

take dictation of any comment." This is done by the St.Paul Fiber, Clay and Metal National biennial...(Arlington, Va.)

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We shall close now the discussion. There is no point in repeating the same arguments over and over again. Particularly that so far not a single voice has been raised in opposition. We can only hope that more weavers will start "kicking" against unfair dealings.

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S H O R T C U T S - 3



M U L T I S H A F T

We are not going to discuss at a great length the multi-shaft looms because: 1-st - the weavers who buy them are or should be experienced enough to use their own judgement; 2-nd - the subject is too long and involved for an article; 3-rd - because we are anxious to get down to more practical matters than theoretical discussions of the merits and demerits of various looms.

This is what we can say about multishaft looms:

1. We should not invest in a loom with more than 4 shafts unless we have to, i.e. unless we decided upon weaving certain articles which positively cannot be woven on 4 shafts. Even the best loom of this type is always a disappointment to anybody who is already used to 4 shafts.

In particular we should never be persuaded to buy for instance an 8-shaft loom instead of a 4-shaft one: "because it costs only a little more, and it still can be used as a 4-shaft one". This is one of the many fallacies of our trade.

2. A multi-shaft loom can be specialised, and then fairly efficient, or built for general purposes, and then much less efficient than a 4-shaft one.

3. Specialised looms such as 8-shaft counterbalanced are good only for a certain type of weaving, and cannot be used for anything else. Thus they have a place in industrial handweaving, but are seldom of any use to a hobbyist, unless of course he can afford to buy several looms.

④. General purpose multi-shaft looms can be divided into 2 groups: single tie-up (jack-type), and double tie-up (countermarche, Swedish, etc).

⑤. Single tie-up (jack type) are easy to set up and adjust, but hard to operate. They have one very important advantage: any number of treadles can be used at the same time. They are best for experimenting, demonstrations, teaching, designing.

⑥. Double tie-up looms take much longer to set up and adjust, because the tie-up has twice as many ties as in a jack-type. Also in nearly all models the ties must be adjusted rather carefully. Only one treadle can be pressed at a time. But they are much lighter in operation, and therefore they should be used for "production" i.e. weaving of long projects (not necessarily for sale).

Here is another fallacy: that a double tie-up loom can be used as a single tie-up. No! No more than the other way around, although in both cases we can rig up some sort of a makeshift arrangement which will perform in a way. If we find by any chance a double-tie-up loom which actually works as a single tie-up as well, let us beware; it simply means that the loom is very poorly balanced and that it is going to be rather inefficient as a double-tie-up.

⑦. Draw-loom, Jacquards, two-harness looms, etc., are entirely beyond the scope of this article. We already have had, and we are going to have more articles about this class.

When buying a loom with more than 4 shafts, we must try it, i.e. weave on it for at least half an hour, to find out how it "feels", or rather how do we feel after such a trial. But we cannot expect here to get the same speed as on a 4-shaft loom, particularly with single tie-up.

And of course nearly all we have said about the 4-shaft applies here: that the loom should be strong, and large, and heavy.

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#### SETTING-UP THE LOOM.

Now comes the second stage: getting from the loom the best possible performance. We must set it in the proper conditions, get acquainted with it, find all small faults of construction (even the best loom is full of them), and correct whatever can be corrected.

When selecting a permanent place for the loom we must consider: accessibility, lighting, and heating.

The loom should remain always in the same place. It should be easily accessible from all sides. There should be enough room in the back to put a bench behind it (to sit down when spreading the warp), and as much space as possible in front - never too much. On at least one side (on the side of the warp-beam crank) about 24" for beaming.

What we are going to say now will provoke strong reaction in some quarters: the loom should be bolted, or otherwise anchored to the floor. The reason is that heavy beating will move the loom forward at a rate of several inches an hour. Rubber pads won't help unless they are cemented to the floor. A loom which moves continually on a hardwood floor or linoleum will ruin its surface in no time. Cemented rubber pads, even if they stay put, will spoil at least several square inches of the floor - when two ¼" holes are hardly visible, and can be plugged or filled with plastic wood later on. Thus if you really like your floors make the wise choice of the smaller evil. Two neat holes should be drilled in the loom frame (usually the front cross-piece which lies flat on the floor), and two smaller holes in the floor. The screws can be 3" or 3½" with round heads. Put ¼" washers under the screw heads. Also for better protection of the floor use felt pads under all wooden parts of the loom which touch the floor. Now drive the screws home very tight - a loose screw will break sooner or later.

In old houses, before doing this, make sure that the floor is level. If not - insert wood strips under the frame until the breast-piece and the batten checked with a carpenter's level do not slope one way or the other.

On cement floors we must use special drills to make holes, and also special expanding bolts. Then perhaps it is better to have rubber pads cemented to the floor. Use the black, sticky kind.

The Light. The daylight should come from one side, not from the front or back. The best source of artificial light is an adjustable lamp attached to the loom frame or on a separate standard. A frosted or milky bulb of 60 to 100W with a shade. Adjust it so that only the part of the loom between the breast piece and the harness is illuminated. Avoid strong light, also diffused or fluorescent light when weaving, but the latter can be used for warping and beaming. For threading - one adjus-

table light in front and another in the back of the loom. Direct light from naked bulbs or tubes should never reach the eyes of the weaver.

Heating. No radiator, hot-air register, etc. should be anywhere near the loom. Work in as low temperature as you can comfortably stand. Keep your weaving studio in always the same temperature - avoid all extremes. Incidentally there is no need any more when weaving fine linen for very high humidity (as often advised in old books), but the air should not be too dry.

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The loom is all set. We make a short but fairly wide warp of any kind; preferably an "easy" one of 10/2 cotton for any weave with balanced tie-up and with tabby sheds. Beam, and thread in any way at all. We shall describe these operations later on.

Now we sit down, open a shed, and try to throw the shuttle (do not throw it actually). When we are sitting, the elbows at rest should be at the same level as the warp, i.e. the same level as the breast-piece. If they are higher we measure the distance from the elbow to the warp level and cut off the same length from the sides or the legs of the bench. On the other hand - the feet should reach the treadles comfortably. Should it so happen that the elbows are in the right position but the treadles seem to be too far down - we must shorten the ties between the treadles and the lams.

It is not so easy when the bench is too low. We can use a thick cushion or another higher bench, or slip some sort of coasters under the bench, or nail extensions to the sides of the bench. But in no case let us get resigned to the fate: "Oh, well - it will work somehow". No! This is a completely wrong attitude.

Here is another fallacy: "rocking benches". The body of the weaver in action does not rock: with normal speed of weaving it would not have time to. It is only when the weaver sits too far from the loom, or when he weaves fabrics too wide for his constitution, that he has to move his body to reach the batten or the edge of the fabric. Rocking may be a good reducing exercise, but it is hardly ever necessary.

Even if the bench is not too low, always use a piece of felt, or rug on top of it. Not only that it reduces the wear on the seat of whatever you are wearing, but it is also hygienic. A flat cushion will do as well but better avoid foam rubber.

The level of the bench may be right, but not its distance from the loom. In most cases the bench is too far. Bring it as close as possible. The knees should not touch the cloth beam, but the batten should be reached without bending forward. If these two conditions are contradictory, there is something wrong with the loom itself, and this is probably the first "bug" we have discovered. Usually the cloth beam is lodged in two round holes drilled in the frame of the loom. If this is the case have another pair of holes drilled farther, and usually higher in the frame. An inch or so in both directions makes all the difference.

Now we open a shed. Does it open easily? Is it clear? No ends of warp hanging down or rising up? If the shed is hard to open, the reason may be that the warp is too tight (release the tension) or that the foot is too far back on the treadle (by "back" we mean here toward the weaver's back). It should be quite close to the tie-up. Again it may be that the bench is not close enough to the loom. If the shed opens as it should but is not clear, there is nothing to worry about. We shall discuss this point later. For the time being let us do our best by shortening the ties of the shafts which remain too high when they are supposed to be all the way down.

We make a few shots of weft to get a good "heading", and then start beating as hard as we can, observing all the time what happens. If the loom frame sort of creaks and moves with the batten, the bolts in the loom frame are loose. A wrench should be supplied with the loom and we must go over all the bolts and tighten them. This by the way should be done periodically, twice a year or so.

If the loom has a friction brake (the best and the only to be used on the warp beam) it may slip during our experiment with hard beating. Sometimes ill advised persons put a drop of oil in there. If you suspect that this is the case, wash it with gasolene, cleaning fluid or even lighter fluid. If this does not help, get hold of some resin (in any hardware store), or if anybody in the family plays violin borrow the thing they rub the bow with, pulverise some of it and apply generously to the brake.

If even this does not help, and you are sure that the brake slips - call the agent who sold the loom and explain.

Now let us pay attention to the batten (beater). When pushed back it should touch at the same time both stops in the loom frame, and

this without any pressure. If it does not, we have discovered another "bug", quite common and in most cases being due to the wood not properly seasoned. The easiest way to correct this is to make two small wedges of hardwood, about 1" by 1" and not more than 1/16 of an inch thick. They are inserted between the swords (uprights of the batten) and the race-board (the lower horizontal piece). First release the bolts, then insert the wedges from the side which is too far from the frame, then tighten the bolts again. Try until the batten is absolutely straight. Cut off the projecting part of the wedges with a sharp knife or a razor blade.

It is impossible to enumerate the less common faults which we are likely to find in a new loom. We can only quote a few examples:

①. The varnish on the breast piece, the slabstock (thread carrier), the lease-rods, and the batten sticks to the yarn or/and the fingers. Remove the varnish with sandpaper. First with medium, then with fine. Rub the wood with boiled linseed oil; wait till it dries; sandpaper with the finest grade again; rub with hard floor-wax and polish - still better: simonize (follow directions).

②. The treadles are not smooth enough i.e. the foot does not slide easily along the treadle when weaving. Make sure that you are not wearing rubber soles; try heavy woolen socks, or light moccasins. If this does not help use the same treatment as in No.1, i.e. remove the varnish oil, and then wax.

③. The batten rubs on the loom frame (always on one side only). Loosen the bolts between the swords and the race board; straighten the batten; tighten the bolts again.

④. The fingers when grasping the batten touch the first shaft. This is extremely annoying, and makes normal weaving impossible. Fault of construction. There should be enough space between the batten and the harness (shafts) for the hand to go around the cape (upper part of the batten) without touching the heddles, or the shaft itself. Replace the rubber stops (if any) with much thicker pieces of wood glued to the uprights of the loom frame.

These were only examples of what happens when we buy a loom at its best. What we may expect from a loom at its worst defies description.

The advice given so far may seem to an unexperienced weaver rather trite and unimportant, but the accumulation of such small faults and mistakes makes normal weaving absolutely impossible.

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