

THE GARDEN STUDIO NOTE BOOK
— OF —
ELEMENTARY HAND WEAVING
By MYRA L. DAVIS AND KATE VAN CLEVE

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HAND AND TREADLE LOOM DEFINITIONS

Apron:	Material fastened to cloth-beam or to warp beam to which warp is tied.
Batten:	Frame containing reed.
Bobbin Shuttle:	Wooden case holding small bobbin of weft. In use this bobbin shuttle is thrown through the shed from one hand to the other.
Cloth-beam:	Rod at front of loom around which cloth is wound as the weaving proceeds.
Comb:	Device used in driving short stretches of weft together.
Dents:	Openings between bars of reed (through which warp is threaded).
Dog and ratchet:	Device for holding a beam in place.
Draft:	Drawing on squared paper showing the threading of a pattern for weaving.
Draught:	Draft.
Drawing in:	Threading warp ends through the harness and reed.
Filling:	Woof; weft; material woven through warp.
Harnesses:	Frames containing heddles.
Healds:	Heddles.
Heddles:	Wires that contain loop for threading warp. (Loop called "eye" of heddle).
Horses:	Wooden piece used in place of pulley, which has a harness fastened by cord from either end.
Lease:	The crossing made by warp threads.
Lease-sticks:	Sticks used at back of loom to separate sheds.
Lambs:	Levers that operate between the treadles and harnesses.
Lathe or sley:	Originally the sword-like stick used for battening in weaving.
Lathe or sley:	On a modern power loom, the part holding the reed.
Pick:	A single row of weft.
Picking:	The movement of the weft through the shed.
Raddle:	A device through which the warp-threads pass in order to wind smoothly on the warp beam.

Reed: Metal through which warp is threaded; used for beating weft into place.

Spreader: Raddle.

Stick Shuttle: Wooden frame which carries many yards of weft wound lengthwise.

Temple: Device for holding the cloth stretched to an even width.

Treadles: Peddles used in changing sheds.

Warp: Material strung on loom. (Shed - opening formed in warp by combination of warp threads).

Warp-beam: Rod at back of loom to which warp is fastened.

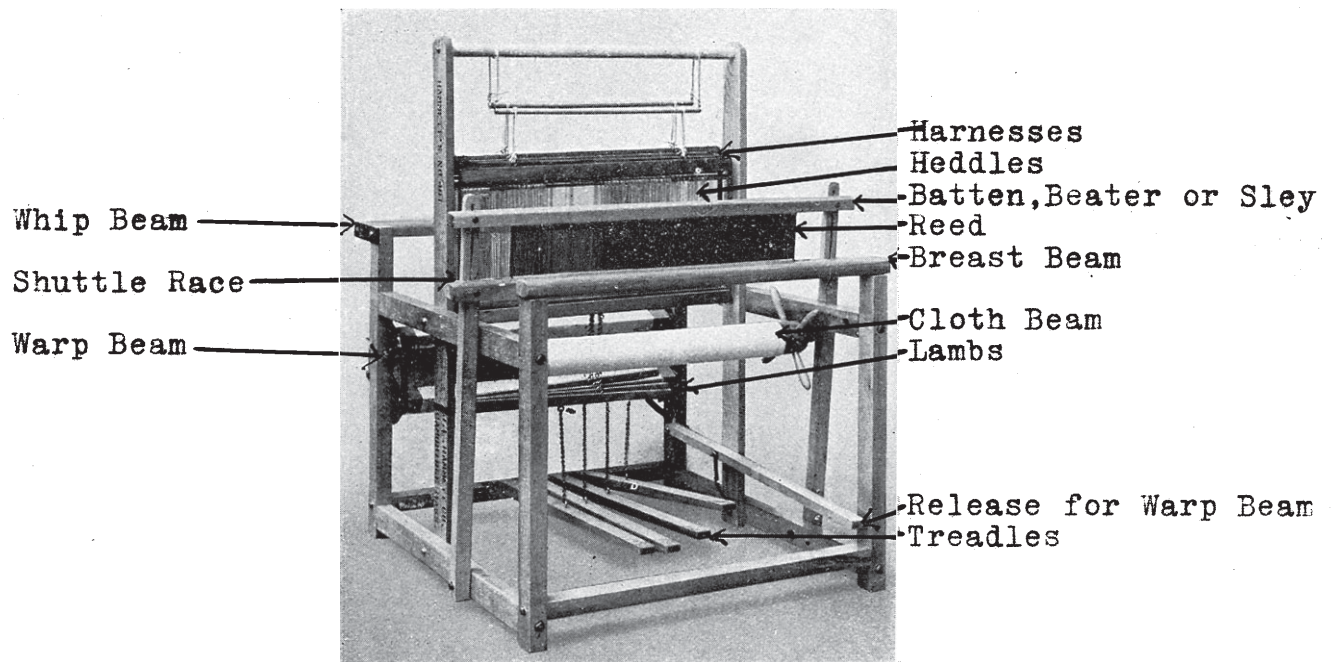
Warp-chain: Form in which warp is taken from bars or drum.

Warping bars: Frame on which warp is wound.

Warping drum: Frame on which warp is wound.

Web: Woven material.

Winding-Pin: Tool used for winding warp forward.



Hammetts Four Harness Treadle Loom

Setting Up of Loom.

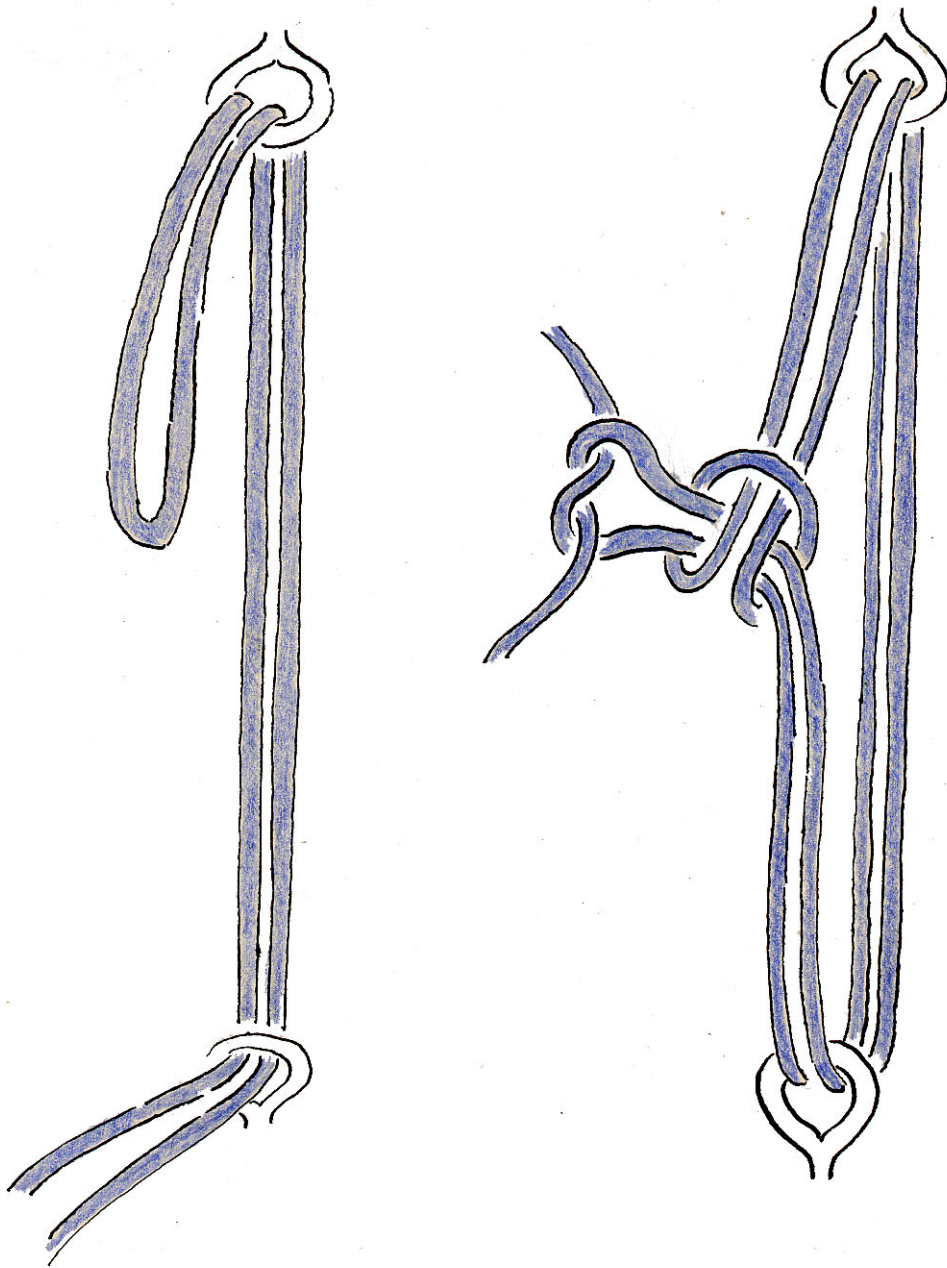
Directions for setting up usually come with the looms, or the frame will be set up and the beams in place, leaving only the harnesses to be hung and the tie-ups to be done.

The harnesses should be hung so that the warp will pull straight from the beam up over the whip beam through the eyes of the heddles and on through the center of the reed.

The harnesses are fastened to the lambs, and the lambs to the treadles with either chains and hooks, or blocking cord and screw-eyes. If the latter are used, cut the cords which fasten the harnesses to the lambs at least 5 times the distance between the harnesses and the lambs; double in the middle and put the loop thus made through the screw-eye on the lamb and through the one on the harness. Turn the loop back on the doubled cord, put the two free ends through and tie in a knot as shown in the drawing. To adjust the length of the cord, untie the knot, shorten or lengthen it and then tie the knot again. The harnesses are fastened to the treadles in the same way.

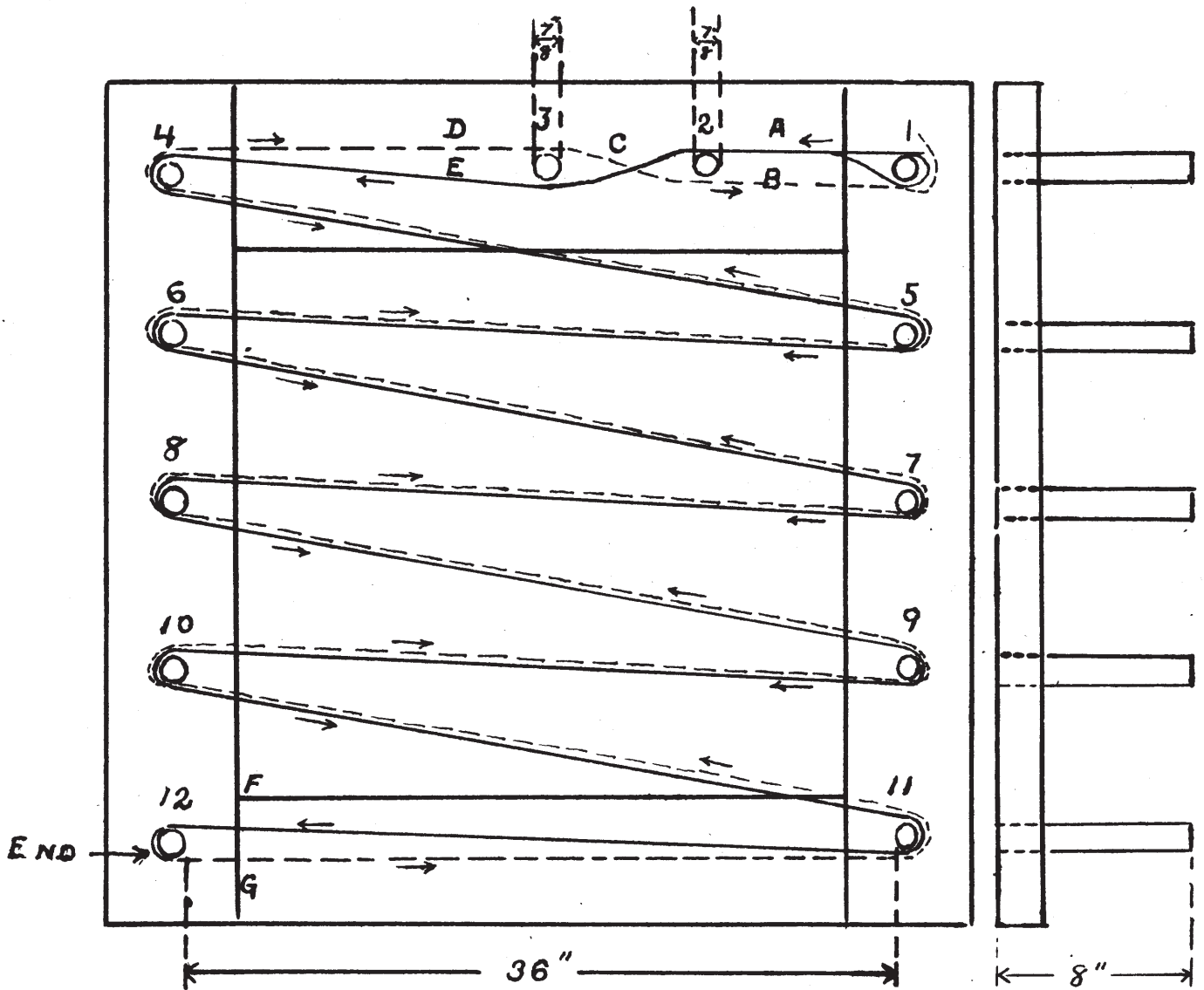
The rollers (or pulleys) from which the harnesses are hung, the harnesses, the lambs and the treadles must all hang evenly, with the lambs slanting upward a bit, and three horizontal.

Harness Ties.



Knot for tying harnesses, lambs and treadles.

WARP BOARD



WARP

TIE IN GROUPS OF 50 THREADS AT C

TIE GROUPS OF THREADS TOGETHER AT A,B,D,E,F,G

TO TAKE OFF BOARD - BEGIN AT END AND CROCHET

WITH FINGERS UNTIL TIES AT D & E

ARE REACHED

WARP CHAIN

C

A

D

E

END



HAND WEAVING.

Draft Reading.

The patterns used for weaving are called drafts or threadings, and are all read and threaded in the same way. Each horizontal line of squares represents a harness, and each black square represents a heddle on that harness. The numbers at the right end of the draft are the harness numbers. In the loom the harnesses number from the front to the back - 1, 2, 3, 4, - which correspond to the numbers on the draft.

Drafts are read from right to left, and the loom is threaded from right to left as you face the front of the loom.

Problem 2.

Warp Chain.

Before one can weave it is necessary to put a warp on the loom, and, before this can be done, the width of the material to be woven must be decided upon and the pattern chosen. Also one must know the number of threads to the inch; - this is found by counting the number of dents in one inch measured on the reed. The number is often stamped on the end of the reed, and reeds are known as a "No. 12", which means that there are 12 threads to the inch, or a "No. 15", which gives 15 threads to the inch, etc. It is better to use a coarse reed and put 2, 3 or 4 threads in a dent when a fine fabric is desired, than to use a very fine reed with one thread in a dent. The No. 12 reed is most generally used, and usually two threads are put through one dent giving 24 threads to the inch. This gives a fabric of sufficient fineness for general use.

For our first weaving we will use the Honeysuckle draft, and plan for material 18 inches wide, with 24 threads to the inch. As the warp pulls in a bit in weaving, that must be allowed for, so we really plan for 19 inches.

By multiplying the number of threads to the inch by the width we get the number of threads necessary to weave that width - $24 \times 19 = 456$. The next thing is to count the number of threads in one repeat of the draft, and divide the number of threads in the warp by the number of threads in the draft in order to have complete repeats. The Honeysuckle draft contains 26 threads, so dividing 456 by 26 gives 17 repeats and 14 threads over. It is better to add 12 threads more, making 18 repeats, than to make the warp narrower by leaving off the 14 threads. $456 + 12 = 468$, which is the number of threads necessary for the warp or warp chain, as it is called.

Warp chains are wound on a warping board, which is a board with pegs set 36 inches apart as shown in the diagram. Between the two top end-pegs two more pegs are set; the first is 12 inches from the right hand peg and they are 8 inches apart. The length of the warp is measured by the number of end-pegs in the board. The usual length is from 10 to 12 yards, although they may be made as long as 30 yards.

To wind the warp, tie the thread around the 1st peg at the right, go over the 2nd, under the 3rd and across to the 4th peg, over the 4th to the 5th peg and so on, as shown in the diagram, for the required number of yards. When the last peg is reached, then come back in the same way until the peg numbered 3 is reached - go over it and under the 2nd, then around the 1st and down again. Continue in this way until 50 threads have been wound. The threads are counted between the 2nd and 3rd pegs. Tie these 50 threads together, put on 50 more and tie them (see sample chain). Keep on until you have 9 groups of 50 threads and the last group of 18, making 468 threads in all. Now tie, as indicated in the diagram, and crochet off the board in a chain.

WARP



APRON

HONEY SUCKLE



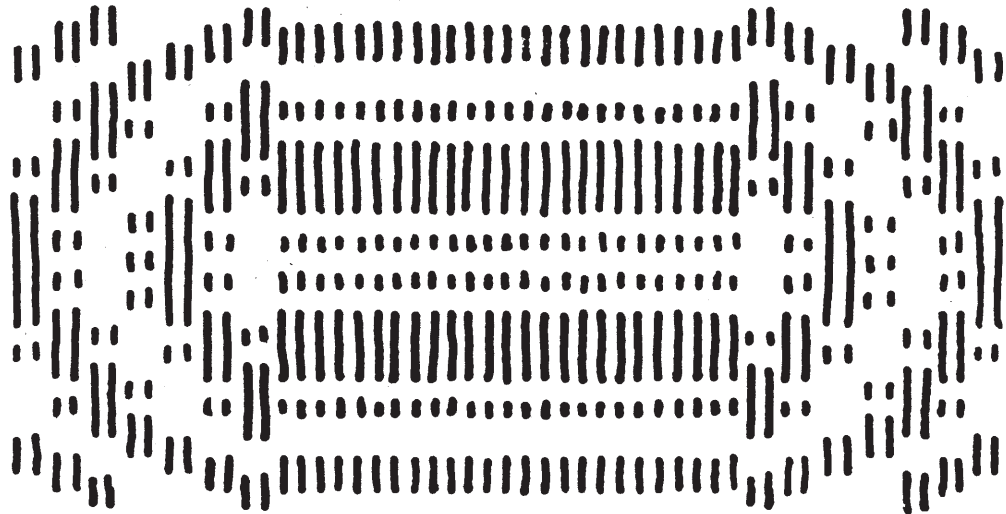
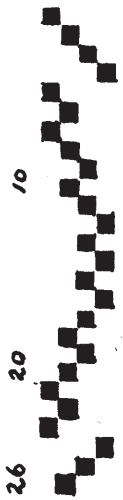
1

2

3

4

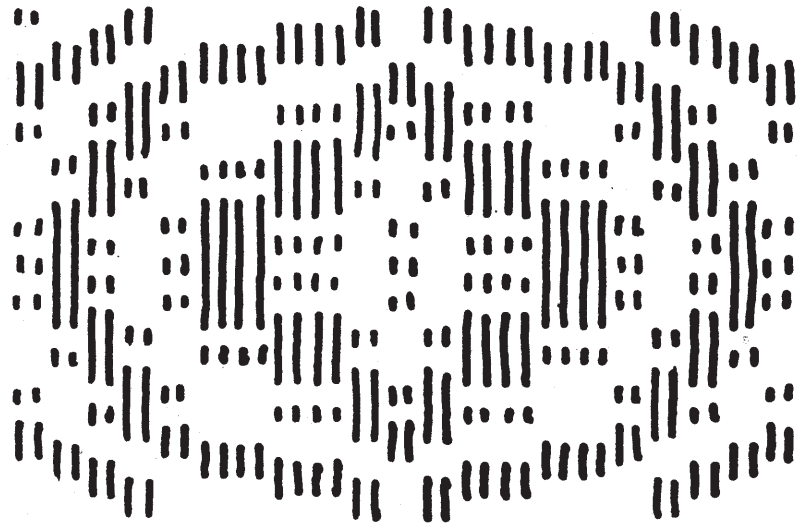
HONEY SUCKLE



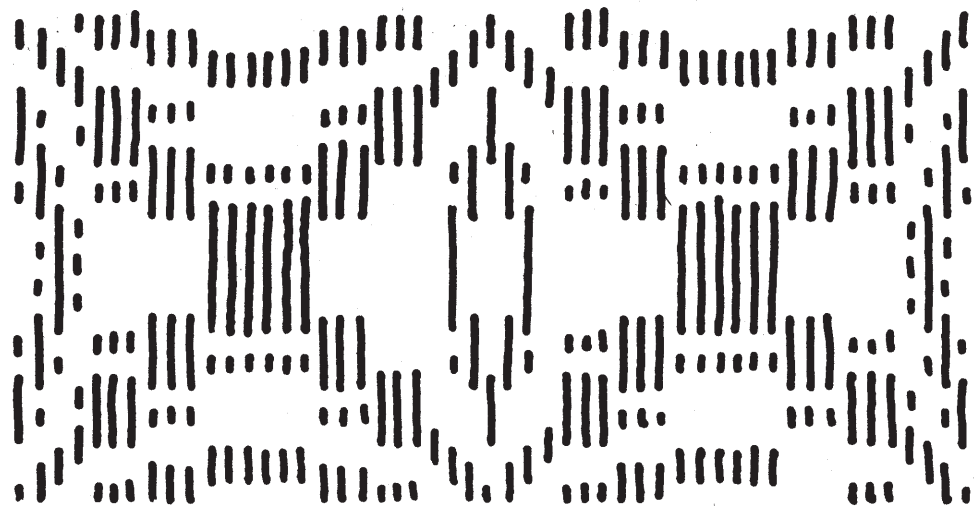
SAMPLE 1



SAMPLE 2



SAMPLE 3



SAMPLE 4

Treadlings for the Honeysuckle Draft.

Sample 1	Sample 2	Sample 3	Sample 4
"As drawn In"	2(3-4)	2(1-4)	2(1-2)
3-4	7(1-2)	2(1-2)	2(2-3)
2-3	2(3-4)	2(2-3)	2(3-4)
1-2		2(3-4)	2(1-4)
1-4		2(1-4)	2(1-2)
3(3-4)		4(1-2)	2(2-3)
3(2-3)		4(2-3)	2(3-4)
6(1-2)		2(3-4)	25(2-3)
3(2-3)		2(1-4)	2(3-4)
3(3-4)		2(3-4)	2(2-3)
1-4		4(2-3)	2(1-2)
1-2		4(1-2)	2(1-4)
2-3		2(1-4)	2(3-4)
Repeat from the		2(3-4)	2(2-3)
beginning.		2(2-3)	2(1-2)
		2(1-2)	
		2(1-4)	

Note:

For treadlings for table looms, use the opposite of each combination given or, in other words, read (in sample 1) 3-4 as 1-2, 2-3 as 1-4, etc.

Group 1.
Problem 3.

Put lease-sticks (flat sticks like yard sticks with holes in the ends) in where the crosses are tied; tie sticks together at the ends and tie them on to the breast beam. Cut the end of the warp where it went around the 1st peg, untie the 1st group of 50 threads, take off the strings tied at A-B and D-E and, beginning at a sufficient distance from the right hand end of the reed to bring the warp in the center, thread 2 threads through each dent. The threads come in regular order in the lease-sticks, so there is no danger of tangles. When all are threaded through the reed (called slewing), the next thing is to thread the pattern through the heddles.

Beginning at the extreme of the Honeysuckle draft, the first black square is in the 4th line, which means that the first thread is threaded through the first heddle on harness 4, the next square is in the 3rd line so the next thread is threaded through the first heddle on harness 3, the next thread through the first heddle on harness 2, the next thread through the first heddle on harness 1, the next thread through the second heddle on harness 4 and so on through the entire draft. It is quite easy to make mistakes in threading, so it is best to prove each group of ten threads before going on to the next and tie them in a loose knot, then go on to the next group of ten. The last group in the Honeysuckle draft has only 6 threads so, after proving, tie it around the other two groups showing that you have completed one repeat. Then go back to the beginning of the draft and do it again. Continue in this way until the entire warp is threaded. There will be 18 repeats.

The warp is now ready to tie into the apron on the warp beam. There are slits cut below the hem of the apron about $1\frac{1}{2}$ inches apart, and there is also a rod put through the hem. Take the threads in the 1st and 2nd repeats, straighten them out, put the ends up through the slit which permits them to pull in a

straight line from the reed. Divide the ends of the threads in two parts, cross them underneath, bring them up on top and tie in a bow knot with a single loop; do this with all the other repeats. See sample knot for method of tying. Some looms have a metal bar put through tapes tacked to the warp beam instead of the apron. The warp is tied to this bar in the same manner.

The next step is beaming the warp. To do this untie the lease-sticks from the breast beam, but do not remove them from the warp. Unchain a short portion of the warp, divide it into two parts, and, taking one in each hand, pull with an even tension, being sure that there are no loose threads, while someone turns the beam. When the lease-sticks have reached the reed, stop, unchain more warp, straighten it out with the fingers, move the lease-sticks back and repeat.

If your warp beam measures less than 36 inches in circumference, it is a good plan to lay sticks on the warp as it goes over the warp-beam, if you are putting on more than 5 yards. The sticks must be smooth and about like a yard stick or curtain stick. The latter may be purchased from any dealer making roller shades and are quite inexpensive. After beaming about 6 turns of the beam, lay in 4 sticks, dividing the beam into quarters; then make about 6 turns more and lay in 4 more sticks, one in each of the spaces between the first 4, and so on until the warp is beamed. These sticks keep the warp tight and smooth on the beam.

When only about three-quarters of a yard is left, tie the end of the warp into the apron or bar on the cloth beam in the same way you did into the one on the warp beam, after bringing the apron or bar up over the breast beam. Tighten the warp by turning the cloth beam, and be sure that there are no loose threads and that all the groups have the same tension - they should be tight and yet a bit "springy".

Now we are ready to weave. A pillow top is nice for one's first piece, and for this choose mercerized cotton No. 3 for the pattern, and No. 10 for the binder (also called tabby). The harnesses are used in pairs, and are pulled down by the treadles. 1 and 3 alternated with 2 and 4 make the plain weave or tabby, and 1 and 2, 2 and 3, 3 and 4, and 1 and 4 are the pattern pairs.

It is best to begin the weaving with some heavy material (strips of cloth torn $\frac{1}{2}$ inch wide are good) in order to fill up the spaces between the groups of threads tied into the apron. To do this, press down treadles 1 and 3, throw the shuttle from right to left close to the reed on the shuttle race through the opening made in the warp, letting the weft material lie loosely in the shed, as the opening is called, and leaving about an inch projecting beyond the warp on the right side. Before releasing the treadles, take hold of the batten in the center and pull it forward in order to beat the weft into place, push it back again, release the treadles 1 and 3, press down treadles 2 and 4 and beat again. Now throw the shuttle from left to right through the shed, (leaving the weft in a tiny loop on the left hand edge) and on an angle upward toward the reed - this angle gives slack enough so that the weft will not pull the warp in on the edges - and beat as before. Do this until the spaces have been drawn together and all the warp threads are evenly spaced. Now weave about 2 inches of plain weaving as above with the No. 10 mercerized cotton. After putting in the first shot of the mercerized cotton, before changing the shed, take the end of the weft that projects beyond the warp, put it around the outside thread, and tuck it into the shed beside the weft. This is the method of fastening the end of the weft at the beginning and end of the weaving, or when putting in a new color. When necessary to put in a new thread, let the old thread go as far as it will, then let the ends of the new and old threads overlap about an inch in the shed and proceed with the weaving.

In using the fine weft, be very careful not to pull it in too tightly, and be sure to leave it on an angle in the shed before beating. If it is pulled in too much it will cause the edge threads to break. If a thread should break, tie a piece of the warp thread onto it with a weaver's knot, draw it forward through its heddle and dent in the reed and fasten by winding it around a pin which you have placed in the fabric.

After weaving the 2 inches of plain weaving with the No. 10 cotton, it is time to begin the pattern, using the treading for sample 1. The pairs of numbers are the harness numbers, and the numbers outside the parenthesis show how many times each pair is repeated. Leaving the shuttle carrying the No. 10 cotton on the right hand side of the loom, press down treadles 3 and 4 and throw the shuttle carrying the No. 3 mercerized cotton pattern weft through the shed from right to left; fasten the end, beat as before and follow with a shot of No. 10 cotton in plain weaving, called a binder, using treadles 1 and 3; put in the next shot of pattern and follow with a binder using 2 and 4. Continue in this way until a square has been woven. When you have woven up to within about 6 inches of the reed, loosen the work by lifting the pawl (or dog as it is often called) and turning the cloth beam about 3 notches; then replace the pawl and release the warp beam, winding the warp toward you by turning the cloth beam until the last row of weaving is about 4 inches from the breast beam. Fasten the warp beam again, and tighten the warp by turning the cloth beam. It is necessary to allow for shrinkage, and the usual amount is 3 inches to the yard, so instead of weaving just 18 inches of pattern, one must weave 21 inches. Finish with the 2 inches of plain weaving with the No. 10 mercerized cotton.

This treading is called weaving "as drawn in" because the draft is followed exactly as it was when the threads were drawn through the heddles. The pairs of harnesses may be used in any order that one wishes, and the variations

in a pattern are made in this way, and also by varying the number of times that a combination is repeated.

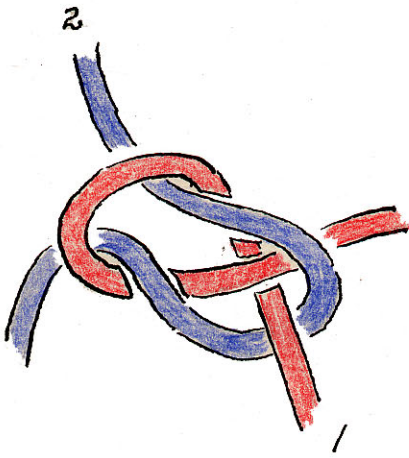
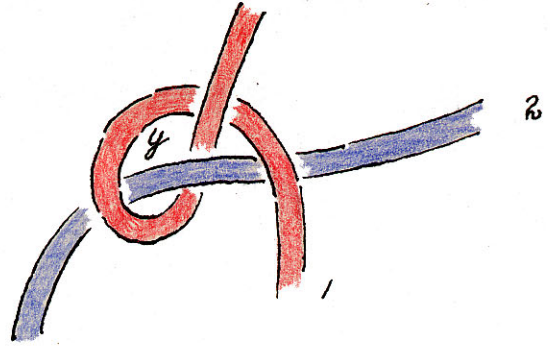
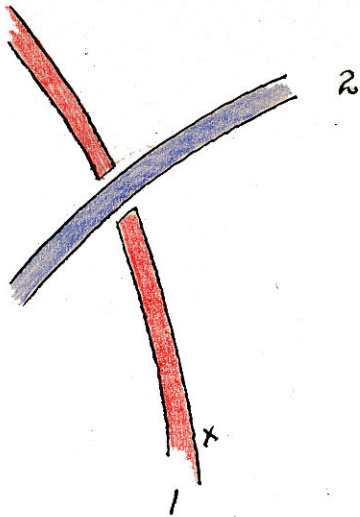
When cutting off a piece of work, roll the work forward until there is 12 inches between the reed and the fabric, leaving the warp quite slack. Take a bunch of threads in the left hand and, with the right, cut the threads between the left hand and the fabric; tie in a loose knot so that they will not slip out of the reed, then cut another bunch and so on.

It is a good thing to weave a sampler of variations, and they are many in the Honeysuckle. Those given in this problem should give a good idea of how they are woven.

If finer or heavier threads are used than those used in this problem, correspondingly more or fewer shots will be needed to give the results shown in the sampler.

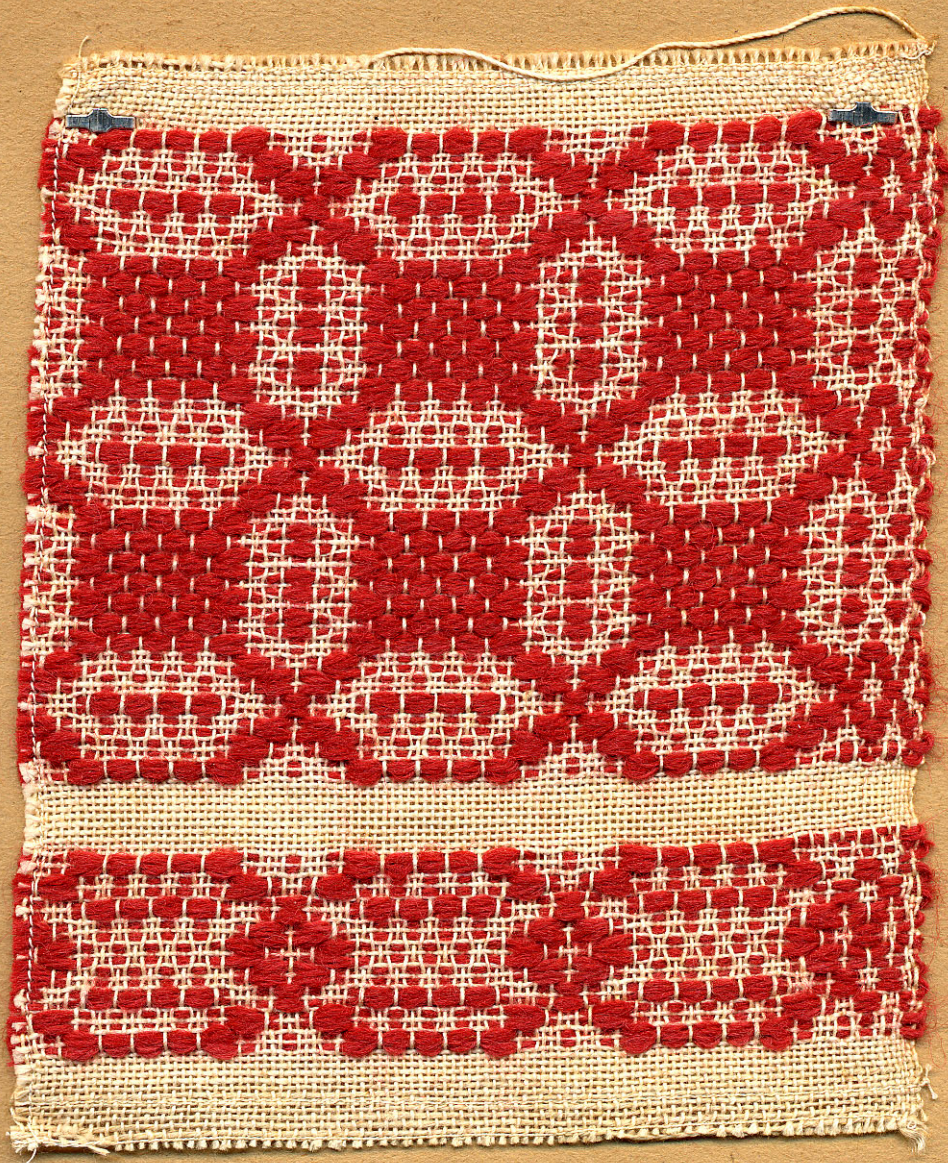
When all but about $1\frac{1}{2}$ yards of the warp has been used, cut the work off as before. Make another warp chain and tie on the breast beam as you did the first, then tie one new thread to one old thread. When all are tied, beam the warp and you are ready for more weaving.

Weaver's Knot



1. Place right hand end (1) at the back of (2) and hold with the left hand forefinger and thumb.
2. Take right hand end (1) at (x), two or three inches below the place where they cross; put over the left hand around its own end and over the left hand end (2).
3. Fold the end (2) back thru the loop at (y) and draw tight.

WOOL I



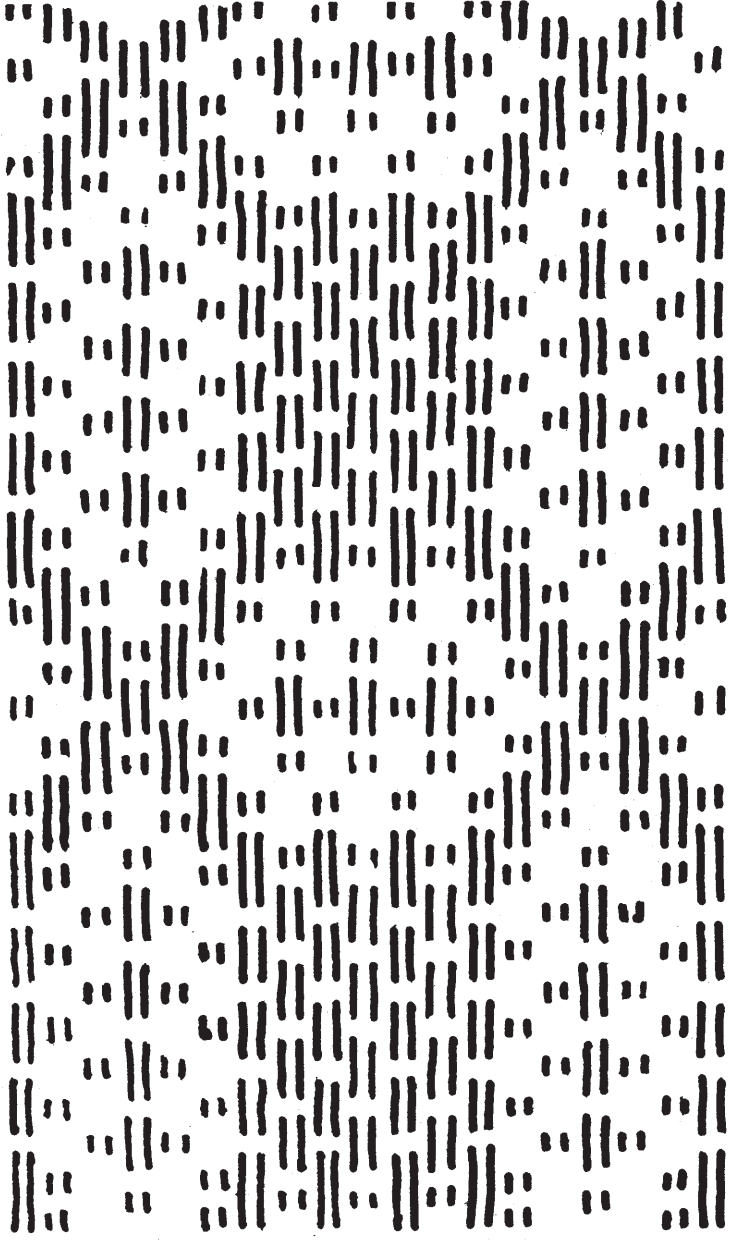
Wool I



TREADLES

1-4
3-3
2-1-2

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



Wool Weaving.

Draft 1

12 Dent reed, 2 threads in each dent.

Cotton Warp (Egyptian cotton in sample.)

Weft, - wool

Binder like warp.

Begin at right of loom in threading, and be sure to end with the same group of threads at left edge, adding the group of threads for selvage again at left.

This is a good pattern for table covers, pillow covers; use with either wool or silk for weft.

A great variety of patterns may be made by using different combinations of treadling.

Treadling.

2(1-4)#	2(3-4)	
2(1-2)	2(1-4)	This group should be repeated to form
2(2-3)	2(3-4)	a square of the colored wool.
2(3-4)	2(1-4)	
2(2-3)	Repeat from #	
2(1-2)		
2(1-4)		

Border Pattern.

Treadling

2(1-4)	2(2-3)
2(1-2)	2(3-4)
2(3-4)	2(1-2)
2(2-3)	2(1-4)
2(1-2)	

Note:

For treadling for table loom, use the opposite of each combination given or, in other words, read 2(1-4) as 2(2-3), 2(1-2) as 2(3-4), etc.