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# THE WEAVER

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# THE WEAVER

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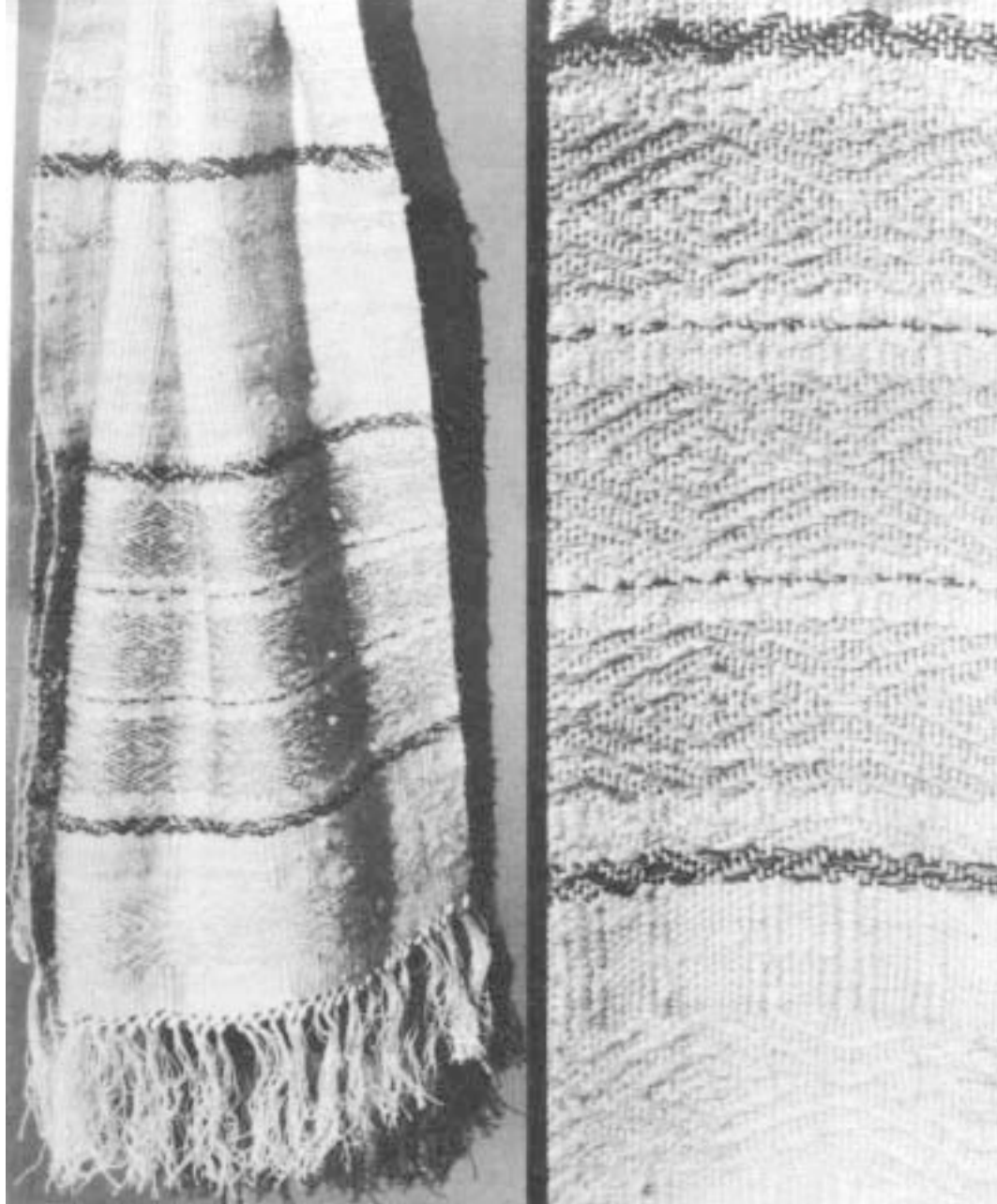
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- blue
- yellow
- rosy tan
- rose
- rosy tan
- blue & yellow
- rosy tan
- rose
- rosy tan
- blue & yellow
- rosy tan
- rose
- rosy tan
- yellow
- blue

Fig. 1A

## *Draperies Woven on a Loom*

by ELEANOR BONTECOU

My small house on a Virginia Hillside was built, the old maple and mahogany furniture had been moved in, and now came the problem of draperies for the living room; draperies that would not tax unduly the pocket-book so flattened by the processes of building and moving yet would harmonize with and be worthy companions for the big Oriental rug of the Mosul type that by its warm tones and bold geometric design dominated and largely determined the decorative scheme of the room. The room itself was simple and informal with plain oyster-white woodwork and sand-float plaster walls of a soft rosy tan. Sunshine streamed in through small-paned windows in South and West walls and on the East side wide French doors framed a view of sky and land over the tree tops and across the plain to the river and the gleaming city beyond. Color was needed in the room, color to tone with the light terra-cotta, the deep blue and the sulphur-yellow of the rug, but simplicity of pattern and design was es-

sential in the draperies that were to frame that natural mural. No suitable moderate-priced material could be found in the shops so the only solution seemed to be to weave the draperies on my Structo loom.

To save time and labor I decided to use a simple threading, a wide setting and fairly heavy materials, and, if possible to select these materials from a miscellaneous stock already on hand. Previous experiments had shown me that interesting effects, rather Oriental in spirit could be obtained on the twill threadings, so for my curtains I selected the "8 Leaf Dornick" threading, the draft of which is to be found on page 270 of Mrs. Atwater's *Shuttlecraft Book of American Handweaving*. For the warp 40/3 linen, natural, ready wound on the Structo spools was threaded double and set at twelve to the inch for the double strands (2 threads through each dent of a 12 dent reed). Among an assortment of rough silks were colors corresponding closely to those of Bernat's Oriental



rug wools, that promised to tone well with the unusual colors of the living-room rug. The yarn was rather fine grist so I wound three strands at a time on the shuttle, and for all but the saffron-yellow used three different shades at once, thus getting more richness and subtlety of tone as well as a better match for the varying shades of the rug.

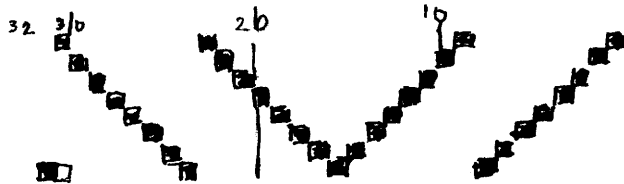
The curtains were woven in bands of the Dornick pattern in the colors of the rug on a background of a modified tabby weave in a rosy tan shade similar to but far more intense than the color of the walls. At the bottom of the curtain, to give weight, the full Dornick pattern (see treadling as given below) was first woven in the background color, then after about an inch and one half of the modified tabby in the same color a heavy border was woven in three wide stripes of a blended rose and terra-cotta edged and separated by narrow bands of the blue and yellow woven in Dornick sequence. (See detail photograph Plate A) For the rest of the curtain the back-

ground color and weave was used broken three times at distances determined by the intersections of the small window panes by a group of three narrow stripes in blue and yellow. For the narrow stripes no uniform weaving was used, each being an improvisation in the Dornick sequence carried out to the required width. In the modified tabby background a self-stripe was obtained by using alternately levers 1-3-5-8 and 2-4-6-7 instead of the regulation tabby levers. This not only made a more interesting texture than the plain tabby but by its vertical 1 lines counteracted the shortening effect of the horizontal stripes on the small windows. The curtains were finished at the bottom with a fringe of the linen warp knotted once.

To get the desired colors I used for the background material one thread of a variegated terra-cotta and tan, one of plain tan and one of dew color; for the wide bands in the border one old rose thread, one light terra-cotta, and one terra-cotta and tan, variegated; for the blue stripes one Dark Chinese blue, one Ispahan blue and one blue-green. The yellow bands were made for the most part of three strands of a sulphur yellow which exactly matched the yellow of the rug, but occasionally a strand of gold was substituted for one of the yellow threads.

The final result was a set of draperies soft enough to push well back from the windows to let in all possible sunlight, heavy enough to draw across the glass at night in lieu of window shades; draperies as informal as the room itself, in tune with the big rug both in colors and in general character, but equally charming in the room when some other floor covering was used. (See plate A for illustration). These curtains had been obtained with the minimum expenditure of time and money.

When the living room curtains were hung it seemed desirable to weave a harmonizing fabric to hang at the windows of a small study that opened into the living room. Using the same warp, threading and setting but with a heavy natural spun silk for weft I wove a one-toned fabric in alternating bands of the Dornick pattern and the same modified tabby. The result was an unexpectedly lovely offwhite material very modern in spirit, depending for its effect primarily on texture. (Plate B)



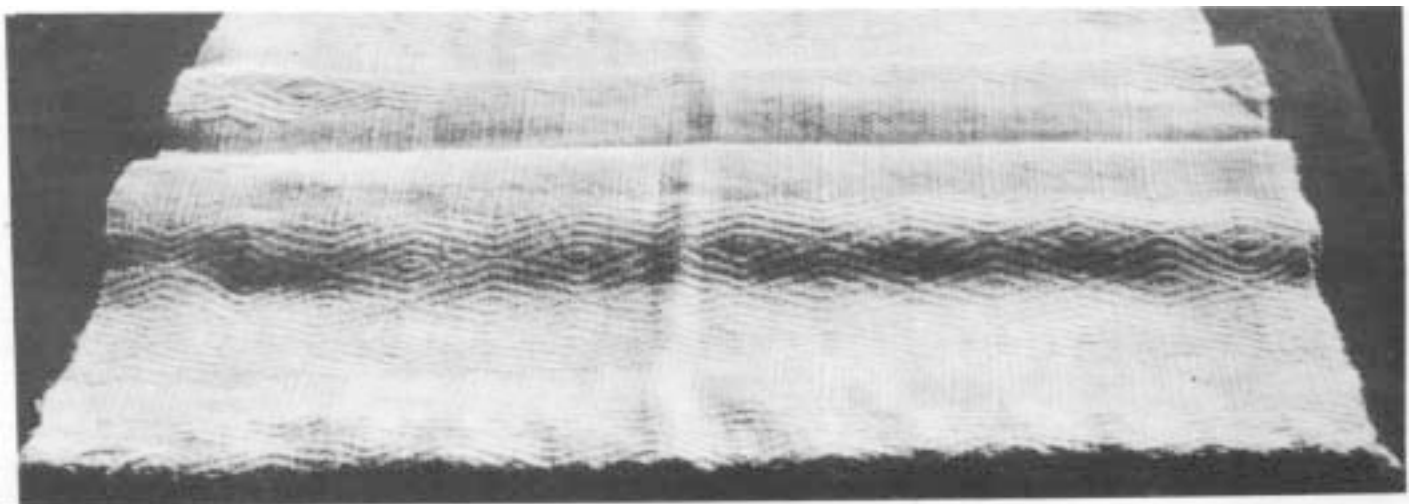
### “EIGHT LEAF DORNICK”

Treadling directions (on the Structo Loom) Pattern

Lever 5-6-8-1		4-5-7-8	
6-7-1-2		3-4-6-7	
7-8-2-3		2-3-5-6	
8-1-3-4	Repeat	1-2-4-5	Repeat
1-2-4-5	3 times	8-1-3-4	3 times
2-3-5-6		7-8-2-3	
3-4-6-7		6-7-1-2	
4-5-7-8		5-6-8-1	
5-6-8-1			

Lever 1-3-5-8  
2-4-6-7

Tabby  
alternately



# "Summer-and-Winter" Weave on Six Harnesses

by MARY M. ATWATER

If someone were to ask me, "What do you think is the most interesting weave for six harnesses?" I should answer without hesitation, "The 'summer-and-winter' weave."

This weave is not limited to six harnesses, of course. The elaborate patterns of more than four blocks require more than six, and simple two-block patterns may be woven on four harnesses. However the majority of our traditional patterns are composed of four blocks, and all these are within the scope of the six-harness weaver.

"What is the history of the weave? and why the name?" one may ask. There are no records to show who first hit upon this method of weaving, but from evidences at hand it appears to have been an American weaver of the pre-revolutionary period, in Pennsylvania. The weave appears to be peculiar to our own country, and all the old pieces still extant, whose history can be traced, appear to have originated in Pennsylvania or one of the bordering states.

When I first became interested in hand-weaving, a good many years ago in the early days of the revival, the summer-and-winter weave was considered a "lost art." The Swedish weavers, who were the only skilled teachers available at that time, knew nothing of it. It was unknown to the mountain weavers of the south among whom weaving had been kept alive through the years. "Weaver Rose," the bare-footed Rhode Island eccentric in whose weaving loft the old art lived through the days of neglect, knew only "four-harness overshot."

There were, however, a number of fine old coverlets and scraps of weaving still extant that showed the interesting structure and texture of the "summer-and-winter" weave. It was not very difficult to unravel from these the simple secret of the technique, and some time later I was fortunate enough to find in an old manuscript weaving book, preserved in the fine collection of the Pennsylvania Museum of Art, some odd drafts labeled "Summer-and-

Winter" that referred unmistakably to this weave. It gave me great satisfaction, I need hardly say, to find that these drafts were written in a special notation, similar to the form of notation I had already devised for my own use.

The summer-and-winter weave is now a familiar technique to most hand-weavers, and if the old-time craftsman who devised the weave is aware—in the place to which all good craftsmen go—of terrestrial matters, he must, I think, find satisfaction in the popularity of his invention.

What is the origin of the name? This, of course, can only be a matter of guess-work. The weaver who devised the weave may also have named it, or the name may have been the inspiration of someone else. Possibly the fact that a piece woven in this manner is usually dark on one side and light on the other, may have seemed to some fanciful person to suggest the seasonal changes. The name refers to the "weave," be it observed, and not to a particular "pattern."

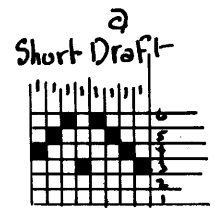
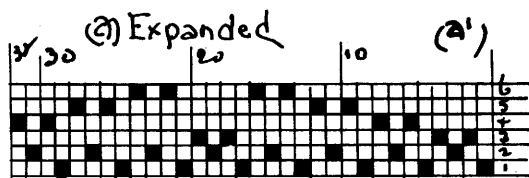
The reasons for the popularity of the summer-and-winter weave are many. Here are a few of them: The fabric produced is a closely combined fabric without long skips or "floats" of weft, and for this reason has wearing qualities greatly superior to those of the familiar "overshot" weave. Moreover the fabric is a "double-faced" fabric, as handsome on one side as on the other. It is not the same on both sides, however; the figure appears dark on light on one side, and light on dark on the reverse. Either side, however, may be considered the "right" side. Another interesting consideration is the greater freedom in the matter of design permitted by the summer-and-winter weave. In overshot weaving the size of a pattern block is limited to the longest skip that can be woven without weakening the fabric too greatly. This makes the largest block rarely more than an inch across. In the summer-and-winter weave this limitation does not exist and blocks may be as large as one pleases. Moreover, in

Diagram One

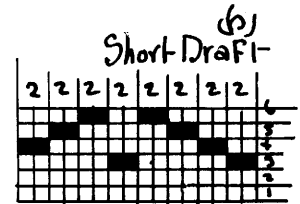
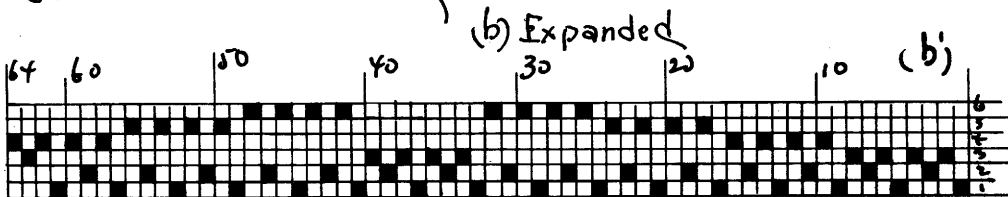
Simple "Diamond" Pattern

(a) Single units

(b) Two units to each block



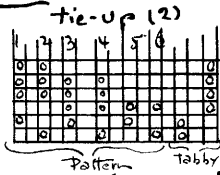
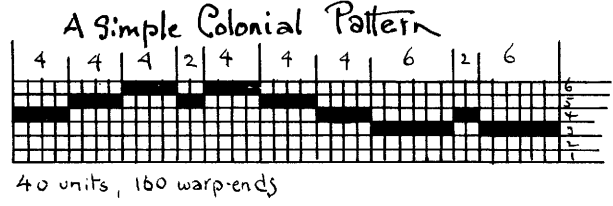
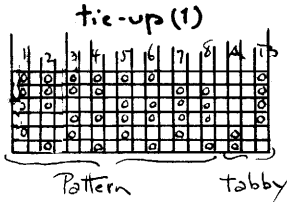
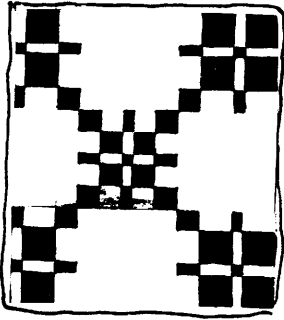
8 units, 32 ends



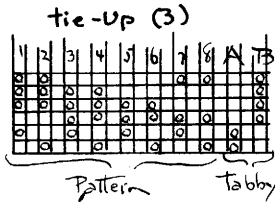
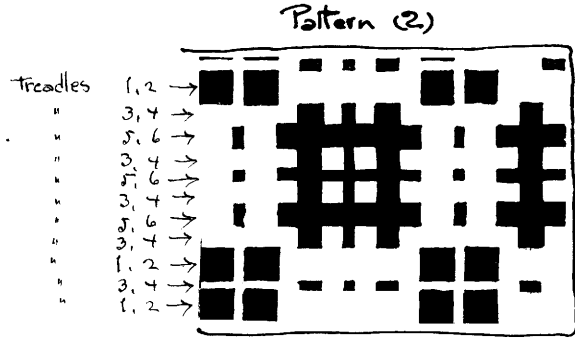
16 units, 64 ends

Pattern (1)

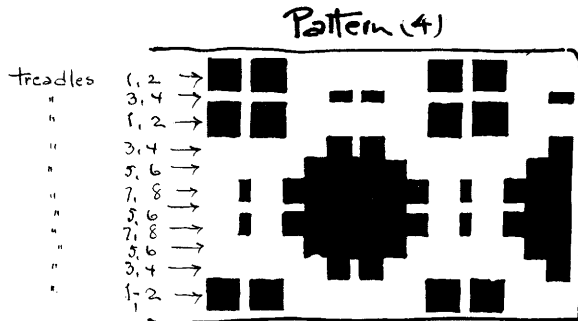
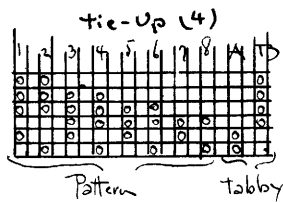
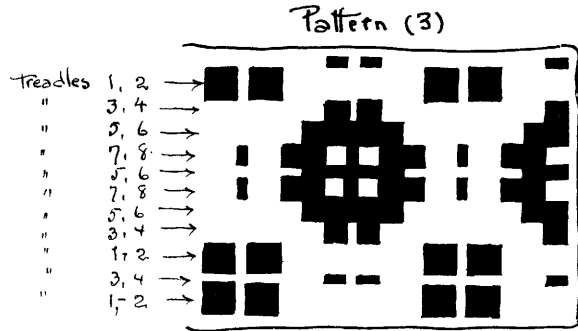
Diagram Two



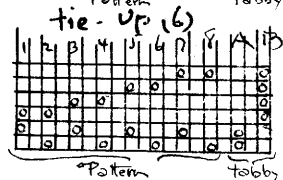
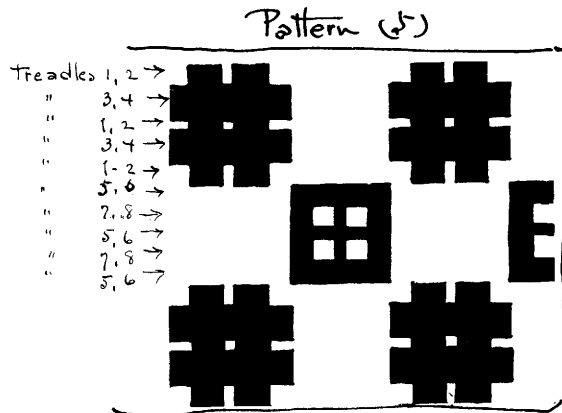
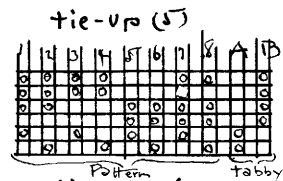
Pattern (2) is woven with only three changes of block, so only six pattern treadles are required



It will be noted that (3) and (4) are alike in tie-up except for a single knot each on treadles 7 and 8. Both patterns are treadled the same.



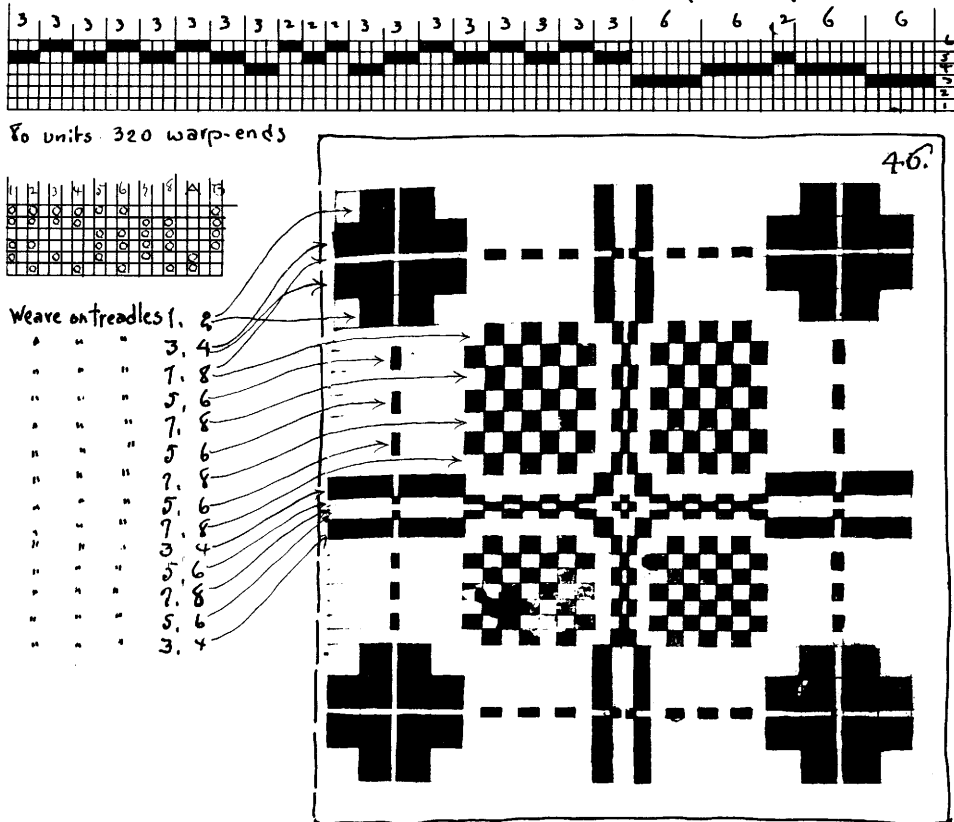
The patterns are stretched as when woven in a single color. But interesting effects may be produced by wearing in several colors.



M. M. Atwater, 1937

Diagram Three

Pattern \*46, from the "Speck" Drawings



this weave several blocks may be woven at the same time, blocks may overlap, and if one likes one may weave different parts of the figure in different colors.

These advantages are obvious, and the summer-and-winter weave is largely superceding the "four-harness overshot." In the first days of the hand-weaving revival the overshot weave was the only pattern weave known to us, and we used it for rugs, upholstery fabrics and other things for which it is not well suited. The old-time weavers used the overshot weave almost exclusively for coverlets and this remains the best use for it. There are other weaves that are more practical and handsomer for other things. Our technical knowledge of weaving has greatly broadened during the last several years.

The summer-and-winter weave, because it is so logical in structure, is far easier to thread and to check and also to weave than the four-harness overshot, — but due to the fact that it employs a special form of notation weavers sometimes find it confusing at first. I shall try to make the matter of the drafts as clear as possible.

The summer-and-winter weave is constructed on the following principle: two harnesses are used to produce the weave itself, and the remaining harnesses are used for the pattern — one harness being required for each "block" or change in the pattern. A "unit" of the weave consists of four threads: the first thread on one of the "tie" or weave harnesses; the second on the pattern harness; the third on the second tie-harness and the fourth on the

pattern harness again. This is uniform for the entire threading, no matter what the pattern and no matter how many harnesses are involved. Half the warp, it will be seen, is threaded on the two tie-harnesses and the other half of the warp is distributed among the pattern harnesses according to the figure of the pattern. It is therefore possible to write the draft by units instead of setting down each individual thread, as in drafts for overshot weaving. The position of the blocked in space of the draft indicates the pattern harness involved, the threading of the tie-harnesses being always the same may be taken for granted.

Diagram One illustrates this system of notation. At (a) is given the so-called "short draft" of a simple diamond pattern, written with single units, and at (a') is given the corresponding expanded draft in which each thread is shown, after the manner of a draft for overshot weaving. At (b) is given the same pattern written with two units to each block and at (b') the corresponding expanded form. The pattern might be written with

three or ten, or twenty units to the block.

The "short draft" is the notation ordinarily used. Both drafts mean exactly the same thing, but it is far easier to thread from the short draft than from the expanded form as anyone will discover on experiment.

As a rule the two front harnesses are the ones used to carry the weave, though some weavers prefer to use the two back-harnesses. It makes no difference whatever in the result which system is used, and either method of threading may be followed from the short draft.

People sometimes find the tie-up for summer-and-winter weaving a bit puzzling. This is, I think, due chiefly to the fact that so many different tie-ups are possible. Each tie-up produces a somewhat different figure on each threading, so that one may vary the pattern by a change in the tie-up as well as by variations in treadeling.

Diagram Two illustrates tie-up. The threading draft given is for a simple figure much used in Colonial patterns. The tie-up at (I) weaves the pattern blocks separately, without overlapping. If this draft is woven, "as drawn in" on tie-up (I) we get the rather uninteresting little figure illustrated. The tie-up at (I) however, may be considered the "standard" tie-up, and is used for all patterns in which the blocks are woven without overlapping. The

other illustrations on the diagram show a few of the variations that may be made by changing the tie-up and treadling. Of course many other variations are possible on this same threading, but these figures illustrate the method of altering the figure. The special tie-ups are given for each figure and the treadles to be used in weaving each block of the pattern are indicated along the margin of the drawing.

As most six-harness looms are operated on the "Rising shed" principle the tie-up drafts show the "raising" ties. Two treadles are required for each pattern block, with two additional treadles for the tabby.

In weaving, pattern shots alternate with tabby shots as in "overshot." Four pattern shots and four tabby shots are woven for each "unit" of the weave, and it follows that materials must be carefully chosen to give a properly proportioned figure. If the weft is too coarse for the warp the figure will be distorted lengthwise, and if the weft is too fine the figures will be squatty. It is not possible to give a rule that will apply to all combinations of material, but in a general way the warp and the pattern weft should not be very far apart in grist, and the tabby should be finer than the warp. Two combinations that have proved satisfactory are: Warp, Egyptian cotton 24/3, set at 30 ends to the inch; pattern weft, Bernat's "Fabri" or other 15/2 yarn; tabby #20 perle cotton or a 20/2 ordinary cotton. Or: Warp; #10 perle cotton or a 10/2 ordinary cotton, set at 24 ends to the inch; pattern weft, homespun or Shetland yarn; tabby, Egyptian cotton 24/3 or material of similar grist.

When a very coarse weft is used as in rug-making, two pattern shots are used for each unit of the weave instead of four. Otherwise a very coarse warp may be used, set very far apart, in place of the ordinary carpet warp at a setting of 12 to the inch, as is ordinarily used.

There are two principal systems of treadling employed in the summer-and-winter weave, known respectively as weaving "one and one," or weaving "in pairs." Both systems produce the same pattern—the difference is in the effect of the background.

Suppose, for instance, we wish to weave the first block of pattern (1), Diagram Two, by the one-and-one method. The treadling for the first unit of the weave is as follows: Tabby A, (using tie-up (1) of course)

Treadle 1, pattern weft

Tabby B

Treadle 2, pattern weft.

Repeat.

To square the first block of the figure, which is of six units, repeat the treadling for the first unit six times, or the four shots as written twelve times. To weave the block "in pairs" treadle as follows:

Tabby A,

Treadle 1, pattern

Tabby B

Tabby A

Treadle 2, pattern

Tabby B

Treadle 2, pattern

Treadle 1, pattern

To square the block repeat this treadling six times. When repeated, of course two shots on treadle 1 come together (with tabby A between) where the treadling starts over. This is correct. The pattern shots for the complete block are:

Treadle 1, once

" 2, twice

" 1, "

" 2, "

" 1, "

" 2, "

" 1, "

Treadle 2, twice

" 1, "

" 2, "

" 1, "

" 2, "

" 1, once

This system is followed throughout the weaving. It will be seen that each block begins and ends with a single shot on the first of the two pattern treadles used for the block, the rest of the pattern shots being woven two and two or "in pairs."

It should be observed that the "A" tabby should be woven between pairs as indicated above, and the "B" tabby between un-pairs. The opposite arrangement produces a less handsome background effect.

Summer-and-winter weave patterns may be woven "on opposites" if desired. This, however, requires a more elaborate tie-up, with four treadles for each pattern block. The effect is interesting in the same way that weaving an overshot pattern on opposites is interesting. Space does not permit describing this in detail but weavers should find no great difficulty in figuring it out.

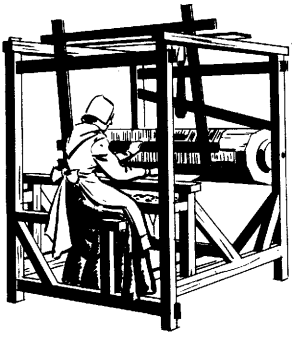
To weave different parts of the figure in different colors the most practical tie-up is tie-up No. 6 as given on Diagram Two. Each treadle raises a single harness, and to produce the desired sheds the weaver uses several treadles at the same time, as may be required. There is a bit of acrobatics about this, but no loom is provided with enough treadles for a complete tie-up. In weaving, a shot of each color is woven between tabby shots.

I have never seen an ancient piece woven in several colors in this manner, but some of the drawings in the old "Speck" book suggest the effect, and the technique holds delightful possibilities. For upholstery and for bags and such pieces it is particularly good.

Diagram Three gives the threading and tie-up for one of the patterns from the "Speck" book, — an old book of weaving designs in manuscript, preserved in the Pennsylvania Museum. The treadling is indicated for each block along the margin of the pattern. Patterns in summer-and-winter weave are more easily followed from a drawing of the figure than from tabulated treadlings, which are apt to be lengthy and confusing.

A great many six-harness summer-and-winter weave patterns have been published, and for further patterns the reader may be referred to my Shuttle-Craft Book of American Hand-Weaving, obtainable from the Bernat Company, price \$3.50.





# Introduction to Weaving

by LILLIAN HOLM

This is one of a series of articles describing in a simple and practical way how to operate a loom as well as how to weave.

With weaving it is to be understood that one gets a connected surface, thicker or thinner, of soft fiber, which result one gets through regular connection or crossings of the threads, all depending upon the quality of the crossings. The weave is then divided into three different types:

- I Proper Weave or Cloth
- II Jerseyart, or Knit or Weaving
- III Tullart, or Fusian lace or Weaving

The real weaving is formed through crossings of two opposite rectangular thread systems in warp and weft. See Fig. 1.

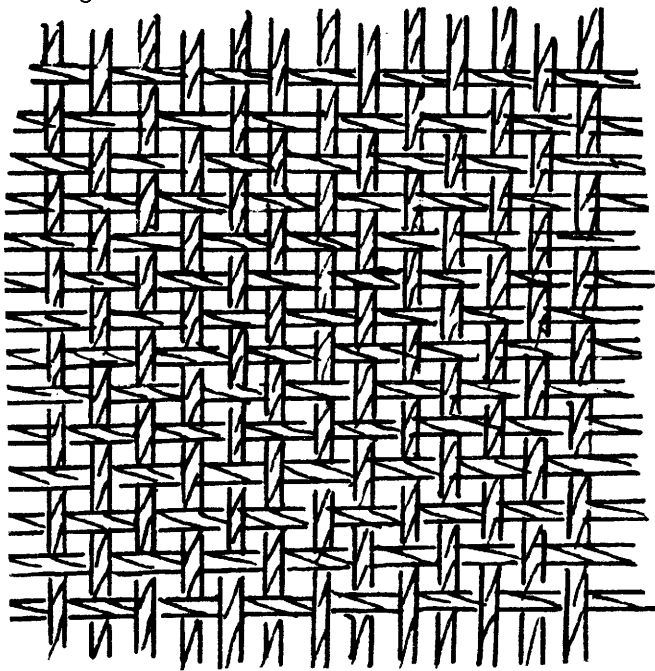


Fig. 1

The Jerseyart weaving one gets through one or many fast running threads that bind to loops and catch each other and therefore form one connection of more or less thick fiber surface. In this group we place plain jersey, knit and crocheted material, and also tied net. See Fig. 2.

The Tullart or Lace weaving we start with many threaded small spools, moving from one side to the other and winding around each other to one tight net. In this group Tulle and Lace etc. are classified. See Fig. 3.

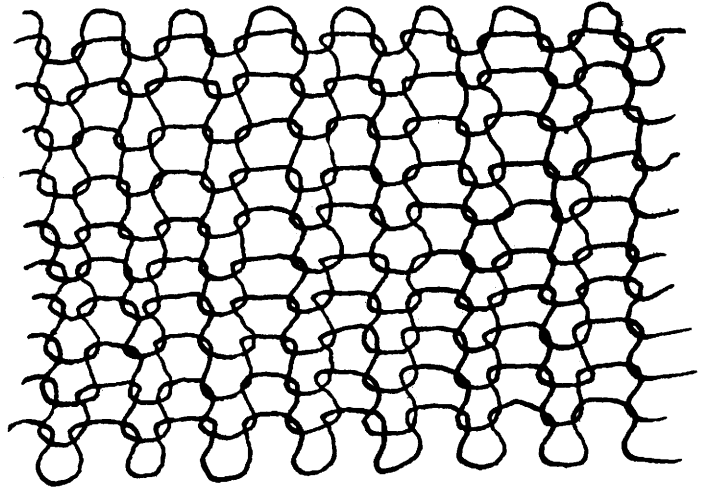


Fig. 2

In our daily talk we give the word *weaving* the more definite meaning of *cloth*, made of warp and weft, and this is the type of weaving that we shall now treat.

For the producing of the two thread systems' crossing, we need certain tools. Learning the names of these tools is called loom weaving education.

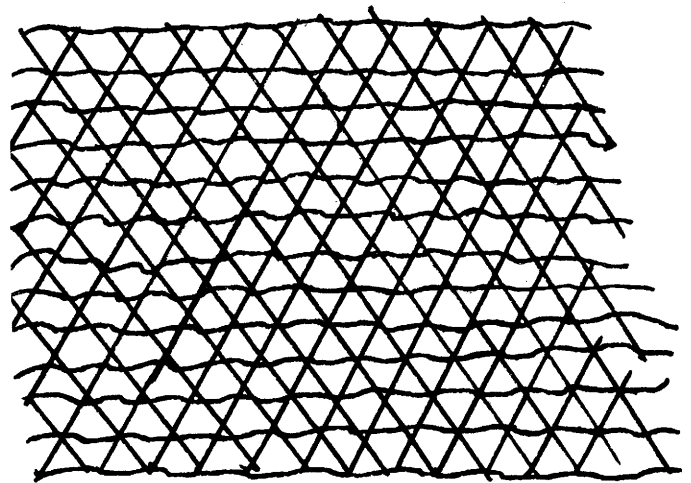
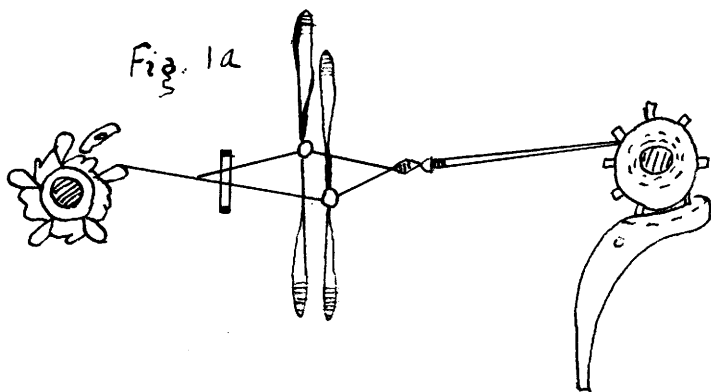


Fig. 3

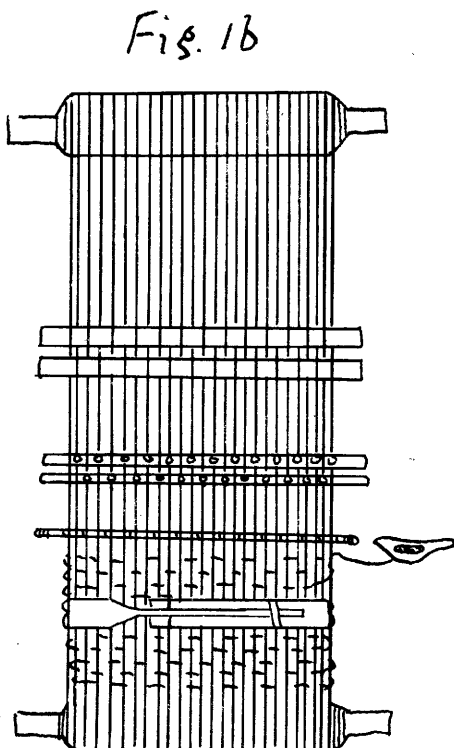
The tools that apply to weaving can be simple or of more intricate types, but they must all have one thing in common: they must be able to divide in advanced order and beside each other tighten the warp-threads in two layers. See Fig. 1a.

This is called forming a shed. The weft threads go between, back and forth, from one side to the other. In this way, the weft threads will be going every other time over and under the warp-threads. After the weft thread has been pushed forward and the warp divided, one will find a new shed. The second weft thread will now go through and be pushed forward close to the former.



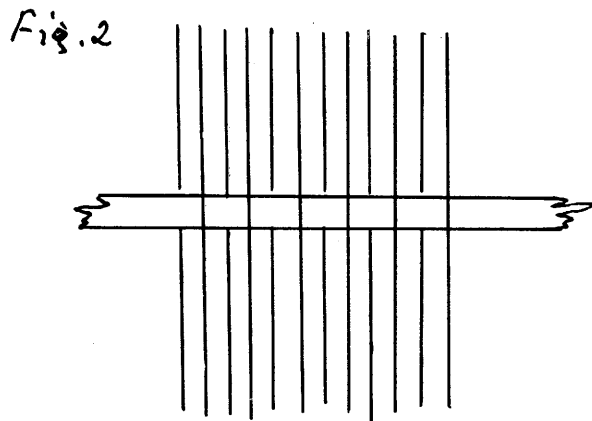
Through the pushing forward of weft threads in different order winding in the warp's thread system one forms a weave. See Fig. 1b.

The most primitive tools consist of wood beams that are fastened vertically or horizontally to the floor and in between which the warp threads are stretched.



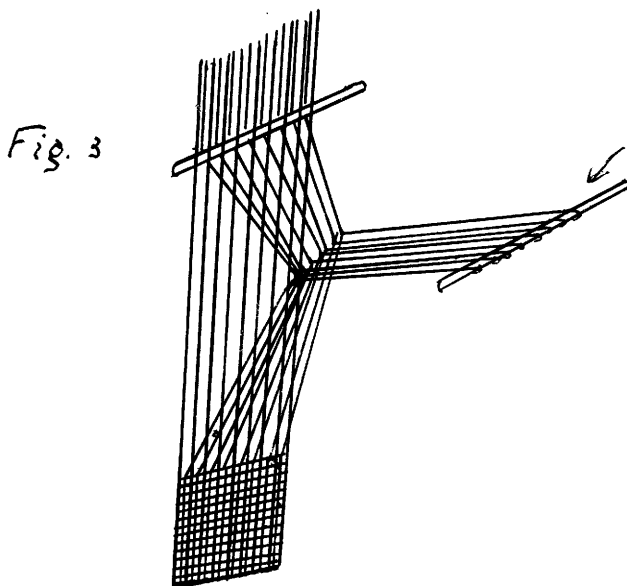
This warp system we very often see in old paintings, among others the old Egyptian, Greek, Oriental primitive people, and also among a few nowadays.

The shed that one gets here is formed through a stick that goes through the warp threads so that every other thread lies above and every other under the same. See Fig. 2.



In this rectangular form the weft thread goes through.

To get the opposite movement in the warp threads, one must see that the threads behind the stick are pulled forward, which is accomplished with the help of loops that are fastened to a stick. See Fig. 3.



We use this simple method even today in our Flamsk weaving (Gobelin).

The most important tool that we need for our weaving is the *loom*. See Fig. 4.

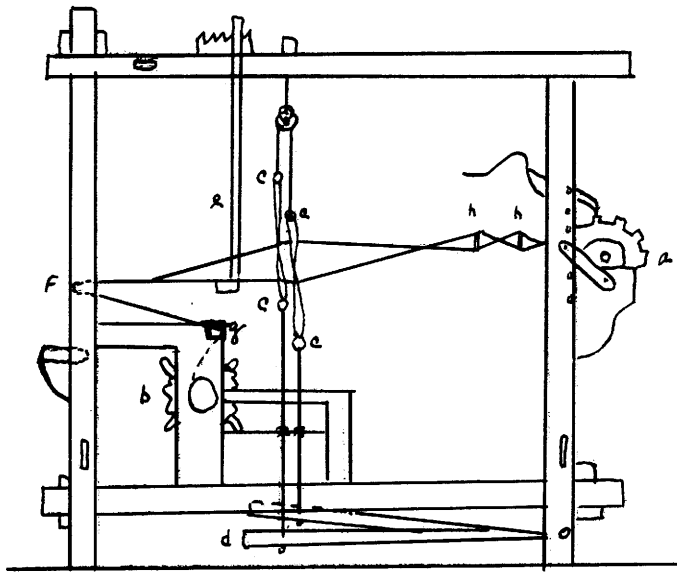


Fig. 4

The most important parts of the loom of today's construction are the *yarnbeam A*, *clothbeam B*, *heddleharness C*, *pedals D*, *beater E*, which are all carried on two side-pieces and held together with a few wooden beams. This is called the Loom body or Frame.

On the yarnbeam we wind our warp and the warp must, during the process of weaving, have a certain stretch, which can be done in a few different ways.

The most common is that the yarnbeam on the one side is provided with a cog-wheel and a hook that will catch as you turn.

The yarnbeam, as you see in Figure 4, is placed in the back of the loom. Sometimes you will find the yarnbeam further down and another beam above, which is called the *stretchingbeam*. See Fig. 5.

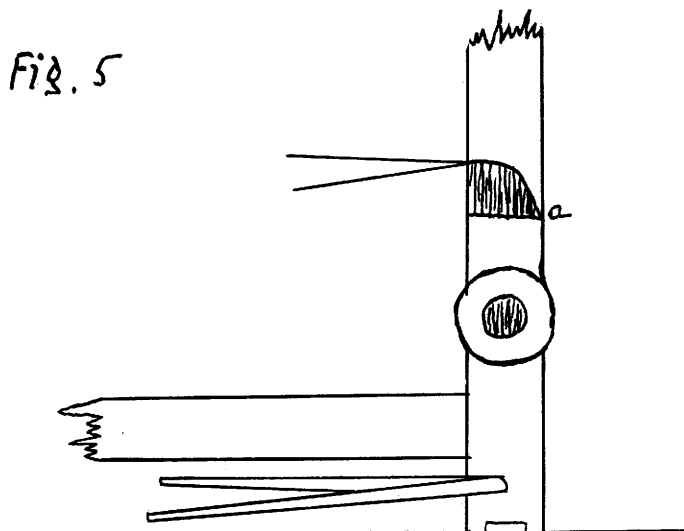


Fig. 5

The reason for having a stretching beam is to keep the warpsurface even. This is quite necessary if you are dealing with long warp, which would make the yarnbeam very thick.

The clothbeam provided with cog-wheel and hook receives the ready made cloth and is placed in front of the loom.

This beam could also be placed in the same line as the warpbeam, but this would be quite inconvenient, as the cloth which rolls around the beam will then grow thicker and the warpsurface will change. To avoid this the clothbeam is to be put further down in the frame. See Fig. 4 B.

There is another beam in front of the loom that is called the breastbeam (see Fig. 4 F) around which the ready made material winds down to the clothbeam.

Above the clothbeam is another beam called the kneeroll (see Fig. 4 G), and, thanks to this beam, we get more freedom when stepping on the pedals.

To divide the warp in two levels, or to make what we call the shed, we must have the heddleharness (see Fig. 4 C), of which there must be at least two. Every harness requires two sticks on which are threaded a large or small quantity of heddles.

The number of heddles on each harness depends on the threadnumber in the warp and on the number of threads that go through the heddles. Usually one thread goes through each heddle.

For handweaving, the heddles that should be used are tied with hard twined cotton thread, with knots dividing them into three sections, — one above where the upper harness goes through, one below for the under harness stick, and one in between, which is called the heddle eye and through which the warpthread goes. (See Fig. 6).

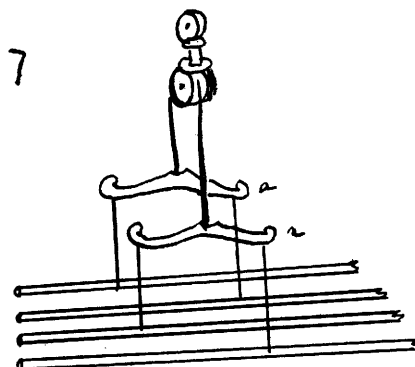
Fig. 6



Heddles can vary in size. The following four types are most common in handweaving. The ordinary heddle is the one in which the over and underpart measure in length about 13 cm. and the length of heddle eye  $2\frac{1}{2}$  cm. is mostly used.

Another type very practical in handweaving with many harnesses is the one where the over and underpart measure about 14 cm. and the heddle eye 1 cm.

Fig. 7

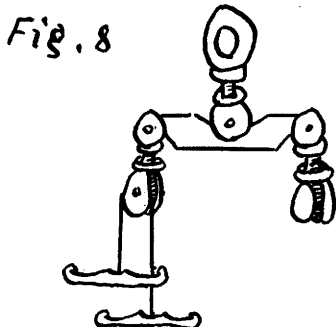


A third type has over and underparts which measure about 13 cm. and a heddle eye of 8 or 9 cm. This heddle is mostly used on harness for plain weaving in all looms that are arranged with *Harneskrustning* (Pattern harness).

The fourth type that is used for *Harneskrustning* in the loom that we have just described has heddles in which the overpart measures 25 cm., the underpart about 33 cm., and the heddle eye  $1\frac{1}{2}$  cm.

When weaving, the heddles must hang very evenly. The harness will then be hung up by *Nickor* (Heddle horses). See Fig. 7.

Every heddle horse carries 2 harnesses. For 4 heddle-harnesses, 2 heddle-horses are needed on both sides of the loom. The heddle-horses are then joined with a string and run through an overhead pulley that is fastened to the loom.



For 8 harnesses another type of pulley is used, and this is called *Lunor*. (See Fig. 8.)

Every *Luna* carries 4 harnesses and is movable like the heddle-horses. Another type can also be used, and this is called *Trissor* (Pulley). See Fig. 9.

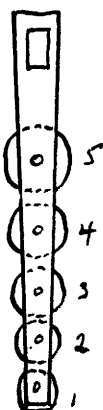
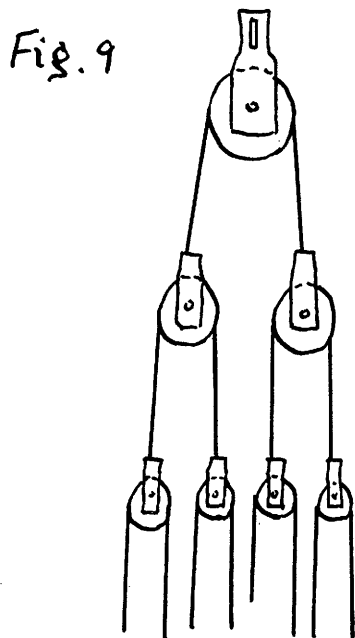


Fig. 10

For the tying of harness for *Drallpattern* or weaving on 8 or 10 harnesses, the pulley arrangement in Fig. 10 is very often used.

The string over wheel No. 2 goes to harness 4-7 obs., the string over wheel No. 3 goes to harness 3-8, the string over wheel No. 4 goes to harness 2-9, and the string over wheel No. 5 goes to harness 1-10.

A string runs over every one of the 5 wheels and is then tied to the harness, so that the string over wheel No. 1 fastens to harness 5-6, the string over wheel No. 2 goes to harness 4-7 obs., and the string over wheel No. 5 goes to harness 1-10.

The heddle-harness movements are done by the pedals with strings which are connected to the harness.

In using many pedals, the passage between harness and pedals necessitates the use of so-called *Lams*. See Fig. 11.

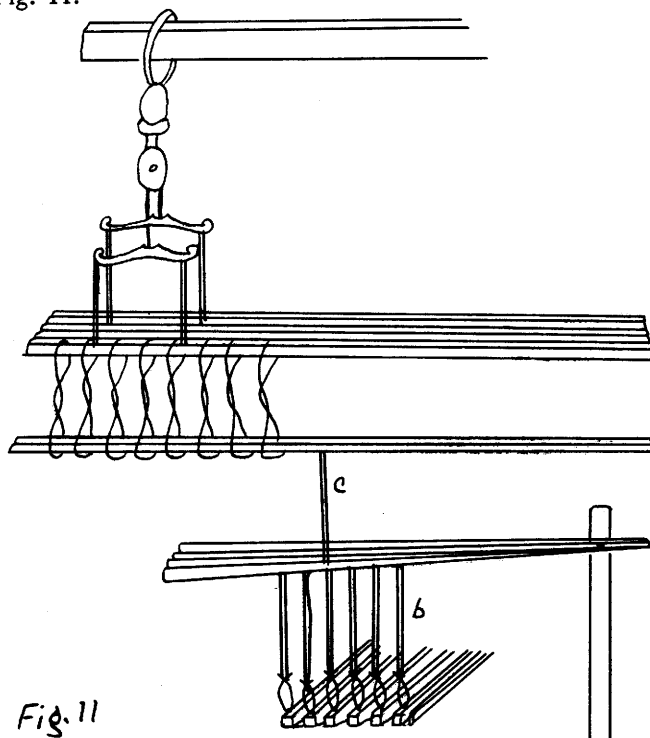


Fig. 11

These are fastened on to the middle of the heddle-harness's lower stick, and one must have the same number of lams as harnesses. The lams are then tied to the pedals. See Fig. 11,B.

It might sound simpler to tie the lower heddlestick directly to the pedal, but the advantage of using lams is that the pedal string can be tied directly over the pedals in a straight line.

Every lam should therefore be provided with many holes, one for every pedal and one for the string that connects the heddle-harness to the lam. The pedals should also have holes, in which loops made of strings are to be placed, and in which the strings coming from the lams are to be tied.

Before the tying, it is very important to see that the harness is at the right height according to the warp. When the warp is stretched, the warp-threads ought to be nearer the heddle eye's under edge; they should also lie even so that they may be checked very easily by using harness holders. See Fig. 12.

The number of heddle-harnesses and pedals to be used is all according to your tabbypattern's square. We shall describe this later in our binding instruction.

After the warpthreads have gone through the heddles, they must also go through the reed, which is placed in the beater.

The swing of the beater can come either from the top of the loomframe or from the bottom but must be movable forward and backward.

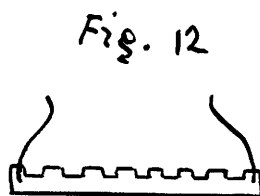


Fig. 12



If the beater is hung from above and is to give a good pound, it must be hung forward as much as possible. If the beater comes from down below, it must be fastened further back. One never gets the same musical pound from a beater that comes from the bottom as one gets from a beater that comes from the top.

For the reed, see Fig. 13.

The reed is made of fine steel or brass, with small spaces in between, called dents, through which warp threads are pulled with the help of a reed hook. See Fig. 14.

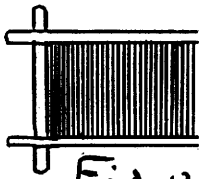


Fig. 13

In choosing a reed for weaving, it is better to use a coarser reed and thread several threads through a dent than to take one that is too fine. In a fine reed the warp threads will wear out, and, in case of knots, they will not go through.

When deciding on a reed, it is best to thread a few warp threads through the reed that is chosen.

If the threads make an even and smooth surface over the reed edge, then the reed is the right size. If they crowd each other, then the reed is too fine. If there are spaces between the warp threads, then the reed is too coarse, and that depends on what you are going to weave. If you wish a hidden warp, then you must have spaces between the warp threads so that the weft threads can easily pack together. If you wish the warp threads to cover the weft thread, then the warp threads must stand almost twice as thick.

In order to get the weft thread through, after one has stepped on the pedal and formed a shed, a shuttle is used. See Fig. 15.



Fig. 15

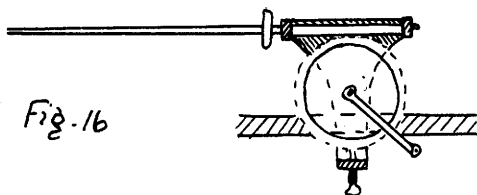


Fig. 16

This little shuttle is made of wood, the center part being carved out, big enough for a paper spool on which the weft thread is to be wound. When winding this spool, a bobbin machine is needed. See Fig. 16.

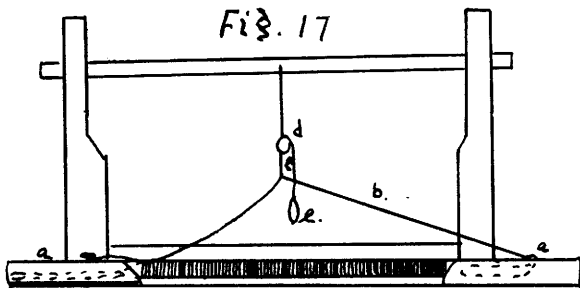


Fig. 17

The size of the spool is all according to what you make, but all spools should be wound evenly and hard.

The shuttle will then be thrown back and forth by hand, but this can also be done by *Ryckverk* (Flying Shuttle). See Fig. 17.

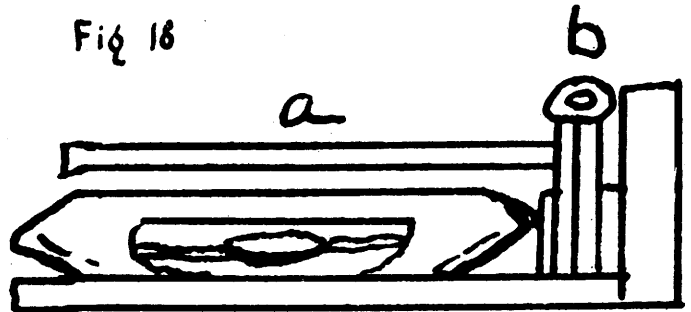


Fig. 18

The beater must then be longer and provided with a box (see Fig. 17 A) in which the shuttle has its place. The beater moves on an iron rod. See Fig. 18 A.

There is also a bouncer, and, when the beater is moving, the bouncer moves. See Fig. 18 B.

The bouncer consists of a wooden block, the inner side of which is lined with thick leather and is hit by the shuttle point.

The bouncers are connected with each other by a string (see Fig. 17 E), to the middle of which is tied another string.

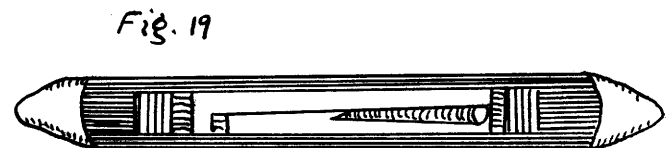


Fig. 19

On the top of the beater, the string is fastened to a wheel (see Fig. 17 D) and connected at the end of the string with a handle. See Fig. 17 E.

By pulling this handle to the right and left, the bouncer will move and push the shuttle over to the other shuttle box.

The shuttles used in the flying shuttle loom should be straight and pointed at both ends, and the points should be made of metal, to give plenty of weight to the shuttle. See Fig. 19.

Continued in the next number.

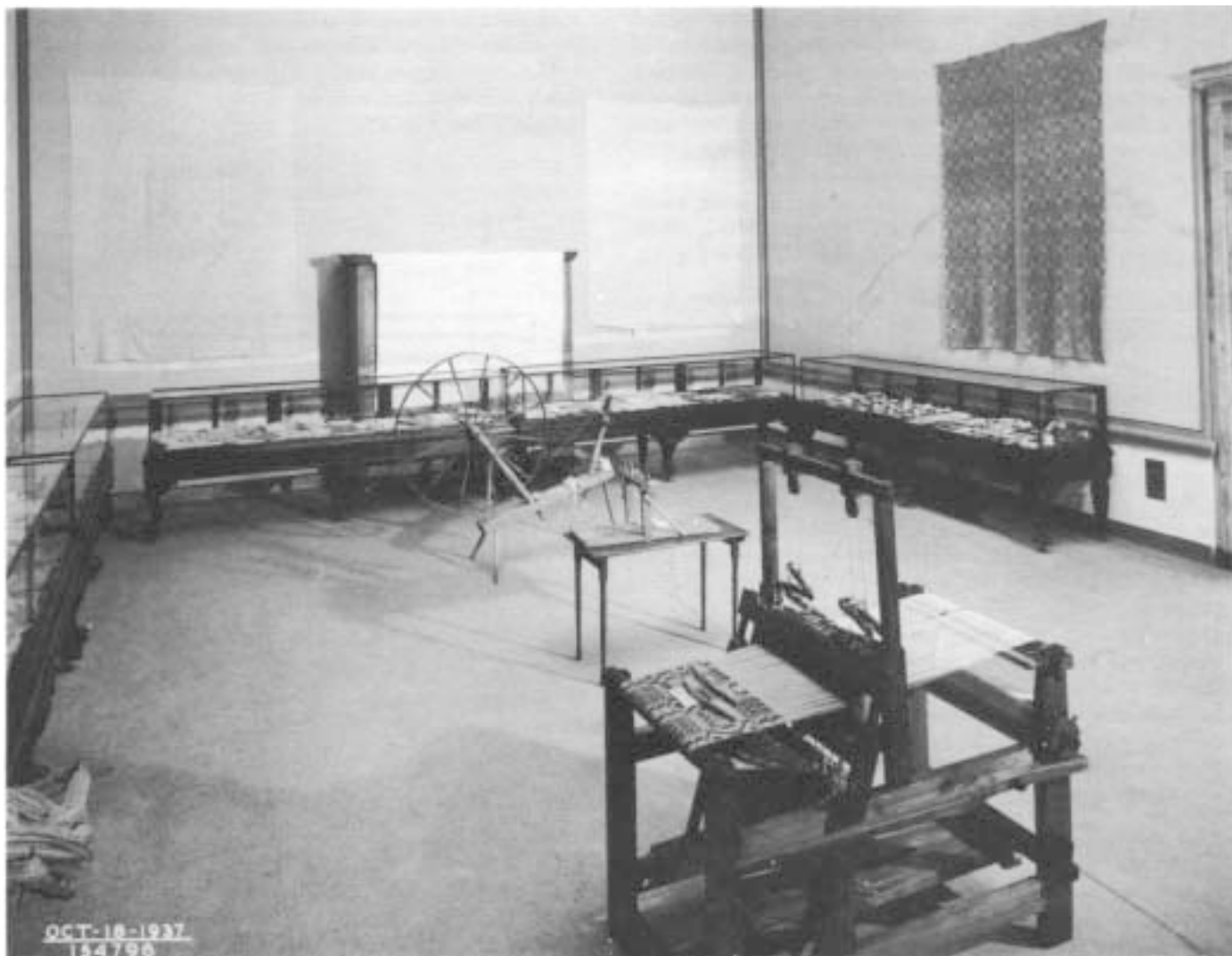


Illustration 1

KENTUCKY HANDWEAVINGS—*Photograph courtesy J. B. Speed Museum, Louisville, Ky., showing loom, cotton gin, wool wheel, other research into early and 19th century American handweavings.*

## *Kentucky Handweavings*

by LOU TATE

Kentucky handweavings are of interest to Kentuckians as well as to the rest of the United States. The J. B. Speed Memorial Museum, Louisville, Kentucky, opened its South Gallery to the exhibition KENTUCKY HANDWEAVINGS by Lou Tate. This exhibit shows some of the accumulations of a hundred and fifty years of weaving in the state. The west side of the gallery was devoted to the research of Lou Tate into early Kentucky handweavings and showed (Illustration 1) early drafts dating from 1775 to 1881, other early items pertaining to weaving, the wool wheel of Mrs. Richard Palmore, a cotton-gin of the type yet in use in Kentucky, a loom reproduced for Lou Tate by The Highland Institute at Guerant in Breathitt County, Kentucky, a SNAIL TRAIL AND CAT TRACK coverlet (circa 1850) of Mrs. Sarah E. McClure, a double CHARIOT WHEELS with double square coverlet of Mr. R. C. Ballard Thruston, a WHIG ROSE linen tablecloth of Mrs. J. H. Bousman, a rare

counterpane of woven knots (circa 1840) of Mrs. Henry Hail (Illustration 3 gives detail), and smaller weavings from early patterns.

The east wall held small tapestries (Illustration 2) and included a modern reproduction of an Egypto-Arabic piece from the collection of Miss Frances Morris and depicting a leopard making his kill, the Carden Arms, the Tothill Arms, the Schooner Clio of Milwaukee, Princess taking a fence, a silhouette L. H. H. (Mrs. Herbert Hoover), several race horses, the Warren Arms, the Teare Arms (Illustration 4 gives detail), several ships, Limon Bay in Panama, and linens with laid-in tapestry designs.

Kentucky has been important for those interested in this field of Americana. As early as 1884, Mr. R. C. Ballard Thruston made a photographic record of the folk arts found on a trip thru rural Kentucky.

Among these photographs are several of spinning and weaving equipment. "The Book of Handwoven Cover-



Illustration 2 "Courtesy of the J. B. Speed Memorial Museum" Ky.,

lets" by Eliza Calvert Hall, which has probably done more to renew interest in weaving for both layman and weaver than any other book, is closely tied to Kentucky. Even today, after twenty-five years, pleasant recollections of this early lover of the old coverlets crop up in Warren, Barren, and other Kentucky counties. Early in the twentieth century, several of the mountain schools did notable work in reviving weaving in their communities. The present research by Lou Tate into early Kentucky handweavings is recent. She started weaving as a hobby in 1927, and after stumbling onto some very early drafts in 1928, she began researching for other early American handweavings. In 1933, Miss Tate decided upon weaving as a profession, continuing the research, teaching a limited number of students highly interested in the creative pos-

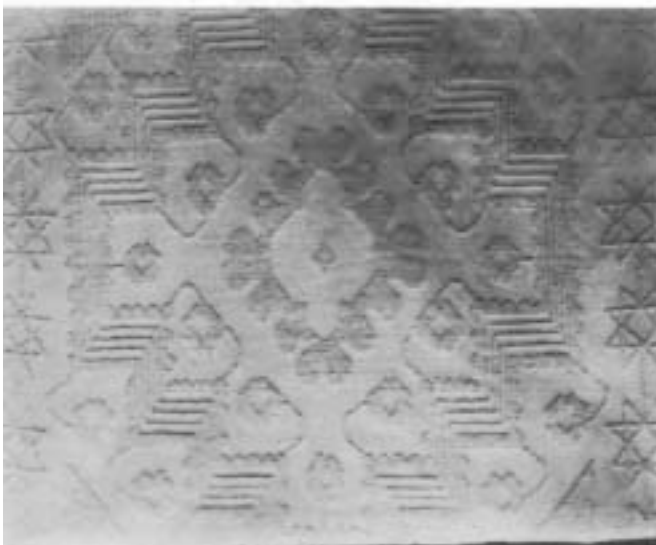


Illustration 3 "Courtesy of the J. B. Speed Memorial Museum" Ky.,



Illustration 4 "Courtesy of the J. B. Speed Memorial Museum" Ky.,

sibilities of weaving, and weaving authentic reproductions and individually designed modern textiles. The exhibition FOLK ARTS OF KENTUCKY, May 22 to November 16, 1937, Folk Arts Center New York was assembled by Miss Tate and included many outstanding items of early Kentucky handweavings. The exhibition KENTUCKY HANDWEAVINGS included over three hundred early drafts, nearly two thousand copies and photographs of early drafts or coverlets, dyeing recipes, old account books having references to weaving, besides old pieces of textiles in the division of the exhibit pertaining to the research, and included reproductions and modern designs in recently woven textiles in the division of the exhibit pertaining to present day weavings.

Tho there is no formal weaving organization in Kentucky, many of those interested in the old weavings exchange drafts and photographs, swap dyeing recipes, help one weaver find a good cotton spinner, help another weaver locate some old man who remembers how to make the little loom used in Kentucky for making saddle girts, or aid some beginning enthusiast to take the draft from her grandmother's coverlets. Even tho the prospect of a textile museum is far in the future, they are locating items for that potential museum; and several of these weavers have small museum collections for their loom rooms. The exhibition of KENTUCKY HANDWEAVINGS has a wide appeal to the layman interested in textiles, to school groups, to art groups, to those interested in Americana, and especially to weavers.

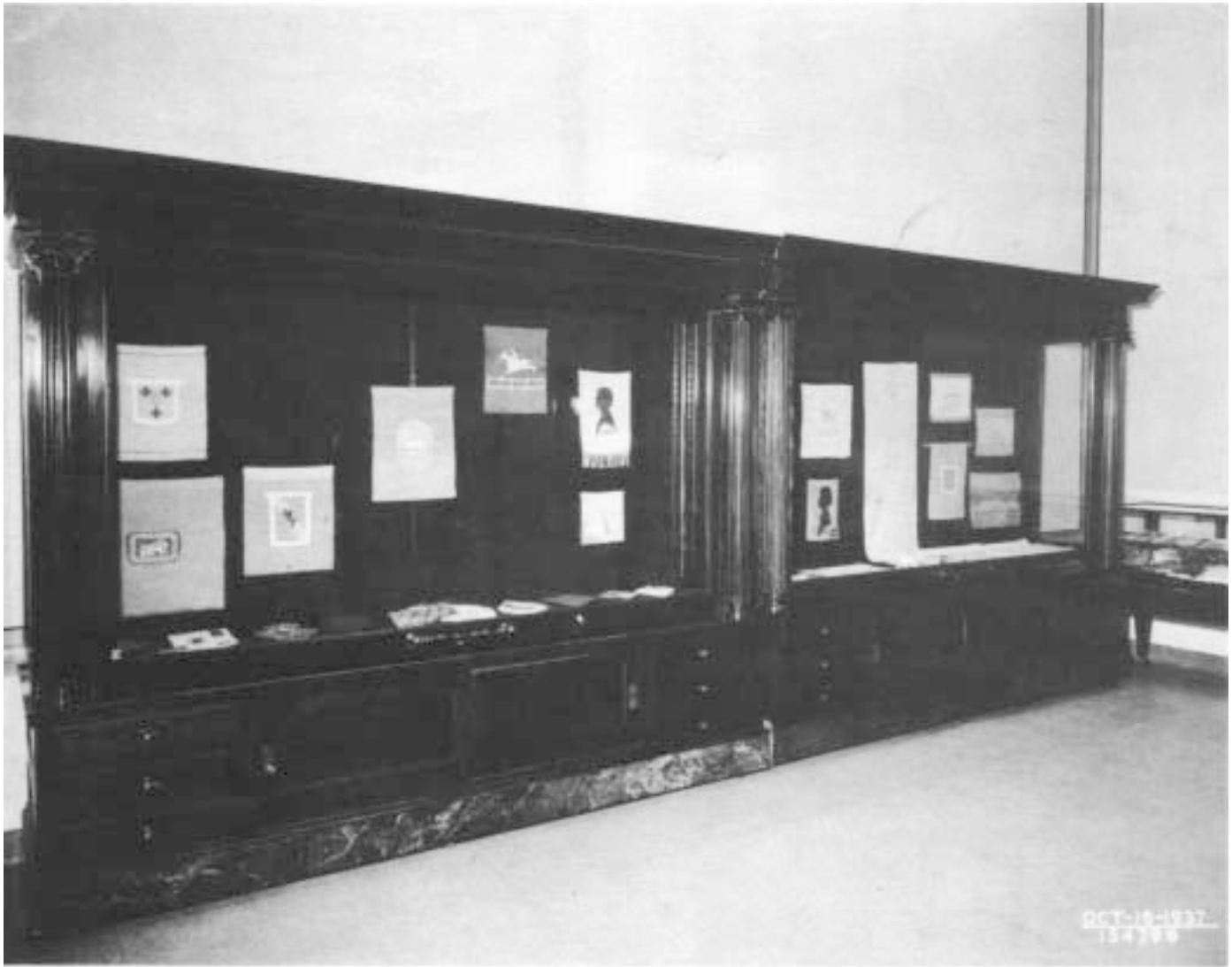


Illustration 2

**KENTUCKY HANDWEAVINGS**—Photograph Courtesy J. B. Speed Museum, Louisville, Ky., showing modern weavings—Carden Arms—1934.

**A LEOPARD MAKES HIS KILL** 1936 from 10th c Egypto-Arabic Tothill arms 1935

Schooner Clio of Milwaukee — 1935

Princess — 1933

L. H. H.—Silhouette of Mrs. Herbert Hoover 1932

The Weaver — 1930

Teare Arms

The Weaver 1937 — Brokers Tip, Kentucky Derby

Lou Tate 1930

Twenty Grand 1934

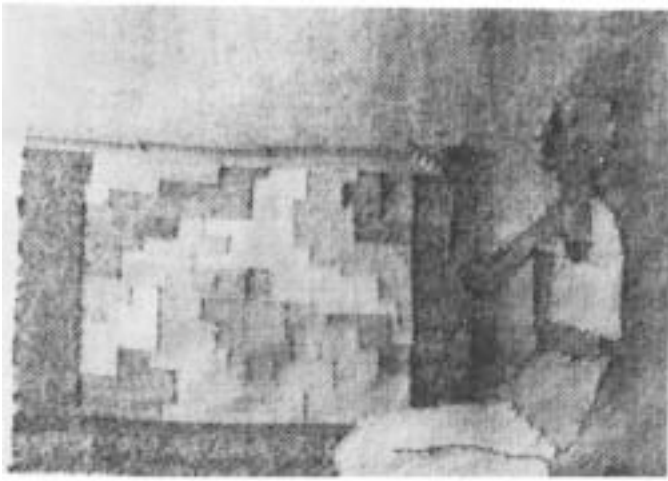
The Folly 1935

Warren Arms — 1936

The Viking Ship 1935

Limon Bay — 1935 — Panama





*The Weaver — woven 1930*

*"Courtesy of the J. B. Speed Memorial Museum" Ky.,*

During the exhibition Miss Jessie Lambert (occupational therapist in Louisville) and Miss Mary Anderson Courtenay (12 year old weaver) wove at the museum and Mrs. Richard Palmore spun wool on the wheel made by her grandfather.

Students from various classes from second grade thru college wove on a piece. Tho this was their first weaving experience, the result was perfect enough to be added to the Museum textiles.

Then there were several talks on various angles of weaving, research seems to arouse more interest for the layman. Mr. Edward Warder Rannels, head of the Art Department at the University of Kentucky, spoke on "Textiles and Traditions" — giving a nice linking of the art and textile traditions of the past to the present folk art development.

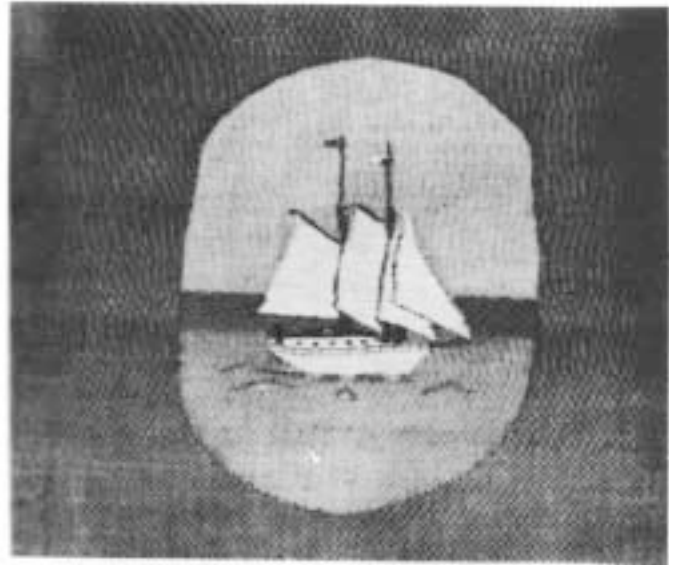
The little weaver "stole the show" — she is a charming unaffected child who was so engrossed with her work that she was totally unaware of the tremendous attention. Incidentally she is a very capable weaver — is working on the cartoon for a tapestry of her home with its lovely century old doorway — and signs her weavings like a master-craftsman.

Concerning Lou Tate and Handweavings  
1726 Third Street  
Louisville, Kentucky

The J. B. Speed Memorial Museum (Louisville, Ky.) exhibited in the south gallery during October 1937 KENTUCKY HANDWEAVINGS from the research collection and from the modern textiles of Lou Tate.

The Courier-Journal (Louisville, Ky.) had three articles on various angles of the exhibit Sundays Oct. 3, 10, and 31. The following is from section one, October 10, and written by Barbara Anderson, Editor of Kentucky Progress.

... "No visitor to the current textile exhibition at the J. B. Speed Memorial Museum can fail to remark that the Kentucky woman's oldest handcraft is by way of becom-



*Schooner Clio of Milwaukee—work copy—Lou Tate 1935  
courtesy J. B. Speed Museum, Louisville, Ky.,*

ing her newest hobby. The women who call every day to see Lou Tate's exhibition of old and modern textiles are not there merely to see and to admire. They are making notes and asking questions. One hears of spinning wheels and looms that are being brought out of attics and sought in antique shops, and the ancient heritage of American women bids fair to take its place as a permanent art.

In the old days women wove for two reasons—to protect and comfort their families and to give expression to their artistic impulses, and the modern weaver finds her chief inspiration in the beauty of the designs created by her ancestors. Lou Tate has contributed enormously to the present enthusiastic revival of the art which, like every renaissance, is due to a fresh wave of appreciation of the treasures of the past.

The service of Lou Tate in collecting and preserving early Kentucky textiles and in adapting the art of weaving to modern use is excitingly illustrated by more than 100 pieces, drafts, cartoons, photographs and so on now being shown at the museum.

This afternoon at 3:30 o'clock Miss Tate will talk informally about her rare collection and her adventurous research expeditions into the remote mountain regions where the practice of weaving has continued without interruption from generation to generation and to the rich river lands where, in the leisure provided by greater affluence, the finest examples of old weaving were created.....

Lou Tate is in no sense a prophet without honor in her own country, but the remarkable success of her present exhibit at the Folk Art Center (May 22-Nov. 18, 1937) has added distinct glory to her fame here at home. Her exhibitions in New York, Washington, and other cities have focused national interest on Kentucky's pre-eminence in the folk arts and have proved an impetus to local appreciation of Miss Tate's revelations and interpretations of early Kentucky Culture. ....

More than 900 visitors, including a party from Lexington, have seen the exhibitions during the past week.... "



## Chairs 'N Things

by VERA N. CARR

Being interested in weaving, with its accumulation of looms, equipment, materials, etc., soon makes hotel living an impossibility, and then comes the question of housing all that paraphernalia.

Doing over an old garage apartment recently for studio purposes has been great fun for one person who has lived in hotels most of her life, and readers of *THE WEAVER* may be interested in some make-shift articles that are being utilized until such time as they can be replaced with some good old pieces.

First, the draperies shown are very pleasant to live with, and durable as well. They are made of drapery cotton and jute and stand, not only the frequent washings necessary, but our hot Florida sunshine too, which is no small item to take into consideration for semi-tropical climates where silk and wool are not at all practical.



These curtains were made of some left over materials, but an unbleached cotton and Bernat's Perugian Filler could be used successfully for this purpose, though it should be set somewhat closer in the loom than the above mentioned materials, which are heavier.

Set at fifteen to the inch, these materials were strung as follows:

Thread:			
1, 2, 3, 4, 37 times	148	Threads	(Black 90 threads)
11 Repeats of draft	396	"	(Tangerine 30 " )
1, 2, 3, 4, 6 times	24	" "	(Yellow 30 " )
			(Jute 418 " )
			( 568 " )
	568	"	



The colored stripes and the last 24 threads along the opposite edge were threaded in a four-thread twill, while the center of the warp was threaded in a six-thread block of the well-known Monk's Belt draft.

A plain tabby weave at 15 shots to the inch was used, yellow for the body and the bottoms woven in the colors to correspond with the edge, which when the curtains were finished formed stripes down the inner edge and across the bottom of the curtains.

At intervals of five inches, one figure was laid in by hand irregularly across the loom, with no attempt being made to keep a uniform system of either color or spacing. Numerous shades, colors and materials may be used for this purpose, and the result is a nice soft yellow with bright colored spots here and there, and all toned down with the wide black stripe which was hemmed back an inch and a half down the center and three inches across the bottom, — which of course, means that the black at the bottom is woven at least an inch and a half wider than the lengthwise stripe.

### CHAIR CUSHION

A cushion made of the jute freshened an old wicker chair, which was repaired and painted a bottle green.

The same draft was used for this cushion cover as was used for the curtains, but the jute was strung two threads through a heddle and the same irregular manner of laying in the figures was followed.

(Continued on page 20)

# Weaving in Many Languages

by HELEN LOUISE ALLEN

Many weavers have foreign books which they use for drafts or for the illustrations but are unable to read the written descriptions. It is hard to get these books translated as people who know a language well may not know weaving terms. For instance, to the average English speaking person "tabby" refers only to a cat, and a "shed" is a small building in the backyard. This is true in other countries as well. When I first purchased my Norwegian and Swedish books I decided that as long as Madison is a center of Scandinavian culture I would have the books translated. I engaged a Norwegian to start on Caroline Halvorsen's excellent book. After about an hour's work which consisted mostly in asking what the terms meant, he decided that I knew more about "weaving Norse" than he did. I then studied Scandinavian grammar and worked on the books by myself.

For some time I have kept a comparative vocabulary of weaving terms in as many languages as there are books readily available to the weaver. The vocabularies in any of the languages are not complete as there are many terms that will have to be filled in by weavers of the different countries; the average dictionary knows nothing of weaving terms beyond "loom", "warp", and "weft." Some of my friends have asked for a copy of my lists and also a resume of Scandinavian grammar to help them puzzle out what the descriptions under the drafts and the illustrations might be about.

The majority of the books are in Swedish or Norwegian with a few in Danish. Most of the descriptions under the drafts consist in explanations of the type of thread to be used and the number of threads to the inch; types of information that each weaver has to work out for his or herself according to the materials at hand or the size of the article to be woven. The Scandinavian weavers usually use a much finer thread than we have the time and patience to use, so the number of threads to the inch is very high. The descriptions are, therefore, not as much use as they might appear to be. However if they will be of any use to any one the following bits of grammar may be handy.

Plurals of nouns and verbs are not made by the use of "s" but "a", "ar", "er", or "or" depending upon the word or the language. This is often accompanied by a vowel change in the word. Thus "tand" is "dent" but "tänder" is "dents". "s" on the end of the word usually signifies that it is a verb in the passive and is to be translated by a form of "to be". Thus "Trampas efter solvning" is "To be treadled as threaded", "Trampas som det solvas", "to be treadled as it has been threaded", "Solvas och bindes som nr. 20", "To be threaded and woven as No. 20." Occasionally the "s" will denote the possessive but there is seldom the occasion to use the possessive in weaving.

Besides the plural hanging on to the end of the nouns in certain cases the article hangs on also, thus making a very simple word look very complicated. For instance, "mönsterränderna" looks formidable at the first glance but resolves itself into "monster", pattern, "rand" row, "er", s, "na" the, or "the pattern rows." "Tramporna" becomes "the treadles."

Prepositions are the hardest things to translate from Scandinavian into English and visa versa. They do not have the same feeling for the prepositions that we have. "13 tander p<sup>o</sup> 1 cm" is 13 dents in 1 cm., but "1 trad i 1 solv" is 1 thread in one eye. The meaning for "p<sup>o</sup>" in the dictionary ranges from "on, upon, at, in, about, against, to, for, of, by," all depending on the connotation. I always figure out the nouns and the verbs and then put in the preposition that best fits the sense without regard to the exact dictionary translation of it.

The terminology used in the Swedish books of Sigrd Palmgren and Maria Collin are somewhat different. For instance, the term for dents used by Palmgren is "tand" but that of Collin is "rör". The translation from the metrical system to the inch is not hard as there are approximately ten centimeters in four inches, thus one multiplies the number given for one dent by ten and divides by four. Usually the number of dents is given in 10 centimeters so one does not have to multiply by ten. In most Scandinavian directions the dents to the cm is given and then the threading thru the eye and thru the reed. The directions may say "8 tänder p<sup>o</sup> 1 cm.: 1 trad i solv, 3 tröder i tand." This works out to 60 threads to the inch. Or to take a Norwegian example "90 tander p<sup>o</sup> 10 cm.: 1 trad i hovel, 2 tröder i tind" gives one 45 threads to the inch.

Some times the number is given in terms which correspond to our inch. "17 tal pr aln" or in the Danish books it is often given "20 Snese pr Alen."

A typical description from Palmgren is this:

Del 1 Nr. 24 Halkrus	Vol. 1 No. 24 Honey comb
Varp: Rostgult bomullsgarn	Warp: Rust yellow cotton
N:o 30/2	30/2
Botteninslag: Guld fargat bomullsgarn N:o 30/2	Background weft: Gold colored cotton 30/2
Figurinslag: Grönt bomullsgarn, 5-dubbelt. 16/2	Pattern weft: Green cotton, spooled five threads together. 16/2
Skedtätthet:	Sleying:
11 tander p <sup>o</sup> 1 cm.	11 dents in 1 cm.
1 trad i solv, 2 tröder i tand.	1 thread in an eye, 2 threads in a dent. (55 threads to an inch)

English	Swedish	Norse	Danish	French	German	Dutch
Weaving Loom Warp	vävning vävstol varp	vevning vevstol renning	Vaening Vaening Trend	Tissage metier chaine (to warp ourdir)	Weben Webstuhl Kette	Weven Weggetrouw-Weefstoel Schering-Kette
Harness Treadles Heddle-eyes	skaft trampor solv	skaft trøer hovel hovelene hovling vevskje tind	Skaft Skamlar Søl	lame marche lisse	Schafte Pedale Litz	
Threading draft Threading how to *Dents	solvning Sked (täthet) rörtand plural tänder uppknytning		Solning Røret Rit	peu	Einzüge	
Tie-up Swift		opknytning garnvinde plural skyttel skytler islett	Opbinding	attache devoirdoir	Kette Inteilung garnwinder	Garnafwinder
Shuttle				navette	Schütze Schiffchen Schlussfaden	Scheetspoel Inslag
Weft	Inslag		Islaet Indslag Bomuld Uld	trame duite coton laine	Baumwoele Woele	Katoen Wol
cotton wool	bomull ull ylle	bomull ull		soie lin fils	Seide Leinen Garn Fäden	Zijde Linnen Garen
silk linen yarn thread (s) cloth	siden lingarn garn trad (ar) tyg	garn trad (er) tõi	Garn Traddl (e) tøj Stof Gardin Drejl	fils tissu tissage	Web Stoff Gardine	Draad Weefsel Stoffeering Gordijn
curtain drill rugs	gardin dräll	gardin dreiel gulv løper tepper		serge	Teppich	
mats white— bleached black unbleached	matta vitblekt svart oblekt	hvit bleket sort ubleket	hvid bleget sort ubleget	blanc blanchir noire naturel ecru rouge bleu jaune	weiss bleicht schwartz ungelbleicht	wit blank, bleek zwart ungelbleekt
red blue yellow	rødt blått gult	rødt blå	rødt blaa		rot blau gelb	rood blauw geel or gele
Pattern	mönster	mønster	Mønster	model patron serge satin bordure	Muster	Model Patroon Keper Satijn (atlas) rand rip
Twill satin border rep tabby plain weave spinning wheel }	kypert atlas bard rips bundväv cärft	atlasbord rips bunnan lerret	bort reps	liaison	flecht	
				rouet	Spinnrad	Spinnewiel

Continued from page 18

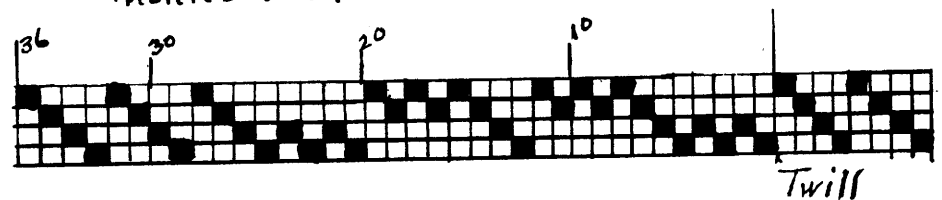
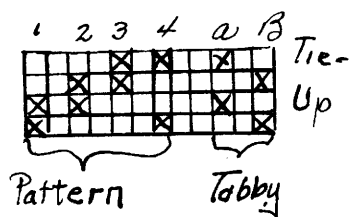
A small wooden box — about 12 x 17 x 7 inches deep — four ordinary door stops from the Ten-cent Store and some black upholstery tacks made a stool which completed the ensemble.

The door stops were used for feet, the box was padded, covered with the material like the chair, and then finished with the tacks. (I might add that the tack job was com-

pleted after the picture was taken, and the same evenly spaced row of tacks appears at the bottom as shown at the top in the picture.)

All this wouldn't, of course, fit into an interior decorator's idea of a high-class job, but it does fit into the surroundings and is a marked improvement at a nominal cost.

### Monk's Belt





# Scandinavian Art Weaving

## SWEDISH DUKAGÅNG

by ELMER WALLACE HICKMAN

Dukagång, it has been said, is to be found in ancient Egypt.

Although this be true, the Swedish people, especially, have realized the desirability of this weave and have so incorporated this technique in their textiles that Dukagång seems pronouncedly Swedish in character. It is *not*, however; because other Scandinavian countries do not, by any means, ignore the versatility of the Dukagång technique. I suppose that the identification of Dukagång with the Swedish people is the result of their textiles being more widely publicised, both commercially and photographically, than the other peoples of Scandinavia.

Dukagång technique is discussed in the Danish publication, "Vaevebog For Hjemmene"; in Caroline Halvorsen's Norwegian book, "Handbok i Vevning", many varieties of this technique are explained under the name of Sjonbragd.

There are, at least, two ways of doing this technique. One is by the use of sticks in back of the harnesses with long-eyed heddles, and the other is by the method described in this article. Maria Collin, in her Art Weaving book, "Skansk Konstvävnad" (Swedish Art Weaving), describes both methods quite fully.

Dukagång, although not unknown to some American weavers, is an extremely engaging technique—not only for Art Weaving but as a technique with which to decorate the web of any so-called plain weave. It is a "laid-in" technique (perhaps more correctly called "pick-up" by the Swedish, since one does pick up the warp threads under which the design bobbins are placed). The technique combines a plain shuttle weave with an inlaid design. The plain shuttle weave may answer for the background when only the design is "picked-up", or the shuttle weave may act as a tabby binder when the design, as well as the background, is "laid-in." The tabby weave in either process holds securely the weft shots of the design. Illustration No. 2 shows the border stripe done by "picking-up" only the design units, and the background is woven by the tabby weft. (An illustration of the entire weaving appears in Volume 11, No. 1 on page 21.) In the stripe where appears the deer design, the design and the background are "laid-in." In the latter (the background) the tabby is still used between each pattern row to hold, in place, both the background and the design weft.

The word "dukagång" means "cloth paths."

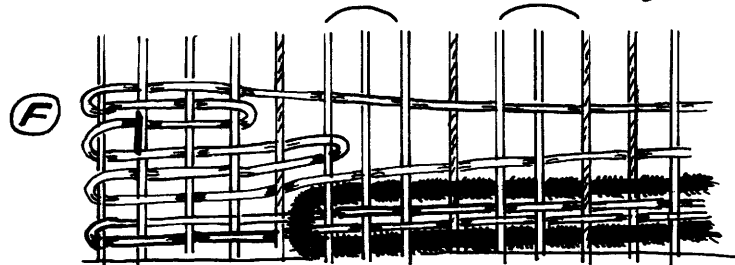
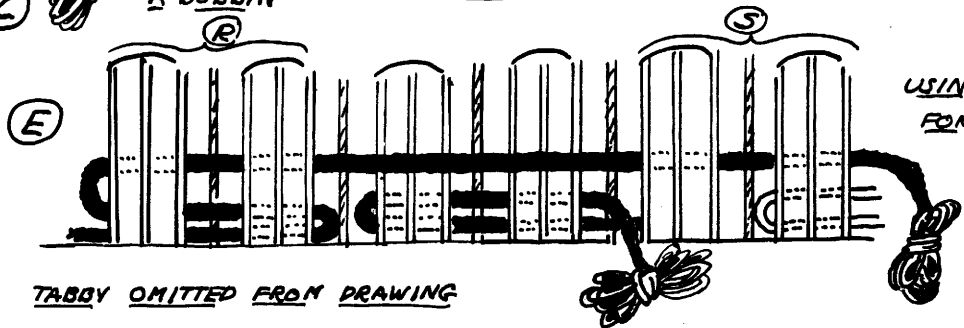
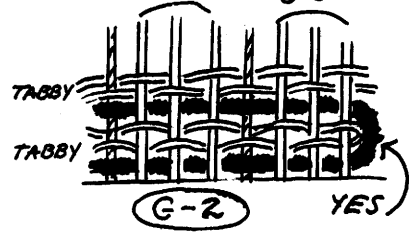
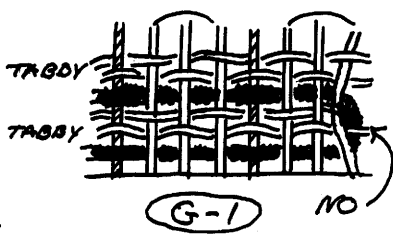
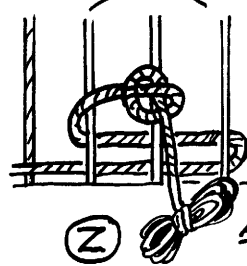
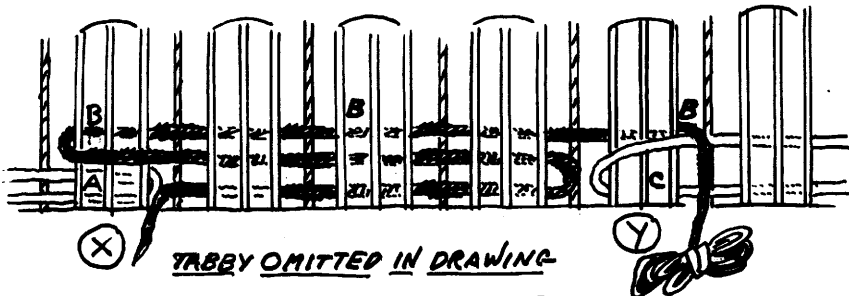
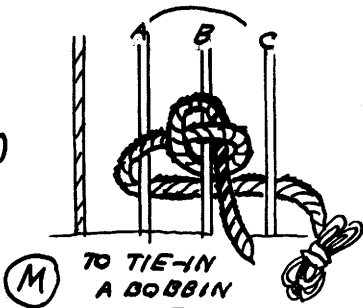
I have seen a few treatises, in English, on the Dukagång technique in varying concepts — some informative and others characterizing its use for simple spot decorative-ness. One confusing explanation, which I read recently, was so confusing that a weaver, unacquainted with the technique, would turn from the information—or lack of it—with a fearful dread that his own mental powers for apprehending were sadly absent. And yet, the working process, as the Swedish do it, is really comparatively simple. The working method requires only very careful observation while one is at the loom. This careful observation is necessary in order to see that all units of design are put into place and put in the right places.

The web in Dukagång—when one has mastered the technique—builds more quickly than either the Åklæ or the Lightning weaves (these two weaves have been explained in previous articles). The work is done from the back or wrong side of the weaving; and a mirror is needed to hold under the right side of the progressive work so that one can see that it is being done correctly. Any sizable mirror that is conveniently handled will do for the purpose.

One *can* make mistakes in the process of working the Dukagång technique; therefore, as I learned from Miss Sara Mattsson, who taught me this weave, a bobby hairpin is a decided advantage to have in one's possession. No other accessory can take its place—not even a large darning needle. "Bobby-pin!" Yes, that brings back to me an unforgettable afternoon while I was learning this unique technique. Naturally, I had none of these precious feminine necessities, so continually had to borrow one from Miss Mattsson. For fear of proving myself a memorable nuisance, I bought a card of this certainly indispensable equipment during noon hour at a five and ten-cent store. Although hesitant, at first, about making the purchase, no embarrassment was caused me. But, when I returned to the studio and proudly displayed my triumphal acquisition to Miss Mattsson and several of the other student weavers, I let myself in for a volley of hilarious epithets and vocal cudgelings, which, though highly amusing, promised to wreck, almost, a much-needed afternoon. Tragedy so often mollifies one's existence. So it was with me; I learned what a hairpin can do to one's determination and one's art!

And the very helpful use of this hairpin is this: should one miss "laying-in" a unit of design and it is found only later, after several rows of the weaving have been put in, the bobby-pin is serviceable to insert the omitted unit.

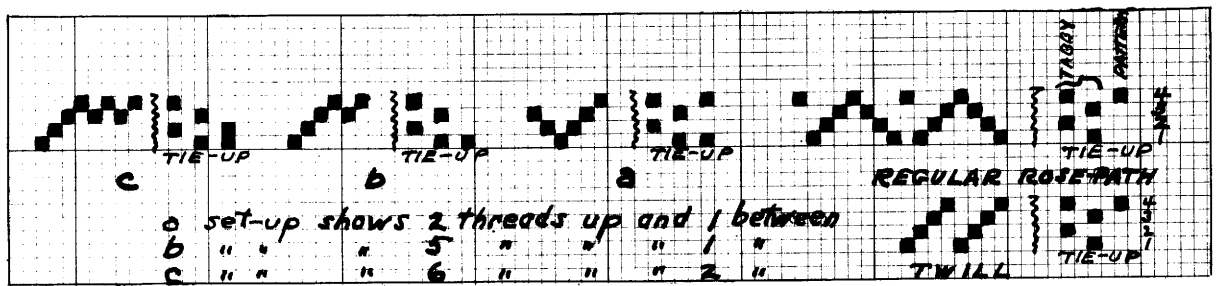
# SWEDISH DUKAGÅNG



IN THE ABOVE, DOTTED LINES ARE USED TO SHOW THE WEFT UNDER THE "THREE-THREADS GROUPS" SO THAT THE SKETCHES WILL BE MORE READILY UNDERSTOOD

THESE SKETCHES SHOW THE WORKING SIDE OF THE WEAVING.

EWY



## DRAFTS AND TREADLING

"ROSE-PATH" AND TWILL ARE MOSTLY USED THE OTHER DRAFTS "a", "b", "c" ARE USED FOR FINER "SET-UPS"

# PLATE NO. 1



ILLUSTRATION No. 1-A—*Experimental Textile, showing the working side.*

With the weft slipped into the head of the bobby-pin, “lay-in” the design unit between the tabby shots and through the correct sheds—the work having been pushed up the warp so that one can get at the vacant place. This will save taking out the finished work, which is always disagreeable to do. The best way, however, to avoid this process is not to make the mistake in the first place . . .

The colors used in the work can be as lavish as one wishes; but it is better to use more subdued tones when the entire weaving is done in the Dukagång technique. Harsh primary colors should really be shunned. Some excellent effects are to be had by combining various tints and shades of one color—such as brown. This combination will run through the darkest brown to the lightest tan, with, perhaps, a touch of rust to accentuate and give life to certain parts of the design.

The designs to be employed are worked out on cross-section paper. The square should count for the group of three threads that the shed produces and the lines that divide the squares on the paper will correspond to the single warp thread that is on the bottom shed. (Refer to draft and tie-up). Great opportunity is offered to the weaver who wishes to create his own designs, but for the benefit of those who do not care to do so, I have arranged a varied assortment of designs to accompany this article. None of the designs are original; all are either adaptations or “liftings” from old Scandinavian sources.

The finished product done in the Dukagång technique looks like a series of long vertical columns or paths with

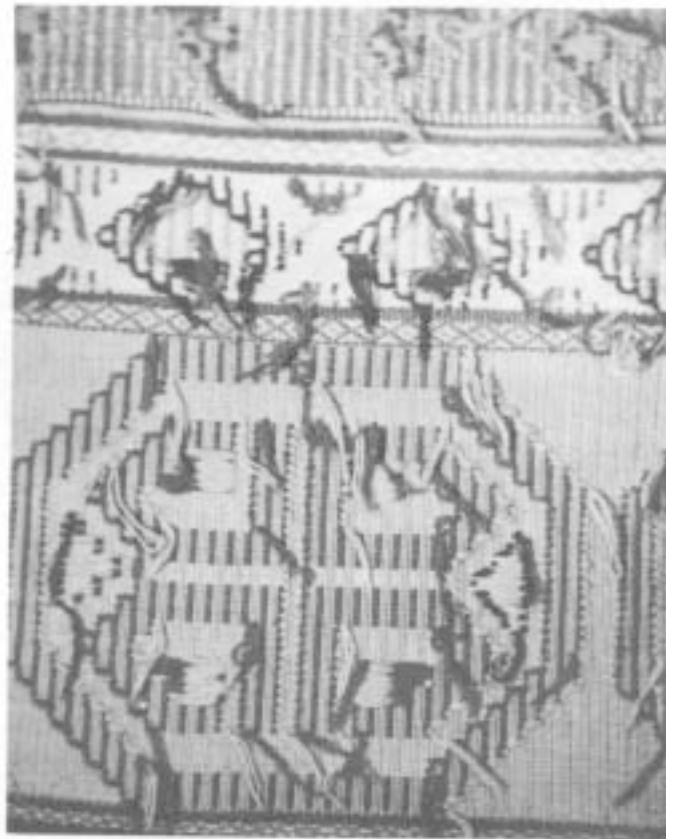


ILLUSTRATION No. 1-B—*Experimental Textile, showing the usable side.*

an interval of one warp thread between each series. This straight path effect happens because the pattern or design bobbins are put-in always on the same treadling combination of three warp threads on top of the shed, and one warp thread on the bottom of the same shed. These three warp threads are completely covered by the weft yarn, while the interval of one warp thread is but partly covered by the tabby weft yarn. Because the warp shows on this interval, the warp threads should be a better grade yarn. The warp is threaded singly through the heddles and the dents of the reed. Warp set too closely in the reed will prove awkward with which to work, yet the warp must be one of strength. A good weft yarn is Bernat’s Homespun wound *doubled* into the bobbins. The tabby when used singly as a binder can be the same as the warp. But when the background is formed by the tabby weft, it is more satisfactory to use a fine wool yarn such as Fabri or Shetland. However, that can be a matter of choice. One strand of Homespun will do quite well, also.

A four harness loom, either table or floor, is used for this work with a tie-up and threading as given in the accompanying draft. The pattern drafts ordinarily used are “Rosepath” and plain twill. When the “Rosepath” threading is used, one can break up the Dukagång technique-areas with stripes of “Rosepath” pattern. The twill will not permit such an interesting pattern stripe.

The “set-up”:

Loom: 4 harnesses, 4 treadles or levers.

Warp: 10/2 mercerized cotton, 16/2 mercerized cotton

or No. 10 Perle cotton.

Weft: Homespun, doubled, for pattern; single for background. Also for background — single Fabri or Shetland.

For tabby: same yarn as for warp.

Reed: No. 15 for 10/2 warp; 1 thread in heddles, 1 thread in dents. No. 12 for 16/2 warp; 2 threads in heddles, 2 threads in dents. No. 15 for No. 10 Perle threaded singly through heddles and reed.

We shall assume that the loom is threaded. On the Structo or Superior looms the pattern design shed will be formed by pressing down Levers 2, 3, and 4. This combination will bring a group of three warp threads on top of the shed, leaving one warp thread (harness No. 1), between each group of three, on the bottom shed. On the floor loom Treadle No. 1 is pressed down causing the shed as the above to be formed. This is the only pattern shed that you use. The tabby sheds are 1 & 3 and 2 & 4. Have your tabby weft on a shuttle of some sort and your design bobbins wound double in the manner described in the article on Aklae weaving. In winding the bobbins with the two strands of Homespun weft wool, it is well to use a swift on which to hold the skeins. Your bobbins can then be wound more easily and quickly. Pull from the skein a length of about twelve feet and then double the thread; but instead of doubling the thread throughout its entire length, begin to wind the doubled strand around the thumb and index finger, and your length that you pulled out will double with that coming from the swift. This accomplishes two steps at once. When you get to the

original end of the yarn, break the second length evenly with the first and tie both ends around the bobbin. This is only a suggestion, however, but it will save time. Wind the bobbin as best it suits you.

Weave about 8 shots of tabby, beginning on the 1 & 3 shed by putting the shuttle in the shed from the right; then, of course, the shuttle will return through the 2 & 4 shed from the left. This procedure is necessary, otherwise, if the tabby weft is put through the shed in the opposite directions, the warp threads at the selvages will not always be caught. Now get the pattern shed—groups of three on top with one warp thread on the bottom. These three warp threads will be hereafter designated as “three-threads group.” The design bobbins are put in from left to right, i.e., the end of the weft yarn will be on the left of the design unit and the bobbin proper on the right of the design unit. This is important.

When inserting the bobbins, the “three-threads group” of warp threads—whatever the number of “three-threads group” may be in the unit of design—are picked up on the middle finger of the right hand when the bobbin is coming from the right-to-left direction, i.e., the warp is passed under the warp threads with the left hand; and as the bobbin passes through the unit of warp threads it is caught with the middle finger—the one that up to this time has been holding up the warp threads—and the thumb of the right hand, and the bobbin is pulled through the shed. Just the reverse happens when the bobbin is coming from the right-to-left directions, i.e., the warp is held up by the middle finger of the left hand; the right hand passes the bobbin through the shed and the bobbin is caught by the middle finger and the thumb of the left



ILLUSTRATION No. 2-A—Right side of weaving—showing detail.



ILLUSTRATION No. 2-B—Working side of weaving—showing detail.



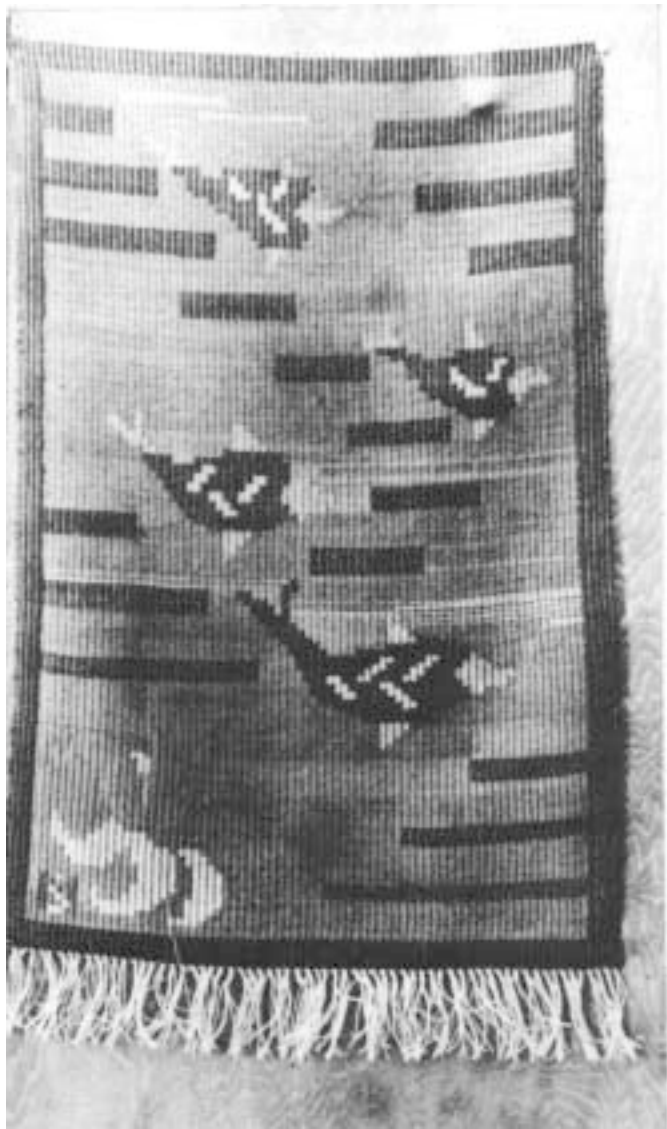
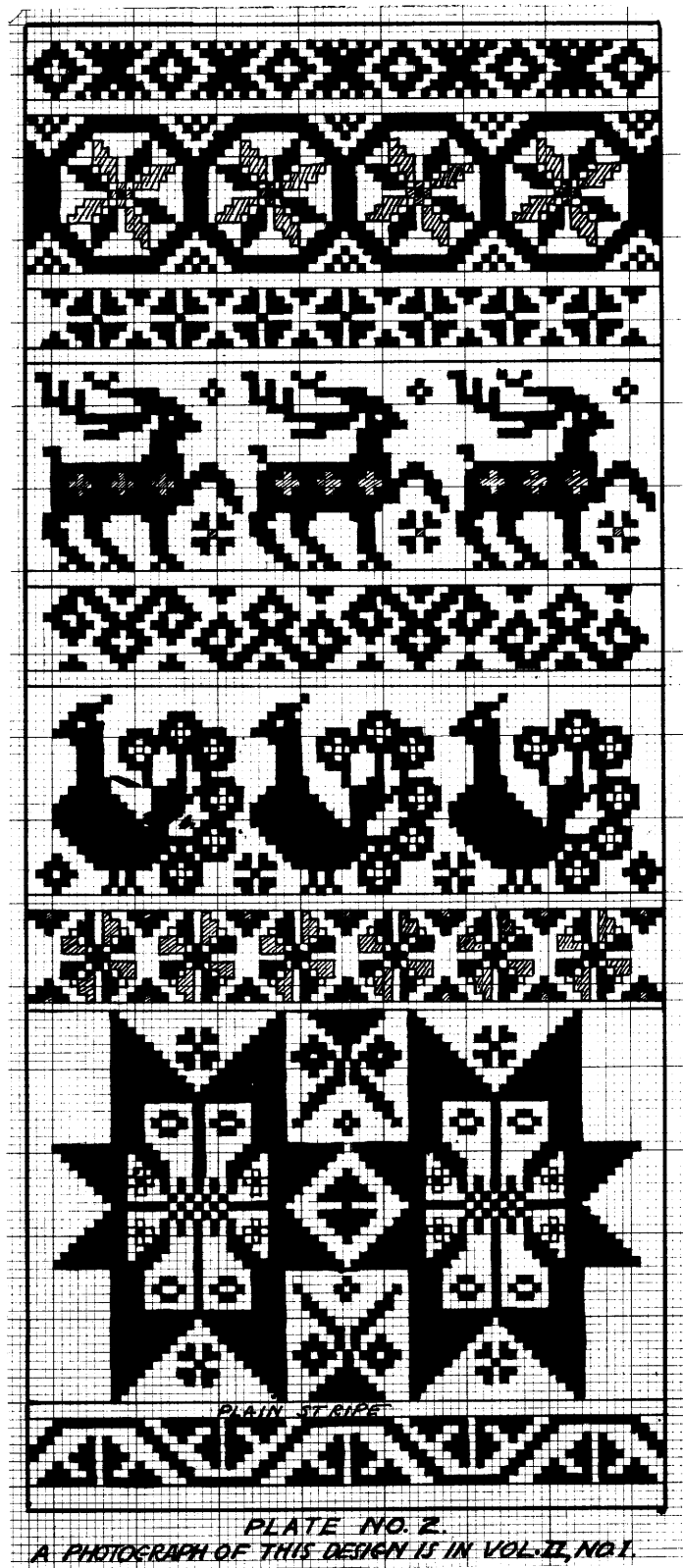


ILLUSTRATION No. 3—Fish design in Dukagong—woven by Miss Sara Mattsson.

hand. *All bobbins at all times must be going in the same direction.*

Put all the bobbins through the “three-threads groups” shed as far as they go in the units of design; change your shed by the 1 & 3 treadling; beat; and throw a shuttle of tabby; change the shed by the 2 & 4 treadling; beat; and put-in another tabby weft. There must be two shots of tabby after each row of design is put-in. Change the shed back again to the pattern shed (treadles 2, 3 and 4 on the table looms, and treadle 1 on the floor loom) and put-in all the bobbins from the right-to-left direction as far as the unit of design goes. This row will, of course, cover the same space as the first row of design weft. *No interlocking takes place in this weave.* Again follow the design row with two shots of tabby.

You continue these two processes—a pattern row from the left-to-right direction, followed by two tabby shots; and a pattern row from the right-to-left direction, followed by two tabby shots—until your blocks are high enough

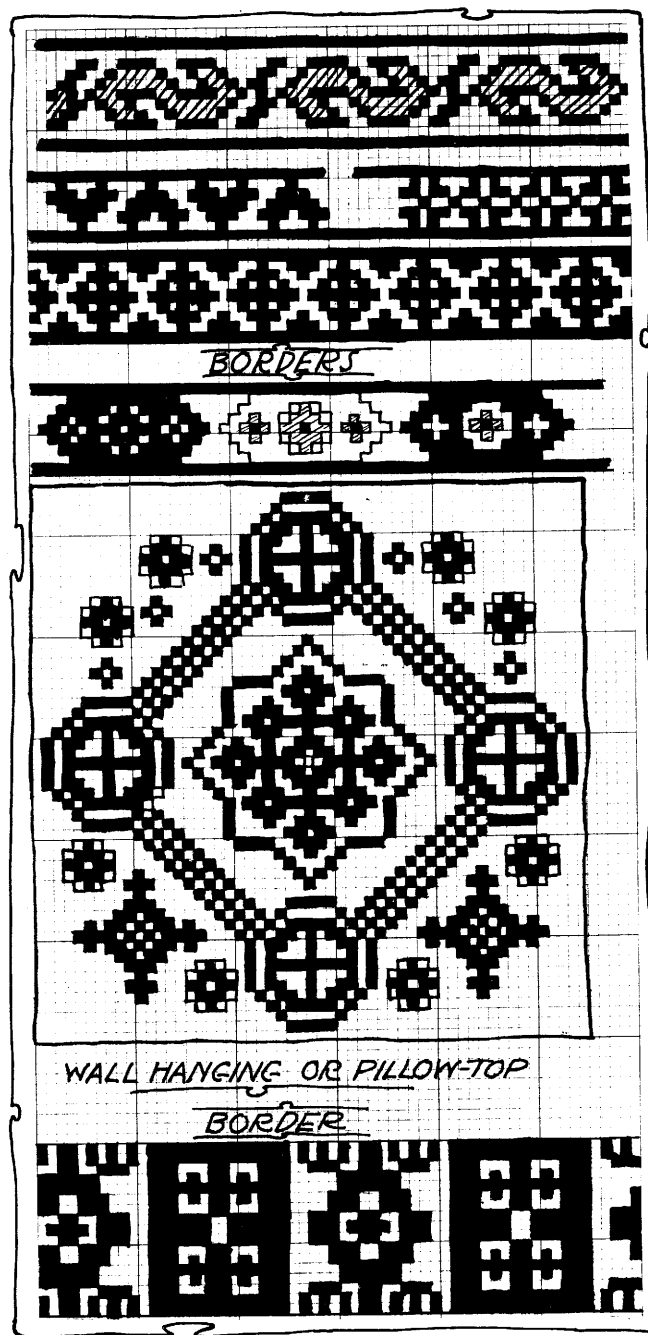


—squared. In other words, it takes three or four shots of pattern weft to square a block of design. It would, at first, be best to use four shots, two to the right and two to the left, so that you can always make your design change on the left-to-right direction shed (the shed that you began with). You may not always be able to do



this as the set in the reed (the warp) may be closer or further apart, according to the number of reed used. Warp set closer than has been advised will require less shots of pattern weft and warp set further apart will require more shots in order to square the blocks. These two processes are all that there is to the Dukagang technique.

In Illustration No. 2 the weaving was done with imported vegetable-dyed wools of a finer grist than Home-spun, consequently it was necessary to use three strands in winding the weft bobbins. Only three shots of weft were woven to square the blocks. The change in design came also on alternating shed directions. This made the following of the design a little more intricate.



In order to help you with difficulties that may arise, the following list of suggestions is offered:

1. When the bobbins are first put-in, whether at the beginning or when a new color bobbin is added, the ends of the yarn are tied as in Figure M. It is necessary to tie the ends in this way so that the end of the yarn points downward. This keeps the end out of the way and from interfering with the progress of the work. When the bobbin is put in the shed, push the main part of the bobbin up the warp threads and tie-in the end on the middle thread of the "three-group." Pull the knot tightly and push it down to the already finished web, remembering to keep the unit of three warp threads evenly separated after you have pulled the knot down.

2. If a unit of design is too long so that the bobbin cannot be put through the shed conveniently, use two bobbins of that color, dividing the unit, say, in half, for each bobbin.

3. When putting the bobbins in the shed on the right-to-left direction start at the left of the loom. When putting the bobbins in on the left-to-right direction, start at the right side of the loom.

4. On advancing in the design: if the weft color advances a unit to the left, take the bobbin and skip *back* over the unit of "three-threads group" to the advancing opening and put weft bobbin through the shed. Figure X, Plate I.

5. If the weft color advances to the right your weft will be carried over the unit or units to the part of the design where it is to be put into the shed. The units that do not change in the design should be put in the shed before those are put-in that do change. Figure Y. For example: it is best to first put-in the A and C bobbins before bobbin B. This will permit bobbin B to come over the C weft caught by any other weft thread. In changing units of catch around the weft thread B. All weft threads must hang free after they are put through the shed and not caught by any other weft thread. -In changing units of design pull the weft tightly enough over the back of the advancing threads so that there is no loose skip; preserve the "arc", nevertheless, when the weft thread is put in the shed.

6. Be sure the tabby does not pull-in the selvage warp threads. Use the horizontal line for the tabby throw as one does in Colonial weaving. Pull the selvage edges out with the thumb and first finger before beating, so that there is sufficient tabby yarn to allow for the take-up of weft in beating. This is particularly necessary in this type of weaving because the pattern shots are so much thicker than generally used in Colonial weaving.

7. If you put-in four shots of pattern weft to square a block of design, your changes will all take place on the same direction shed (left-to-right) with which you originally began your work. But if you need an odd number of shots to square your blocks (this will depend on the thickness of your weft yarn and the "set" of your warp

in the reed) — as three or five shots — your pattern change will take place on the second shed with which you began in alternate changes of design. It would be best, while learning, to square your blocks with an *even* number of weft shots. Less confusion will result. A No. 12 reed with two strands of Homespun would take four shots to square the blocks; a No. 15 reed, with a 10/2 warp would require only three or four shots to square a block with the double strand Homespun wool — according to the beat of the weaver.

8. When pulling or feeding the yarn from the bobbins do not pull too hard because single-ply yarn, such as Homespun, breaks easily. If you have any difficulty in this respect use Shetland or Zephyr. Try some other yarn at first rather than your patience!

9. To tie-off a bobbin, slip the bobbin around the middle thread of the “three-threads group” with a slip knot and cut off the weft thread about one and one-half inches from the work. Figure Z.

10. If you wish your work to be extremely neat on the wrong side, use a bobbin for each unit of design, regardless of colors. But if the skip, say, Yellow to Yellow is not too long, one bobbin will suffice. Figure E. That is, if you have the design as at Figure E with one “three-threads group” to be covered by Yellow weft; next to it—to the right—is a Black weft color of one “three-threads group”, and next to the Black is a Yellow color unit of two “three-threads groups”; put the Black weft in the shed (from left-to-right, in this case) and then, taking the Yellow bobbin, put it through the shed (from left-to-right) for the distance of one “three-threads group.” Bring it up, then, and out to the surface of the weaving. Skip over the Black unit, and then put the Yellow bobbin into the shed for your distance of two “three-threads groups.” The Yellow yarn will be pushed down over the back of the Black when beaten down by the beater. The drawing is exaggerated to show this more clearly. The same applies when the weft is going from the right to the left of the loom. It isn't well to skip over more than three units of design.

11. Pick up the *three* threads in each group instead of, as might happen, just *two*.

12. Don't make bobbins too bulky. They are not easy to work with. Eighteen or twenty wrappings around the thumb and finger are sufficient.

13. Make a habit of working only a certain distance between the front cross beam of the loom and the batten. Then wind the work onto the cloth beam. This will help keep not only a more even width throughout the weaving but also allow a larger shed in which to work. This latter is particularly applicable to the smaller looms.

14. While working at the loom keep a good tight tension on the warp at all times.

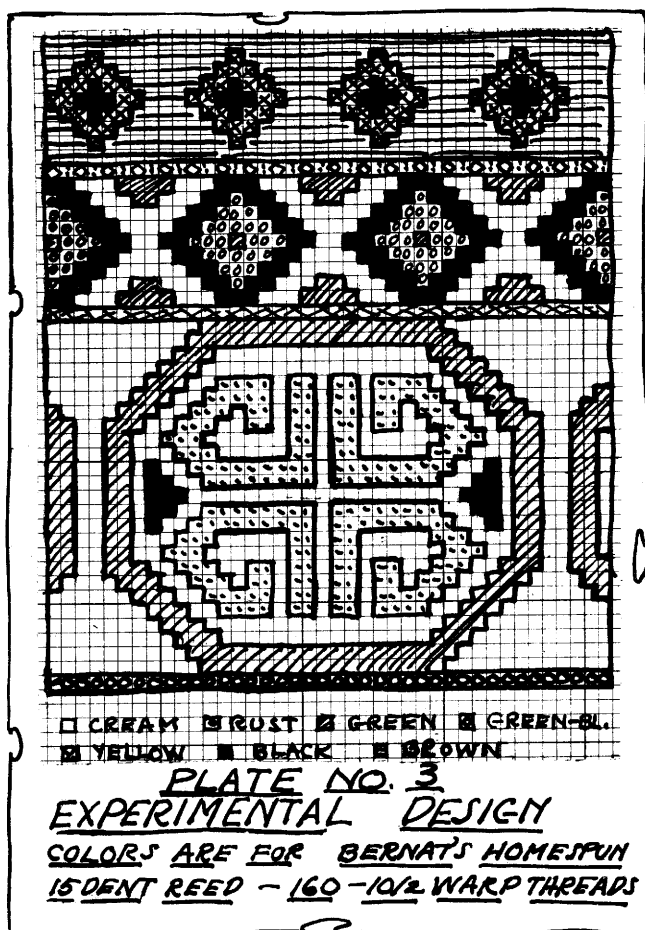
15. Watch the under side of the weaving in your mirror

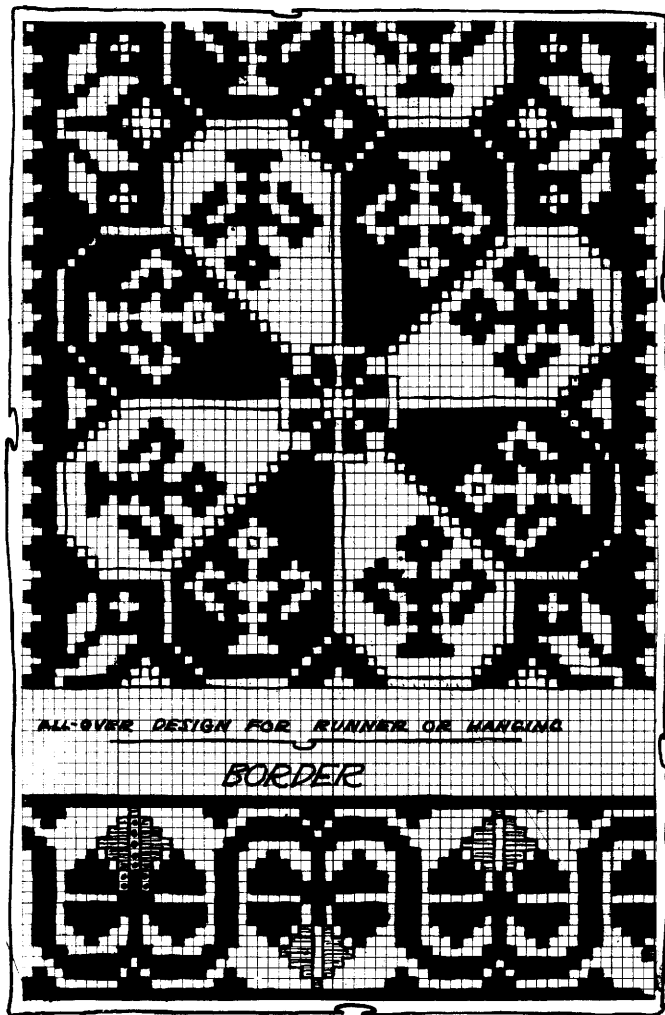
to see if you have picked up all the design units and if you have put the weft under them correctly. (Refer to No. 11 above). If, after you have put-in your tabby, you see that all the bobbins are not hanging in the same direction, you will then know that you have neglected to fill that row as the design has indicated. If, for any reason, you discover that a pattern thread has been omitted several rows back, a bobby-pin is a good thing with which to darn-in that missing shot or shots.

16. In turning your bobbins to put-in the next pattern shed—after the tabby is in—allow enough weft thread at the turning so that the warp threads will not be pulled in. Figure G. The group of three warp threads must remain equally spaced throughout the length of the weaving. You will have great difficulty with this at the selvages. They are bound to “pull-in” somewhat.

17. You should have a convenient place to lay your tabby shuttle when not in use—since it is lying idle a longer time than in Colonial weaving. This will allow free use of the width of the web while working with the bobbins.

18. When the sides at the selvages become lower than the main body of the weaving, fill in the depression by building up with weft yarn as in Figure F. This will often happen when the background is made with the tabby





and only the design is done in the Dukagång technique.

Dukagång can be made on a two harness loom also, but one would have to use long-eyed heddles and sticks. These sticks are placed in the back of the harness to raise the pattern threads—similar to the Upphåmpta technique—but this process is an ancient one and troublesome; much too slow for us moderns.

### THE EXPERIMENTAL PIECE

In Illustration No. 1 and Pattern No. 1 you will find all the necessary steps to learn the Dukagång technique. At the beginning the large design as well as the background is "laid-in." Refer to the set-up given in this article for the warp, reed number, etc. In the middle border the design is "laid-in" but the background is made with the tabby. The tabby being one strand of Homespun or Shetland. The narrow stripes are done on the "Rosepath" treadling. The top border has the design "laid-in"; the background is Brown Shetland tabby, while a Gold color thread is put-in on the Lever No. 1 shed of the table or Treadles 2-3-4 of the foot-power loom.

The warp consisted of 160 warp threads. Weave a plain

heading for about three-quarters of an inch; the first narrow stripe is made by a "Rosepath" design in the center with plain tabby on either side.

The Dukagång technique then begins with Levers 2-3-4 down on the table loom or Treadle 1 down on the foot-power loom. The light colored (Cream) weft yarn (Homespun H 702) — two strands — is put-in from the left side of the loom for eleven blocks (refer to draft) or through eleven groups of "three-threads"; a darker color (Green No. H 616) is put through seventeen groups of "three-threads"; the light color (Cream) is put from there on out to the right side of the warp threads. After these bobbins are put-in and tied, two tabby shots are thrown — the first on the 1-3 shed from the right; and the other, of course, on the 2-4 shed from the left. This is repeated for four shots of pattern design. This will square the blocks.

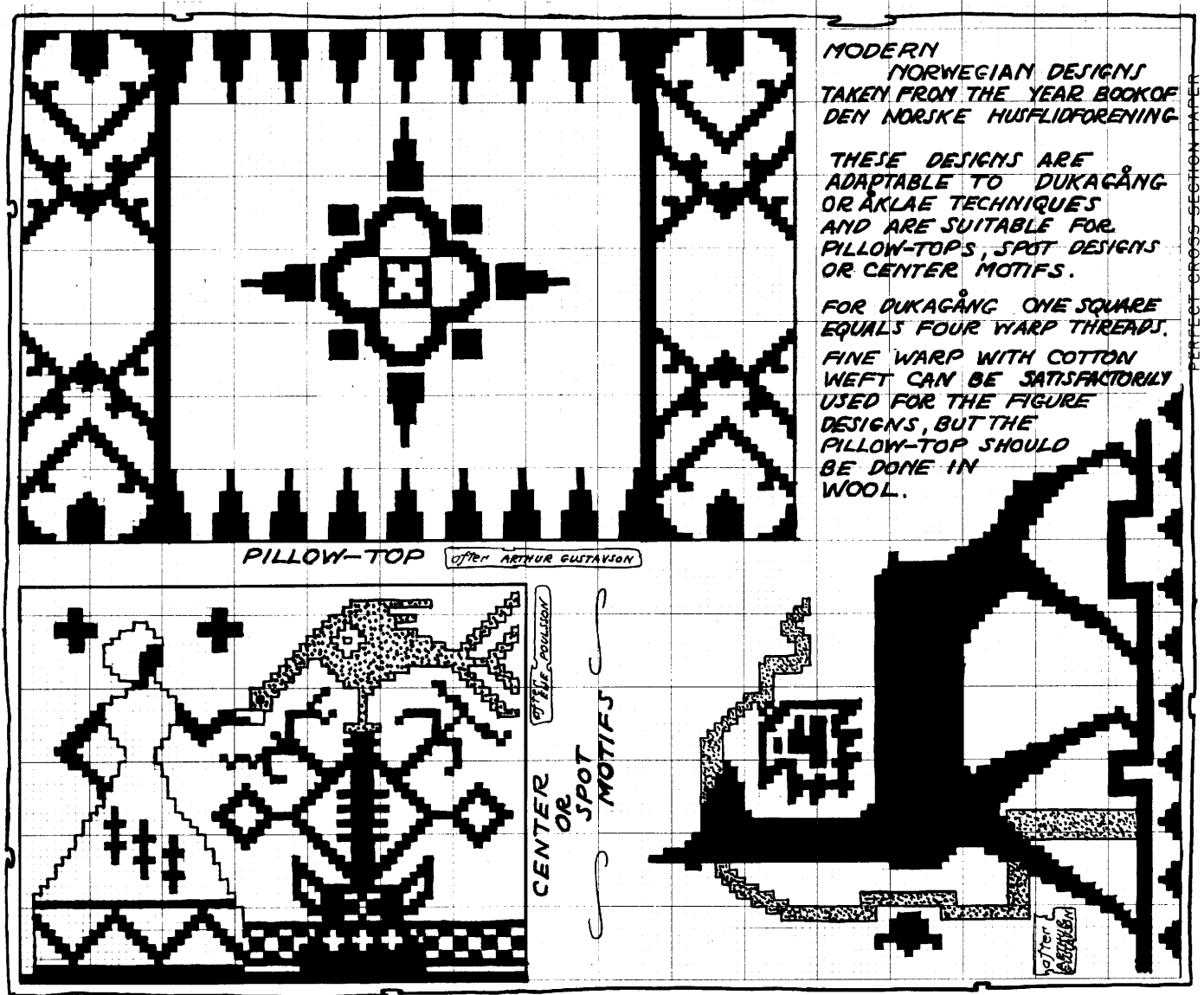
Then the pattern changes. The Green advances one "three-threads group" to the right and one "three-threads group" to the left. Four shots of this are done in the same manner as above, i. e., pattern shot followed by two tabby shots.

In the third row the Green advances again one group to the left and one to the right. A new Light Yellow (H 111) bobbin is added and tied-in from the left to right on the thirteenth group, proceeding through the shed for fifteen "three-threads groups." The new Yellow bobbin is in the center of the design and the Green bobbin is on either side of it for 3 "three-threads groups." A new Green bobbin will have to be added to use on one side of the Yellow. You will now have bobbins in this order: H 702, H 616, H 111, H 616, H 702. Proceed with this for four shots, alternating with two tabby shots. Follow the draft for the next row—advancing with the Green on the right and the left of the center; advancing with the center color on the right and on the left. Of course, the Cream color bobbins on the sides are decreasing. Four shots are taken as above.

On the fifth row of the design, new bobbins will be added. Then your bobbins will be under the "three-threads groups" in this order: from left to right, Cream through 7; Green through 3; Yellow through 2; Rust through 4; Yellow through 1; Rust through 2; Center Yellow through 1; Rust through 2; Yellow through 1; Rust through 4; Yellow through 2; Green through 3, and Cream through 8.

The small center side triangles are Black (H 807). When you get this far you should have no trouble going through the entire design, being careful to follow the draft.

A little help with the middle border: a Black bobbin is tied-in under two "three-threads groups"; skip three groups; Green is put-in under four groups; skip three groups; Black bobbin goes under three groups; skip three groups; Green is put-in under four groups; skip three groups; Black is put-in under three groups; skip three



MODERN  
NORWEGIAN DESIGNS  
TAKEN FROM THE YEAR BOOK OF  
DEN NORSKE HUSFLIDFORENING

THESE DESIGNS ARE  
ADAPTABLE TO DUKAGÅNG  
OR ÅKLAE TECHNIQUES  
AND ARE SUITABLE FOR  
PILLOW-TOPS, SPOT DESIGNS  
OR CENTER MOTIFS.

FOR DUKAGÅNG ONE SQUARE  
EQUALS FOUR WARP THREADS.  
FINE WARP WITH COTTON  
WEFT CAN BE SATISFACTORILY  
USED FOR THE FIGURE  
DESIGNS, BUT THE  
PILLOW-TOP SHOULD  
BE DONE IN  
WOOL.

PERFECT CROSS-SECTION PAPER

PILLOW-TOP *ARTHUR GUSTAVSON*

CENTER OR SPOT MOTIFS

*ARTHUR GUSTAVSON*

groups; Black is put-in under two groups. Change to the 1-3 shed and beat hard. Then throw your tabby Cream wool; change shed (2-4); beat, and throw your tabby Cream wool. This is continued for four pattern shots, followed each time by two tabby shots.

In the next row a Blue-Green (H 820) bobbin is added to the center of the figures; your Black edging of the figures advances to the right and to the left and your Green figure, between the diamond shaped figures, decreases to two groups. Follow the draft from now on and you should have no trouble.

The top border, as has been said, has a Gold color thread on the one shed. The procedure is this: pattern shot put-in; Gold color thread follows this on the Lever 1 or Treadles 2-3-4 shed, then two shots of tabby (Brown Homespun or Shetland) follow this tinsel thread. The figures are Yellow (H 111) and Black center.

The Gold color or tinsel thread can be rather effectively used, if desired, with tones of Brown and Black for bags,

runners and hangings. If the colors are not carefully chosen when the tinsel thread is used the effect may prove to be cheapening. The use of this tinsel thread is nothing more than a novelty; I, myself, would rather discourage the use of it. It detracts from the intentional look of the textile and that look should be a peasant-craft one.

Dukagång technique can be used for finer textiles. The warp can be linen or cotton or fine wool, set closer in the reed. With these finer warps, towels, pillow-tops, runners, etc. may be woven. The process is the same, however. Several designs are given that are more modern than the old Scandinavian designs; these have been adapted from sources that have been woven in Norway within recent years. For these finer textiles Caroline Halvorsen gives in her book, "Handbok i Vevning", a number of threading drafts and tie-up for each. These are designated on Plate I as "a", "b", and "c".

Try Dukagång! It is worth while, and you'll enjoy doing it.

# Questions and Answers

by MARY M. ATWATER

*Question:* How can I calculate the quantity of material for a coverlet, in overshot pattern weaving, to be made in two strips, each 42" wide, and three yards long? I want to use Egyptian cotton 24/3 for warp and tabby, and Shetland yarns for pattern weft.

*Answer:* To calculate the quantity of material for your warp you must first determine the yardage to the pound of the warp-yarn to be used. This can be calculated from the "count" of the yarn. Calculations for cotton and woolen yarns are based on the very inconvenient figure 840, which is taken as the yardage per pound of a #1 thread. To get the yardage of a 24/3 cotton multiply 840 by 24 and divide by 3. Or divide 24 by 3 and multiply 840 by the result—8. This gives a yardage to the pound in cotton of this count at 6,720.

Now calculate the linear yardage required for your warp and divide by 6,720. For two strips, each three yards long, finished, the warp should be made eight yards long to allow for shrinkage and wastage. The warp-setting of 30 ends to the inch is best in this material, and as the warp is to be 42" wide multiply 42 by 30, and then multiply this result by 8. This gives a result of 10,080, if my arithmetic is correct. (I do not guarantee it.) Dividing 10,080 by 6,720 we get 1.5 or 1½ pounds, exactly. However, it must be borne in mind that if the warp is on spools an allowance must be made for the weight of the spools. There is no yardage in the spools, unfortunately.

To calculate the quantities of pattern weft and tabby it is necessary, for exact results, to have a sample—woven as you expect to weave your coverlet. A loosely woven fabric takes much less material than a closely woven one, naturally. A coverlet, however, should be quite closely woven—not less than 26 shots of pattern and 26 shots of tabby to the inch. Taking this as a foundation, calculate the linear yardage of weft in a similar manner to the warp calculation. Multiply 26 x 6 x 42. The result is 6,552. As Shetland yarn runs 2,000 yards to the pound, divide this result by 2,000. The result will be 3 and a little over

a quarter. To allow for wastage and shrinkage, say three and a half pounds of Shetland yarn. A pound of cotton like the warp will be sufficient for tabby.

In ordering materials it is always wise to allow generously for emergencies. It is far less costly to have a little material left over than to run a trifle short. The left over material can always be used in other weaving, but to run short means delay in getting a re-order, and the material when received may not exactly match the first lot in shade.

Quantities of material for other fabrics may be determined in a similar way. For a tweed fabric the calculation is simpler as the same material is used for both warp and weft. The home spun yarn used for tweeds is usually warped at 15 ends to the inch, and woven 15 weft shots to the inch. Suppose you wish to figure for ten yards of tweed, 36" wide: Multiply 36 x 15 x 10, which gives you the yardage in the warp. Multiply by 2, as there will be the same yardage in the weft. Divide by 2,000, and the result will be the number of pounds of yarn required.

Wool yarns are calculated on the same base, — 840 — as cotton yarns, and the yardage may be determined from the count, when that is given. However many yarns go by trade names, such as "Saxony" or "Fabri", and the count is not stated. Fortunately the Bernat price-list gives the yardage to the pound of all the yarns supplied, which saves a lot of arithmetic.

Linen yarns are calculated on a base of 300. A #14 singles linen therefore has 14 x 300 yards to the pound, and a 40/2 linen runs 40 x 300 yards, divided by 2, or the same yardage as a #20 singles, — 20 x 300 yards to the pound.

The base figures from which the calculations are made are traditional and come down to us from very ancient times. It seems remarkable that a decimal system of counts has not been adopted long before this. But the old usage still prevails.



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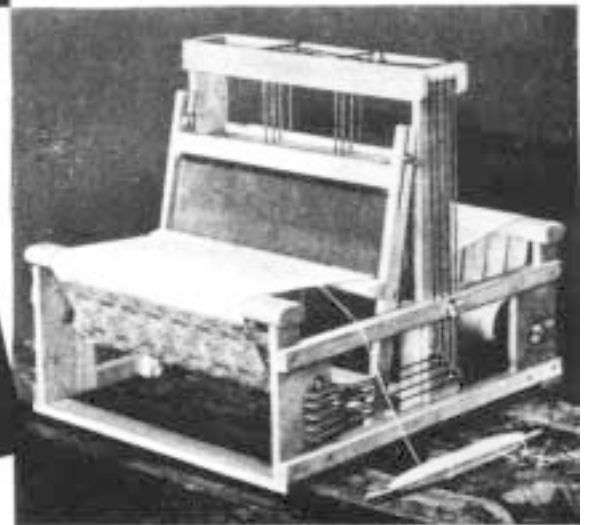
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