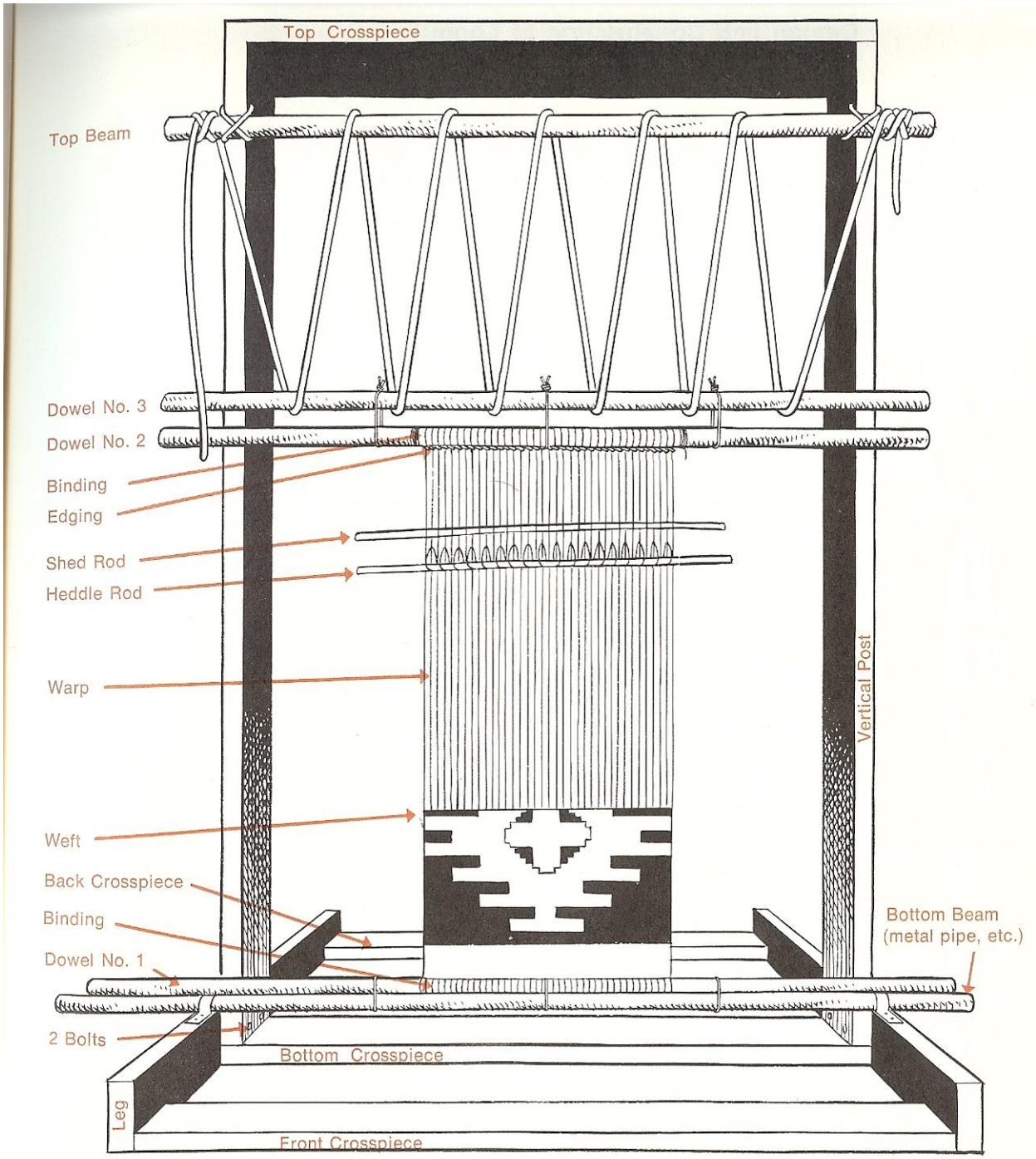
Top Crosspiece
Top Beam
Dowel No. 3
Dowel No. 2
Binding
Edging
Shed Rod
Heddle Rod
Warp
Vertical Post
Weft
Back Crosspiece
Binding
Dowel No. 1
Bottom Beam
(metal pipe, etc.)
2 Bolts
Bottom Crosspiece
Leg
Front Crosspiece

List of Supplies Needed for Construction of Loom

4 pcs. TWO-BY-FOURs 34″ long (straight) for the crosspieces

2 pcs. TWO-BY-FOURs 42″ long (straight) for the verticals

2 pcs. TWO-BY-FOURs 30″ long (straight) for the legs

5 1″ DOWELS 36″ long (straight) for the beams
Three of these dowels are not part of the constructed loom but are needed once warping begins. For the basic two dowels which will be used as upper and lower beams (see illustration), ¾″ metal pipe could be substituted.

4 FLAT CORNER IRONS 3½″ x ⅝″

16 FLAT HEAD WOOD SCREWS for above ¾″ #6

4 MACHINE BOLTS 5/16″ x 3½ to attach upright frame to base

8 WASHERS for above

¼ lb. BOX NAILS #10

2 ¼″ DOWELS 22″ long to be used as shed rods
These are not part of the constructed loom, but are required for the warped loom. Willow sticks are traditional and preferable, if available.

1 pr. LEATHER BOOT LACES 54″ long to bind top beam to uprights
The leather look is usually the most aesthetically pleasing. However, rope, wire or 2 pipe straps may be used with equal success.

1 sheet ROUGH SANDPAPER

2 ¾″ TWO-HOLE PIPE STRAPS to attach lower beam to legs, and necessary screws

Tools Needed

Hammer	Adjustable wrench	5/16″ bit, optional
Screwdriver	Pliers	

Design and Construction of Loom

This loom has been designed for the following features:

1. The weaver needs free and wide access to the loom. To achieve this the legs are placed at outer edges of loom and forward bracing of vertical posts is not used. Such bracing would interfere with insertion of batten.

2. The loom needs to be solidly built so no extraneous side motion occurs. Bracing to this effect is achieved by application of flat corner irons screwed to rear of loom frame.

3. The loom must be built of heavy construction to provide weight which counters the pull on shed rods. A front cross beam is provided upon which the weaver may lean with no discomfort, while her weight adds to loom stability. The connecting back crosspiece provides similar ballast while creating a place for additional weight if needed. (Weavers may place rocks, bricks, cinderblocks, etc., here.)

4. The weaving needs to be held in front of the loom proper so batten insertion will not be continually hindered by the vertical posts. The top and bottom beams are therefore designated to be longer than the loom width and thereby hold warp in desired forward position.

CONSTRUCTION PROCEDURE

1. Nail two 2″ x 4″ x 42″ pieces to two 2″ x 4″ x 34″ pieces to make a frame with dimensions 34″ x 46″.

2. Screw flat corner irons to rear of four corners.

3. Nail legs to front and back crosspieces.

4. Bolt upright frame to base: a. Drill two 5/16″ holes through bottom of frame and base on each side of loom. b. Insert a bolt with washer through each hole after drilling. c. When all four bolts are in place, add washer and nut to each. Tighten each with wrench and pliers.

5. Attach upper beam to top of vertical posts by chosen method: a. *With leather:* Drill hole in vertical posts and pass leather through hole before encircling top beam. b. *With pipe straps:* Attach top beam with two pipe straps screwed into position.

6. Attach lower beam to top of legs by screwing pipe straps into position.

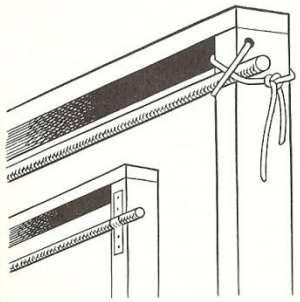

Figure 1: *Alternate methods of attaching upper beam to vertical post.*

Additional Loom Supplies

These items are not part of the loom proper, but are included in the loom supply list, as well as in the warping supply list. They are discussed here in detail in case you are scavenging your loom and need time to locate materials.

3 1″ DOWELS or BROOMSTICKS 36″ long (straight) to mount warp on loom (See Dowels Nos. 1, 2, and 3 on drawing of loom.)

Since the reservation doesn't support instant lumberyards, reservation weavers have learned to keep old handles from brooms, rakes, shovels, hoes, etc. These are invaluable and every weaving household has a supply. Especially favored are the broomsticks, but you can substitute regular 1″ doweling for this purpose. The broomsticks or dowels need to be as long as the loom is wide so they can hold the weaving in front of the loom proper.

2 ¼″ DOWELS or WILLOW STICKS 22″ long for the shed rods

You will need two sticks of smaller diameter to help you manipulate the warps during weaving. These are called the shed rods and traditionally are made of willow or hardwood. Willow is a strong and supple wood. A straight branch is cut, tied to a broom handle so it will dry straight, and then kept in reserve until needed. These branches are about ¼″ thick and at least 12″ longer than weaving width. A ¼″ dowel, obtainable from the lumberyard, is also workable, as is a curtain rod, or other suitable metal rod.

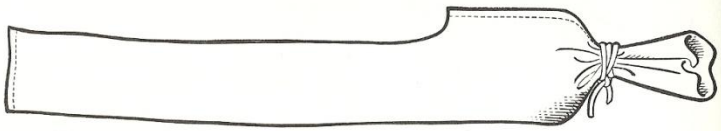

Figure 2: *Common "pant leg" tool case.*

TOOLS

A good tool is highly valued by Navajo weavers and receives special care. Some are extremely specialized. A weaver usually has favorite ones, whose weight and balance are a part of her. Replacements for these are hard to come by.

Sometimes men make tools and sell them to the trading post as a source of income. However, weavers who take pride in their weaving and derive pleasure from the weaving process, do not buy these trading post tools. They prefer to make their own, or have a member of their family make them under close supervision.

A few tools are inherited from mothers and grandmothers. These old wooden implements, shiny and smooth from long usage and loving care, are treasured accordingly.

Some weavers give expression to the power they feel in a tool. To lend a tool to someone is to give of your power. Thus, it is not frequent that a tool is lent or given unless, of course, it is to a close and trusted friend, and then it is not just the loan of a tool, but a gift of energy and ideas as well.

The Case

As you are gathering the equipment and tools for your loom, you will undoubtedly be looking for an orderly manner in which to keep them.

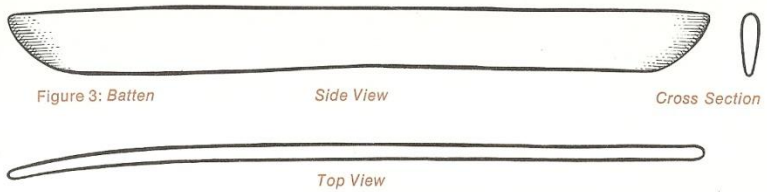

Figure 3: *Batten*

One common way among the Navajo weavers is to stitch a canvas case. Some weavers rip up an old pair of their husband's jeans, using one leg as a ready-made case. All that is required here is to stitch the bottom together and secure the top with a piece of leather or rope.

The Batten

The batten is one of the most cherished and basic weaving tools. It is used to separate warp sets so a weft may be passed. It is, of necessity, made of hardwood, for it has much interaction with the tight warp threads and will groove beyond usage if a softwood has been used. In addition, it must be capable of polishing to a highly refined finish, so as not to catch the warp threads.

Any hardwood may be used: oak, walnut, mahogany, reservation "cedar," etc. Oak is one of the favorites. It lasts a long time and takes on a beautiful patina from repeated contact with body oils and from constant rubbing of warp threads.

The purpose of this flat tool is to separate the warp strands sufficiently to allow passage of a weft through, hence the width of the batten. In addition, each is designed with a slight curve toward the front end, which aids in its insertion between warp threads.

For your first rather small project, we suggest two battens: one of medium width (1″) and one smaller (½″). The medium one will be used for the first half of the weaving, and the narrower one will be

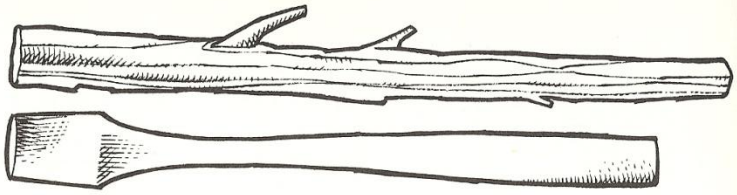

Figure 4: *Batten wood sources — hardwood branch and axe handle.*

substituted as the remaining weaving space gets smaller. When a few inches from completion, a refined ¼″ dowel may be used, or an umbrella rib. These will be discussed later.

Because the batten is such a basic tool, we take time here to describe its ideal attributes and the way in which it can be fashioned. However, weavers who do not wish to put time in on this tool can consult the chapter on *Supply Sources.*

FOR THOSE WHO WANT TO MAKE THEIR BATTENS

On your wanderings through a forested area, keep a lookout for a branch of hardwood, which is about 1½″ in diameter, and another about half that size. The branch you are looking for should have a section which is basically straight for about 27″. After cutting it, remove the bark and flatten it on two sides (rasp, saw, sander) until it is about ⅜″ thick. The sides to flatten are determined by the shape of the branch, and by which end has a slight curve. The top and bottom edges should be quite straight. The curve should be on the left and ease gently toward you.

When the front and back surfaces have been flattened, put the end with the curve to your left and round the lateral ends as shown in Figure 3. The top and bottom edges are slightly thinned — the bottom edge a little more so than the top. Sanding adds the final touch and the batten is now ready.

Figure 5: *One method for shaping batten.*

When a hardwood branch is not available for making the batten, an axe handle or broken baseball bat can be substituted. The axe handle is more adaptable due to the already flattened sides. A baseball bat may take power tools to transform it.

When a weaver has a batten which does not curve enough, one remedy is to warp it. This is done by coating it liberally with grease (shortening, etc.) and burying it in wet sand for a week. A heavy weight is placed at the point where the curve should be. Nature then joins in shaping the tool.

The Weaving Fork

The weaving fork is another of the cherished tools and is used to beat the weft into position. These, too, are made of hardwood from a found branch, or from a hammer or axe handle which weavers can salvage upon breakage.

The forks are not difficult to buy. Weaving stores generally have some type, as it is fairly standard equipment in many weaving methods. For Navajo forks, consult chapter on *Supply Sources.* For those in a hurry, a heavy table fork might be a temporary solution.

Although weavers have several forks among their weaving paraphernalia, one of the size and shape indicated here will suffice for this small project.

FOR THOSE WHO WANT TO MAKE THEIR FORKS

Obtain one piece of hard, heavy wood which measures at least ½″ x 2″ x 12″. The basic shape is first drawn on the wood, and the piece then contoured accordingly by rasping, filing, and sanding.

The tines of the fork are made by sawing straight lines for about 2″ every ¼″. The points are then whittled and sanded to a taper, the final product being ½″ in the middle and slightly thinner at the edges.

The area between the tines should be sufficiently wide so as not to bind the warp threads upon beating.

Other Tools

There are a few other items which you might be looking for. The first is a 5″ curved sacking needle which is used at the end of the weaving when inserting the weft is difficult.

The other, also used at the end, is an old umbrella rib.

The rib, although of great help in the weaving, is not indispensable. It may be replaced by a very small ¼″ batten. Since this is the same size as the shed rod dowels, we suggest that you treat the ends of one dowel as for a batten. This dowel may function as the top shed rod until about 3″ from the top of the weaving, when the tightness will necessitate removal. It may then be used as the smallest batten.

Figure 6: *Fork pattern, actual size.*

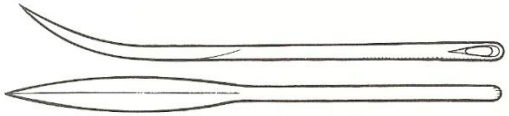

Figure 7: *Sacking needle, top and side views.*

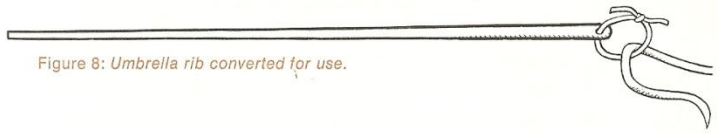

Figure 8: *Umbrella rib converted for use.*

Each Navajo weaver usually has an extensive set of tools. Although not required here, an average set might include:

Two forks: 1 large — 2″ wide
1 small — 1″ wide

Battens: 1½″, 1″, ¾″, ½″, ¼″, and smaller reeds.

Umbrella rib • Sacking needle • Shuttles: two or three straight twigs of wood with broken ends (greasewood).