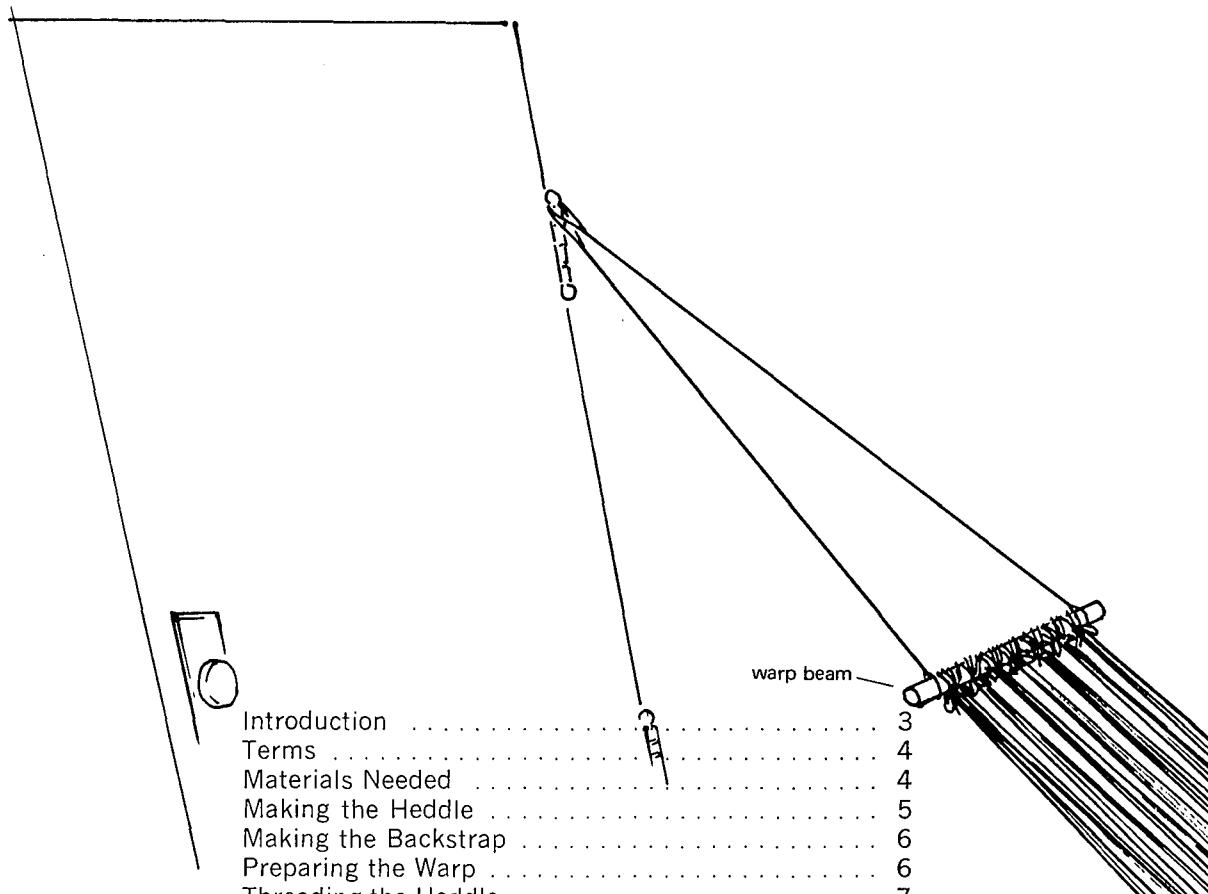


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Backstrap Weaving

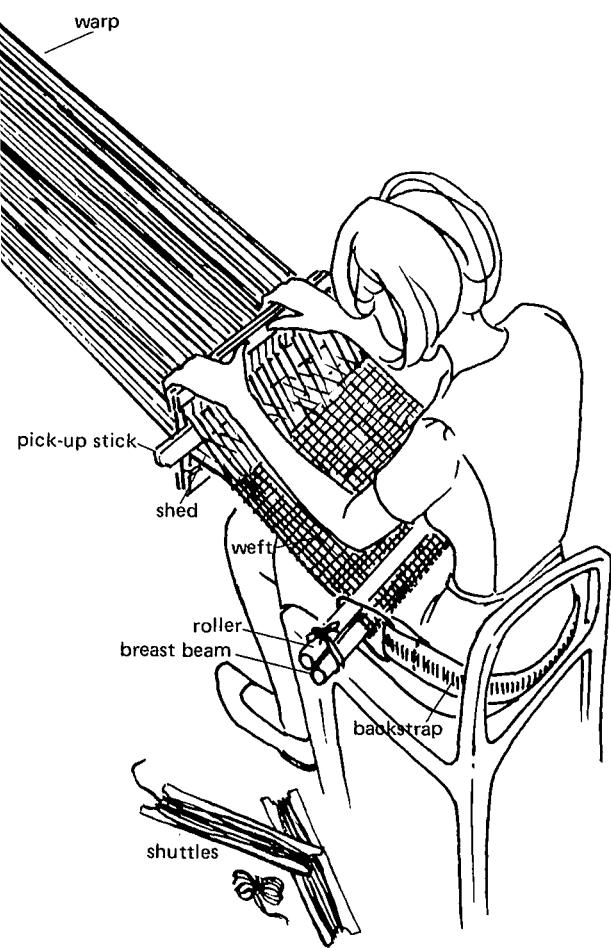
Extension Bulletin 362—Revised 1980

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This bulletin was written by Huldah Curl, state arts extension coordinator and director, Continuing Education in Art, Agricultural Extension Service and General Extension Division, University of Minnesota, with the assistance of Lila Nelson and Laurel Hansen Stanell. Mrs. Nelson is manager of the crafts shop at the Norwegian/American Museum, Decorah, Iowa, and past president of the Minnesota Weavers' Guild. Mrs. Stanell, who did her master's thesis on backstrap weaving, formerly taught art in the St. Louis Park, Minnesota, public school system and now lives in New Jersey. Both Mrs. Nelson and Mrs. Stanell have taught extension courses for the University of Minnesota.



The backstrap loom offers a number of advantages over more elaborate floor looms:

It is inexpensive. Materials to make the loom cost less than \$10.00.

It is simple to make. Starting from scratch, you can get the materials and construct and thread the loom in about a day and a half.

It is easy to handle. When not in use you can roll it up and store it on a shelf. The loom can be carried from place to place and set up for weaving anywhere, indoors or outdoors.

The backstrap loom demonstrates the basic principles of weaving used with any kind of loom. You can make a variety of useful and decorative fabrics with it: scarves, place mats, wall hangings, runners, pillow covers, ties, footstool covers, belts, etc. All can be as creative and skillfully done as fabrics woven on expensive floor looms.

Our directions will show you how to build a 20-inch rigid heddle. We have chosen this size because it is wide enough for fairly ambitious projects while still permitting fairly quick construction and threading. You can weave narrower fabrics with a 20-inch heddle by threading it only to the width you desire using the middle of the heddle. Or you can adapt these directions to make a heddle as narrow as 5-10 inches, or as wide as 28-30 inches; much over 30 inches becomes cumbersome to work with. As you become proficient in weaving you will probably want to make several heddles of different widths.

The quantity of yarn specified in the directions is enough for a piece of plain weaving about a yard long and 20 inches wide, the full width of the heddle.

Plan to spend most of a morning or afternoon buying the materials. You can make the heddle in a couple of hours, but warping (threading) the loom will take more time. If you can't warp the loom at one sitting, arrange a place where it can be left undisturbed and warped over a period of time. Once the loom is warped, you are ready to go.

A persistent and uninterrupted weaver can produce about a foot of plain, 20-inch wide weaving in an hour. Your weaving speed will depend on your own temperament, the complexity of your design, how closely or openly you weave, and the thickness of your yarn. You will learn by experience how quickly or slowly you can weave.

TERMS

The Warp is the series of vertical threads in a fabric across and through which the horizontal threads are woven. The warp must be evenly spaced and kept at even tension while the cross threads are being woven through it. To keep even spacing and tension, the warp is tied at each end to two dowels and stretched lightly but firmly between them. These dowels are called the breast beam and the warp beam.

The Breast Beam is the dowel closest to you and against which you do the actual weaving.

The Warp Beam is the dowel farthest from you and towards which your weaving progresses.

The Weft or Filler Yarn is the series of horizontal cross threads in a woven fabric that go across and through the warp to make cloth.

The Header is made of strips of rag and sticks woven into the warp before you begin actual weaving. It helps space the warp evenly.

Shuttles are notched pieces of wood, cardboard, or plastic. The weft or filler is wound onto the shuttles to make it easier to handle. Or you may want to use butterflies if you are working with small amounts of filler yarn. Butterflies are made by winding the yarn in a figure-8 around a couple of your fingers.

The Heddle is used to part the warp threads. When you raise or lower the heddle, alternating warp threads are raised or lowered. This permits passing the filler (on the shuttle or butterfly) through at one stroke, rather than painstakingly passing it over one warp thread, under the next, over the third, etc., as you do in darning a sock.

The Rigid Heddle used with the backstrap loom is a framework with alternating holes and slots through which the warp threads are strung.

When you raise or lower the heddle, alternating warp threads are raised or lowered. This makes a space above or below the other warp threads so you can pass the shuttles or butterflies through alternate threads of the warp. The triangular space created by raising or lowering the heddle is called *The Shed*. It is sometimes further specified as a raised shed or a lowered shed.

The Pick-Up Stick is about $2\frac{1}{2}$ or 3 inches wide with one rounded end. The stick is inserted in front of the heddle after a shed has been formed to keep the shed open while you pass the filler yarn through. (The use of a pick-up stick is optional, but most weavers find it very handy.)

The Batten or Beater is a long stick with one thin edge. It is used to press the weft firmly into place after each shuttle or butterfly has been passed through the shed. (The use of a batten is optional; most weavers simply use the heddle to press the weft into place.)

The Backstrap is a piece of firm cloth several inches wide and about 30 inches long (upholstery webbing, which comes just under 4 inches wide, is ideal) that is worn around the hips and attached to the breast beam with cord loops. When the loom is fully assembled and the warp beam is suspended from a hook, the weaver can control tension in the warp by leaning backward or forward in the backstrap.

The Roller is a dowel tied to the breast beam on which finished weaving is rolled up as you progress.

MATERIALS NEEDED

From a lumberyard

Check everything you get to make sure it is straight and fairly smooth.

For the breast and warp beams and for a roller: Three 26-inch x $\frac{3}{4}$ -inch wood dowels.

For framing the heddle: Four $\frac{1}{4}$ -inch x $\frac{3}{4}$ -inch x 20-inch strips of screen molding or any wood molding.

For a pick-up stick: A strip of wood about $\frac{3}{8}$ -inch x $2\frac{1}{2}$ inches x about 28-30 inches, rounded at one end.

For a batten (optional): A strip of wood about $\frac{1}{4}$ -inch x 2 inches x about 28-30 inches, with one long edge planed to $\frac{1}{8}$ -inch thickness.

From a restaurant or restaurant supply house

For making the heddle: About 75 coffee stirrers: wooden sticks about $1/16$ -inch x $\frac{1}{4}$ -inch x $5\frac{1}{2}$ inches, rounded at both ends. They come in boxes of 1,000. They need careful checking—don't use crooked, warped, or jagged sticks with knots.

You will need about 60-65 for the heddle described in this publication; however, be sure to keep about 75 to allow for breaking or losing some. Some hobby shops also stock coffee stirrers. Be sure you don't get tongue depressors or craft sticks, which are a good deal wider.

From a hardware store

For making the heddle: A small jar or bottle of white glue. Two or three sheets of fine grade sandpaper. An electric drill. You don't need to buy a drill; either borrow one or ask a hardware dealer or neighbor to drill the holes for you. The bit should be $3/32$ -inch. Any smaller hole is difficult to thread and any larger hole may split the stirrers.

A small roll of 1-inch masking tape. Several rounds of tape wound around the outside ends of the breast and warp beams will keep the warp from slipping off the beams.

About 3 yards of fairly strong cord for stringing up the outside ends of the loom and for making loops in the backstrap.

From a department store, yarn store, or dime store

For shuttles: Several 12-15 inch wooden or plastic knitting bobbins. You can improvise shuttles instead of buying bobbins.

For the backstrap: A yard of 4-inch-wide upholstery webbing.

For warp: 150 yards of carpet warp. Carpet warp is ideal for a beginner because it is smooth and fairly soft. Slubbed warp might catch in the heddle and interfere with its free action, and soft warp permits either close or loose weaving.

For threading the heddle: A number 8 or number 9 crochet hook (American sizing) or any small crochet hook.

For weft: About 150 yards of yarn, the approximate amount of weft you'll need to complete a project of plain weaving a yard long with this heddle. Don't splurge on weft at the outset: your ideas may change as you progress with your first project. Use old yarns you may have on hand. Although your warp should be all the same kind for a beginning project, you can use a variety of yarns for weft: thick, thin, slubbed, smooth, cotton, wool, synthetic, etc.

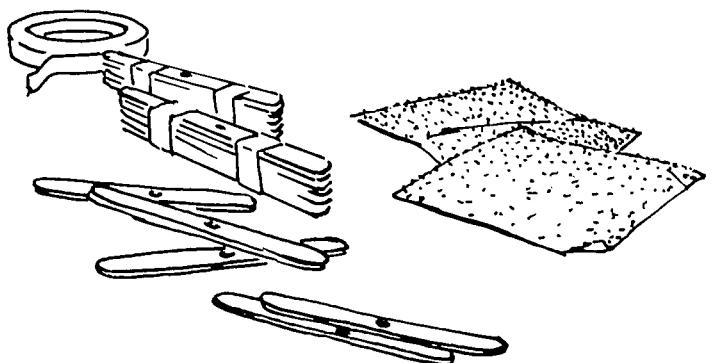
From home

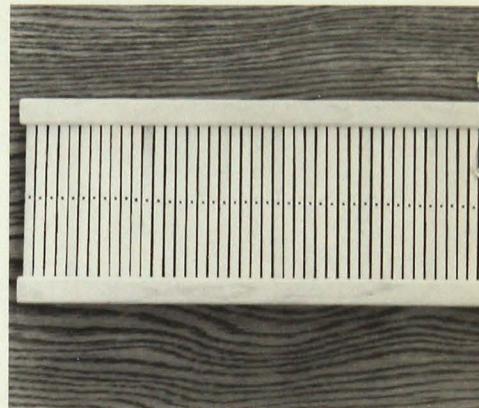
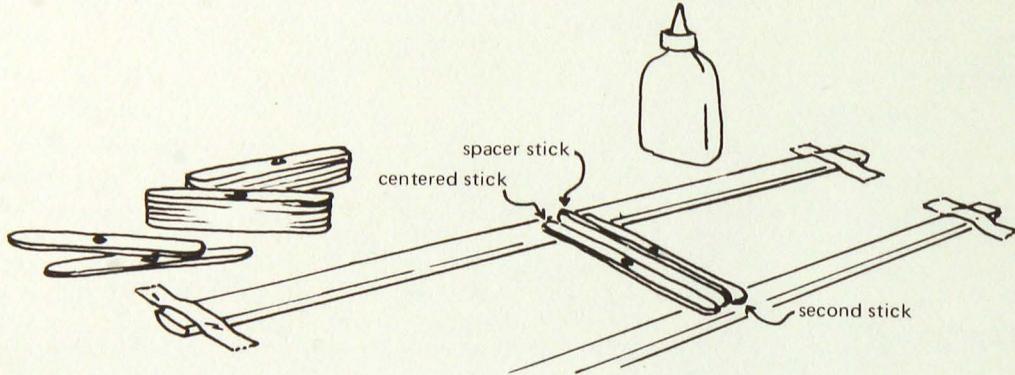
As a header: Five 1-inch x 25-inch strips of old rags and any straight stick or small dowel 21-22 inches long (a yardstick cut down is ideal).

As a batten: You can use a table fork if you want your weaving to be tight and warp completely hidden by the weft.

MAKING THE HEDDLE

After selecting about 75 straight, smooth coffee stirrers, pile them in bundles of five or six and tape the ends so they can't shift. Mark the middle of the top stirrer in each bundle and drill a $3/32$ -inch hole with an electric drill. Untape the bundles and sand the edges and holes as necessary. Tape two strips of molding to a flat surface 5 inches apart and with their ends even. If you





are using rounded screen molding, be sure the flat side is up. Mark the exact middle of each strip of molding. Glue the first coffee stirrer at this point to fasten the two strips together. About $\frac{1}{4}$ -inch of the stirrers will be glued to each strip of molding. Using the thickness of a coffee stirrer as a spacer, glue a second one, lining up the holes evenly. (It doesn't matter if the ends aren't even; they won't show when the heddle is completed.) Continue to glue stirrers on either side of the first one until the molding strips are filled. After the first few you may be able to judge the space by eye. It's a good idea to glue the first half dozen and let them dry for 10-15 minutes; once they are dry the heddle will be fairly rigid. As you proceed, make sure you aren't gradually running all the holes uphill or downhill and be sure to keep the molding strips the same distance apart.

When you have the molding strips filled, glue the two other strips, rounded sides out, over the tops and bottoms of the stirrers. Let the heddle dry for an hour, or even overnight, before you start threading it.

MAKING THE BACKSTRAP

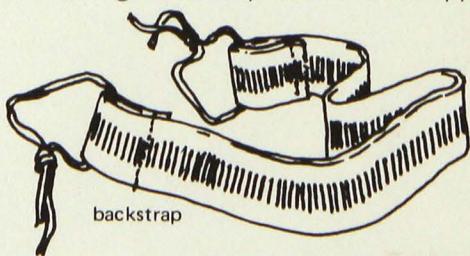
The backstrap should fit around your lower back with the ends coming up just about even with the front of your hip bones. Measure the upholstery webbing and make 2- or 3-inch hems in the ends. Make cord loops through the hems that will add about 3 inches on each side when tied. Don't tie them permanently; you may need to adjust them.

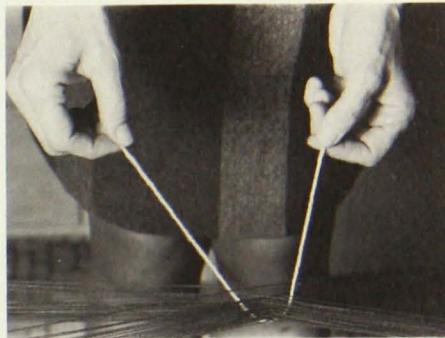
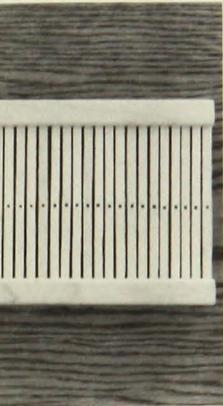
PREPARING THE WARP

One easy way to measure warp is to wind it around the upper backs of a couple of straight backed chairs. Set the chairs about 5 feet apart and weight them with books or something heavy so they won't shift while you wind the warp.

When you measure warp, allow about 2 feet of extra length to provide for tying-on, for a header, for shrinkage as the weft is woven through, and for the gradual disappearance of the shed as you finish weaving. With the chairs set 5 feet apart, the warp when cut will be at least 60 inches long, enough for a yard of weaving plus 2 feet extra. Make as many complete turns around the chair backs as you have coffee stirrers in your heddle.

Since you are using carpet warp, which doesn't tangle easily, and since you are not using a great quantity of warp with this loom, you can, if you wish, follow the directions in the rest of this paragraph and proceed directly to "Threading the Heddle." Simply wind the warp around the chair backs as many times as you need, bring the last thread up to the outside edge of a chair back, cut it, and tape it down to the other threads with masking tape. You need not wind the warp in a figure-8; just wind it around the outside of the chair backs. Then cut through all the threads where you taped down the end. Lay the warp out on a table, even up the cut ends, and cut through the warp at the exact opposite end.

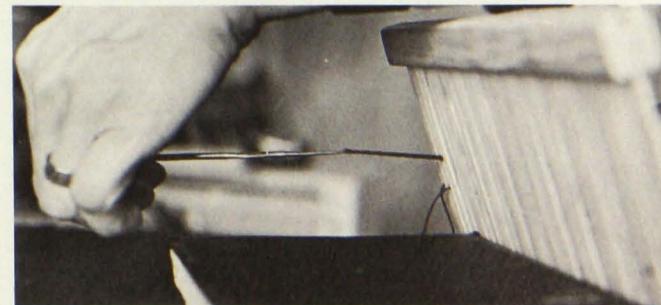


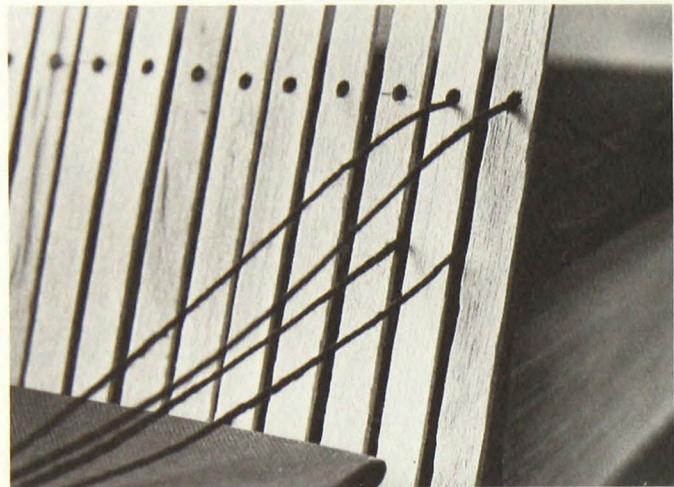


However, if you have any plans for progressing to weaving on a more elaborate floor loom, you should learn how to make a cross and a *chain*. These techniques also are essential if you use fine warp that tangles easily, whether for a backstrap or a floor loom. To make a cross, wind the warp in a figure-8 around the chair backs with the threads crossing between the chairs, as shown above. When you have finished winding the warp, tie a short length of yarn in a contrasting color loosely through the cross; bring it up from the bottom through the two loops of the figure-8 and tie it on top. Then cut the warp as explained above. To make a chain, push the cross up to within about 2 feet of one end of the warp and make a series of slip knots in the longer end of the warp. Or tie it with contrasting yarn at 1-foot intervals.

THREADING THE HEDDLE

Next, thread the warp through the heddle. If the full width of the heddle is not being used, the warp should be centered and approximately equal numbers of slots and holes left unthreaded on each edge of the heddle. Stand the heddle upright on a table between a couple of books. Lay the warp on the table and thread it through the heddle, alternately through a hole in a coffee stirrer and through a space between coffee stirrers, beginning at one edge of the heddle and working toward the others. You can either poke the warp through the heddle or make a loop in the end of each warp thread and hook it through with the crochet hook. If you have made a cross and chain, leave them in the warp while you thread the heddle with the short end of the warp. Lay the warp on the table with the yarn cross lying flat with the knot to one side. You will see immediately how





the cross keeps the threads in order, the first thread coming from above, the next under the cross. Proceed to thread the heddle, again working from one edge to the other, pulling each warp thread out of the cross as you proceed.

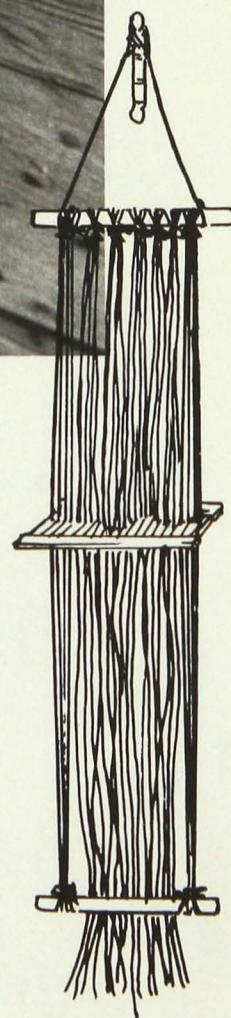
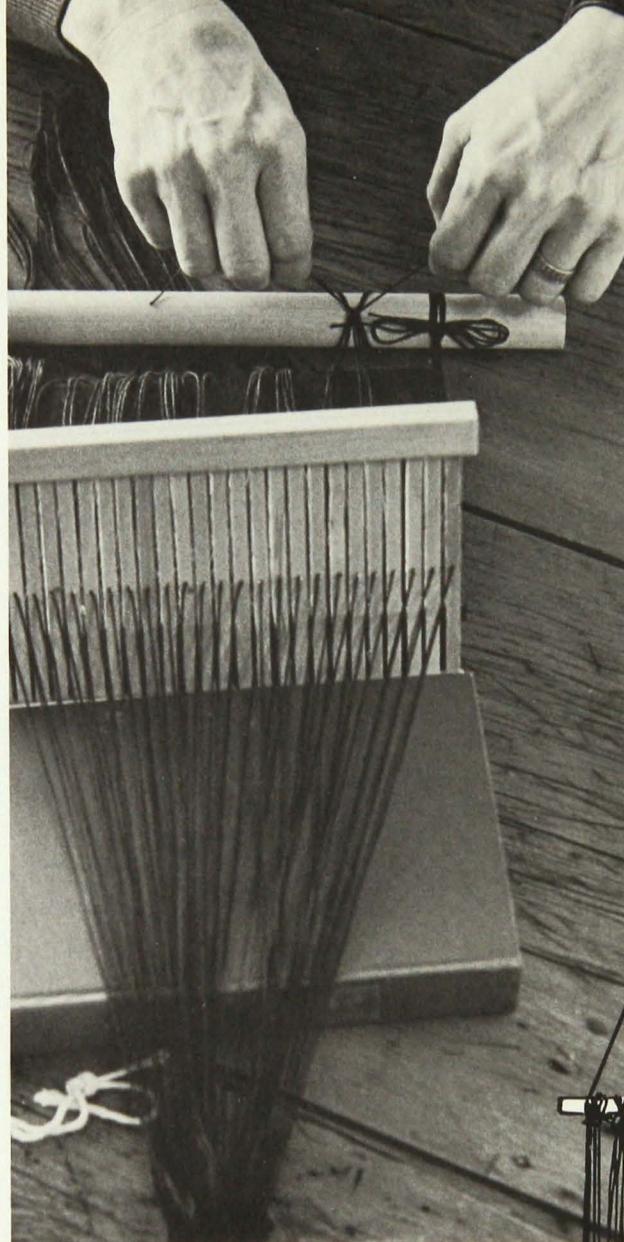
TYING ONTO THE BEAMS AND ASSEMBLING THE LOOM

Leave the warp and the heddle in place on the table while you tie the warp onto the warp beam.

Take two of the $\frac{3}{4}$ -inch dowels and wrap several rounds of masking tape a couple of inches in from each end. You want 20 inches of free space for tying on between the tape on each dowel.

Lay one of the dowels on the warp ends that have been threaded through the heddle. Begin tying onto the dowel (the warp beam) just inside the masking tape. Take the threads in order as they come from the heddle and continue until all the threads are tied on. An easy way is to tie four threads on at a time. Bring four up from under the beam, split them and take the halves under and behind the four threads, bring the halves around front, and tie them in a tight bow knot, as you would shoelaces. When you get to the end of tying on, you may not have an even set of four threads, so just tie the one or two or three left over as best you can. When you are finished, spread the warp as evenly as you can on the warp beam.

If you have made a chain, remove it from the rest of the warp and, taking them in order from the heddle, tie four outside warp threads onto each end of the breast beam. Don't tie them too tightly; you will need to untie and re-tie almost immediately when you check the warp for even tension. Once these first eight threads are tied on, you have no further danger of losing the heddle out of the warp.



Tie two cords, each about 3-4 feet long, to the outside ends of the warp beam. Then make firm loops in the free end of each cord. Slip these loops over a hook, a door hinge, a window lock, or a similar fixture and let the loom dangle. Make sure the hook or hinge is firm; there will be a good deal of tension on it once you start weaving.

Some weavers prefer to tie one length of cord to both ends of the warp beam and then just hang the loom by this cord over a hook or fixture. However, the one length of cord can slip on the hook and cause problems in maintaining even warp tension; our method may seem a little picky, but it will save you grief later on.

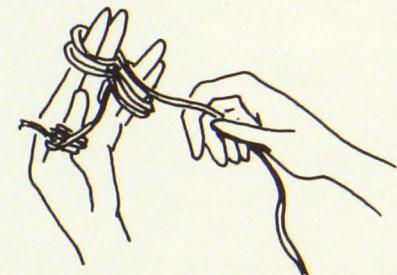
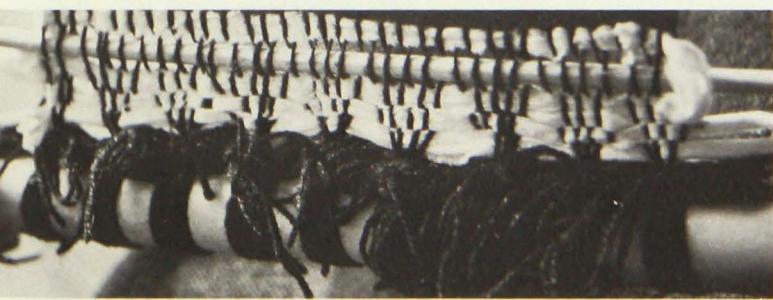
Make sure the loom is hanging straight and that the breast and warp beams are parallel. Re-tie the first eight threads on the breast beam if necessary.

Pull up a chair, put the backstrap around your hips, and loop the cords in the hems of the backstrap around the ends of the breast beam. For comfortable weaving the breast hem should be about 2-3 inches from your body. Re-tie the cords in the backstrap if necessary to get the breast beam the right distance from you.

Continue to tie the warp onto the breast beam, keeping the threads in order as they come from the heddle and controlling even tension by leaning forward or backward. Spread the warp out evenly as you tie on.

When all the warp is tied onto the breast beam, check again to make sure that the two beams are parallel and that none of the warp threads are too tight or too slack. You may have to do some retying to adjust tension. Even tension is essential for successful weaving and it will pay off in the long run, or even short run, to get it correct now.

Making a header is a quick way to get the warp even on the breast beam. Use the strips of rag and the cut-down yardstick or dowel. Raise the heddle and insert the pick up stick and then insert one of the rags all the way across the warp into the shed about 10 inches from the breast beam. Lower the shed and insert the pick up stick, then insert the second rag; raise the shed and insert the third. Beat all three together down to the breast beam with the heddle (or the batten if you are using one). Lower the heddle and insert the stick and beat it down next to the rags. This will keep the selavage edges from curling. Changing the shed as necessary, insert one or two more rags, beating them down together. Your warp should now be spread out evenly and you are ready to weave.



9

WEAVING

Decide on the weft you want to use first and wind it on a shuttle or make a butterfly by winding it in a figure-8 on your fingers, as shown above. Leave about 25 inches free.

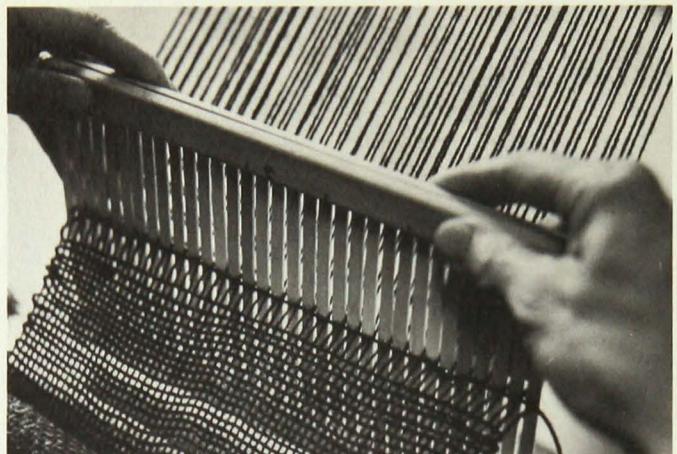
Raise the heddle. If you're using a pick-up stick, insert it in front of the heddle to keep the shed open. Insert the shuttle (or butterfly) diagonally across the warp, leaving a loose end of about an inch at the beginning. Insert the weft diagonally so that it rests firmly against the edge warp thread but does not push it inward. "Bub-



ble" the weft thread by pulling it down with your finger into little semi-circles (eight or ten should do) to distribute the ease evenly. Remove the pick-up stick and beat the first thread into place with the heddle. Lower the heddle, changing the shed, insert the pick-up stick, and return the shuttle back across the weft, inserting it diagonally, and "bubble" the weft. Remove the pick-up stick and beat the second weft thread into place with the heddle. That's all there is to plain weaving.

Don't worry about loose weft ends. With the first thread, or any future changes of thread, just leave about an inch free at the side. You can weave these loose ends with a needle or you can weave them in as you progress by folding each loose end over the outside warp thread and beating it into the end of the preceding row. Never tie weft ends: weaving them in keeps them tight without a bumpy knot.

Remember, insert the weft diagonally so you won't pull in the selvages. Also, if the weft becomes uneven (higher in some places than others) the higher section probably has looser warp tension. Even the tension by carefully untying the problem warps at the breast beam and retying more tightly. If a small section is lower than



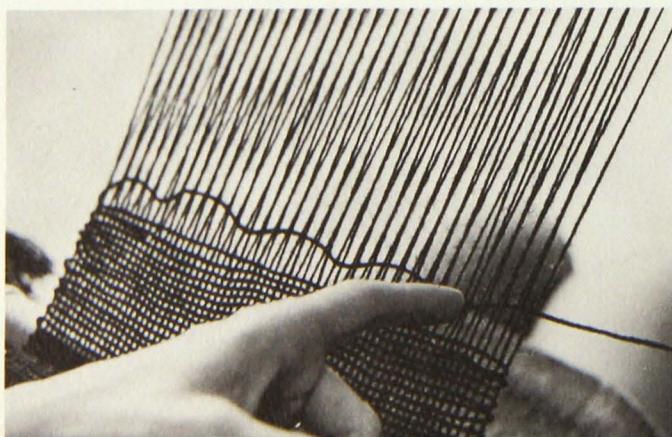
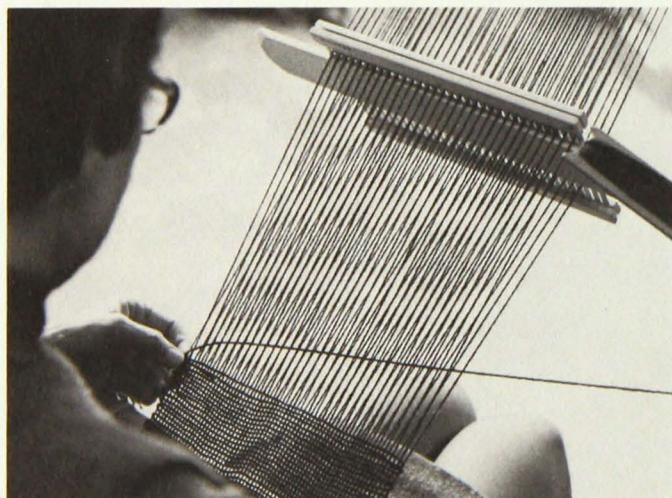
the rest, the warp probably is too tight and should be retied. (The time may come when you will want to distort the weft deliberately for decorative effects, but at first you should probably practice making it even.)

As your weaving progresses you may wish to roll up the finished part so you won't have to stretch so far as you weave. Just remove the backstrap and roll the finished weaving on the breast beam. When it is rolled up, place the 1-inch x 1-inch third dowel (the roller) against the breast beam as a stay and tie it in place very tightly with string.

To finish off a piece of weaving, cut or untie the warp threads from both beams and tie the warp in pairs over the weft threads at each end of the weaving. With the weft tied securely, you can continue to finish the warp ends, either by cutting them into a fringe or by continuing to knot them in pairs, or fours, or any reasonable number. If you are making a wall hanging, you may wish to incorporate something such as a dowel rod for hanging and for weight.

There are many traditional weaving techniques you can learn about: rya knots, tapestry weaves, lace techniques, etc. They are not complicated once you have mastered plain weaving. You should try different techniques and materials, also. You may be inspired by natural objects, by colors, by architectural structures, or household objects. Good design is based solidly on common sense. Design elements such as open spaces, stitchery techniques, natural grasses, pods, etc. can be highly effective in a wall hanging, but they are not very practical when incorporated into a pillow cover or table runner.

Several books are listed below. We urge you to buy *Step-by-Step Weaving*. It is clear, thorough, and well illustrated. You may also wish to buy some of the others or check with your local library. Your County Extension Office may have additional sources and information about classes and workshops through the Department of Continuing Education in Art, Agricultural Extension Service and Continuing Education and Extension, University of Minnesota.





BOOKLIST

Barbara Taber. *Backstrap Weaving*. New York: Watson-Guptill Publications, 1973. \$12.50.

Books for the Weaver and Books for the Needleworker, 1969-70, catalog; Craft and Hobby Book Service, P.O. Box 626, Pacific Grove, California 92950; free on request.

Jane Redman. *Frame-Loom Weaving*. New York: Van Nostrand Reinhold Company, 1976. \$13.50.

Karen Swanson. *Rigid Heddle Weaving*. Watson-Guptill Publications, 1975. New York. \$17.50.

Mary Atwater. *Shuttle Craft Book of American Hand-weaving*. New York: Crowell, Collier and McMillan, 1951. \$7.95.

Nell Znamierowski. *Step-by-Step Weaving*. New York: Golden Press, 1967. \$1.95.

Clara Creager. *Weaving—a creative approach for beginners*. New York: Doubleday & Co., Inc., 1974. \$3.95.

Weaving Techniques and Projects by the editors of Sunset Books; Menlo Park, California: Lane Magazine & Book Co. 1975. \$1.95.

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