Assembling and Weaving on Counterbalance and Countermarch Looms

Joanne Hall

Whether you are planning to purchase a new loom, or you have one you have not used for a while, or you are looking for a used loom or have found one, these pages will help you to understand counterbalance and countermarch looms. The information here will apply to most all makes of counterbalance and countermarch looms.

Today we hear from many weavers who need help learning to use their new or used looms. Many weavers with counterbalance and countermarch looms find the Glimakra website and the help they need. They often send us a photo of their loom and we can usually identify the loom for them and point out some nice features the loom has for weaving.

For more complete warping information, ask for the book, **Learning to Warp your Loom.**

Glimakra counterbalance and countermarch floor looms are made in three frame sizes, with weaving widths from 26 to 63 inches. If you have the Glimakra Standard loom, do not be intimidated by a large frame. A large loom is your friend, not only for your weaving, but also for your comfort. Greater loom height adds to comfort, providing you with better posture while weaving as well as comfort for warping and threading. A large loom gives greater loom depth, which allows for the addition of more shafts and treadles. It also allows for the addition of loom accessories like a fly shuttle, a second warp beam, sectional beams and even drawlooms.

If you have a Glimakra loom, you can receive loom assembly instructions from your local weaving shop or from Glimakra USA.

Standard loom with horizontal countermarch and 8 shafts

Loom frame assembly
Assembly of the loom frame is not as difficult as it may seem at first. Looms have basic frame parts which are very similar from one loom to another and most loom parts are unique and only go in one place. After you get the basic frame assembled, the rest will fall into place as you warp the loom and thread the heddles. Weaving looms are made to be easy to take apart and put back together.

Purchasing loom parts
Most parts such as tie-on bars, shaft bars, lamms, treadles, lease sticks, warp sticks, reeds, warping equipment and weaving accessories can be ordered. If you have a used loom, which is no longer in production, you may still be able to get many of the parts.

Wedges
The holes made for the assembly wedges are tapered just like the wedges. Insert the wedges in the correct direction so that the taper inside the hole matches the taper of the wedge. If you do not do this, it is difficult to remove the wedge without causing damage to the wood. Some very old looms may not have the holes cut with a taper.

Treadles
A common mistake made when assembling the loom frame is to attach the treadles in the front of the loom instead of the back, where they are nearly always attached.

Here is why they are attached at the back:
Treadles on counterbalance and countermarch tie-ups do not need to move far to open a shed. Since some shafts go up and some go down, the treadle moves only half the distance of the size of the shed. A jack loom treadle needs to move the full distance of the shed. They are angled up high since they need to move down as far as the shafts move up. So treadles on jack looms are more comfortable to use if attached in the front of the loom. Counterbalance and countermarch treadles stay more horizontal in use because they do not need to move far. This is especially true with a deep loom and long treadles. This makes it easy to put your foot on the treadle. And since treadling is easier when they are attached in the back, most traditional counterbalance and countermarch looms have treadles attached in the back.

Treadle holes
The beveled holes should be on top of the treadle. The bevel is to keep the cords from wearing.

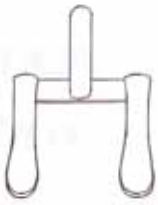
Counterbalance loom parts

With a used loom, you may have received some extra parts which you do not recognize. They may be part of your loom or part of something else. The book, **Learning to Warp your Loom** will show you loom parts as well as weaving accessories and what they look like. Sometimes a countermarch loom will have parts for a counterbalance tie-up.

Counterbalance loom parts
If you have counterbalance tie-up parts, they consist of a beam to put on the top of the loom and two pulleys which may look like this.

You may also have four pieces of wood about 7 inches long, which are called horses. A counterbalance loom can be made into a countermarch loom and if you have a countermarch loom, you can get counterbalance parts.

Here are two counterbalance tie-up parts which are for tying up more than four shafts. Contact Glimakra USA if you want to tie up more than four shafts on your counterbalance loom.

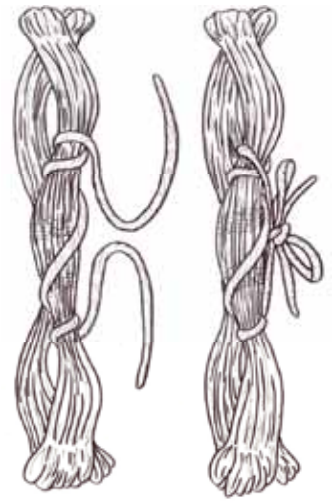


Double pulleys

Drall pulleys

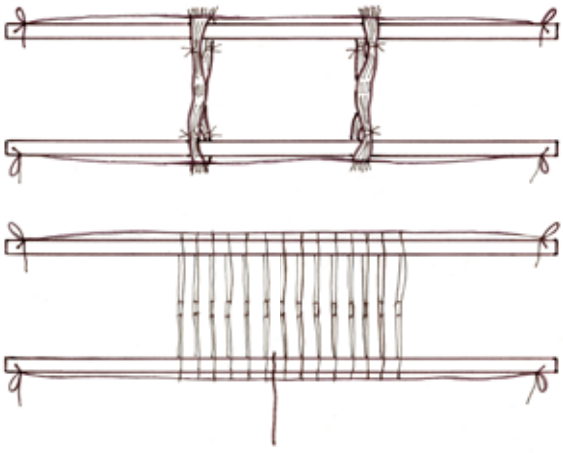
Heddles
Swedish looms made before 1980 usually came with hand tied heddles, 10 1/2 inches long. If they are in good shape they can be used, or you can replace them with Texsolv heddles, 11 inches long.

Hand tied and Texsolv heddles should be tied into bundles. And, they can be washed after they are tied.



Tying heddles

Shafts made with two wooden bars
Counterbalance and countermarch looms have shafts which are made with two shaft bars and the heddles. For full width warps, a cord is tied from one end to the other to keep the heddles on. Shaft bars are often longer than the weaving width.



There is a cord is in the center of the bottom shaft bar. This will later attach the shaft bar to the lamm. If there is no hole in the shaft bar, measure to find the center and wrap the cord around the shaft bar.

Shafts need to be light weight
Counterbalance and countermarch shafts are light weight. They hang free, so it is easy to add or take off extra heddles. Because of this, you never need to count heddles. This simple shaft design allows the use of long eyed heddle, which can be used for pick up weaves and drawloom weaving.

There is no need to have metal heddles, metal bars, or sides on the shafts, all of which are used to add weight on jack loom shafts.

Tie-up cords
Older looms were tied up with ordinary cord. Today, Texsolv cord and pins are used. Texsolv cord was designed for tying up looms and it uses pegs and pins in place of tying knots. It can be purchased by the yard or on spools.

Tie-up kits
Texsolv tie-up kits are available for both counterbalance and countermarch looms from 4 to 16 shafts. Kits have pre-cut cords in the correct lengths, including beam cords. They also have the arrow pegs and/or anchor pins for attaching the cords.

Old cords on used looms
If you purchase a used loom, do not leave the tie-up cords on the loom, as they may not have been correctly placed. Sort them by length to use later as you tie up the shafts, lamms and treadles.

If your used loom has any odd looking metal hardware or chains added to your treadles, shafts or lamms, it may not be original loom equipment. It is best to remove it and replace it with Texsolv cord. Metal hardware adds weight and it can affect the balance of the moving parts of the loom.

Sometimes a used loom will be found with the shaft bars replaced with square frames and metal heddles. Not only are these frames too heavy, but the shafts made with two bars are easier to use. It is best to go back to the original construction.

Hanging Beater
The beater on traditional Scandinavian looms hang from the top of the loom. It will have a beater cradle here with at least three positions for hanging the beater. Jack looms often have beaters attached to the bottom of the loom, since they need to have a shuttle race. Since the warp on a counterbalance and countermarch loom is tensioned tightly, no shuttle race is required unless a fly shuttle is attached. On wide looms, a fly shuttle attachment is often available to put on the hanging beater.

Characteristics of the hanging beater.
* The tall height of the loom gives the hanging beater a very long sweep, for a more even beat.
* It can be heavy and still be easy to use. It easily falls back into place after you beat.
* It is easy to control the beat weave, even with an open weave. The beater will not fall onto the fell (the last weft woven).
* It is easily adjustable in height for different heddle and reed sizes.
* Your reed is removed by simply lifting the bar that sits on the top of the reed.
* The beater easily lifts off the loom for threading the heddles. It is usually not bolted in place.
* The motion of moving a hanging beater is easier on your shoulders. The weight of the beater does most of the work.

But, the best advantage of a hanging beater is that it can be advanced while you are weaving. After weaving a few inches, simply reach up and push the beater back a notch into the next position on the cradle and continue weaving. Then, the warp does not need to be advanced very frequently. This also provides space so that you do not have to push the beater towards the shafts to throw the shuttle.

Attaching the beater
It may be possible to hang the beater incorrectly. The reed is placed at the front of the beater. If the reed is not in the center of the beater, the part with extra wood which may look like a shuttle race, is placed in the back.

Plan your first warp
Putting on your first warp is part of the assembly of the loom. Most of this assembly is only done the first time you set up the loom. When you put the second warp on your loom, all of the tie-up cords can remain unchanged on the loom. Even the treadle cords do not need to be changed, unless you choose to use a different treadle tie-up draft. Then, treadle cords are the only ones which will need to be moved.

You will need the warp on the loom to properly tie-up and see the sheds. If you have a loom with more than four shafts, you may be tempted to tie up all of them before you start to plan your first warp, but this only means that you will probably be taking some parts off when you put your first warp on. And you will probably not get the cords the right lengths without a warp on the loom.

If you have a Glimakra loom, you can be assured that it will weave exceptionally well, so you do not need to put all the parts on the loom to check them. And loom parts are available if you find you are missing something.

It is also a good idea to start with a two or four shaft weave. Choose something simple like a rag rug or a towel warp, or something that you have woven before. Avoid a very narrow warp, like a scarf if you are tying up a counterbalance loom. And avoid a warp which is the full width of the loom. You need to learn how to use your loom and challenging yourself with too many shafts or a weave which you have not woven before, may not be a good way to start.

Purchasing reeds
If you need to order a reed for your loom, a four inch reed is tall enough to get good sheds. To measure the weaving width, measure the distance across the loom on the inside of the side frames or measure the length of the cloth beam. Shaft bars are usually longer than the weaving width. To test an old reed for rust, take white threads, put them through the reed and move them up and down. If color is found on the white threads, it is best to get a new stainless steel reed.

Order for Warping and Tying up your loom

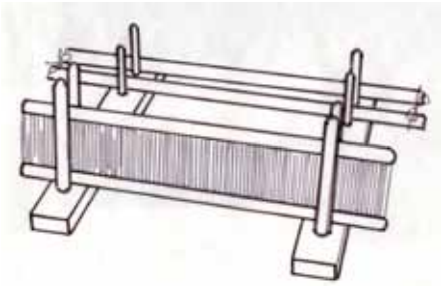
Putting on your first warp.
If you follow this list, in this order, for assembly and warping your loom, the process will go quickly. Plan your first project to be 2 or 4 shafts. Take off any extra shafts and lamms.

1. Wind and beam the warp.
2. Assemble your countermarch (or use your counterbalance beam) and put it on the top of your loom.
3. Pre-sley the reed or use a raddle.
4. Attach beam cords and beam your warp.
5. Assemble your shaft holders and shafts, hang them, sit inside if possible and thread the heddles.
6. Sley your reed and move it and the shafts forward and put the reed into the beater.
7. Tie your warp ends to the tie-on bar of your cloth beam. Tighten the warp tension.
8. Set the shafts at the correct height, tie up the shafts to the top of the loom.
9. Adjust the height of the beater so that the warp threads travel through the center of the reed.
10. Put the lamms on a table and attach treadle cords to your lamms according to your tie-up draft.
11. Attach the lamms to the loom and hang them from the bottom shaft bars.
12. For countermarch, attach treadle cords to the lower lamms, attach them to the loom.
13. Attach your treadles to the loom and attach the treadle cords.
14. Weave one or two inches, checking for errors.
15. Then examine the sheds. If a shed is not acceptable, adjust the treadle cord lengths.
16. After you have woven on the loom, you will know the loom and you may even decide that it works better than you had thought. Then you can start to consider adding shafts and treadles.

Your subsequent warps
Here is the procedure for putting on your second warp, with the same treadle tie-up. No adjustments are needed.

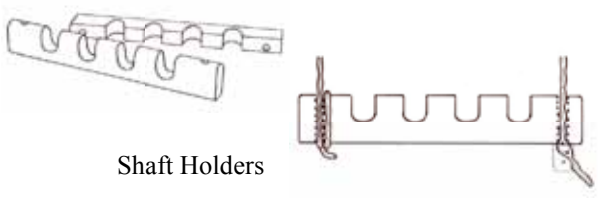
1. Plan your project, wind the warp.
2. Select your reed and pre-sley it or use a raddle.
3. It is often more comfortable to detach the lamms from the shafts to take the weight of the treadles off the heddles. Mark the position on the lamm cords for the re-attachment of the lamms.
4. Raise you shafts out of the way by putting the bottom shaft bar on the shaft holders, or spread the heddles to the sides.
5. Beam your warp.
6. Thread your heddles and sley your reed. You may want to push the shafts to the back of the loom and sit inside.
7. After threading and sleying, move the shafts and reed forward, back to their weaving position and re-attach the lamms.
8. Tie your warp ends to the tie-on bar of your cloth beam. Tighten the tension and weave.

If you need to add shafts and treadles, simply put them on the loom in the same way that you put the first ones on. If you are threading a complex pattern, it can be easier to first thread the back shafts without the front ones being there. Then hang the front shafts to thread those heddles. This prevents threading mistakes.
If you later want to weave with fewer shafts, tie the extra shaft's heddles into bundles and remove the extra shafts. There is no advantage to leave unused shafts in the loom. Treadle cords can remain attached to the lamms. The cords coming from the countermarch can be left in place or removed. You will need to change your treadle tie-up.



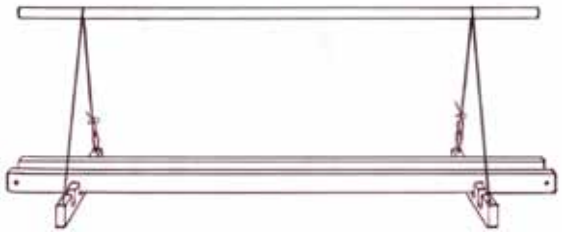
A reed holder will hold your reed and lease sticks during warping.

Assembly of shaft holders
Before threading the heddles, the shaft holders are hung from the top of the loom. Complete instructions are in the books, **Learning to Warp your Loom** and **Tying up the Countermarch Loom**. Assemble the shafts with some heddles. There is no need to count them. The shaft holders will hold the shafts in place and the wire pins will keep the shaft bars in order and lined up during the assembly.



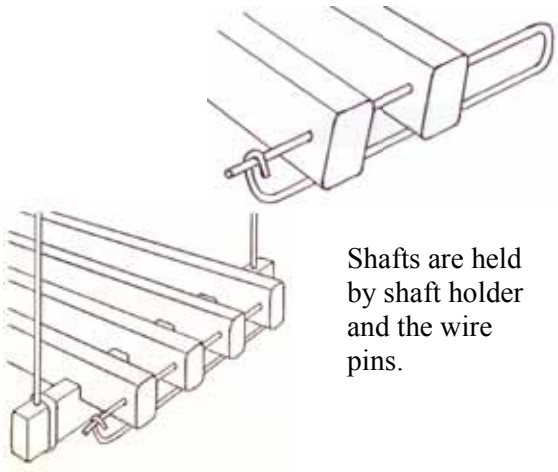
Shaft Holders

Adjusting shaft holders
The height of the shafts in the loom can be changed by adjusting the cord on the shaft holders. You can raise the shafts for comfortable threading of the heddles. After sleying the reed, tying and tensioning the wrap threads, the shaft holders are adjusted to put the shafts at the correct weaving height. The shaft holders need to hold the shafts level. The warp threads need to be held in a straight line from the breast beam to the back beam. If the holders are set too high, lifting the warp, lower them. If the holders are holding the shafts too low, the tensioned warp threads will hold the heddle eyes up, but the top part of the heddles will be loose rather than vertical and taut.



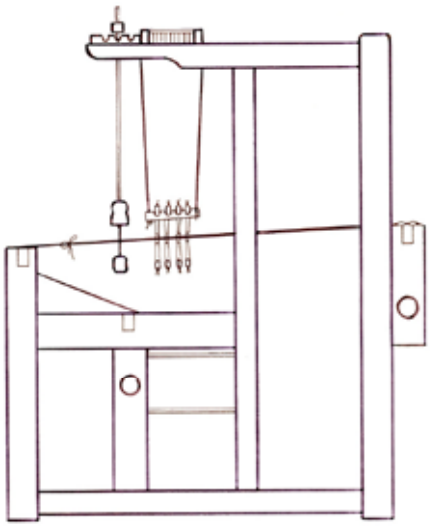
Shaft holders assembled with Texsolv cord.

Adjust the beater height
The warp threads travel through the center of the reed. The beater should be adjusted in height to achieve this.



Shafts are held by shaft holder and the wire pins.

Tensioned warp is straight
Note that the tensioned warp goes straight from the breast beam to the back beam. The warp should be centered in the loom and the shafts centered to the loom. When the warp is tensioned, the loom is ready for the tie-up. Traditional looms usually have the back beam higher than the breast beam. This makes weaving on the loom more comfortable.



Placement of the shafts and beater
The shafts hang down from the top of the loom directly behind the beater. They should be up as close to the beater cradle as possible, for the best shed. Shafts should hang very close together. The lamms will be placed directly below the shafts. Do not put spacers between the lamms as this will spread the shafts out and give you poor sheds. It can also cause the lamms to catch on each other.

Advantages of adjustable treadle cords
Adjustable treadle cords will allow you to make your weaving shed the size you need. Most looms provide you with a shed that is larger than necessary for most weaving. You may want to make your shed smaller if you have a fragile warp or if you are having trouble getting nice selvages. Adjustable treadle cords will also allow you to adjust and perfect your sheds.

Learning to make treadle ties
If you have not tied up your treadles before, practice first. When you are using anchor pins to attach the treadle cords at the loom, you will be putting the pins under the treadle and you will not be able to see the pin. Put a treadle, treadle cord and anchor pin on a table. Button the pin into the cord and practice putting the pin legs into the treadle hole. This will make it easier to do it at the loom. The holes which are beveled indicate the top of the treadle.

Heddle Length and Size of Shed
Counterbalance and countermarch floor looms have heddles which are 9 1/2 to 11 inches long. Heddles are measured off the loom, from knot to knot.

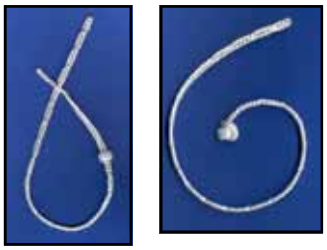
With a breast beam height less than 34 inches, the loom should have 9 1/2 to 10 1/2 inch heddles, as there may not be enough height for longer heddles.

A breast beam height of 35 or 36 inches gives enough space to have the 11 inch heddles. Heddles longer than this make the tie up difficult, especially for a countermarch loom.

An 11 inch heddle will give you a shed at the heddles, which is more than 4 inches high. You will have about a 2 1/2 to 3 inch shed at the reed. This gives you about 2 inches where you put your shuttle, which is more than is needed. Shuttles are usually from 5/8 inch to 1 1/4 inch tall. A normal size shed where you put your shuttle is 1 1/2 inches tall.

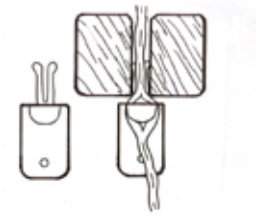
How to use Texsolv cord, pegs and pins

Two ways to attach cords to shaft bars



Using beads to tie up jacks, treadles and lamms

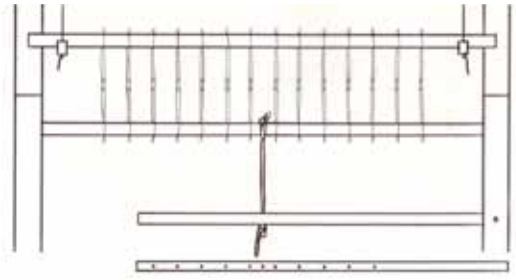
Cord threader



Anchor pins are used to attach cords to treadles, jacks and lamms.

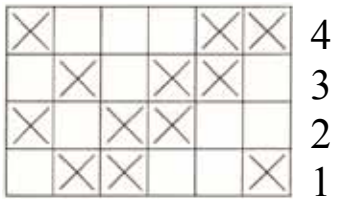
Ideal loom with horizontal countermarch and eight shafts

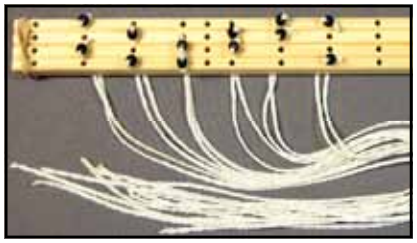
Attaching treadle cords to lamms
There is a lamm in the bottom of this diagram, showing the holes drilled into it. There is a hole for each treadle, directly above the treadle. There is also a center hole in the lamm, which is the exact center of the loom. It is for attaching the lamm to the center of the lower shaft bar



The first time you put the lamms onto the loom or any time that you will make a change to your treadle ties, put the lamms on a table and number them. Put the treadle cords in the appropriate places, according to your tie-up draft. Be sure that you attach the cords where there is a black square or X on the draft. If instead, your draft has numbers, look at the source of your draft to determine how to read the draft. For weaving comfort, plan to use the center treadles. Do not use the center hole.

Treadle tie-up draft





Here, black beads are attached to the treadle cords to simplify the tie-up. The cord placement corresponds to the Xs in the draft. If you cannot remove the lamms from the loom, get comfortable where you can reach the lamms and attach the treadle cords at the loom.

Attaching lamms to the loom
Maintain the order of the lamms when you attach them to the loom. There is a cord in the center of the bottom bar of each shaft. Put this cord down in the center of the warp. This cord will be vertical. Attach each lamm to it's shaft. To start, the lamms should be approximately parallel to the floor and all at the same level. If you have a countermarch loom, you may later want to raise them slightly.

Height of Treadles from the Floor
Treadles are usually tied level with the floor and about 3 to 5 inches off the floor. Tying the treadles low gives you a shed which is easy to treadle, as it makes it easier to put your foot on the treadle. Tying your treadles low will also stop the opening of the shed before the threads are pushed up against the neighboring shaft bars. It is also good to have the treadles touch the floor if you have a short loom. If you are very tall, you may need the leg space that lower treadles will give you.

Vary the lengths of the treadle cords
For treadles which are attached to the back of the loom, the shafts in the back will need to move further than the shafts in the front when you press on a treadle, so the treadle cords which are tied to move the fourth, or back shaft, should be taut. The cords tied to the front lamms should be a little slack. This difference may be only one or two holes in the Texsolv cord, or 1/2 to 1 inch.
1. If you are tying up eight or more shafts, there may be 2 holes difference in length from the shorter cords for the back shaft to the longer cord on the first, or front shaft.
2. If you have a very large shed, the difference will be greater. It is better to make your shed smaller.

Weaving on a counterbalance or countermarch loom
When you get to know your loom, you will understand how sheds are made. Pressing your foot on the treadle moves all the shafts, so no threads are left to be held by gravity. When you lift your foot, you will not hear the falling of shafts like you do on a jack loom. The shafts do not need to move until you press on the next treadle.

Warp tension
Since counterbalance and countermarch tie-ups require that the warp travel straight from the breast beam to the back beam, the warp can be tensioned tightly. All the shafts move when you press on the treadle, so the tension on the warp is equally tight on the top and bottom of the shed. The threads are tight enough to support the shuttle, so you will have fewer skipped threads and you are less likely to have the shuttle fall to the floor. Sheds will open easily, even with sticky or closely sett warps. This makes the nice clean sheds that counterbalance and countermarch looms are known for.

Nice selvages
The tight warp threads make weaving progress with nice selvages, without the need to weight or treat the selvages in any special way.

Tighter weaves
Setts for weaving on counterbalance and countermarch looms are sometimes a little closer, with a higher number of threads per inch. This is because you can weave with a tighter tension and it is easier to weave a denser, tighter weave.

Treadles
When you are weaving, you cannot make the mistake of having your foot stay too long, complicating the next shed. When you push down on the next treadle, your other lingering foot will be pushed up by the tie-up. This prevents skipped threads. You will also find that you can weave barefoot without any discomfort, since you are moving light weight shafts.

Recent history of loom designs
In the late 1800s and early 1900s when the Arts and Crafts movement created an interest in weaving, one still found strong weaving and loom building traditions in Scandinavia and in Europe. There, weaving was still done in the home for the sake of tradition, even during and after the industrial revolution. They were still making looms the way they had made them in the past, with function as the major criteria. Weavers there were accomplished and made fabrics with fine threads and with beautiful craftsmanship. They wove damask and weaves with many shafts. Their looms could have more shafts added, and could also be provided with a drawloom.

During this time in America, the hand weaving tradition was set aside when the industrial revolution provided machine made cloth. Our melting pot society did not have the strong cultural traditions to keep handweaving alive. There were few places to go to for instructions to get started weaving. There were few who had a mother or grandmother still weaving for the family and few who had a member of the family who remembered how to make a loom. Although there were immigrant made looms and some older barn frame looms, these were often tied up with only two shafts for rug weaving. Weavers did not have much interest in drawlooms and multishaft weaves, but there was an interest in rag rug weaving. So looms with two and four shafts were common. Without a recent hand loom making tradition, new hand looms made in America were not copies from traditional functional designs. Modern industrial loom features influenced the designs, giving them metal heddles and solid heavy shaft frames.

Fashion in the 20th century eliminated tall furniture and high ceilings and so in America, the tall loom castle was out of style. The desire for a short, more streamlined loom helped to give birth to the jack type hand weaving loom, with it's heavy shafts. There was no tall castle to hang the beater, so it was attached at the base of the loom.

Although Scandinavian weavers have experimented with jack looms, they prefer to weave on their traditional, functional counterbalance and countermarch looms, as did their mothers and grandmothers before them.