

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 recognize 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

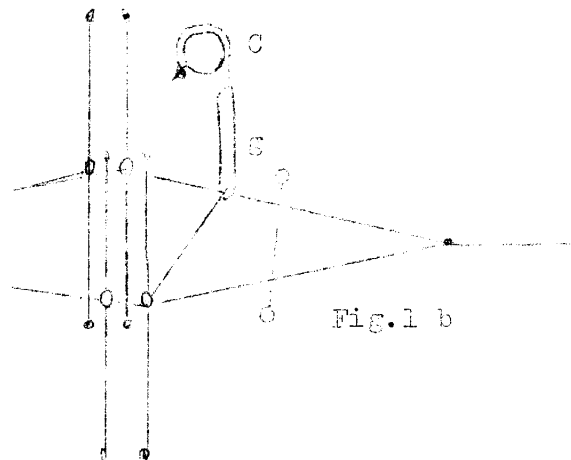
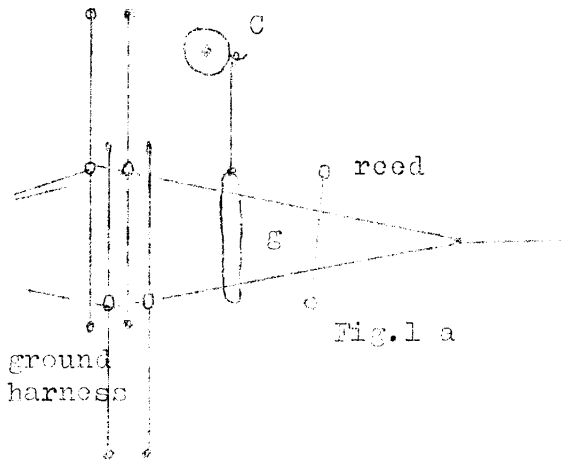
### and How To Make It

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-loom 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.

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  $3\frac{1}{2}$ " 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  $3\frac{1}{2}$ " 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.

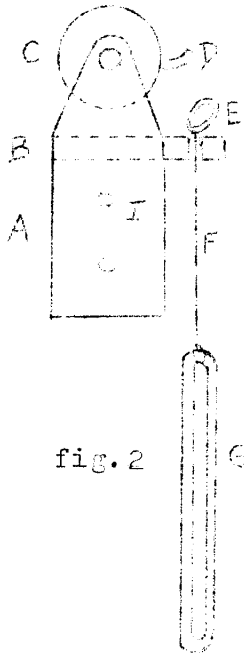


fig. 2

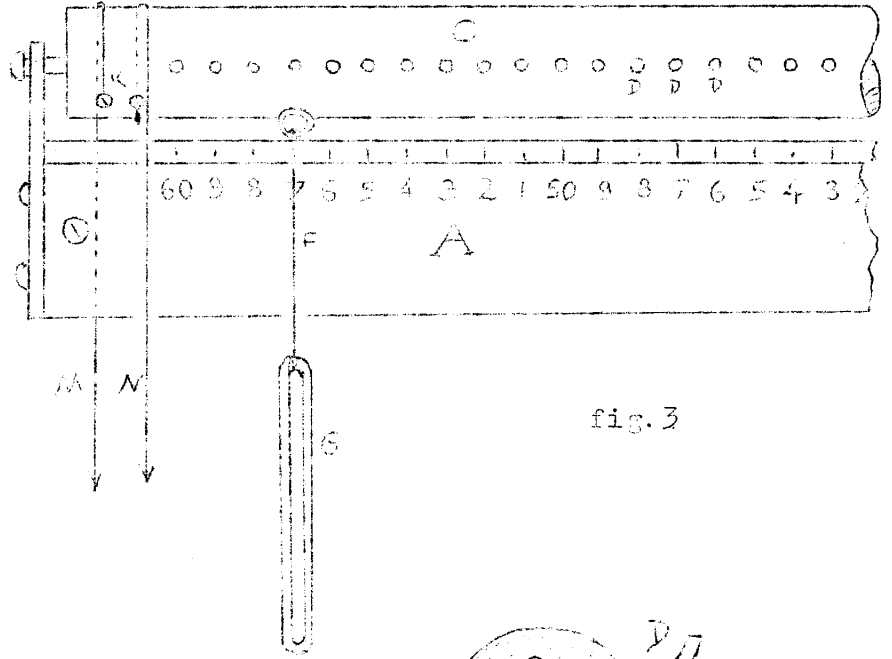


fig. 3

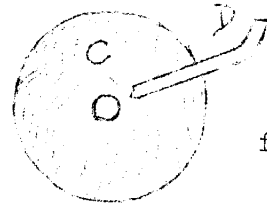


fig. 4

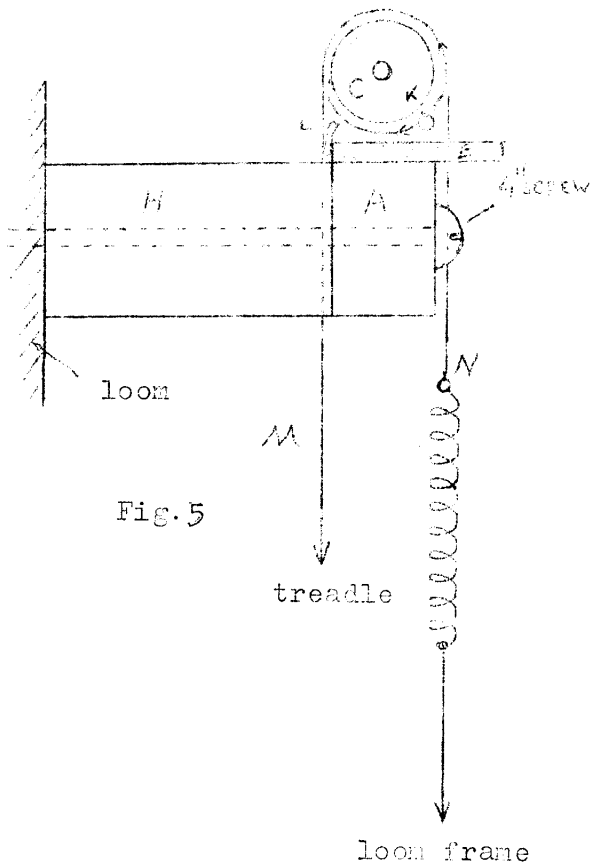


Fig. 5

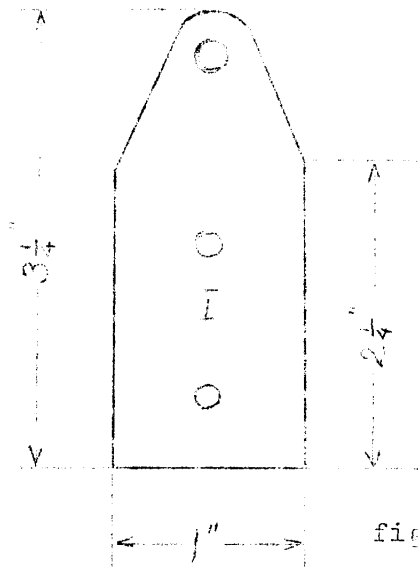


fig. 6

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 gasoline. The other end of the cord is tied (later on) to a small wire washer about  $\frac{1}{4}$ " 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  $\frac{1}{3}$  or  $\frac{1}{4}$  of an inch apart in one row all along its edge. These should be drilled with a  $\frac{3}{32}$ " or  $\frac{1}{8}$ " 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  $1\frac{1}{2} \times 2$ " (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  $1\frac{1}{2} \times 2 \times 3$ " (W fig.5). On top of the cumber board support (a) there is a roller (c) as long as the support and about 1" to  $1\frac{1}{4}$ " in diameter. It rotates on two steel plates (I figs.2 and 6)  $\frac{1}{8}$ " 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 comparatively fast.

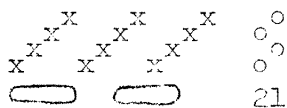


Fig. 7

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 treading 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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