller number of frames.

DOUBLE WEAVES

MULTI - BLOCK PATTERNS

With a large number of heddle-frames any pattern can be woven in double weaves provided that we have a sufficient number of treadles.

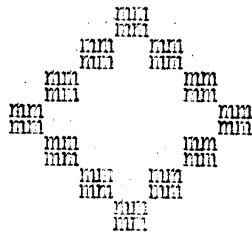


Fig. 1

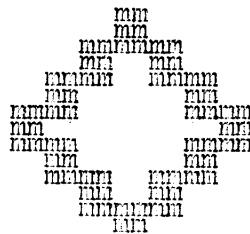


Fig. 2

For instance a four-block pattern in fig. 1 can be woven on 16 frames, and 16 treadles but if the blocks are combined as in fig. 2, the number of treadles becomes too high to be practical (28).

Even a direct tie-up won't help very much,

because of the number of treadles which have to be used simultaneously. This is why even comparatively simple patterns in double weaves must be woven either on a loom with a double harness, or with a jacquard or dobby machine to operate the frames.

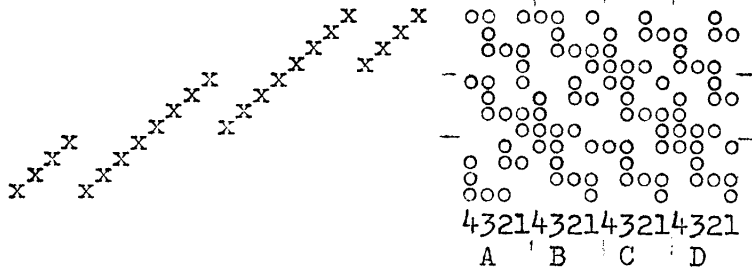


Fig. 3

About the only patterns which can be woven with ordinary equipment are the three-block ones. These will call for 12 frames and 16 treadles, which is practically the highest number which can be operated without machinery. The draft in fig. 3 will give each

block of pattern separately (groups of treadles A, B, C) and one combination of blocks (group D).

The threading drafts as well as the tie-ups for double weaves are really very simple, but they take a lot of space, and time when drawn in full. Consequently we use nearly always short drafts or profiles for threading, and short drafts for the tie-ups. In profiles one square corresponds to one unit of the weave, and in short tie-up drafts one "o" - to a tie-up for a four frame double weave, when the empty spaces are the reversed tie-up. Thus the full draft in fig. 3 will have as its corresponding short draft the one in fig. 4.

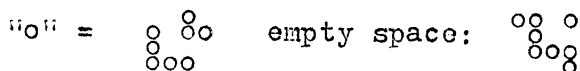
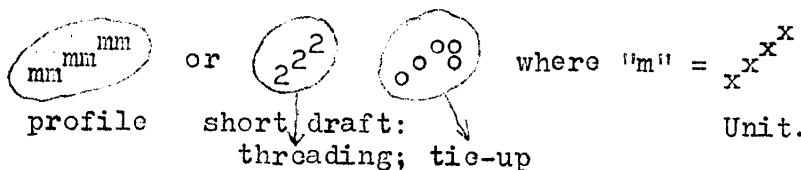


Fig. 4.

The tie-up on fig.3 does not look very clear. This is because the heddle-frames are rearranged for easier threading. If we change the draft so that the frames which weave one layer of the fabric will be kept together, the tie-up becomes much easier to understand. To make the draft still clearer we marked in fig.5 the two colours in the warp: one with "x", the other with "m". One position of the layers ("x" on top) has then the usual tie-up (fig.5 A), and the other its reverse (fig.5 B).

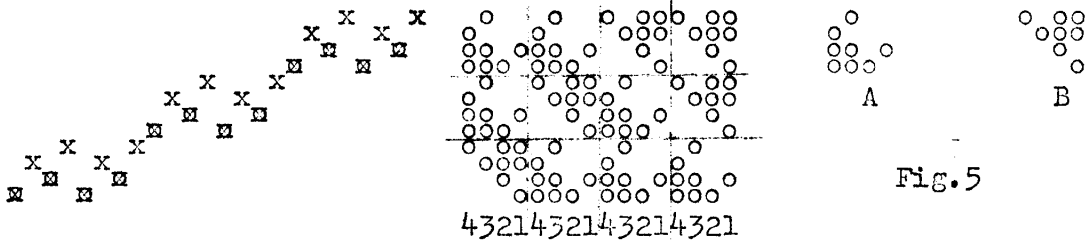


Fig.5

The treadling in the first case (fig.3) would be 4321 for each block of the pattern - one colour on 4 and 2, and another on 3 and 1. In the second case (fig.5) it is 4231, which is more convenient because the feet are used alternately. Here one colour of weft is used on treadles 1 and 2, and the other on 3 and 4.

Any project for patterns in double weave must start with the profile. This is made from the drawdown of the pattern as in fig.6.

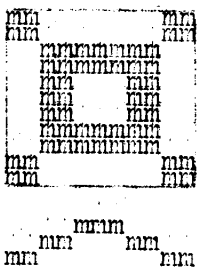


Fig.6

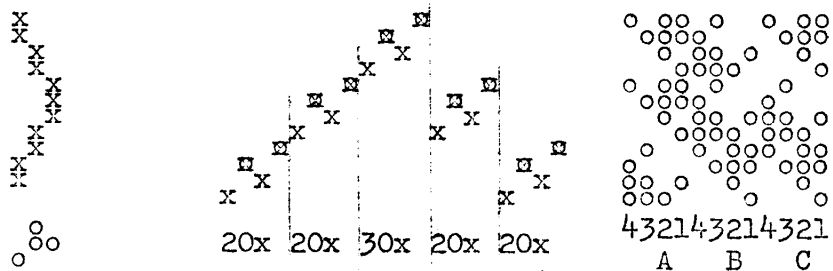


Fig.7

At the same time we get short treadling draft, and short tie-up draft (compare "Analysis of Patterns" MW 3), which is absolutely necessary to develop later into the full tie-up draft.

The next step is to figure out the warp, which will give us the number of ends per one square of the profile. Our profile has 11 squares, and each square has to have an even number of repeats of four. If our warp will have 440 ends, each square will have 10 repeats or 40 ends.

The full threading draft may be drawn either as in fig.3, or as in fig.5. In the second case each "m" of the profile is replaced

with 10 repeats of: $\begin{matrix} x & x \\ m & m \end{matrix}$ which gives us the draft on fig.7.

The treadling will be: 20 times A (4231), 20 times B (4231), 30 times C (4231), 20 times B (4231), and 20 times A (4231). In all blocks the treadles 4 and 3 will carry one colour, and the treadles 2 and 1, another colour.

Before threading the draft may be rearranged, so that the

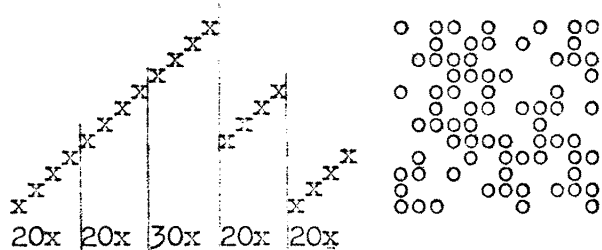


Fig.8

heddles will be threaded in a continuous way (fig.8). One must be very careful with the new tie-up. When any frame in the threading draft is moved to a new position, all the ties lying in line with the frame must be moved as well. The treadling with the new tie-up remains the same as before.

So far we discussed only double weave woven in tabby. In theory both layers can be woven in any weave: twill, satin, or pattern weave. In practice only the simplest twills are satisfactory, because of the number of frames they require.

The simplest twill 1:2 or 2:1 requires 12 frames for two block patterns. Here we have a choice of weaving both sides in 1:2 twill (tie-up A, fig.9), or both sides in 2:1 twill (tie-up B), or one side in 1:2 and the other in 2:1 twill (tie-up C).

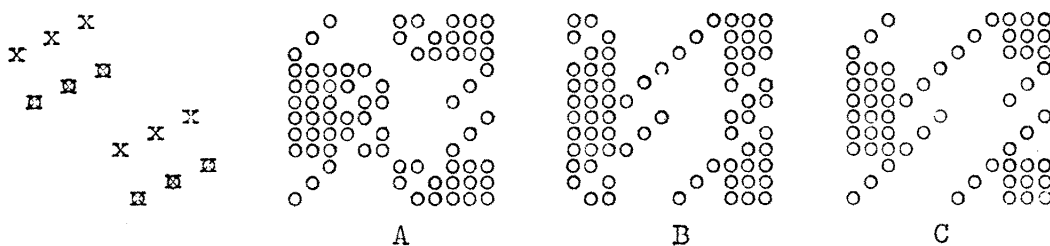


Fig.9

Each of the above tie-ups is composed of 4 "units" of ties. Unit "a" in fig.10 gives two layers of one block, both in 1:2 twill.

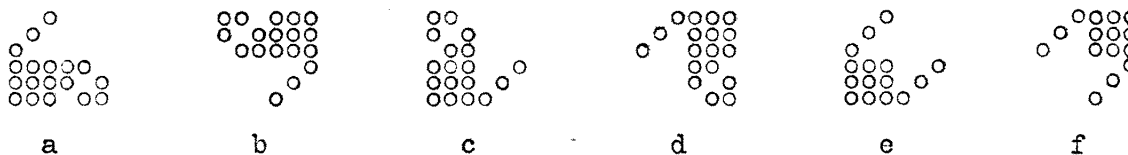


Fig.10

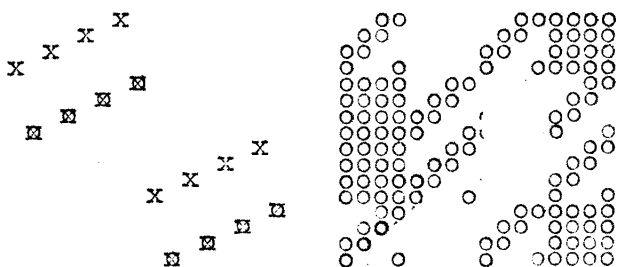


Fig.11

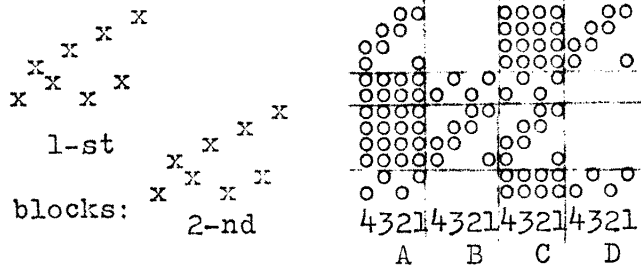
"b" is weaving the second block in the same way. Unit "c" produces 2:1 twill for one block, and "d" for the other. Finally unit "e" weaves one layer in 2:1 and the other in 1:2 twill, when "f" is its companion for the other block.

All these units can be combined in one tie-up and even more variety can be achieved. For instance on the same side of the fabric one block can be woven in 1:2 and the other in 2:1 twill. Then the direction of

the diagonal can be changed as well, thus producing the effect of a turned twill, and of the double weave at the same time.

We shall have still more possibilities with a 1:3, 2:2, or 3:1 twill. Individual blocks can be woven in any of them, as biased or broken twill. Fig.11 shows an example of 2:2 twill with all diagonals going in the same direction.

Still another class of pattern double weaving has one block woven in an entirely different weave than the other. For instance one block in twill, the other in tabby, when underneath the order is reversed.

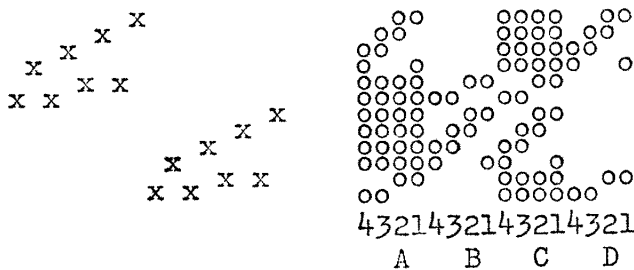


In fig.12 heddle-frames 1, 2, 7, and 8 are threaded for tabby, the remaining ones for twill. Groups of treadles A and B (used alternately) give in the first block: twill in the upper layer and tabby in the lower layer, when the second block has tabby on top, and twill underneath.

Fig.12

Groups C and D give just the opposite: tabby on top in the first, and twill on top in the second block.

Basket and twill are very similar in drafting to tabby and twill



With identical treadling we shall get in fig.13 basket where we had tabby in fig.12. On the other hand if we change the treadling let us say for one giving broken twill, we will not get either tabby in fig.12 or basket in fig.13.

Fig.13

and 1:2 or 2:1 twill cannot be woven on less than 24 treadles (only 10 frames) unless two treadles are used at the same time, as in fig. 14.

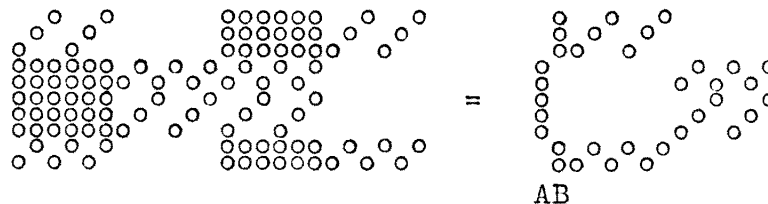


Fig.14

Pressing at the same time treadle A or B and one of the other treadles we can get all combinations of ties necessary.

DOUBLE TIE-UP LOOM

New ideas in loom construction.

To be quite frank, the ideas we are going to suggest are not new at all. Some of them are centuries old. But for some reason or other they have never been (as far as we know) all used in one loom.

The loom we are trying to design is not going to be a universal one, but as close to perfection as we can make it. Its purpose is to satisfy an advanced amateur weaver, who would like to experiment with a variety of weaves, but who occasionally will have to produce a larger quantity of a fabric. We want the loom to be comfortable, and light in operation, easy to set up and to work with.

To satisfy these requirements we decided on the following characteristics:

1. Double tie-up, so as to have good sheds with all possible tie-ups. But we do not want to have adjustable ties.
2. Floating lamms - so that the whole space under the loom can be taken by treadles, and that all treadles will require the same pressure to open a shed.
3. Friction brakes on both warp- and clothbeams.
4. The cloth beam moved to the back of the loom, so that there will be more room in the front, both for making the tie-up and for weaving.
5. The warp beam placed on top of the loom.
6. Built-in raddle.
7. Very light heddle-frames.

Each of these items presents a problem or problems and we shall take them up one after another.

1. Double tie-up means two sets of lamms. In ordinary looms they are made in two sizes: short for sinking shed, and long for rising shed, and they are placed in two rows one above another. Then the ties must be of different length too. We shall place all lamms side by side, so that all ties will be of the same length, and the only adjustment takes place when the loom is assembled. But when the lamms are side by side, they require more space in depth of the loom instead of height. This is why our loom cannot have too many frames. Ten or twelve will be about the limit. Otherwise the space taken by the lamms (which cannot be too thin) would be too large.

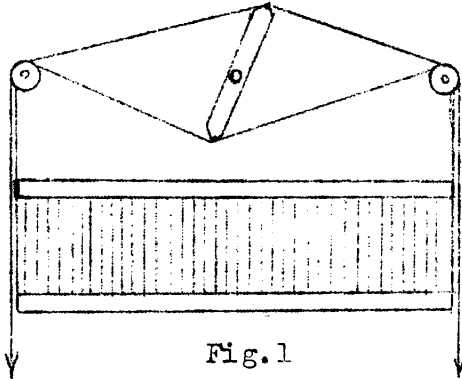
2. The loom we design is going to be built by an amateur, so it cannot contain complicated parts in cast iron. This is why we have chosen a rather involved method of moving the frames. This method does not require any special parts - everything can be bought in a hardware store or made at home.

The lamms "float" i.e. they are not hinged, but keep always a horizontal position, regardless of where they are attached to a treadle. The arrangement of levers and pulbys which make them do it is shown in fig.1. It keeps level not only the lamms but the heddle-frames as well.

3. One friction brake is quite enough to regulate the tension of the warp, but since a brake of this kind is cheaper than a ratchet wheel, we shall use this kind of brake on both beams.

4. The advantage of having the cloth beam at the back is three-fold. First the weaver can sit closer to the loom without hitting the cloth beam with his knees when working. Second, the tying-up is much easier. Third, even a very bulky fabric can be woven in large quantities, since there is plenty of room around the beam.

However moving the beam to the back is possible only when there is enough space between the frames and the lamms. The treadles could be tied directly to the frames (for the sinking shed) if not for this space needed by the cloth.

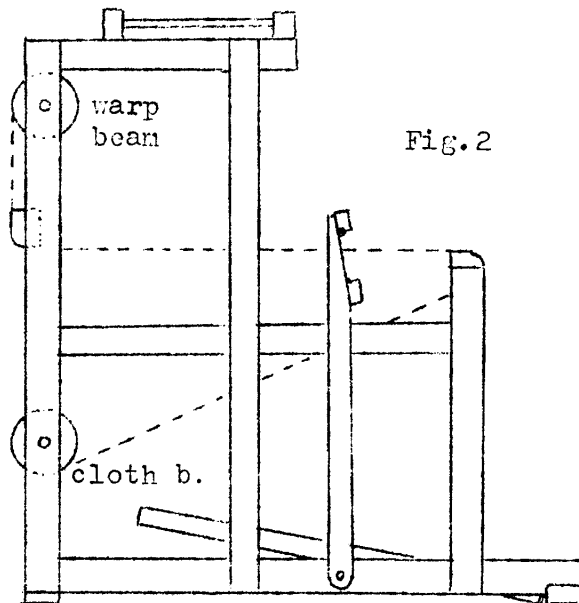


5. The warp beam then is in the back of the loom, but above the warp instead of being below it. This arrangement does not present any particular advantage except that it leaves room for the cloth beam.

6. The raddle is built into the slabstock, which by the way is mounted upside-down. There is no need to remove the raddle at the end of a warp, because the distance between the last frame and the back of the loom is much shorter than usual. The lease rods are removed after threading the loom.

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7. It is very important to have all the moving parts of the loom as light as possible. Consequently we decided upon cord heddles, and soft-wood frames with hardly any hardware in them.



For the same reason we make the treadles of very light wood (white cedar in our case).

Fig. 2 shows the side view of the loom frame, with the batten, treadles, and both beams in place but without heddle frames.

In the coming issue of Master Weaver we shall give more information about the making of parts and assembling them. However there will be enough left to the ingenuity of the constructor to make the work interesting.
