MASTER WEAVER

BI-MONTHLY BULLETIN FOR HANDWEAVERS

JANUARY · 1953

FULFORD · QUEBEC · CANADA

No.:

Draft by:

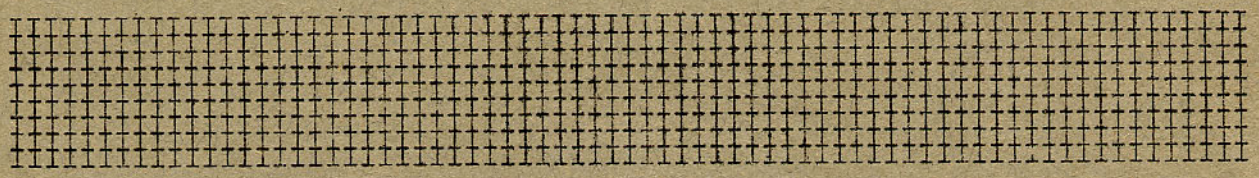
Weave:

Woven by:

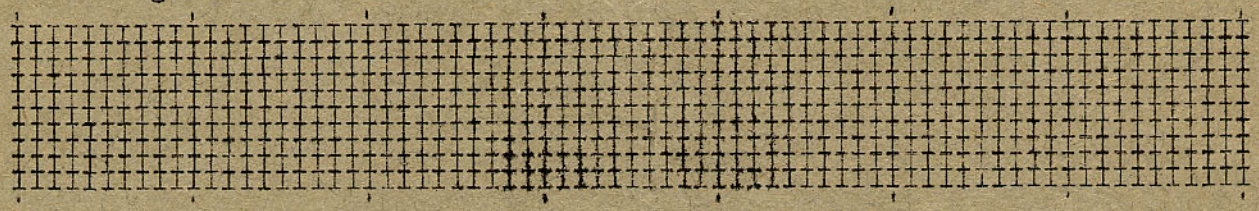
Pattern:

Date:

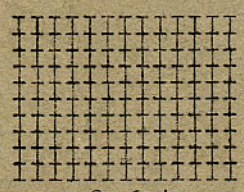
Short draft. Profile. Short tie-up.



Threading Draft:



Tie-Up Draft: Treadling:



12 10 8 6 4 2
11 9 7 5 3 1

SAMPLE:

Warp:
- sett:
- reed No.:
- sleying:
- No. of ends:
- width in reed:
- yarn:

Weft:
- picks per inch:
- yarn:

Finishing:

Remarks:

MASTER WEAVER

Z - HANDICRAFTS • FULFORD • QUEBEC • CANADA •

January, 1953 No.7

DOUBLE WEAVES

Circular and Double-Width Cloth.

In the last issue of the Master Weaver we have discussed the drafts for Double Weaves and for the time being we shall not return to this subject. We shall try now to translate the drafting or the theory of double weaves into practical operations.

We propose to take up different weaves in the following order: circular, double-width, double face, stitched layers, and patterns in double weaving.

Circular cloth. This particular weave presents very few problems, but on the other hand is very seldom used by the hobbyist. The only practical application it could find, would be seamless cushion covers, handbags etc. But since it takes much longer to weave such fabrics than to make the necessary seams, and since the said seams are not objectionable, the technique is rather pointless. Still here it is:

Supposing that we should like to have a cushion without any seams, stitching, or hemming, woven in 1:2 twill with a diamond pattern, we can use the draft on fig.1

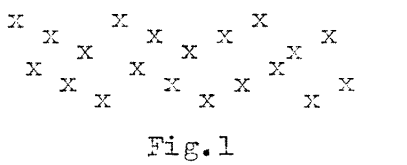


Fig.1

We start with an inch or so of tabby (treadles 1 and 2), then weave the pattern on both sides, for instance:

3647583647584736584 7

then leave about 3 inches of warp to be tied into fringe. The tying should be done on the loom: groups of warp ends are cut and tied one by one. Each layer must have its fringe tied separately. Now after cutting the piece off, we turn it inside out. The inch or so of tabby will remain inside holding the two layers together at one end. After stuffing the cushion, we can finish it by tying the fringes on both sides together. Thus we shall have a woven article finished without using a needle. The achievement may be amusing, even if not very convincing.

We can go one step further and finish the cushion on the loom, so that a layman will be rather at a loss to explain how the thing was done. Let us start exactly as before, but leave enough warp below the tabby band to make fringe later on. When the cushion is nearly finished we can stuff it on the loom, first releasing the tension of the warp and then opening one of the tabby sheds (tr.1). This is the tricky part, because all the stuffing must go below the breast beam of the loom. Let us pull the warp as far forward as possible, so that

only about 2 or 3 inches of the fabric will remain on top, stuff the cushion, and then go on weaving tabby for another inch or so. The size of the cushion must be such that it won't start rolling itself on the cloth beam before it is finished. After the tabby band is woven, leave enough warp for the fringe, and cut off. Fig.2 shows the cushion in

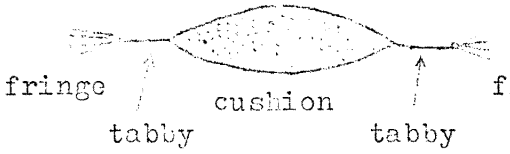


Fig.2

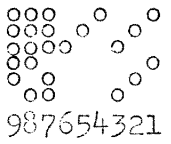


Fig.3

cross-section. If more than 8 treadles are available, the ends can be woven in twill instead of tabby, so that the pattern on the end bands will be similar to the one on the cushion. For instance (fig.3) treadles 1,2,3 will be used for the ends: 1231232132, and the remaining treadles - exactly as before: 4758694758695847695 8.

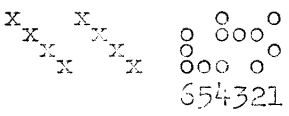


Fig.4

The same cushion can be woven on four frames in tabby. Then the draft will be as on fig.4. We shall start with tabby on treadles 1 and 2, continue with tr.: 3,4,5,6 for the cushion and finish with 1 and 2. Both layers as well as the ends will be in tabby, and the only patterns possible are either plaid, or log cabbin (see Colours in Simple Weaves, MW No.5).

Double-Width cloth. In theory double-width cloth is nothing else but a circular fabric open on one side. In practice the difference is very substantial. The only reason for weaving double-width is to have twice as wide a fabric as a single one woven on the same loom. This involves a fold in the fabric, which fold should become invisible after the fabric is opened and ironed. Besides this, there should be a continuation of pattern, if any, and otherwise the two halves of the fabric should be identical in every respect.

We have already (page 7, No.6) discussed the difficulties of drafting for such fabrics in a very simple case of a biased twill. When it comes to a definite pattern the problem is a little more difficult, but not much. As long as the pattern is symmetrical, both halves of the draft are identical, except for one central heddle ("⊙" fig.5) which may happen in either of them, and which is not repeated.

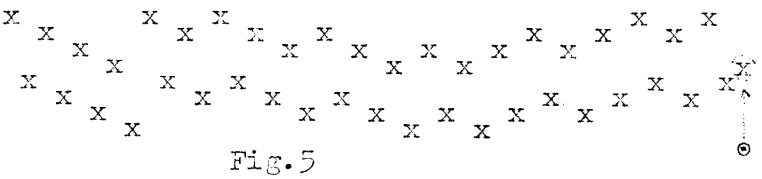


Fig.5

(binder omitted in the tie-up)

But so far we had only theoretical or drafting difficulties. These can be always solved on graph-paper. What cannot be so easily eliminated, is the fold. As long as we have the fabric on the loom, the fold is for all practical purposes - a selvedge, and it is subject to all the distortions and deformations of the latter (see our article "Selvedge", MW No.6). To make it perfect there should not be any pulling in, or letting out at the edge. This edge must be not only straight, but it must have the same count of cloth (ratio between warp and weft) as the rest of the fabric. Which is next to impossible for most of us.

This is why several compensatory techniques have been developped.

One of them is based on the principle that every weaver has a tendency to pull in the edges. If we knew exactly how much we pull them in, the remedy would be obvious: space the warp ends at and near the fold so much farther apart as to overcome our pulling in. If we pull them in 25% more than the body of the fabric, and then space them 25% more than other warp ends, the result should be an even count. In practice however hardly anybody knows his percentage of pulling in - except perhaps for weavers who work always with the same kind of yarn, the same weave, and setting.

Thus the first suggestion is to experiment. When sleying let us space the last half of an inch of warp at the fold - on a whole inch. For instance if the sleying is 2 ends per dent in a reed No.15, the last 15 ends should be spaced: 1,2,1,1,2,1,1,1,1,1,1,0,1,0,1. Then let us weave a few inches, cut off, iron and see what the fold looks like. If the fold is now too open, we can bring the last two ends nearer to the center: 1,2,1,1,2,1,1,1,1,1,1,1,1. Then weave another few inches, cut off and compare with the first attempt.

Another method is to have special reeds made with dents growing wider towards the fold. Such reeds of rather old vintage can be found in antique shops. The difficulty here is that regardless of the width of the woven fabric the fold must be always at the edge of the reed, which may result in weaving off the center of the loom, unless the reed can be shifted in the batten at will.

If the fabric is woven entirely in tabby, sometimes it is possible to weave it without paying any attention to the fold, and after the piece is taken off the loom, to pull out some of the warp ends where they are too close together. But they must be pulled in pairs to preserve the weave. After such an operation the warp ends will not be evenly distributed, but if the total number per inch is correct, washing and ironing should spread them more uniformly.

Besides these methods there is still the possibility of getting a satisfactory fold, by weaving very slowly and correcting each pick of weft at the fold with fingers. This is however not only slow, but rather difficult way of weaving.

So much about the fold. Another difficulty results from the fact that one layer of the double fabric is wound on the cloth beam always <u>on top</u> of the other layer. This means that the top layer is stretched more than the bottom one. How much more, depends on the thickness of the fabric and on the circumference of the beam. If the fabric is fairly thick, let us say 1/8", and the diameter of the beam rather small - 3", then the upper layer will be stretched by $\frac{3}{4}$" on each turn of the beam i.e. on each $9\frac{1}{2}$ inches. This is nearly 8%, and not every yarn can stand so much stretching. Linen for instance will stretch, but it will not come back, which means that one side of the finished fabric will be that much longer. In case of a bedspread 3 yards long, one side would be 9 inches longer than the other. Wool can take it easier, but it is about the limit for cotton or rayon. Thus when weaving such fabrics one should avoid heavy cloth, and have the cloth beam as thick as possible. This is where the old looms with beams a foot in diameter come handy.

The third obstacle in all double weaves, not only in double-width fabrics, is the great number of ends per inch. Obviously it must be double compared with a single layer weave. If the latter calls for

30 ends, then the double one must have 60. This means so much more friction when opening the shed. Fortunately in case of circular and double-width fabrics one half of the warp stays always below, or above the shed, but in other double weaves all warp ends cross each other at regular intervals. The additional friction in case of double weaving comes from several sources: friction between the warp and the heddles (twice as many as usual), the warp ends between themselves, the warp ends and the reed, and finally there are twice as many movements of the batten as in normal weaving. All in all the friction during weaving may be not twice but several times as great as usual.

What can we do about it? First, not to increase this friction any further, the reed should be the same as one used for a single-layer fabric. Thus if No.15 reed would be used for a single cloth of 30 ends per inch, the same reed must be kept for a double weave with 60 ends. If it is No.9 reed for domestic wool at 18 ends per inch, do not try No.18 reed for the same fabric woven double, or the beating will be quite a problem. With many double weaves the reed should be actually more open than the one used for a single fabric.

Since the sheds do not open as easily as in the case of single layer fabrics, the loom for double weaving should be either counter-balanced with a shed regulator (see MW, No.1), or still better - double tie-up jack-type (so called "Swedish"). Sticky or fluffy yarns should not be used for warp. Weaves which require closely set warp (rep, warp-face satin etc.) should be avoided.

To start with, one should select a rather light and fine fabric, both layers woven in tabby, or simple twill, the warp smooth, elastic, and resistant to friction. If the weft can be different from the warp, it should be not elastic. In pattern weaving if a binder is used, it would be advisable to adopt single linen for this purpose. It will overcome to a large extent the tendency to draw-in the edges, which in turn will result in a better fold.

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FROM THE EDITOR

We wish to thank here all our readers who sent us messages encouraging us to continue the publication of Master Weaver. We apologise for not being able to answer all these messages with personal letters, but their number makes it impossible.

All suggestions which we received are duly classified, and we shall act upon them as soon as possible.

One of the suggestions was to publish a sample card, which would answer the requirements of average weavers. You will find it on the inside front cover of this issue. It can be easily copied on a typewriter, or you can get any amount of them through our Information Service at $ 5.- a hundred.

S.A.Zielinski

BORDERS ON ALL SIDES

Every weaver is confronted from time to time with a problem: how to make in a simple way and without going into too many frames, four identical borders on a square piece of weaving. The problem in theory is not difficult, and it can be worked out in any weave and pattern, provided than one is not limited by his weaving equipment. But what if one is? If one has only 4 frames, and only one warp beam?

Then of course not every weave and pattern can be used, but even so we have quite a few possibilities. We shall describe here three of them: lace, swivel, and overshot - or rather a very simplified version of overshot.

Both lace and swivel will have the same kind of two-block patterns suitable for borders on all sides. For instance:

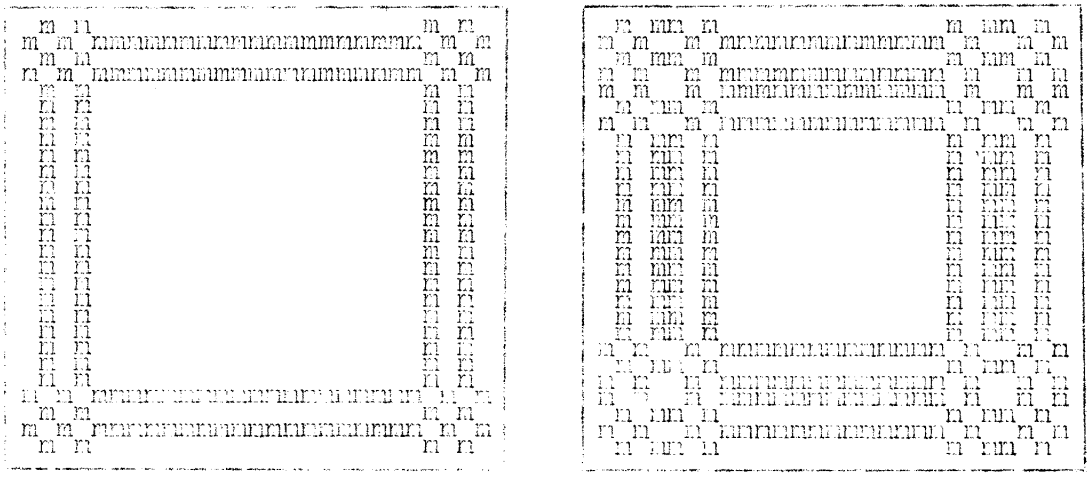

Fig.1

These patterns have profiles (fig.2) which can be developped into full drafts by replacing each "m" with a unit of corresponding weave.

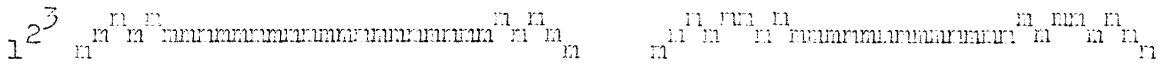

Fig.2

In case of Lace Weave, block 3 should be turned, i.e. have the floats in opposite direction than block 2. This will make the borders identical on all sides. Thus the units will be:

1-st (ground) x x x / x x x 2-nd x x / x x x 3-rd x x / x x x

the tie up consequently should be:

and the treadling: 1-st bl.(ground) - 434343, 2-nd: 232343, 3-rd: 414143.

The same profiles developped into Swivel weave will have units:

1-st (ground): x x x x x 2-nd: x x x x / x x x x 3-rd: x x x x / x x x x

with the usual tie-up: o o / o o / o — 4321 or o o / o o / o o o / o o — 4321

and the treadling: 1-st bl. - 43434343, 2-nd - 24324324324324, and 3-rd - 14314314314314. Pattern weft: 1, 2. Binder or ground: 3, 4.

When replacing "n"s of the profile with units of weave, at least two units of lace should be taken for one "n", to get the proper lace effect.

The case of overshot used for all around borders is not so simple and requires a certain amount of theoretical considerations to understand the problem. Four block overshot requires 4 frames for horizontal borders, and 8 for both horizontal and vertical borders, which would give us borders on all sides. Two-block overshot on opposites needs only 6 frames for four borders. The question arises now, whether such a thing as a single-block overshot exists at all, because if it does it probably requires less than 6 frames to be woven in both directions. Well, it certainly does exist, but whether it should be still called overshot, is a question. In any case we do not know any other name for it. Whatever it is, it can be woven on 3 frames and fig.3 gives an example of threading draft:

x x x x x x x x x x x x x x x x — o / o o / o o — 321

Fig.3

x x x x x x x x x x x x x x x x — o o / o o — 321

Fig.4

Treadle 1 gives the floats for the "pattern", treadles 2, and 3 - tabby. But we can write the same draft in a slightly different way (fig.4) and what we have now is a spot-weave. But this is something which happens in weaving very often - that two different weaves when very much simplified become the same thing. And this is why we are in doubt whether to call the new weave a "single-block" overshot, or something else.

If we would rather stitch the floats to the ground tighter than in fig.3, we can do so by putting more heddles on frame 3 (fig.5).

x x x x x x x x x x x x x x x x — o / o o o / o o

Fig.5

Whichever draft we shall use (3 or 5) we can weave a horizontal border composed of floats of different colours on a tabby background. And still we have one frame left, and this can be used for weaving vertical borders. Since we have only one frame, the vertical border will give us only one block of pattern, just as the horizontal one. The frame 4 will carry only colours in warp, corresponding to the colours used in weft for horizontal borders. Fig.6 shows

x x x ⊠ x ⊠ x x x ⊠ x ⊠ x x x x x x x x

x - ground warp
⊠ - pattern warp

Fig.6

an example of how these colours in warp are arranged. It is immaterial where they are inserted as long as the order of the former draft (3)

is preserved. As an example of a complete project we can take the following draft (fig.7):

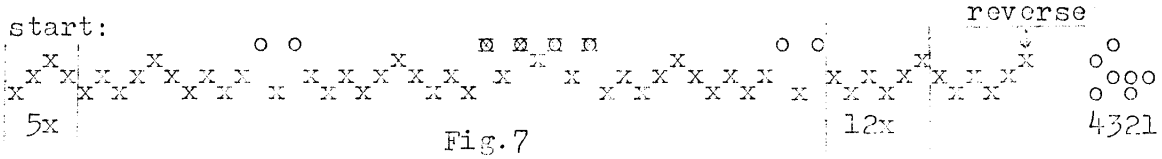

Fig.7

Let us make the warp grey, except for "o" which is blue, and "⊠" which is navy. When sleying one should not consider the ends in the frame 4 as belonging to the warp at all. I e. if the sleying calls for two ends per dent, then sley all grey (x) 2 per dent, and the other colours wherever convenient, except that two ends threaded through frame 4 should not go into the same dent.

The treadling should start with 4,1,4,3 - 5 times, then 4,1,4, 1,4,3 - twice, then comes the crossing of the two borders which is always tricky. The crossing cannot be completely symmetrical since we have to have one set of colours or the other on top. One of many ways of crossing is as follows:

2 4 2 3 4 1 4 1 4 3 4 2 1 2 4 2 1 2 4 3 4 1 4 1 4 3 2 4 2 3

where "-" is blue, "=" navy, and all other treadles - grey. Then we continue with 4 1 4 1 4 3 up to the next border.

It would seem that for a good job we need two warp beams: one for the grey ground, and the other for the blue and navy floats, because there is much less take-up in weaving on the vertical floats than on the tabby ground. In practice however we do not want the floats to be stretched as tightly as the tabby ends. The difference in the take-up just compensates for the desired effect of the pattern standing out on a flat ground. For that matter it is advisable to start a new warp of this kind by weaving for a while on treadles 1 and 4 which leave the pattern warp alone and produce the desired slack.

The frame 4 in counterbalanced looms has a tendency to rise too high because there are so few ends which it operates. It is a good idea then to tie it with two cords to the loom frame so that it could not rise any higher than the other frames. Thus an unnecessary strain on the pattern warp will be avoided.

The basis for the above project is the draft on fig.3. A similar project can be made with draft on fig.5. The treadling must be changed accordingly.

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WEAVING TERMINOLOGY

We have received the following remarks from Mrs.Mary M.Atwater, and we have her permission for their publication:

"Yes, the vague way our technical terms are used is very annoying. People cannot say what they mean when the words they have to use mean a dozen different things. To have to define as one goes along takes so much space. I particularly dislike "semi-damask" for overshot. Nothing could be much less like damask than the overshot weave. And I also dislike "lace weave" for the Spanish openwork or eyelet weave

which is anything but lacey. This is particularly misleading because there is a real lace weave.

"I agree that it would be better to use the word "harness" in the English manner as you suggest, rather than for a heddle-frame as it is custom with us. But I think it is rather hopeless to try and make the change. I made a mistake when I christened the "Bronson" weave as I discovered after the name and the weave had become fairly current, and though I have tried ever since to get it back to its proper title I have had no luck, so I suppose it will continue to be "Bronson". As long as people use a word for one single thing, and others regognize it as meaning that thing, one can't really quarrel with it. It is when people use the same word for half a dozen different things - as "finger weaving" is used - that I feel something should be done.

"Origins and names interest me. I got the name of the "summer-and-winter" weave from an old manuscript book preserved in the library of the Pennsylvania Museum of Art in Philadelphia. I coined the name "crackle weave" as the Scandinavian name was impossible for most people, and I was using it in ways quite different from the Scandinavian and thought it might as well have an American name. The "shadow weave" which I found quite by accident when I was looking for something else, I just named in order to have a handle for it. These names have nothing to recommend them except utility."

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PATTERN HARNESS

and How To Make It

Weavers who try to find means for self-expression in the pattern rather than in the intricacies of weaving techniques are often frustrated by the technical limitations of a weaving loom. Freedom of design means so many heddle-frames per one block of pattern, and one block is not much for self expression, and neither are five or for that matter even ten blocks. On the other hand so called "free techniques" are in most cases desperately slow, so slow that no amount of artistic inspiration can be expected to survive the drudgery involved.

This conflict between the artistic temperament and the technical limitations of hand-weaving has been solved long ago by the unknown inventor of the Draw-Loom, a loom where each heddle can be operated separately. From our point of view however such a loom has several drawbacks. First it is not on the market and probably will never be. Its construction is involved and very expensive. Then it requires slave labour in the form of a draw-boy who opens the sheds or combinations of sheds. Finally it takes days or weeks to make the necessary tie-up for any particular pattern. It would not be too bad if we were to repeat this pattern hundreds of times, but who wants that?

On the other hand if we are willing to sacrifice some of the advantages of a full blown draw-loom, we can compromise on something which will still give us a complete freedom of pattern, which does not require a draw-boy, and which can be operated at a reasonable speed without a permanent tie-up for each pattern.

In most draw-looms the ground is woven on a separate harness hung in the front, and the pattern on a similar harness in the back. The ground harness has several heddle-frames, and the pattern harness several hundred individual heddles. In our case we have to use an ordinary loom which provides the ground harness. Since most looms have not enough space in the back for an additional harness, we shall hang it in the front. By doing this we limit ourselves to a few weaves only, it is true, but this additional pattern harness can be installed or removed in matter of minutes, and consequently does not hinder the normal operation of the loom. It can be set up when a warp is already on the loom, without re-threading the standard harness.

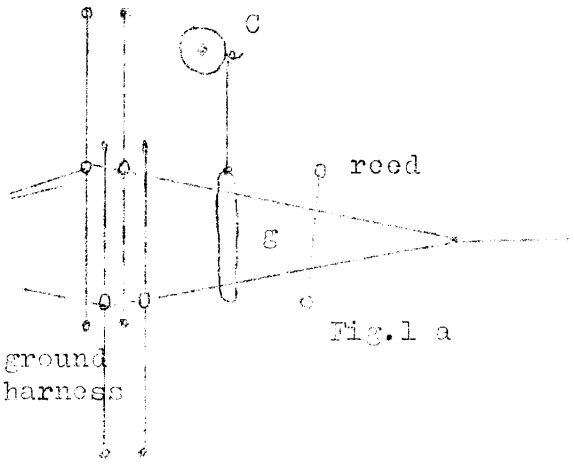

Fig.1 a

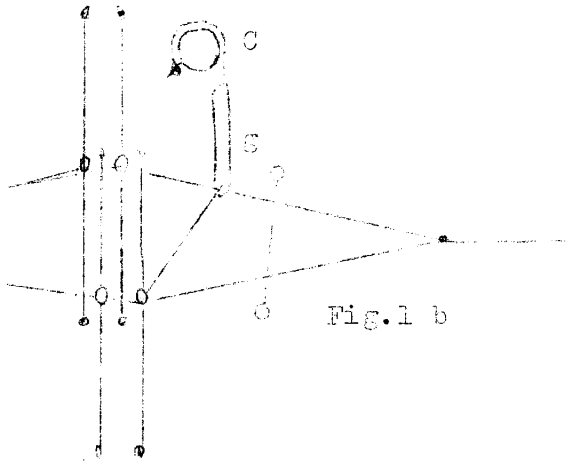

Fig.1 b

In principle it works on a rising shed only, and its role is to keep selected groups of warp ends in the upper position, thus preventing them from being woven into the ground (fig.1). The pattern harness has long-eye heddles (g). The warp ends pass from the back first through an ordinary harness with 4 frames, and then through the pattern heddles. When the latter are in their lower position (fig.1 a) they do not work at all. When they are raised however (fig.1 b) the corresponding warp ends are pulled out of the shed. The heddles selected for a row of pattern are hung on a roller (c) and raised by this roller being turned.

Theoretically then all the weaves executed in this way would belong to the Dropped Weaves. In practice however quite a few weaves respond to this treatment. For instance: Spot Weave (Bronson), Lace Weave (Bronson or Swedish Lace), Swivel, Embroidery (Dukagang and other), Paper Spots, and all Dropped Weaves proper such as Dropped Twill (similar to spot weave but with a twill background), Dropped Basket, etc. All these weaves will have from 3 to 4 blocks of pattern per inch, i.e. up to 180 blocks of pattern for a 45" loom.

The construction of the pattern harness is shown on fig.2 and 3. The heddles are made of heavy copper or brass wire about .080" in diameter, and 3½" long (g - fig.2 and 3). The best way of making a quantity of them (at least 108 for a 36" loom) is to cut a piece of iron sheet 3½" wide and a foot or so long, and then wind the copper wire around it. The wire must be straight and soft (it can be softened by heating it with a blow torch) and we shall need up to 100 feet of it.

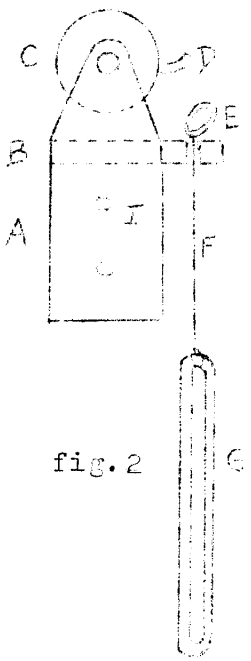

fig. 2

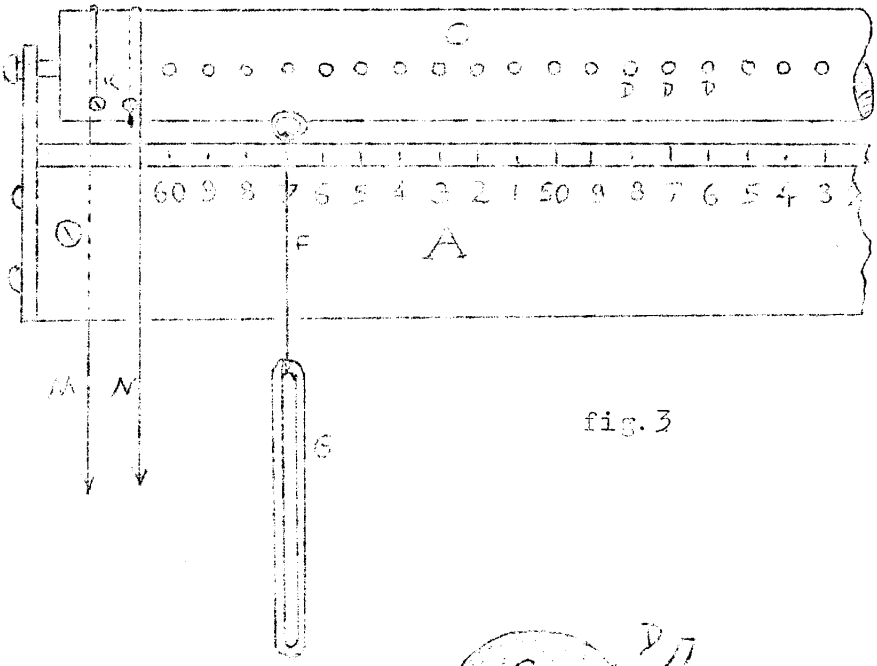

fig. 3

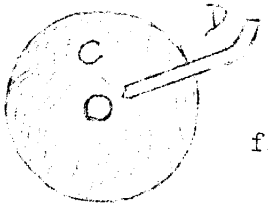

fig. 4

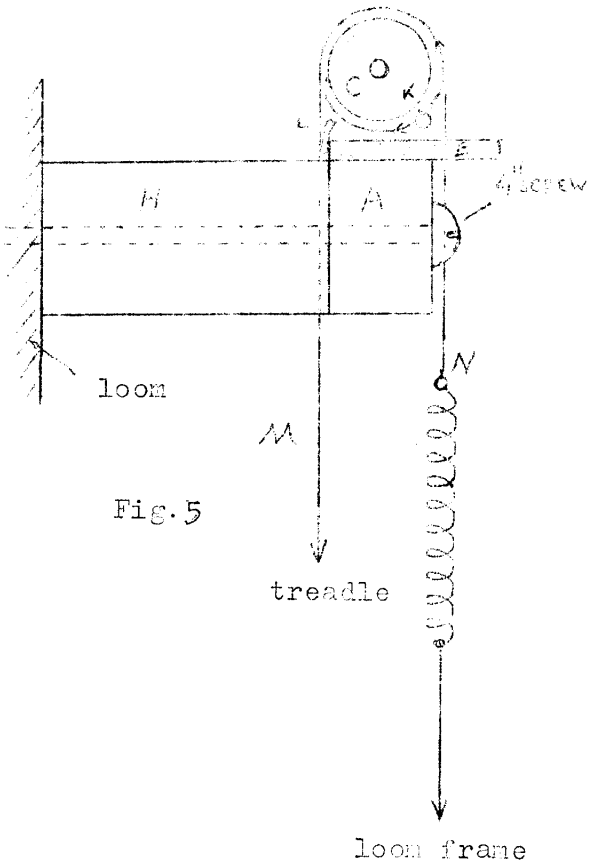

Fig. 5

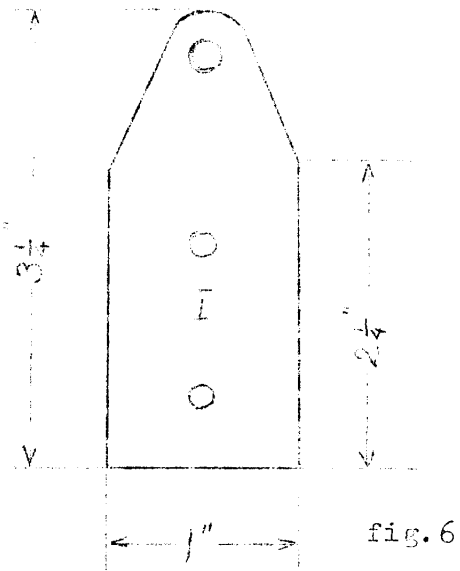

fig. 6

Then place it, iron sheet and all, in a vise and cut one edge of this coil with a hack-saw. This will give us a number of individual heddles open on one end. This end must be soldered after each heddle is straightened up and both ends brought together. A soft solder is quite sufficient.

Each heddle hangs on a short piece of cord (f) about $3\frac{1}{2}$" long. It can be either heddle cord or fishing line. If the former is used it should be impregnated with paraffin wax dissolved in gasolene. The other end of the cord is tied (later on) to a small wire washer about 1/4" in diameter. It would be as well not to have a knot at the lower end of the cord (catches in warp), so the heddle and the washer (e) can be tied together by a loop of cord with a knot at the washer.

These pattern heddles are kept in proper order in so called Cumber Board (b). It is a piece of good quality plywood about $\frac{1}{4}$" thick 2" wide and a little longer than the reed of the loom. It has holes 1/3 or 1/4 of an inch apart in one row all along its edge. These should be drilled with a 3/32" or 1/8" drill and cleaned out so that the heddle cords can easily slide through them. It will help if the cumber board is saturated with paraffin wax (apply hot).

The cumber board is screwed to a piece of 1"x2" (or thereabout) made of any hardwood or even good pine. This piece (a) must be long enough to reach from one upright supporting the loom's harness to the other, and is fixed to these uprights with only two long and heavy screws passing through two pieces of wood 1"x2"x3" (" fig.5). On top of the cumber board support (a) there is a roller (c) as long as the support and about 1" to $1\frac{1}{2}$" in diameter. It rotates on two steel plates (I figs.2 and 6) 1/8" thick. They can be replaced with hardwood boards about $\frac{1}{2}$" in thickness, and other dimensions as in fig.6. These plates are screwed to the cumber-board support (a). The top hole should be slightly larger than the diameter of screws set in the roller. These screws should be about 2 or $2\frac{1}{2}$" long and well centered in the roller.

The roller has a row of nails with heads cut off and slightly bent upwards (fig.4) driven all in one line at the same distance from one another as the holes in the cumber board, and directly above these holes. Since driving of more than one hundred nails in a roller might split it, it is advisable to drill pilot holes of nearly the same diameter as the nails first.

On the left hand side of the roller one quarter turn below the nails we shall have two small screws (k figs.3 and 5) to which two cords will be attached: one going anti-clockwise to a treadle which will operate this harness, and another going clockwise (N) to a spring (screen door spring) attached to the loom frame. A stop (L fig.5) made of a piece of soft steel will prevent the roller from turning too far and thus dropping all heddles.

This is all, or nearly so. The last thing to do is to mark numbers opposite each hole in the cumber board. Since most patterns are symmetrical it may be as well to mark the central hole (half way the length of the loom) as "0" and go in both directions with consecutive numbers: 1,2,3,4,5,6,7,8,9,10,1,2,3,4, and so on (fig.3).

The operation of the pattern harness is very simple. First the pattern must be worked out on graph paper. If it is a symmetrical one, only one quarter of the whole pattern is drawn down - if not the whole pattern must be drawn. The paper should have all vertical spaces between lines numbered in the same way as the cumber board is numbered.

The threading of the loom is always plain i.e. 1234. It should be done before the pattern harness is set up. The warp should be tied to the apron, and the weaving started so that the warp is properly spread. Only now comes the pattern harness. It should be fixed to the uprights of the loom with the two 4" screws, and all the pattern heddles dropped into the proper spaces between the warp ends. For instance if we have a warp of 24 ends per inch, and the pattern harness has 4 heddles per inch, we have 6 ends per pattern heddle. In case of spot or swivel all 6 ends should be threaded now through the nearest pattern heddle. To do this we cut a group of 6 ends and pull it through the first pattern heddle, then the next group of 6 and so on. When the whole warp is threaded in this way it must be tied again to the apron. It may seem that this double threading is a waste of time, and that the whole should be performed as one operation, but in practice it takes less time to cut group by group, than to do it all at once. However, we are always open to suggestions. In case of lace or embroidery weaves only 4 ends are cut and threaded through the pattern heddle, the next two are left alone.

The tie-up in most cases requires only tabby treadles, or for dropped twill - four treadles. Thus there is always one treadle to spare for the pattern harness roller. If this is not satisfactory, an extra treadle can be added - it can be a rather short one set on the left hand side of the loom.

We start weaving with the ground, which is woven as if the pattern harness were not there. As long as the roller is not turned the pattern heddles do not interfere with plain weaving, whether the heddles are already hung on the roller or not. When it comes to the first line of pattern we select the proper heddles according to our drawing, and press the pattern treadle. This is tied to the roller by the cord "m" (fig.3) and it raises all the pattern heddles hung on the roller. Now one or several shots of pattern are made. If there is binder between the shots of pattern, the roller is lowered for each shot of binder by releasing the pattern treadle (gently!). The spring attached to the cord (N) will pull the roller to its neutral position. When one block is finished and another is to be woven, some of the heddles are unhooked from the roller and others attached to it. When all heddles attached to the roller are to be replaced, the pattern treadle should be released suddenly - this will result in all the heddles being detached from the roller.

The possibilities of a pattern harness are quite impressive, and it would take a book to describe all the techniques involved. To start with, the dropped weaves are the easiest, because they have no binding shots, and the pattern treadle is held down for the duration of one block of pattern, and consequently the weaving is comparitively fast.

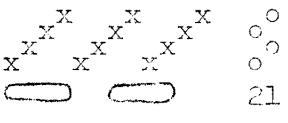

Fig. 7

For instance "Paper Spots" which are nothing else but dropped tabby can be woven in any combination of blocks as in fig.7. Since the blocks of pattern are separated by tabby, the floats are always of the same length. The treadling should be always 1212 with the pattern harness raised, and then 12 with the roller in neutral position. Since there is no binder, only one shuttle is used and the whole operation is fast and easy. When one block is squared or otherwise finished the next block is selected on the cumber board and the weaving resumed.

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