

SPEEDING UP THE PROCESS OF LOOM WARPING

by FLORENCE B. FOWLE

My experiences with advanced weaving pupils, with procedures in studios I have visited and with various text books on weaving have convinced me that few weavers are acquainted with quick and efficient methods of warping a loom. It is in the hope that the use of such methods will result in a saving of time and nervous energy to many weavers that this exposition is undertaken.

For power looms, all warp beams are filled away from the loom. A single thread cross is secured in the warp. The worker stands in the loom, in the space between the heddle frames and the warp beam. To the ends of the old warp as they come from the heddles, he twists, in the correct sequence, the ends of the new warp. The new warp is then pulled through the heddles and reed, tied onto the cloth beam bar and the loom is ready for weaving.

Amateur weavers and small studios are not equipped to fill warp beams in this manner. Some weavers wind the warp from front to back of the loom by means of a raddle, or warp spreader, which is placed in the loom after removing the harnesses. This necessitates a great deal of extra work. Also, the warp lies in bunches on the warp beam instead of smoothly in the correct order of the warp ends.

Some prefer to draw the warp ends through the reed from front to back, thread the heddles with the chosen threading, tie the ends onto the warp beam bar, and then wind the warp onto the warp beam. This is a far better method, as it

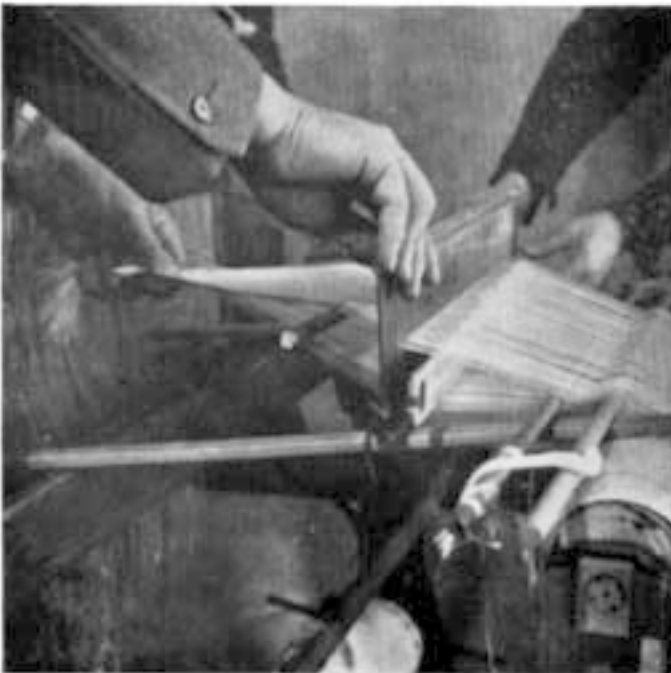


Illustration No. 1



Illustration No. 2

ensures the warp ends' lying smoothly on the warp beam, in the correct order. It is a rather awkward process, however, to select the ends in proper sequence, especially if the warp is sleyed, or drawn through the reed, two warp ends to a dent. It then becomes necessary to transfer the single thread cross through the reed in order to thread the warp ends in their proper order. To do this is a little tedious, but not difficult.

If the top of your beater is removable, it will be found convenient to take the reed from its vertical position and lay it horizontally across sticks placed at the sides of the loom, from breast beam to warp beam, to support it. See Illustration No. 2. After the reed is sleyed, run a broad shuttle or similar stick through the warp in the same position as the shed stick nearest the reed. Push this stick close to the reed and turn on edge, holding a tension on the warp. The separation of alternate warp ends will be visible behind the reed. (Illustration No. 1.) Place a dowel through the opening thus revealed. You can then remove the shuttle and the stick from the shed you have thus transferred from the front to the back of the reed. Now run the broad stick through the warp to duplicate the second shed stick which will have marked the crosses in the warp. When the broad stick is turned on edge close to the reed, and the dowel behind the reed moved a few inches away, the second cross will be visible. A second dowel can be placed behind the reed through this opening. The single thread cross will have been trans-

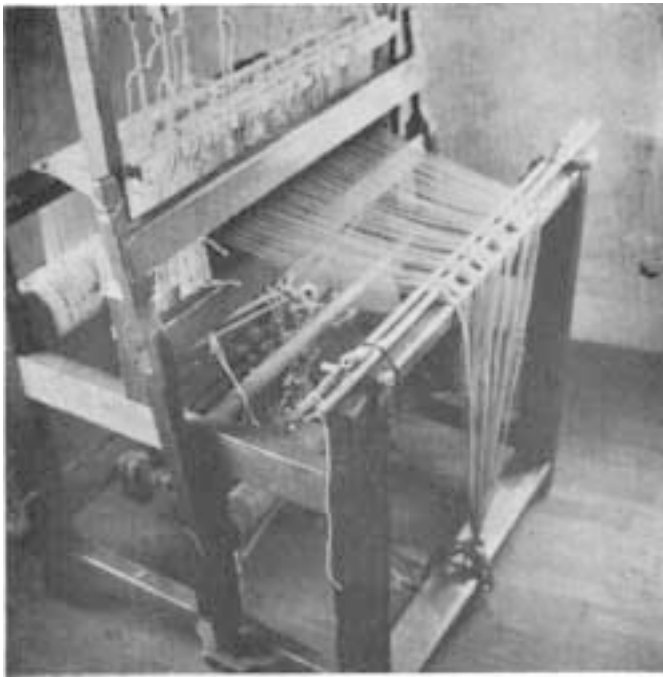


Illustration No. 3

ferred through the reed and the new warp can now be threaded in the correct order, tied to the warp beam bar, and wound on the beam. See Illustration No. 2.

In this process, however, a time-wasting difficulty presents itself. A well made warp is measured off on the warping frame with all the warp ends the same length and tension, and lying next each other in perfect order and perfect alignment. During the threading and tying-on process this alignment is disturbed, as it is impossible to keep all the warp threads absolutely together when tying the groups of threaded ends onto the warp beam bar. While winding on the new warp it will be necessary to comb and smooth and pull and otherwise struggle to restore the even tension lost in the process of threading and securing to the warp beam.

A very simple device will overcome this difficulty. Before disturbing in any way the new warp, while it is still the smooth group of strands removed from the warping frame, determine at what point, measuring from the end at which the single thread cross is secured, the warp is to lie across the breast beam in order to allow sufficient length for threading and tying on. Have an assistant hold the warp against the breast beam at this point while you secure the alignment of the strands by means of a tassel head. To make this tassel head, measure off about a yard of some strong worsted yarn, double Germantown or knitting worsted or its equivalent in finer yarn. This is to be tied around the rope of warp at a point as near the floor as possible. If you are equipping a foot loom, the tassel head will be formed close to the foot-beam which connects the frame of the loom close to the floor. If you have a table loom, use your ingenuity to supply a substitute for this foot-beam. A straight

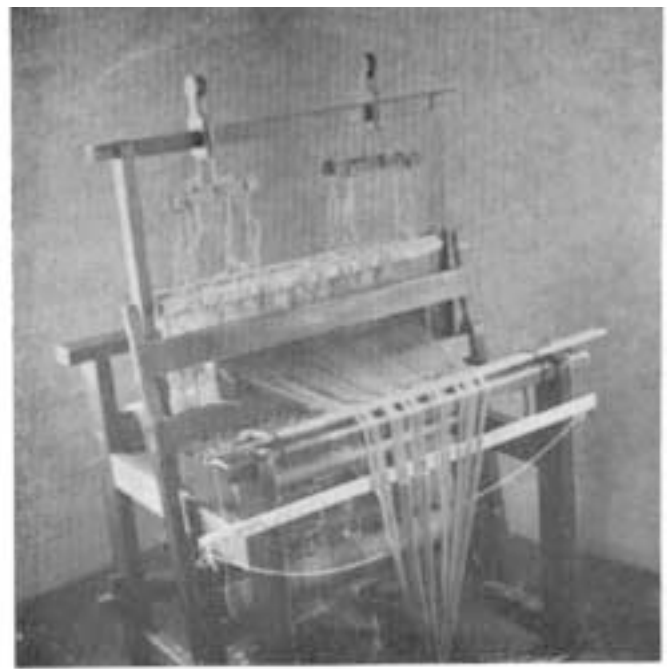


Illustration No. 4

chair laid on its back under the table and weighted down if necessary, may answer. Having determined the correct spot, a few inches above the foot beam, tie the yarn tightly around the rope of warp in a hard knot, leaving equal ends. Double the warp rope back on itself at the point where the yarn is tied, to form the ball part of a tassel head. Holding the doubled rope in one hand, wind one of the lengths of yarn firmly several times about the doubled warp to form a collar below the ball of the tassel, making this ball quite small. Hold securely while the other length is wound about in the other direction. See that the collar is very tight, and tie in a hard knot. This collar will hold the alignment of the warp ends beyond the possibility of slipping. The long ends of yarn may now be passed around the foot bar, at the exact center of the loom, and tied securely. See illustration No. 3. Thus an even tension on all warp ends is assured.

The object of securing the tassel head at the floor is to avoid, as far as possible, differences in the length of the warp ends. There will of course be a slight difference in the length of the warp ends from the tassel head to the heddles in the center of the loom and those on the edges. In wool warps this difference is quite negligible. In linen or cotton warps the difference is taken up in beaming by holding the warp chain in process of being beamed as far from the loom as the dimensions of the room will permit.

When the warp is tied onto the warp beam bar and is ready for beaming, the next step is to put the beaming-stick in position. A yard-stick with a small hole bored in each end is satisfactory. Before the tension at the foot-beam is released by cutting the yarn with which the warp is held down, run the yard-stick through the warp to duplicate the

further forward of the two dowels which mark the single thread cross. Through the hole in one end thread a length of strong twine a foot longer than the stick. Pass this twine behind the entire warp and tie the other end through the hole in the opposite end of the stick. See illustration No. 4. This stick will divide the warp into two planes, with alternate warp ends above and below. The twine is to hold the position of the stick if it should slip out of the warp during the beaming process. By following the twine to one end of the stick, it can be restored to its proper position.

The shed sticks which have marked the crosses can now be taken out, as their function was to indicate the order of warp ends for reeding and threading. As this has been done, and one of the shed sticks has been replaced by the beaming stick secured with the twine, they are no longer needed.

The warp is now ready for winding on the warp beam. Its smoothness and order is ensured by its even distribution through the reed and heddles, which will keep it in its proper order during the winding process. If available, four persons is the ideal number for a beaming team. Of these, three may be unskilled labor. However, two may accomplish the task in only a little more time.

After you are assured that the beaming stick is secured in place, the yarn forming the tassel head is carefully removed. The warp is unchained and the person who is to hold it moves back with it as far as the dimensions of the room will permit. If the warp has been well made and tied with the same tension to the warp beam bar, the warp ends should all be the same length and the warp wind smoothly through reed and heddles and onto the warp beam.

Before beginning to wind, the yard-stick secured by twine, which we have called the beaming stick, now comes into use. With your assistant holding the warp under tension, carefully centered so that the two selvages are equally tight, stand close to the loom, facing it. Hold the beaming stick in one hand, the hand farthest from the warp, and turn it on edge to separate the two layers of warp. Press down the lower layer with the stick, at the same time grasping a group of the upper layer of threads and pulling these upwards, thus separating the two layers widely. See illustration No. 5. Repeat the process across the width of the warp until the two layers are completely separated. Then move backwards a yard or so and repeat, continuing until you work back to the assistant. As the warp moves forward in winding, this separating process is repeated.

Pull the beater forward and let it rest against the breast beam. Should any warp ends twist about each other due to slight differences in tension, the beater will tend to be pushed backward by this twist and warn you before a break can occur. If a helper is available to stand in front of the reed, watching for such twists and plucking at the warp threads to separate them should such twists occur, so much the

better. If another helper is available to turn the warp beam, that too will save time.

As soon as the warp is separated and you are ready to wind, stand behind the loom. By pressing lightly on the warp at the edges and toward the center, you will be able to detect any differences in tension. If the warp is not held correctly centered, one selvage will be looser than the other. As you wind the warp on, repeat this testing process often.

When beams are filled by machinery, the tension is controlled mechanically and is constant. The tension should be as strong as possible without making the winding too difficult or causing the loom to move forward, and as constant as human muscles can hold it. With a heavy warp, such as rug warp, it is well to have an improvised snubber, a heavy chair inverted so that the warp may pass over and under the rungs and add resistance without the exertion of so much pull on the part of the holder, will be a great assistance. If the warp is a lighter one, the holder may stand with arms extended fully forward. Let the weight of the body, leaning slightly backward, keep the tension, rather than arm muscles.

As the warp is wound on, do not allow the rope of warp to slide through the hands. The friction on the outer threads of the warp will disturb the alignment of the warp ends. Instead, release the grip of the forward hand and take a new grip behind the other hand — rather like climbing a rope backwards.

As hand beamed warp can not be wound so tightly as machine beamed warp, it is necessary to wind papers between the layers of warp on the warp beam to prevent the top layers from cutting into the layers below and spoiling the tension. Double layers of newspapers answer this purpose perfectly. As one paper is wound under, another is introduced. In introducing a paper, hold the edge taut between the two hands so that it will wind smoothly under without wrinkles. Papers wound in with the warp have the further function of preventing the selvages from slipping down over the lower layers and so spoiling the edge tension. Some weavers use thin sticks laid across the beam every few inches. Sticks used in the bottoms of window shades are sometimes so used. These make a bulky warp beam, however, and on a short warp are no more efficient than paper. Building paper, cut in lengths the width of the warp beam, is convenient for looms wider than newspapers.

A wool warp up to twenty yards long should wind on in fifteen minutes or less, without manipulation, as the elasticity of the yarn takes care of slight inequalities in tension. Linen and cotton, as they have no elasticity, may take a little longer, as any differences in tension which occurred when the warp was made will appear as slack threads in the winding. In case of such slack ends, avoid a combing action through the warp. Place a hand about the offending section, fingers flat below, thumb pressed flat above and smooth downward, until the slack of the loose

ends is caught under the hand gripping the warp. If too many of these loose ends have been smoothed down, it may be necessary to move forward with the warp until the smoothed section is beamed. Then retire to the original position and repeat. These inequalities are not caused by beaming. They were caused on the warping frame.

This proceeding covers the beaming of an empty loom. It often happens that a loom equipped with a much-used threading needs a new warp. To empty and re-thread is a slow process. Much quicker to tie on a new warp of the correct number of ends. The problem involved here is to tie new warp to old warp so that the tension on all threads shall be the same. By fastening the new warp by means of a tassel head to the foot-bar, as described above, in order not to disturb the alignment, this tying on can be done in far less time than required for re-threading. Arrange the new warp so that the shed sticks marking the crosses lie on the breast beam and the ends reach about to the beater. Tie these sticks down to the ends of the breast beam a trifle loosely with strong worsted yarn, and insert a pencil or other small object between the beam and the sticks at each end so that the warp threads will not be pressed against the breast beam and unable to move freely. Insert another wedge between the shed sticks at each end, so that the crosses between them will be clearly visible when selecting the threads in their correct order for tying on to the old warp. See Illustration No. 3.

Before cutting off the last piece of work from the old warp, open one tabby shed and insert a shed stick, preferably a small round dowel, in the shed. Pull this dowel forward, open the other tabby shed and insert a second dowel. Push both dowels back close to the reed. When cutting off the work, grasp the warp ends in bunches, cut close to the cloth, and tie the groups of ends close to the reed with slip knots. These shed sticks are essential when two warp ends are sleyed through a dent, as otherwise it is impossible to tell which end comes first.

The knot used to tie the old and new warp ends together is a square or reef knot. It has the advantage of being distributed around the warp yarn and hence goes through the dents easily. The method of tying this knot so that the tension shall be alike on all joined ends is illustrated in Figures 1 to 8 of Illustration No. 6. For purposes of explanation call the old warp black and the new warp white. When practicing this knot to acquire facility before typing on a warp it is advisable to use yarn of two different colors.

Fig. 1. Select the first thread of the old warp (black) and hold in the left hand, between thumb and index finger, the hand to be held in a vertical position. Select the first thread of the new warp (white) and hold in the same manner, except that the end will of course point away from you. The right hand should be about four inches in advance of the left. For practice, a group of threads to represent the old



Illustration No. 5

warp may be tied to any stationary object, and a group of threads of a different color to represent the new warp tied to your belt.

Fig. 2. Separate thumb and index finger of right hand from the other three fingers. Allowing the three lower fingers to pass below the black warp thread, cross the white thread over

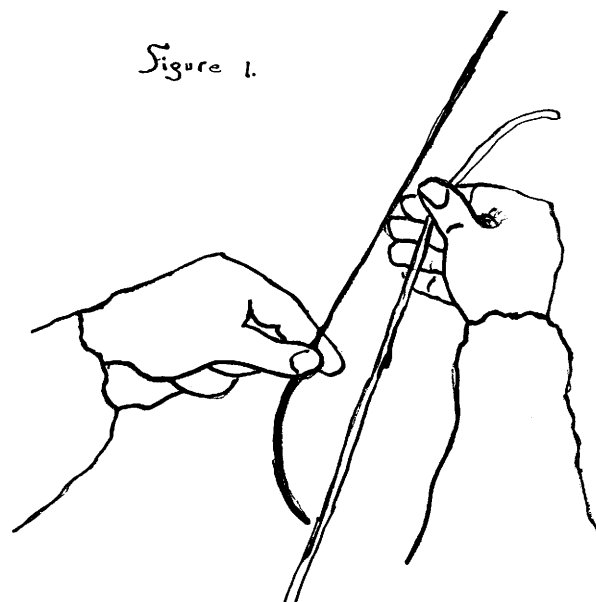


Figure 1.

the black thread, producing the triangular space X.

Fig. 3. Insert middle finger of right hand in this space.

Fig. 4. Transfer grip on white thread to middle and fourth fingers.

Fig. 5. Pull white thread to the right and hold again between index finger and thumb, this time with its end

hanging down over the palm and pointing towards you.

Fig. 6. With the white thread behind all four fingers, press little finger of right hand on the crossing of the two threads. Maintain this pressure until tying of the knot is completed.

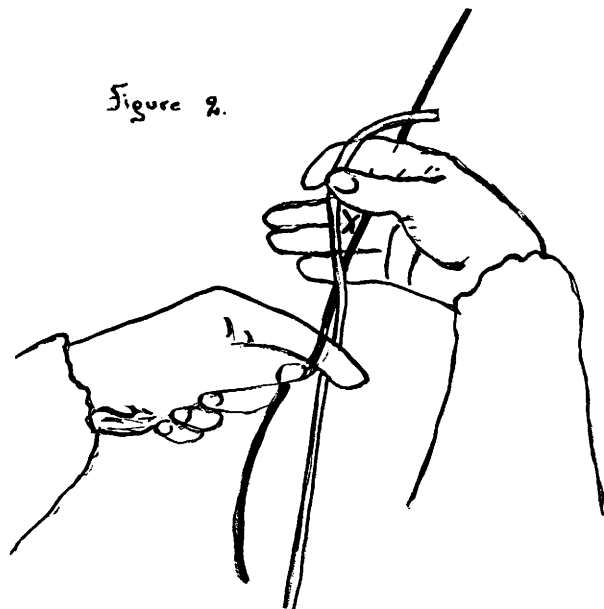
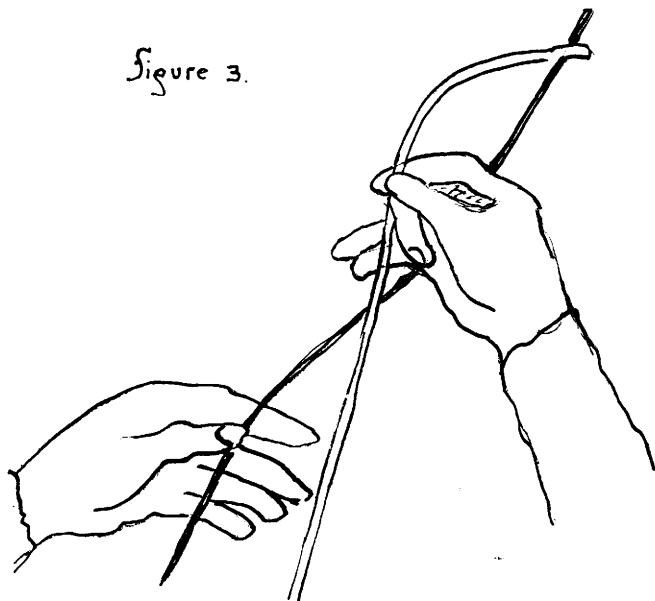


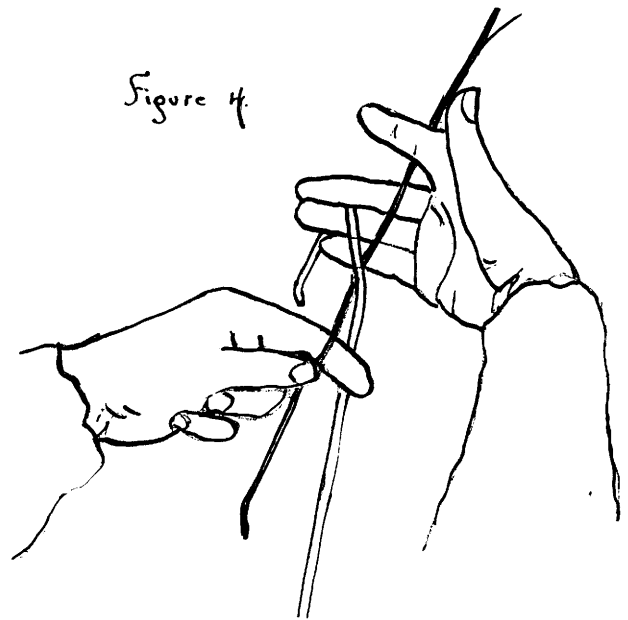
Fig. 7. With left index finger lift black thread so that it lies beside the white thread across the right index finger. With the right thumb roll the white thread over the black,



catch again with right thumb and finger and hold while you consider the next move.

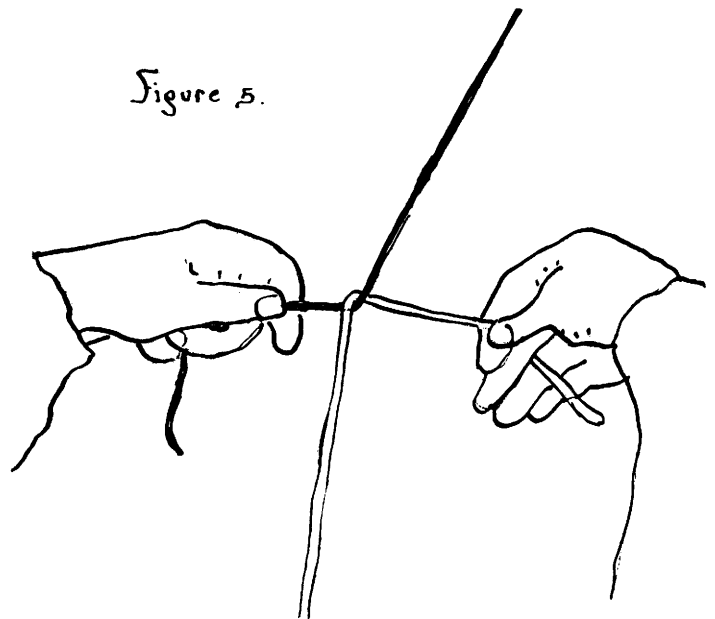
Fig. 8. Be prepared to make three simultaneous motions. With left index finger pull black thread away from you,

Figure 4.



parallel with its own color, with right hand pull white thread toward you, parallel with its own color, both pulls to be of the same strength. As the pull begins, withdraw the little finger from the point where it has been pressing against

Figure 5.



the crossing of the two threads. Are you ready? Gently, not jerking, pull!

If the pull is stronger with one hand than with the other the knot will slip. This ability to break the knot is a great advantage if by mistake you have tied the wrong ends together. To break the knot, straighten out either the black or the white thread, and the other can be pulled off it.

Figure 6.

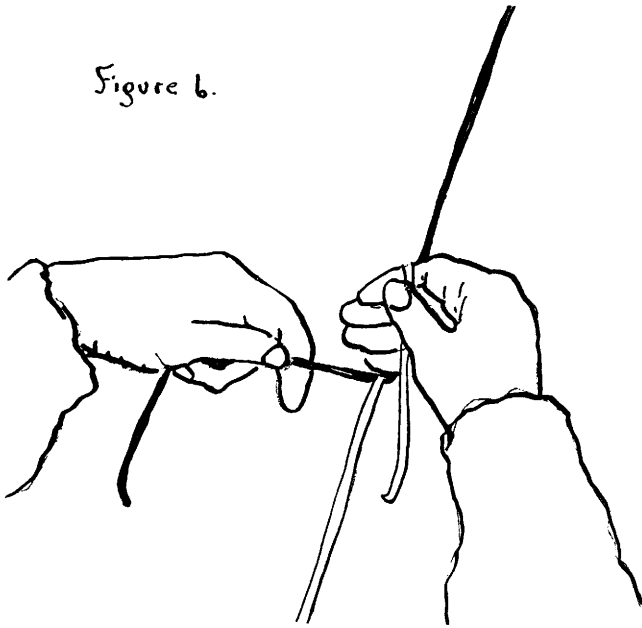
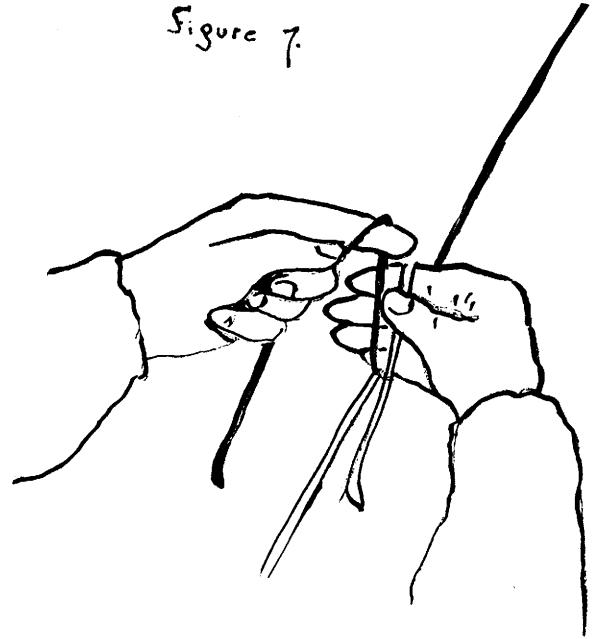


Figure 7.



At first, to test your knot, tug lightly at each knot when tied to see if it is secured. It will take a little practice to get the same tension on all the ties. Two people can rarely match each other's tension. It makes no difference whether you tie with a tight or an easy tension, provided all are alike. In case of appreciable differences in the tension, enough to cause slack ends in beaming the warp, it may be advisable to untie the old warp ends from the warp beam bar, pull the tension even and retie before releasing the tassel head from the foot bar.

While description of the method of tying this knot sounds complicated, dexterity comes very quickly. Wool is quicker to tie than cotton or linen. A six hundred end linen warp of twenty yards length can be tied in two hours or less, and beamed in less than half an hour, if the warp, when measured on the warping frame, has been made with all the strands the same tension and the same length.

Figure 8.

