



RIGID HEDDLE LOOM

*Instructions for Assembly,
Warping, and Weaving*



Rigid Heddle Loom shown with optional Trestle I Stand

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Your rigid heddle loom has been crafted from the finest hardwood maple and each piece has been sanded and hand oiled. Each loom includes an 8-dent, 10-dent, or 12-dent rigid heddle reed. (The “dent” size refers to the number of holes and slots per inch in the reed.)

Your rigid heddle loom may have been ordered with the accessory package (listed below). If not, you may find it helpful to have the following equipment: a warping board or a set of warping pegs, a threading hook, a stick shuttle, a pick-up stick, and a rigid heddle table stand or a trestle floor stand.

ASSEMBLY INSTRUCTIONS

Rigid Heddle Loom Parts List

Reed

1 -- Rigid heddle (8, 10, or 12-dent)

Wood Frame Pieces

Left and right side pieces with heddle holders

Warp beam with ratchet gear attached

Cloth beam with ratchet gear attached

Rear beam

Front beam

2 -- Lease sticks, holes in ends

3 -- Apron rods, no holes

2 -- Wooden crank handles

Hardware

2 -- 1” Round-head screws

2 -- 1” Flathead phillips screws

4 -- 1 3/4” Flathead phillips screws

2 -- Ratchet pawls (or ratchet brakes)

8 -- Apron cords for 20” loom
or 10 Apron cords for 25” loom

Accessory Pack Contents

1 -- Rigid heddle table stand

Table stand parts and hardware:

2 - Table stand upright w/ clamps

2 - 2 1/2” Flathead machine screws

2 - 1/4” Wing nuts

2 - 1/4” Washers

1 -- 12” Stick shuttle

1 -- Short heddle hook

1 -- Warping peg

1 -- Table clamp

Tools needed:

regular screwdriver

phillips screwdriver

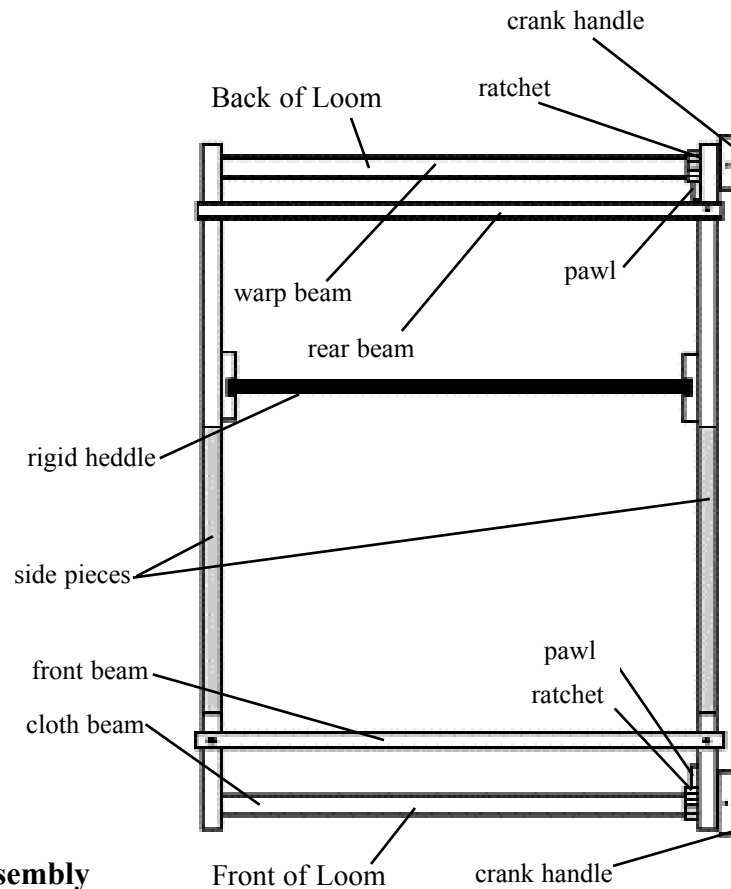


Diagram 1:
Parts and assembly

MORE READING

Davenport, Betty. *Hands on Rigid Heddle Weaving*, Loveland, Colorado, Interweave Press, Inc., 1987.

Hart, Rowena. *The Ashford Book of Rigid Heddle Weaving*, Ashburton, New Zealand, Ashford Handicrafts, 2002.

Periodicals

Handwoven, Interweave Press, Inc., 201 E. Fourth Street, Loveland, CO 80537.

Fiberarts, Interweave Press, Inc., 201 E. Fourth Street, Loveland, CO 80537.

Shuttle, Spindle and Dyepot, Handweavers Guild of America, 2 Executive Concourse, Suite 201, 3327 Duluth Highway, Duluth, GA 30096.

APPENDIX: HOW TO DETERMINE E.P.I.

The greater the yarn size, the fewer warp ends per inch will be needed. But how do you know exactly how many ends there should be for a firm, not flimsy fabric? Some of this comes from experience, but if you are uncertain how you should set a particular yarn you can always weave a sample before beginning your project. There is also a rule of thumb which is quite useful: simply wind the yarn you want to use as warp around a ruler for 1” so that there are no spaces between wraps. Then count the number of wraps in this 1” and divide by two for the number of ends per inch.

OTHER NIFTY TOOLS FOR RIGID HEDDLE WEAVING



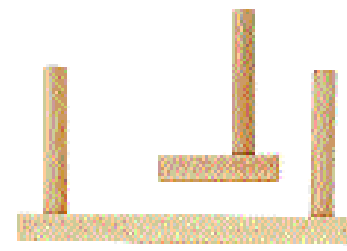
Pick-up Sticks



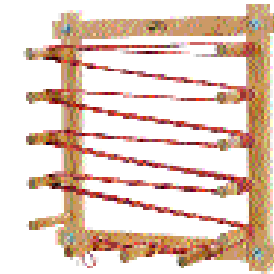
Trestle I Stand



Table Stand



Warping Pegs



4 1/2 and 14 Yard Warping Boards



Change sheds by putting the rigid heddle in the opposite position. Pass the weft back through the shed and beat the weft into place with the heddle. Repeat these two rows. That's all there is to it! Pretty soon you'll find that all this comes automatically, almost without thinking.

There are lots of variations and manipulations with color, texture, and different kinds of yarn. Once you start seeing the possibilities, you'll discover that you will never run out of new things to try. That's what's fun about weaving.

FINISHING YOUR HANDWOVEN FABRIC

When you can't weave any farther, or have finished your project, it is time to remove your weaving from the loom. Weave a few rows with a waste yarn. This will hold your weft in place when you remove the fabric from the loom. Unwind the fabric from the cloth beam. Untie the warp from the apron rods, or cut it close to the knots with a pair of scissors.

Inspect your fabric when you remove it from the loom. All loose ends should be secured. Look for weaving errors. If you have skips, you may cut out the weft from these areas and needle-weave a new weft in, overlapping a bit on both sides so that the ends are secure. If you have broken ends, needle-weave these ends in place.

Remove your header and secure your warp ends. Usually this is done before washing your weaving. If you want to have fringe, tie the ends to prevent the weft from raveling. One way to do this is to use overhand knots, overlapping ends from one group with another to make a tidy finish. Or you can hem your weaving. Before hemming you may want to zigzag stitch along the raw edge. Finally, wash your fabric and let it dry. Trim any ends which may have worked loose.

SOME WEAVING TIPS

Use your first project to become familiar with your loom. Here are some tips to help with your weaving:

- ♦For a nice even fabric, try to beat evenly with the rigid heddle.

- ♦Eventually you will run out of weft on your shuttle. You can tuck the tail end of the weft into the next row of weaving an inch or so, or you can simply overlap the new end with the old end where it runs out.

(See Diagram 14)

- ♦If you find that it is hard to move your heddle up and down, your tension may be too tight; however, you do want the tension to be fairly taut so that your weft will pack in nicely. The tension can be tightened by simply cranking the handle on the warp beam, and loosened by raising the ratchet pawl on the cloth beam and letting the ratchet fall back a couple of notches.

- ♦At some point a warp end may break. This can be easily fixed by simply tying on a new end to the broken one, rethreading the end through a slot or hole and securing the end to your fabric by making a figure eight over a T-pin. The loose ends of warp can be sewn into the fabric after you've removed the weaving from the loom.

- ♦One thing you will notice as you first begin to weave is that your selvages pull in. You can correct this problem by allowing some extra weft in each shed. To place extra weft, use the technique of slanting or bubbling the weft before beating.

- ♦As you weave, the weaving will advance closer and closer to the heddle and the shed will get smaller, which makes it harder to fit the shuttle through. At this point it is time to advance the warp. First, loosen the back pawl and allow several inches of warp to fall forward. Replace the back pawl and crank the cloth beam counterclockwise to advance the warp. Be sure that your warp doesn't move too far forward, which would make it difficult to beat the weft. Should this happen, simply reverse the process. Pat across your warp to check that you have the same tension as before; adjust your tension if necessary.

ASSEMBLE THE FRAME

Step 1. Attach the ratchet pawls to the inside of the right loom side using two 1" round-head screws. Attach the ratchet pawls with the teeth facing down. Tighten just enough so the pawls can still move freely.

Step 2. Place the short tenon of the cloth and warp beams into the holes in the left side piece. Next, slip the right side piece onto the long tenon (end with ratchet gear). Make sure that the ratchet pawls fall on the top of the ratchet gears.

Step 3. Place the curved sides of the front and rear beams in the curved slots on the top edge of the loom sides. Secure with the four 1 3/4" screws.

Step 4. Place the crank handles on the outer right-hand ends of the warp and the cloth beams. Line up the holes, and secure with the 1" flathead screws.

ATTACH THE APRON RODS TO THE BEAMS

Step 1. There is one pre-cut looped cord for each hole in the cloth and warp beams. To attach the apron cords to the beams, insert one end of the cord through a hole in the beam and pull the cord through a few inches. Take the other end of the cord and put it through the second to last loop of the end you put through the beam. Pull firmly on the cord to tighten it around the beam (Diagram 2A). Install the other cloth beam and warp beam apron cords in the same manner.

Step 2. Attach an apron rod to each set of apron cords. Start at one end of the cloth beam with the outermost cord and work across. Fold the cord at about 4" from the end and insert this doubled cord through the second loop from the end of the cord (Diagram 2B). Slide an apron rod through the loop formed by the doubled-over cord at point X. Pull the cord tight (Diagram 2C). Repeat across the entire beam. Attach an apron rod to the warp beam in the same manner. (Note: you will have one extra apron rod. This rod is supplied in case you use an alternate warping method which requires it.)

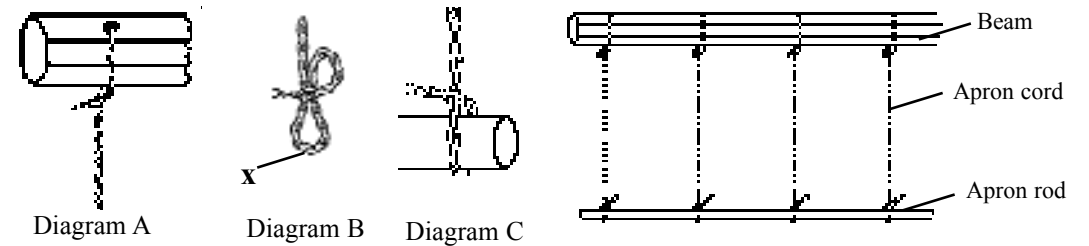


Diagram 2: Attaching apron rods

WEAVING

Weaving is the process of interlacing two sets of threads. One set, the warp, is held taut by the loom, and the other set, the weft, is woven perpendicular to these warp threads. The "rigid heddle" is designed to move the warp threads up and down so that the weft can be easily passed through the space between them. It is also used to beat the weft. The warp threads are alternately threaded through the slots and holes in the rigid heddle. When the heddle is raised the threads in the holes go up, while those in the slots remain level, forming the first of the two possible sheds. When the heddle is lowered, the threads in the holes move down below the threads in the slots to form the second shed.

GLOSSARY OF WEAVING TERMS

Balanced weave: Fabric in which the number of warp ends per inch (see e.p.i., below) equals the number of weft ends (or picks) per inch (see p.p.i., below).

Beat: To push the weft threads into place with the rigid heddle.

Cross: The figure eight made at one end of the warp when measuring. It keeps the warp ends in order and helps prevent tangles.

E.p.i.: Ends per inch. The number of warp threads, or ends, per inch, determined by the number of slots and holes per inch on the rigid heddle.

Heddle holder: The notched block on the inner face of the loom sides. Holds the heddle in the upper position (on top of the block) or the lower position (under the block). When the heddle is in the notch it is in the neutral position.

Loom waste: The ends of the warp threads which are not usable because they are knotted onto the loom, or remain unwoven.

P.p.i.: Picks per inch. The number of shots or picks of weft per inch.

Plain weave: The most basic weave in which the weft is woven over and under, over and under warp threads. Also called tabby.

Rigid heddle: The device that creates the sheds in weaving and is made up of alternate slots and holes. It is also used to beat the weft.

Selvedge: The very outside warp edge of the woven fabric.

Sett: The number of warp ends per inch.

Shed: The space between raised and lowered warp threads through which the weft passes.

Shuttle: A tool for holding and carrying weft.

Sley: To thread the warp through the rigid heddle.

Tabby: See plain weave.

Take-up: The amount of warp length “lost” during weaving. The warp, instead of going in a straight line, actually curves over and under the weft, and therefore extra warp yarn is required.

Warp: The threads stretched on the loom, wound onto the warp beam and threaded through the rigid heddle; as a verb, the process of threading the warp onto the loom.

Warping board: A rectangular frame fitted with dowel posts, used to wind the required number of equal-length pieces of warp yarn in preparation for threading the warp yarn onto the loom.

Web: The woven cloth.

Weft: The thread or yarn which is passed through the shed across the warp threads.

Weft-faced weave: A weave in which the weft covers most of the warp. Usually this is achieved by using a thin, widely spaced warp and a thick or soft, closely packed weft.

Step 5. Tying the warp to the front apron rod

If not already cut, cut all the loops at the front of the warp. Bring the front apron rod around and over the top of the front beam so that it is six inches from the rigid heddle. Take a 1” group of threads from the center of the warp and bring them over the top of the apron rod. Divide this group in half and tie as illustrated in Diagram 13. Tie 1” groups to the right and left of center alternately. When all groups are tied, check that the tension on all the warp ends is even by gently patting across the warp threads. Tighten any group of ends that is too loose. Then tie the end of each group in a bow.

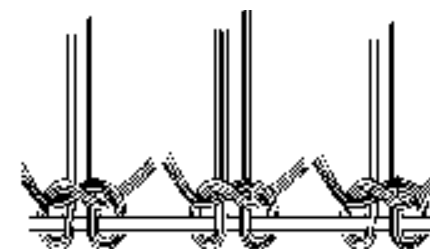


Diagram 13: Tying the warp to the front apron rod

WEAVING

To weave on the rigid heddle loom, the rigid heddle is alternately raised and lowered to make two sheds. The first shed is made by resting the rigid heddle on the top of the heddle holder (upper shed). The other shed is made by placing the rigid heddle under the heddle holder (lower shed).

Before beginning your project, it is a good idea to weave a “header” with scrap yarn. The purpose of the header is to spread the warp out evenly so that your weaving project can begin on an even, uniform warp. Usually three or four rows of heading material is sufficient (see Diagram 14). To weave in your header, place your rigid heddle in the raised-shed position and pull your heading material through the open shed. Beat the first row in place by taking the rigid heddle firmly in both hands and pulling it toward you until it presses the weft into a horizontal position, close to the front of the loom. Now place your rigid heddle in the lower-shed position and bring your heading material back through to the other side. Again, use your rigid heddle to firmly pack the second row of heading into place. Repeat these two rows several times, until your warp ends are evenly spread (see Diagram 14). Note: if you plan to have fringe on your woven piece, allow for this length by weaving a few more rows of header.

Wind the weft yarn for your weaving project onto a shuttle, which will carry your yarn back and forth across the warp. Stick shuttles are recommended for rigid heddle weaving — they are inexpensive and are easy to handle. To wind your shuttle, make a figure eight from end to end. Wind just enough yarn on the shuttle so that it can pass freely through the open shed. You may wind both sides of the shuttle or just one, depending on what feels most comfortable to you (see Diagram 15).

Begin weaving your project with the shed opposite the one used for the last row of heading. Take your wound shuttle and place it through the shed. To secure the tail end of your weft, pass it around the very edge warp thread and back into the shed an inch or so. Then beat the weft into place with the heddle.

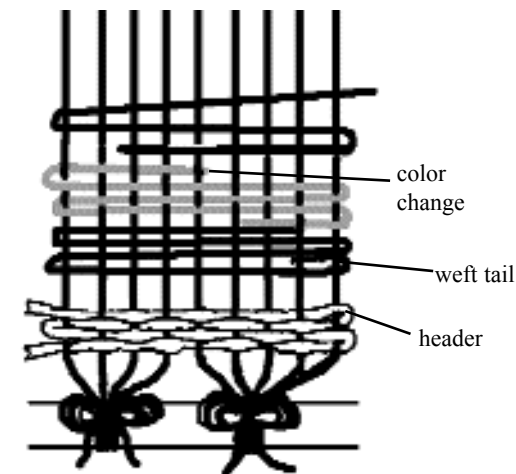


Diagram 14: Weaving



Diagram 15: Shuttle

USING THE RIGID HEDDLE TABLE STAND

The table stand is designed to attach the rigid heddle loom to a table top. The two sides of the stand are first attached to the loom, then to a table. Push a 2 1/2” flathead machine screw through the hole in the heddle holder from the inside of the loom, and then through the hole in the top of the table stand upright. Secure with a washer and a wing nut. Repeat for the other side.

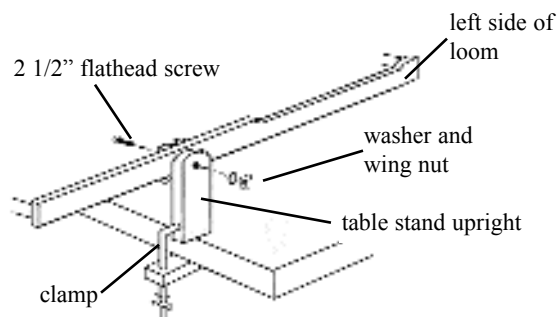


Diagram 3: Warping set-up

To set up the loom for warping, attach the table stand uprights to the loom with the clamp facing the back of the loom.

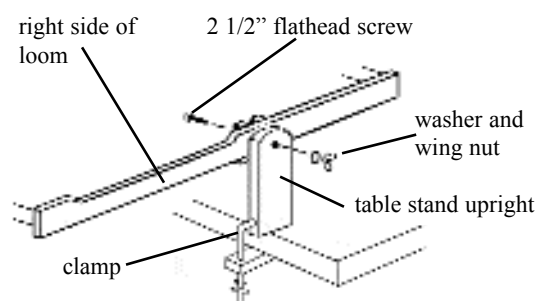


Diagram 4: Weaving set-up

To set up the loom for weaving, attach the table stand uprights to the loom with the clamp facing the front of the loom.

Which Warping Method Should I Choose?

Direct Method: Using the single warping peg

The direct warping method, developed by Rowena Hart, is a quick way to warp your loom. It is best for short warps, single-color warps, or striped warps of even numbers.

Indirect Method: Using the warping board

This is the traditional method. It is the most versatile warping method, good for long and short warps and has no stripe or color restrictions. Measuring the warp is a separate step in this method, so it takes a

Step 3a. Direct Method: Measuring your warp with the single warping peg

To measure your warp with this method, attach the warp to the warp beam and sley the reed as you measure.

Using the rigid heddle table stand, clamp the loom to a table with the back of the loom at the edge of the table. Clamp the warping peg to a table top as far away from the back of the loom as the desired length of the warp.

Place your ball or cone of yarn on the floor by the back of the loom. Bring the back apron rod up over the warp beam and rear beam toward the heddle, then tie the end of the yarn to the apron rod. Using a heddle hook, pull a loop of yarn through a slot in the reed. Place the loop of yarn over the warping peg (Diagram 5). There are now two warp ends going through a single slot, with one end tied to the apron rod, and the other ending in the ball or cone of yarn.

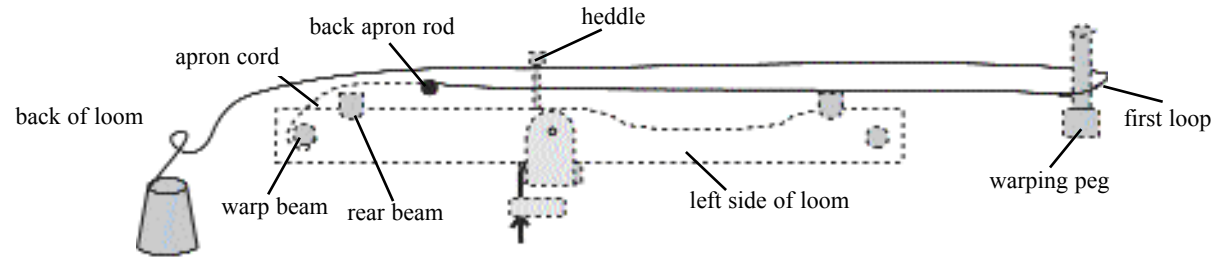


Diagram 5: Placing first loop

From the cone end, pull another loop of yarn under the apron rod (it will encircle the apron rod) and through the next slot in the reed, then place the loop over the peg. (See Diagram 6.) Be sure to go around the apron rod with each pass. You'll notice that you alternately pull the loop above and below the apron rod. Repeat this process for the width of your warp. To finish, bring the yarn to the apron rod and cut it, leaving enough extra length to allow you to tie the cut end onto the apron rod.

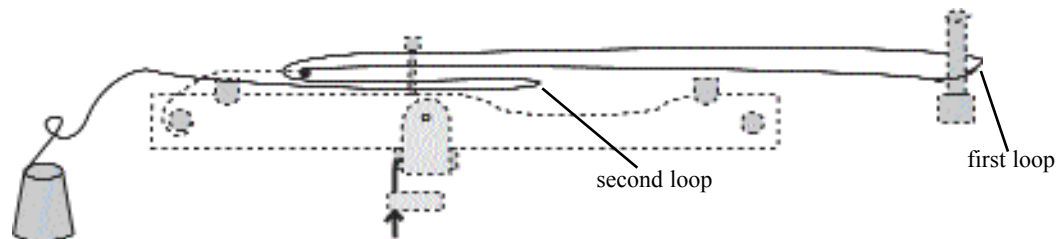


Diagram 6: Placing second loop

When you have finished measuring your warp, tie all the warp threads together near the peg with a scrap of yarn, and cut the end of the loop formed around the peg. Wind the warp onto the warp beam as described in Step 4, then continue with threading the heddle as described in the next paragraph.

The next step is to thread the heddle. Facing the front of the loom, take one warp end out of a slot and, using the heddle hook, place it in the adjacent hole. You will now have one warp end in the slot and one in the hole. Continue working across the reed until all the warp ends are in alternating holes and slots. Tie the warp onto the front beam as described in Step 5.

Step 3b. Indirect Method: Measuring your warp on a warping board

A warping board with pegs (see Diagram 7) is used to measure the warp. To determine which pegs of the warping board to use, cut a piece of string a few inches longer than the length of one warp thread. Following Diagram 7, tie one end of the string to peg **a**. Carry it along the outside of the top pegs to peg **b**. From peg **b** carry the string across the board to peg **c**. Continue back and forth across the board as many times as necessary and end by wrapping around pegs **d** and **e** and ending at **f**. Tie the end of the string to peg **f**. This string serves as a guide for the warp thread to follow.

To measure the warp, tie the end of the warp yarn to peg **a**. Carry the yarn along the path of the guide string until

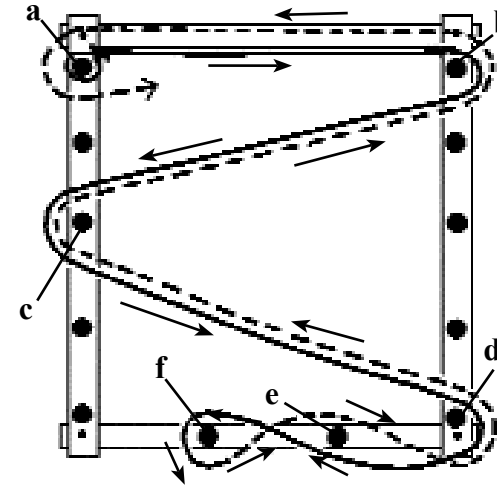


Diagram 7: Winding the warp

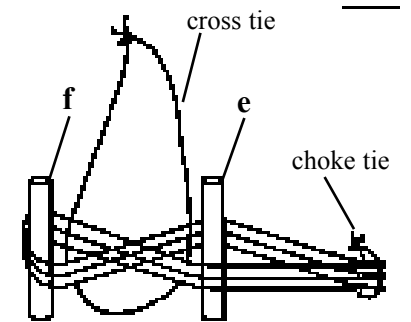


Diagram 8: Tying the cross

you reach the second peg from the end (peg **e**). Carry the yarn under **e** and over **f**. One warp thread has now been measured. To measure the second warp thread, carry the yarn around peg **f**, over **e**, and under **d** to form a figure-8 configuration (this figure-8 is called the "cross" and serves to keep the warp ends in order). From peg **d** follow the guide string back up the warping board to peg **a**. Now, two warp ends have been measured. Continue measuring threads in this manner until you have measured the total number of threads needed. Remember: from peg **a** to peg **f**, then back from peg **f** to peg **a** is two warp threads. Tie the last warp thread measured to peg **a**.

Before removing the warp from the warping board, tie the cross with a contrasting color tie, as illustrated in Diagram 8. Now cut several short pieces of string and bind the warp tightly at approximately 18" intervals. These "choke" ties keep the warp from tangling.

Remove the warp from the warping board and lay -6- it out in front of the loom.

The next step is to thread the heddle. Place the rigid heddle in the notch of the heddle holder. Find the center of the rigid heddle. You may want to make a permanent mark at the center of your rigid heddle since you will need to find it each time you warp your loom. From the center, measure half the weaving width of the warp to one side to determine where the edge of your weaving will be on the rigid heddle. For our example of a 16"-wide warp, this will be 8" from the center point.

Locate the end of your warp bundle that has the cross. Cut the warp loops at the cross end of the warp and hold the cross on your hand, as shown in Diagram 9. Look at the cross in your hand. Notice that the threads stack up Lincoln-Log style. Take the top end and place it through the slot at the outermost edge of your weaving width. A threading hook is a helpful tool. Now take the second end and thread it through the hole in the rigid heddle next to this first slot. Place the third end through the next slot and the fourth end through the next hole, and so on. Continue across the entire warp width until all the ends have been threaded (Diagram 10). Tie overhand knots in warp-end groups of about 1". Then tie each group around the back apron rod and secure this knot by tightening it up to the first knot (see Diagram 11).



Diagram 9:
Holding the cross

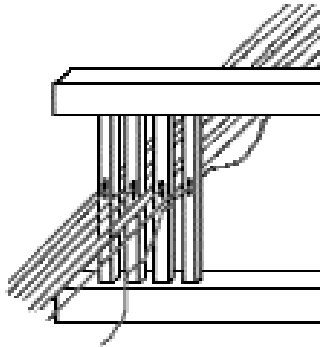


Diagram 10:
Threading the rigid heddle

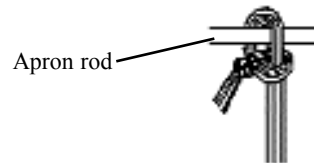


Diagram 11:
Attaching warp to the back apron rod

Step 4. Winding the warp onto the warp beam

If you measured your warp on a warping board, remove the first small tie binding the warp; holding the warp at the next tie, shake the warp until it is loose and even. Loosely wrap the warp bundle once or twice around the front beam to put a little tension on your warp during beaming (Diagram 12). Now begin cranking the warp onto the warp beam by turning the beam *clockwise*. When the warp has been rolled around the beam once, insert heavy paper between the layers to keep them separated. The paper should be at least two inches wider than the width of the warp so that no threads slip off the edge of the paper as the warp is rolled on.

Continue rolling the warp and the paper onto the beam. Every so often stop cranking and pull hard on the warp bundle to tighten the paper and warp on the warp beam. Cut each binding tie as needed, and shake or comb the warp to relieve it of any tangles. Stop winding when the front-end loops of the warp are about 10" from the rigid heddle.

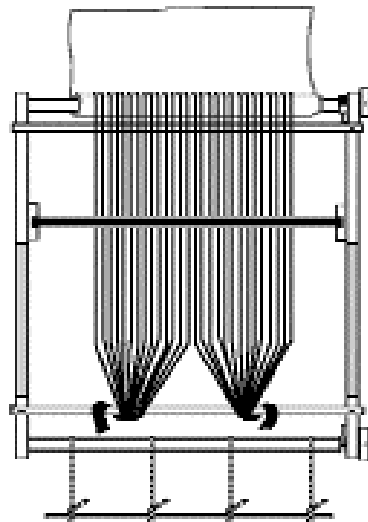


Diagram 12:
Winding the warp onto the warp beam

WARPING YOUR RIGID HEDDLE LOOM

Step 1. Calculating warp yarn

You'll need to decide what you are going to weave, because the amount of yarn required depends on the planned size of the piece. Will it be a runner, a placemat, a scarf? Follow this formula to calculate the amount of warp you

Quick Guide to Warp Calculations

Let's say you're going to weave a table runner that is 16" wide and 40" long.

A. Calculate the length of your warp: The length of the finished piece is 40", but you will also need additional warp length for tying onto the loom and other loom waste. The average loom waste is approximately 24". You should also add to this figure another 10% (= 4") for take-up, which is the amount of warp length "lost" during weaving. It is a good idea to add another 10% (= 4") for possible shrinkage when washing the fabric after weaving. Add these four numbers to get the total length required for the warp:

B. Calculate the total number of warp ends: To determine how many ends per inch (e.p.i.), you will need to

40" (length of piece)
24" (loom waste)
4" (take-up)
4" (shrinkage)
<hr style="width: 100%; border: 0.5px solid black;"/>
72" or 2 yards (total length)

count both the holes and the slots in one inch of the rigid heddle. For this example, let's say you have a 10-dent reed, so you'll set your warp at 10 e.p.i. Now multiply the width of your planned weaving times the e.p.i. to get the total number of warp ends.

In our example: 10 e.p.i. x 16" weaving width = 160 total ends of warp yarn.

C. Calculate the total amount of warp (in yards) needed:

Finally, to figure how many yards of warp you will need, multiply the 160 total ends by 2 (the length of each warp end in yards). In our example, you will need a total of 320 yards for warp.

Here's the simple formula (from steps B and C above):

Total warp ends x length of warp (in yards) = total yards of warp

Step 2. Calculating weft yarn

The amount of weft yarn you will need is determined by how firmly you pack your weft. For a balanced weave (the same number of warps per inch as wefts per inch), buy the same amount of weft as warp. For a weft-faced weave (where weft packs tightly and covers the warp), buy up to five times more weft than warp.

Step 3. Measuring your warp

There are two ways to measure your warp, directly with a single warping peg or indirectly on a warping board. Both methods are presented here. To measure (and warp) your loom with the single warping peg, see Step 3a. If you are using a warping board, see Step 3b.