RADDLES.

When the warp is all prepared for beaming, it has to be wound on the warp beam so that its width will be about the same as the width in the reed. We say "about" but in most cases we make it exactly the same. Somehow we take it for granted that, since the warp is supposed to be let's say 40 inches in the reed then it should be beamed 40 inches as well. How far are we justified in this? The practice shows that we must be right most of the time, since we do not experience much trouble in weaving. And this is perfectly true, as long as weaving of rather coarse yarns is in question. By "rather coarse" we mean anything heavier than 20/2 cotton, 24/2 wool, or 16/1 linen. With finer yarns the case is not so simple. For instance the breaking of warp ends at the edges despite all the precautions taken may be often traced back to this habit of beaming.

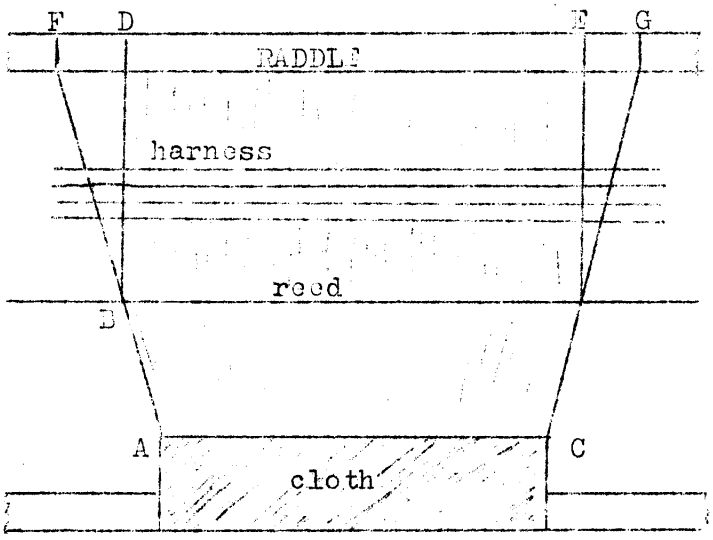

Fig.1 explains why it happens. The width of the woven fabric is always less than the width in reed, because of the take-up on the weft. With very few exceptions, such as warp-face fabrics, the cloth is narrower than the warp in reed. In result the warp-ends between the cloth and the reed are not straight but run at an angle. The wider the warp - the larger this angle. It depends also on the amount of the take-up in weft, on the yarn used etc. As long as this angle exists, the warp ends - particularly at the edges do not pass freely through the dents of the reed, but rub on the blades. This rubbing does not matter very much in case of heavy, smooth, and strong yarns. But with really fine, slightly rough, and not resisting friction threads, the ends at the edges get frayed, worn out, and eventually broken. More warp ends are broken because of friction than from any other cause.

Now let us suppose that the warp ends do not go in a straight line from the back to the front of the loom (line D - B), but also at an angle (line F - B). Friction would be much smaller, although it could not be eliminated altogether. During its motion, the reed at least part way won't touch the warp. Thus the answer to the problem is to spread the warp from F to G, instead of from D to E.

The exact width of warp on the warp beam is very hard to figure out, because as we mentioned above, the take-up or drawing in of the edges depends on too many factors. At any rate the width of beaming should be always more than the width of warp in the reed. We might estimate it very roughly at about the same percentage as the percentage of the take-up. For instance if the fabric is 10% narrower than the warp in reed, then the width in beaming should be 10% higher than the latter. A warp 40" in reed, which gives a 38" fabric should be beamed at least 42". Of course all this applies to really fine weaving.

The spreading is the easiest and fastest if we use a raddle. Reeds are very poor substitutes for several reasons. First - the reed is usually held in the batten - which is much too far from the warp beam. If we want to guide the warp so as to produce a uniform layer, the guiding device must be quite close to the beam. Then even if we place somehow the reed on the slabstock, the spreading takes much longer than in case of a raddle. Finally with a reed there is a necessity of transferring the lease from one side of the reed to the other, or the reed could not be removed.

A raddle is essentially similar to a reed but open on one side. And it has fewer dents per inch. The ancient home-made raddles had sometimes only one dent for 2 inches. They were made entirely of wood with pegs instead of steel blades or wires. Our "modern" raddles have from 2 to 4 dents per inch.

An old-fashioned raddle had usually a "cape", or a wooden cover which closed the open side of the raddle after spreading.

The raddles on the market can be used either in the batten, where they are fitted instead of the reed, or they can be laid flat on the slab-stock with the blades projecting toward the back of the loom. However for reasons given before we do not advise placing the raddle in the batten.

The most convenient way of attaching the raddle to the slab-stock is to drive two screws in the latter, one at each end, and then to cut off their heads with a hack-saw. The screws should be about 2" long and 1" should project above the upper surface of the slabstock. Two holes are drilled in the raddle so that they will fit the screws. The raddle when in use will be simply laid on the slabstock with screws in holes. There is no need to fasten it any more since the tension of the warp will press it down.

We can easily make a simple raddle at home. Take a piece of wood as long as the loom is wide, and about $1\frac{1}{2}$" x $\frac{3}{4}$", or 2" x 1". Mark a line along the center of one of the flat sides and starting with the center divide it into half inch sections. Now drive one 1" nail into each mark, so that about $\frac{1}{2}$" will project. This is the raddle. It should be fixed to the slabstock as described above.

When spreading we take a strong thread (8/4 cotton), tie it to the first nail in the raddle and then as the spreading progresses we wind it around the nails thus securing the warp in the raddle.

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