

The History and Technique of Tapestry Weaving

ARTICLE II: MAKING A WARP

WEAVING, of whatever kind it may be, demands for its successful practice the most meticulous care and exactness, not only in the weaving itself, but in every stage of the preparations for it. The selection of yarns for the work and the raw materials of which they are composed; the beauty and fastness of the dyes with which they are treated and the character given to them by spinning; all require particular attention, as do also the looms and the various appliances by means of which the actual work of the weaver is carried on. As soon as all this is realized and attended to, the art of the weaver is perhaps more pleasurable and satisfying than any other of the artistic crafts; but, without this particular care and forethought, weaving may be, and too often is, the most bewildering and disappointing craft of them all.

Before proceeding to set up a loom for weaving a piece of tapestry, of course the selection of a suitable design must be made. On this point naturally a great deal might be written and much advice be given: but for the present we will suppose that that important matter has been settled, and that a simple, primitive design of geometric character has been chosen for a first essay in tapestry weaving on a portable frame, constructed as described in the introductory article of the present series, which the author ventures to imagine some interested readers of *THE HANDICRAFTER* may have had made.

The most suitable warp for such a carpet is made of the best clean, lightly spun flax or hemp *seaming twine* manufactured for use by tent or sailmakers and upholsterers. It should be free from fluff and be very strong and flexible. For such a carpet, especially for a first attempt at tapestry weaving, a medium count of warp, say of 12 threads to one inch, will be quite fine enough, and, at the same time, not too coarse, if carefully wrought, to produce work of neat artistic effect.

The size of the twine to be used for the warp is an important matter for consideration, for, if the tightly stretched warp twines stand too near together, they will not allow the weft, which has to encircle each string like the link of a chain, to be settled in its place without undue pressure or banging and beating down in order to make it completely hide the warp, both at the back and front as it should do; but, on the other hand, the twine must not be so fine as to allow the weft to be pressed down too easily into a soft, flabby material

quite different from the solid texture of properly woven tapestry.

The preparation of the warp for the tapestry frame is a much easier operation than making the warp for an ordinary loom for automatic weaving, or even a long length of warp for a tapestry loom with rollers: the preparation in the present case only consists in cutting the twine into lengths long enough to reach two-and-a-half times round the frame: lengths which, when folded in the middle, passed over the top and tied at the bottom edge of the frame, will each make two strings of the complete warp. The cross in the warp, which keeps it in order, without which no kind of weaving could be begun or carried on, in this case has to be taken after the twines are all tied on the frame and exactly spaced as suggested above, 12 to the inch, or whatever the count decided on may be. Cutting all the lengths of twine to the exact size required for the frame, which is about a yard high by 2 feet 8 inches wide, is not a difficult operation if done systematically in the following manner: Two long, strong screws, nails or hooks will be needed; they must be driven into a wall or board at a convenient height $2\frac{1}{4}$ yards apart, and project from the wall far enough to be fixed very firmly and allow of a goodly quantity, say 100 yards, of twine to be evenly wound on them into a skein $2\frac{1}{4}$ yards in length when the two loose ends have been tied together.

A formal diagram of such a skein is given at the top of the page of drawings illustrating the first process of warping. At letters *A*, *B*, *C* and *D*, Figure 1, the two dark parallel lines joined by half circles at their ends represent a skein of any required number of warp twines resting on two pegs $2\frac{1}{4}$ yards apart, ready for being made into a warp or a part of one. The skein has been made by first looping an end of twine to the peg at letter *A* and carrying the twine over to the peg at letter *B*, then round the peg and back again to letter *A*. At every such round, two threads of warp will be laid so that a 12 to the inch warp will require 144 rounds of twine to be made. It is not necessary to wind the whole warp at once, but skeins of 20 or 40 rounds would be found more convenient for handling. Before removing the skein from the pegs, it must be firmly tied up at each end at the points marked *G* and *D*, Figure 1. When this is done, the skein may be safely removed and allowed to hang loose from one of the pegs, as shown at Figure 2, letter *A*.

All the twines at one end of the skein have to be cut, leaving them the required length, $4\frac{1}{2}$ yards: but before this is done the compound loop of strong cord, Figure 3, must be prepared. It is drawn the full size in order that its construction may be readily seen and understood. A simple loop of strong cord has been made, and the end which is clear from the knot has been formed into a slip-knot, called by weavers a *snitch*, and through the open snitch (see diagram Figure 4) the end of the loop near to the knot *m* has been passed and the snitch drawn tight on the double cord. Through the noose thus made, letter *K*, Figure 3, the end of the skein, Figure 2, letter *A*, after being removed from the peg, has been passed and the noose drawn very closely around the twines near to the temporary knot, letter *c*, which knot can then be removed and the ends of the twines may all be cut with safety.

Figure 5 is a drawing of the final preparation of a skein of warp twines. They hang, held firmly by the noose, from a convenient support near the tapestry loom ready to be drawn out one by one and mounted on the frame in the manner to be presently described.

The above may seem to be a very small matter to require so much explanation, but a very short experience of the nature and behavior of a bundle of loose threads will prove the value of it, for nothing in the world can be more unmanageable and distracting than an unregulated tangle of a large number of loose threads, twines or cords.

When the operator is ready to begin the warping, he must grasp the whole bundle of twines, Figure 5, with his left hand, and at the same time with his right hand lift one of the loose loops near letter *O*, and firmly draw the double cord through and from the noose; as soon as the two ends of the twine are free from the noose, they can be drawn through the rest of the skein quite freely.

A goodly number of twines being ready for mounting on the frame, the frame itself must be prepared for receiving them by the removal of the few fittings which would prevent the operator getting freely to any part of the frame either behind or before.

Illustration No. 2, Figures 1, 2 and 3, gives a front view and the side elevation of the tapestry loom: a section, taken at the centre, of the stretching bar is also given. A photograph and working drawings of the complete loom were reproduced in the November issue of *THE HANDICRAFTER*.

At Figure 1, an essential though simple portion of the loom is shown without the cover called the *cap*, which protects the row of wires that answers one of the purposes of the reed in the ordinary loom. The wires divide the stretcher-bar *AA* into $\frac{1}{4}$ -inch spaces, into each of which equal numbers of warp twines will be placed as the work of warping proceeds, so that, when the grooved lath called the *cap*

is again fitted over them and screwed down at *ee*, the twines will be securely kept in their places.

The headle-rod, letter *H*, and its two supporting brackets *GG* have also been removed in order that the warper may find a clear course both at the back and front of the frame for placing each double thread of twine in its exact position and fixing it there. This is indicated by the dotted line at Figure 2, letters *dd*.

Before beginning to warp the twines, it will also be necessary to make sure (1) that the stretching-bar *A*, the top-bar *D*, and the cross-bar *C* are all exactly parallel. This will be best proved by means of a spirit level.

(2) The cross-bar *C* must also be very carefully and clearly marked with vertical lines one inch apart, to match the spacing of the reed on the stretching-bar.

(3) It is sometimes necessary during the progress of the tapestry weaving to slacken the tension of the warp. This must be provided for by screwing the stretching-bar *AA* into the exact position shown in the drawing: it can then be lowered at any time an inch, which will be sufficient to allow of the warp being slackened when required.

All the above directions being attended to, the work of warping can proceed at once.

The operator will find it most convenient to stand in front of the loom at the left-hand side, so that the frame, which stands on legs, will be at a convenient height for him to reach equally well both the stretching-bar at the top of the loom and the cross-bar at the bottom. One pair of twines from the skein which has been arranged to hang above a table in such a manner that their loose folds rest upon it, as shown at Illustration 1, Figure 5, must be taken at the uncut end at letter *O*, carefully drawn out, as already described, and the double-folded end must be placed by the left hand behind the stretching-bar *A*, taken over it by the right hand, and placed without twisting between the first and second wires of the reed. Before drawing the double twine down to the cross-bar, letter *C*, a finger of the left hand put between the twines and kept there while the front loop is drawn will effectually prevent their twisting as they are drawn up. The same care must be taken at the front to prevent their twisting together as the loop is brought down to the front of the cross-bar and a little below it: here a single snitch must be made and the two ends, which will reach several inches below the bar, must be put through it and the snitch drawn tight. Before finishing the snitch-joint by tying the usual single knot, the tension given to the twines must be determined on with deliberation, as the success of the whole warp depends in great measure on the first tying up being even.

When fixed on the cross-bar, the pair of twines

must be exactly parallel to the side of the frame and, if the marking of the bar has been correctly done, twine No. 1 will be exactly on the first mark, and it follows that the first mark of every inch on the bar will be covered by the first twine of every twelve.

The snitch joint in every case must be very carefully made and fixed by tying a *single knot only* of the two ends close to the snitch. This is quite enough to secure it; a double knot would spoil it because it would make it impossible to regulate the tension by it. This can be easily proved by experiment.

Instead of being both entered in the same reed, the second pair of twines will have to be entered with the second wire between them; there having to be three twines in every $\frac{1}{4}$ -inch space in order to accommodate twelve twines in every inch. If all the above directions are carefully followed, there should be little difficulty in completing the whole warp in like manner.

When the cap of the reed with its deep groove is fitted over the row of wires and firmly screwed in its place on the face of the stretching-bar, there will be no danger of the twines getting out of order, especially if a turn or two be given to the screws of the stretching-bar and the tension of the warp has been increased.

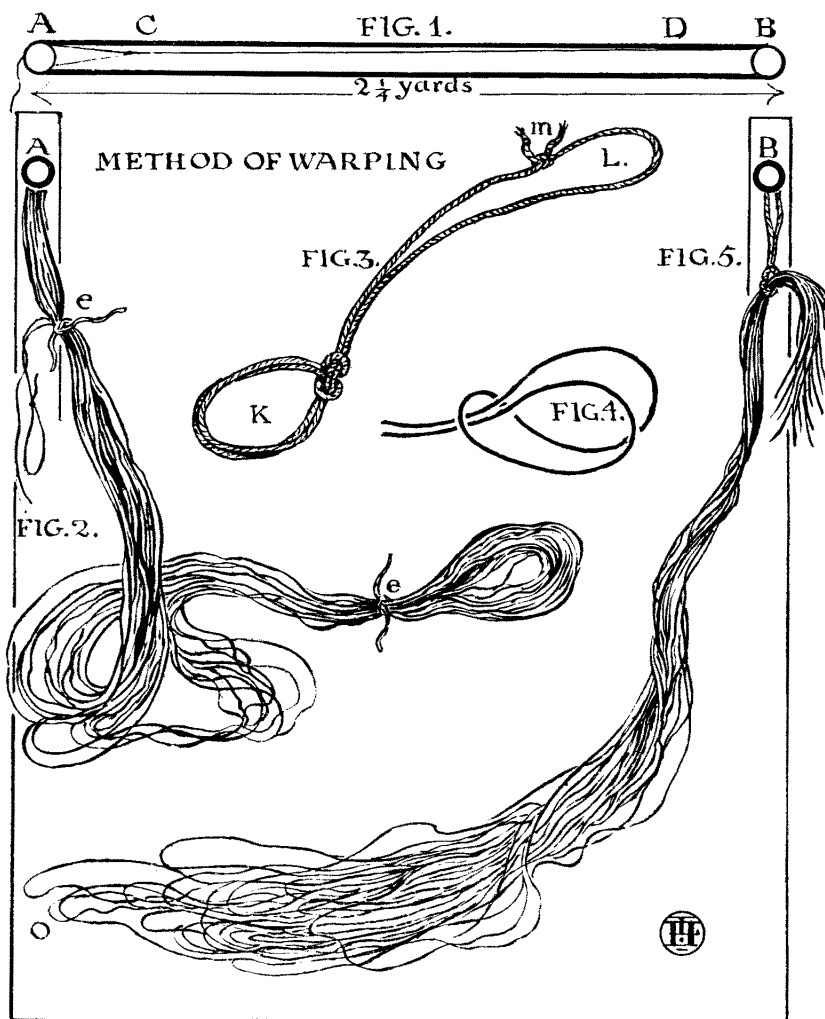
Taking the cross in the warp is the next matter which requires careful attention in order to enable the weaver to make the alternate openings necessary for tabby weaving, of which texture tapestry weaving always consists as already explained.

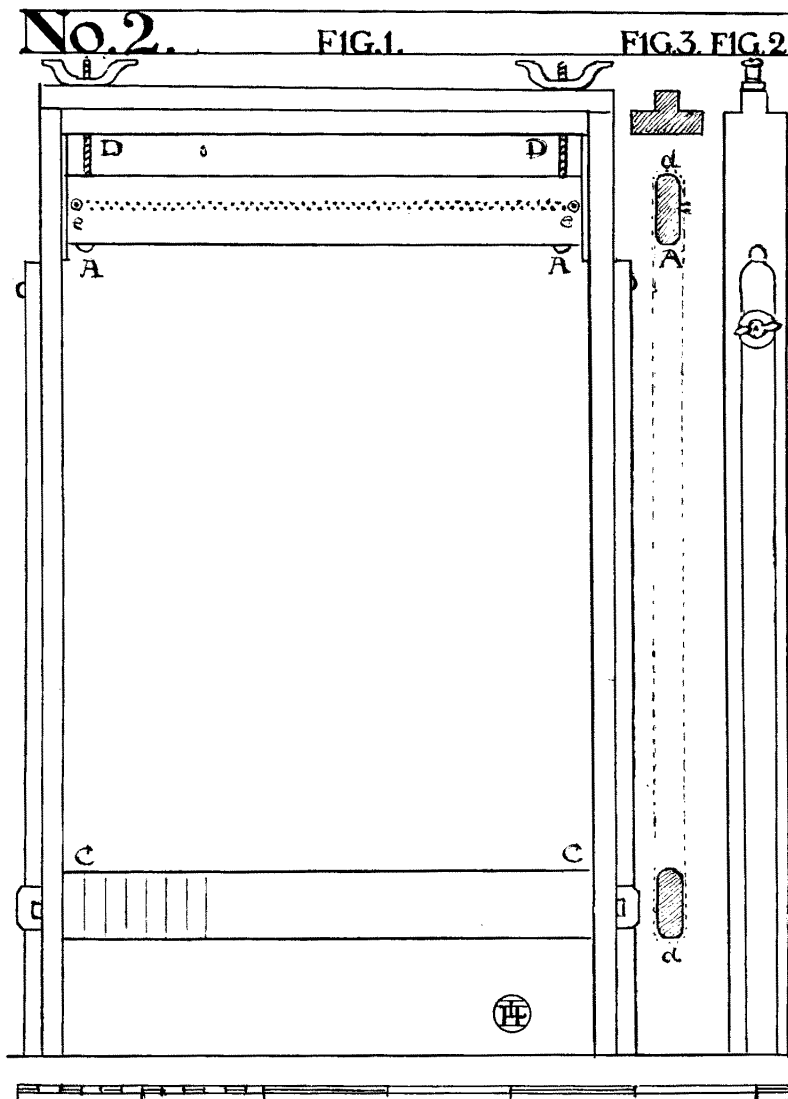
The best implement to use for the purpose of taking the cross is a packing needle about 4 inches long, slightly bent towards the point. It must be threaded with a strong, soft, colored cord, rather more than the width of the loom in length.

An enlarged drawing of a part of the warp will greatly assist in the understanding of this rather difficult process; which also has to be perfectly done, or it is worse than useless; in fact will have to be done over again until it is correct.

The 24 vertical, double lines of the diagram Figure 1 of the illustration No. 3 will be sufficient to represent the twines of the whole warp when stretched out on the

loom. The zigzag row of black dots indicates the wires of the reed driven into the stretcher-bar at the top of the frame between the letters *A* and *A'*. Below each of the letters *AA'*, screw eyes, *ee*, are fixed in the bar, and at letter *A* a strong colored cord, after being tied at one end to the screw eye, and at the other threaded in the eye of the needle, the cord must be carried by the needle over twine 1 and under twine 2, over twine 3 and under twine 4, and so on over and under all the twines alternately, until it reaches the left-hand side of the loom at letter *A'*. There it is drawn straight, but not too tightly, and fastened to the second screw eye *e*. This cord has to remain permanently intersecting the warp until the tapestry panel or carpet is finished. The second colored cord, which has to be twice the length of the first, after being threaded in the needle, must be carried by the needle from the left, letter *A'*, over the first twine, under the second, and so on, exactly in the same manner as the first cord, but over and under alternate twines, until it goes under the first twine at letter *A* on the





right. Instead, however, of being tied close to the screw eyes *ee*, either at the right or left, the long loose ends of the second cord must be tied by their extreme ends to the screw eyes to keep them out of the way for the time being and leave the cord quite loose. The purpose of the second cord is to make an easy opening for the introduction of the pointed rod *CC* into the shed, which is easier to accomplish nearer to the centre of the warp. The rod being ready, the cord must therefore be lowered and the twines lifted and gathered up in convenient groups for passing the pointed end in the same course as the cord, from right to left, until the point emerges on the left-hand side of the warp. The stick and the cord must next be brought up to the position shown in the diagram, the stick be attached by cords to the screw loops *ee* and then the long colored cord, having served its purpose, will be left ready, as depicted in Illustration No. 3, to be untied and drawn out.

doubled and the ends joined as at letter *d*, which makes it into a loop. At Figure 5, the opposite end of the loop *d*¹, a knot has been tied 4 inches from the end. This so far completes the heald. As soon as a sufficient number of healds exactly alike have been made, they can be attached to the warp twines and hung in their places on the headle-rod *H*, in order as follows: (1) The first twine of warp which we will suppose Figure 2, *aa*, to be, is a backward one, as it goes *behind the pointed rod*, letter *C*, Figure 1, of Illustration No. 3. It is therefore a twine to which a heald is to be attached. The heald prepared as at Figure 5 must be taken to it and the twine brought well forward. (2) The end of the heald, letters *fd*¹, must be passed behind the warp and brought forward. (3) The loop *fd*¹ must be formed into a snitch, and (4) the end of the long loop *d* passed through it and drawn close, but not so close as to prevent the closed snitch from slipping down the

For the next step in the preparation of the loom, the headle-rod *H* and the brackets *GG* on which it rests must be refixed. The healds, by means of which the twines at the back of the rod *C* are brought forward to make the second opening for the weft, have yet to be made. The number of healds required will be just that of half the number of twines of the whole warp, one heald having to be looped to every alternate twine and to the headle-rod as well: as shown at Illustration No. 3, Figure 2; letters *aa* being part of a warp twine; letter *b* a section of the headle-rod, and *cc* a heald looped around the rod *b* at one end, and at the other end looped around the twine, *aa*.

The healds must be made of quite fine, smooth, strong twine, and must be all made exactly of the same length, so that when a group of them is drawn forward, to form a shed, all the twines of the warp which they govern shall be exactly level and the opening perfect.

Figures 3, 4 and 5 of Illustration No. 3, which show the making of a heald in its three stages, will require but little description. The length of twine, Figure 3, must be 26 inches, or thereabout, according to the size of the loom and the convenience of the weaver. At Figure 4, the twine has been

double thread of the loop, Figure 5, until it is stopped by the knot *d*. This will enclose the warp twine *aa* in a short loose loop as at *c'd'*, Figure 2, and the long loop will be ready to be joined to the headle-rod as shown at Figure 2, letters *bc*. The headle-rod itself must be temporarily balanced on the left-hand bracket of the loom so that, as the healds are, one after the other, looped on to it, it can be pushed along until all are in their places and the opposite bracket is reached. The rod thus balanced on the bracket in such a manner that it can be pushed gradually along to the right-hand bracket *G* is shown at Figure 6, Illustration No. 3.

The first heald being looped to the first warp twine, a single snitch must be made at *d*, Figure 5, and be put over the rod and pushed along it as far as the bracket *G* will allow. This being

done; passing a *front* twine, the second *back* twine must be brought forward and furnished with its heald, which in turn must be looped by the snitch to the rod. Thus the work of passing a front warp twine, connecting a back one and the headle-rod together must be continued until the rod has reached the right-hand bracket and all the twines which are in front of the cross-rod *C*, Figure 1, Illustration No. 3, are at the front and all those that are at the back, being connected to the headle-rod can be brought forward, singly or in groups at will, by means of the healds in order to form a shed.

The above arrangements all being accomplished and found, on examination, to be correctly done, the loom may be pronounced to be quite ready to receive the foundation laths of the tapestry in the first and second sheds at the bottom of the loom.

