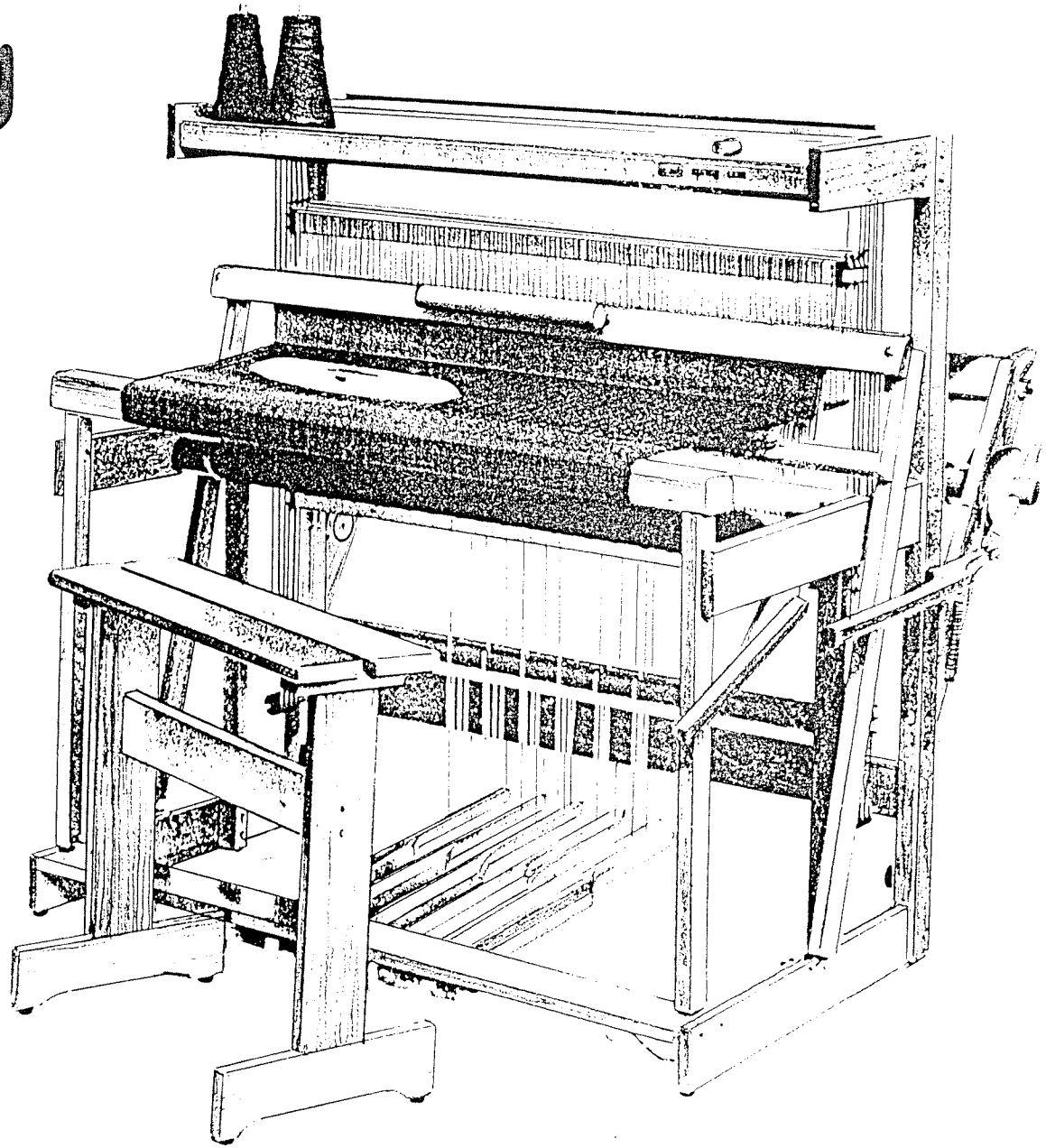
Louët spring



The parallel countermarch system

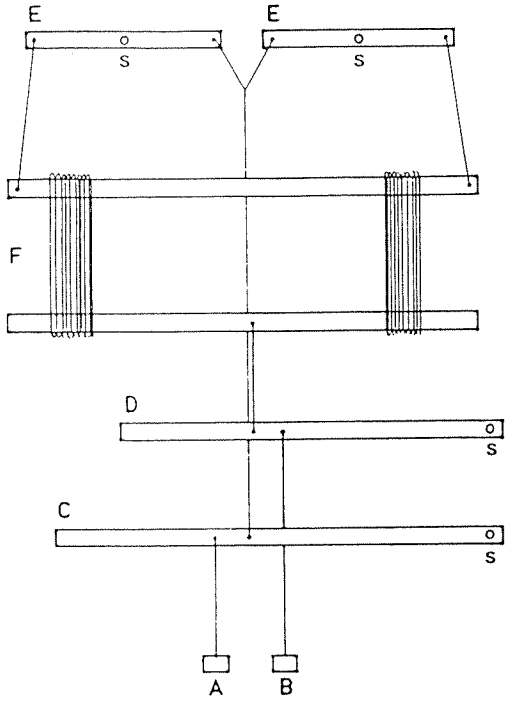
In a countermarch loom, every shaft is actively involved in each shed: each shaft is either lifted or pulled down by each treadle. Uneven sheds, for example a satin weave shed, where four shafts are lifted and one is pulled down, open cleanly every time. The warp ends on the fifth shaft do not tend to ride up as they often do with jack looms. When the shed is made, the same tension is applied to the raised ends as to the lowered ones, resulting in equal tension everywhere.

Look at the diagram to help you understand how a countermarch loom works. You will see that there are two lams beneath each shaft. One of those lams is directly connected to the shaft and moves in the same direction as it does: When this lam is pulled down the shaft moves down. The other lam is connected so that it moves in the opposite way: When this lam is pulled down the shaft rises.

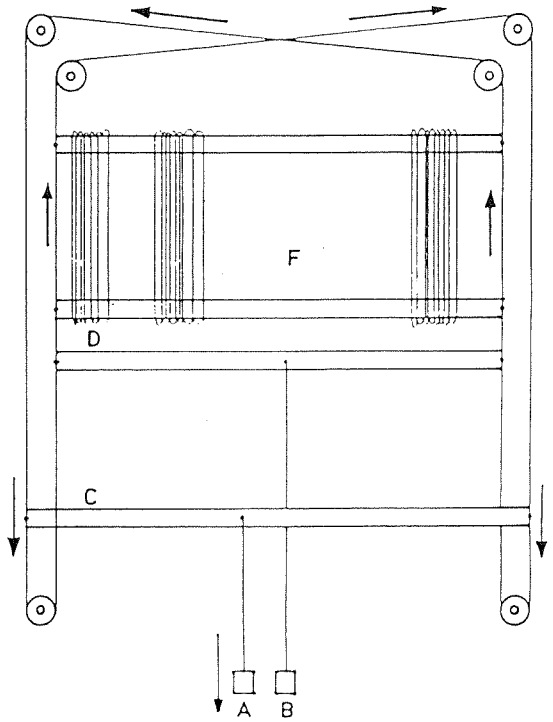
Because each treadle is tied to one of the lams of each shaft, twice as many connections per treadle must be made, on the average, compared to other looms. Before the advent of texsolv cord, a knitted polyester cord with loops in it, the time required to tie up a countermarch loom was daunting. Once the ties were made, there were still problems as knots slipped or had to be untied to adjust the cords. Fortunately this drudgery is a thing of the past. The texsolv cords, wich neither stretch nor require knots, are simply slipped over pegs. The required cords are attached to the lams when the loom is assembled and are always ready thereafter. Changing the tie-up is simpler and faster.

A traditional countermarch loom is set up so that the lams pivot (these pivot points are marked S in the diagram). The closer to the pivot point the treadle is, the more power is required to push the treadle down to obtain the shed. Treadles tied-up more to the end of the lams are easy to push, but obtain a smaller shed.

The parallel countermarch system works differently: There is no pivot point for the lams, which means that the treadles will operate similarly over the whole width of the loom. Both the Spring and the Hollandia looms can accommodate up to 14 treadles, all of wich will work with equal ease. It is not possible to push a combination of treadles with a countermarch loom, so having enough treadles is important.



Traditional countermarch system: The points marked S are the pivoting points for the lams C and D and the jacks E. When treadle A is drepressed, C moves downwards. Lam C is connected to the jacks E, wich pivot at S and come down in the center lifting shaft F. When treadle B is depressed, lam D moves down and pulls the shaft F with it.



Parallel countermarch system: Each shaft is attached to a cord which goes over all six rollers. The ends of the cord are joined, forming a continuous loop. When treadle A is depressed, the lower lam C, attached to the outside of the loop, moves down, pulling the shaft up. When treadle B is depressed, the upper lam D, attached to the inside of the loop, goes down pulling the shaft with it.

The warp tension regulator

In designing a loom we have several wishes; we want a compact loom, a roomy, well-defined shed, unvarying warp tension and treadles wich require little effort to operate. When the shed is made, extra tension is applied to the warp on an ordinary loom. Working against this extra tension is more work for the weaver and subjects the warp to additional strain.

The tensioning device on the Spring and Hollandia loom solves both problems. The breast beam is attached to the loom in such a way that it is free to move toward the shafts when the shed is made and then back toward the weaver when the shed is closed again. The distance between the breast beam and the back beam actually changes in the rhythm with the weaving. Thus the shed may be larger, there is a smaller tension increase on the warp and less effort is required to make the shed. The advantages of this system are especially evident as we near the end of the warp. Even when the end of the warp is verry close to the shafts, a good shed can be made, thus saving yards and yards of wasted warp over the life of your loom.

The warp tension regulator also bring on exactly the same warp tension each time the warp is advanced.

The Texsolv system

Cotton heddles have the advantage of being silent in use. Metal heddles, flat or wire, have the advantage of having open eyes. Texsolv heddles combine these advantages. The bundles of heddles with your new loom are a continuous line of 100 heddles folded into a zig zag. Each bundle is fastened in four places. These ties make it easy to pass the heddle bars through the upper and lower loops of the heddles. **Do not remove the ties which form the bundles until the heddles have been slipped onto the heddle bars.**

If you need to remove heddles from the shafts later, first tie them as they were originally. If you wish to cut the heddles apart, use a pair of sharp scissors.

Texsolv cord should be cut at the connection between two loops. To prevent unraveling, the ends should be singed. Be careful not to overdo the melting. **Please be aware that melted polyester is verry hot and will burn the skin.** The first loop in the cord as mentioned throughout these instructions is the one 1/2 inch from the cut, melted end. The loop right at the end is not strong enough for use.

Congratulations; Your Spring loom is one of the most innovative, cleverly designed floor looms on the marked today. As you assemble your new loom, you will learn more about how it works and what sets it apart. This instruction book will make it an easy job, if you follow the instructions careful.

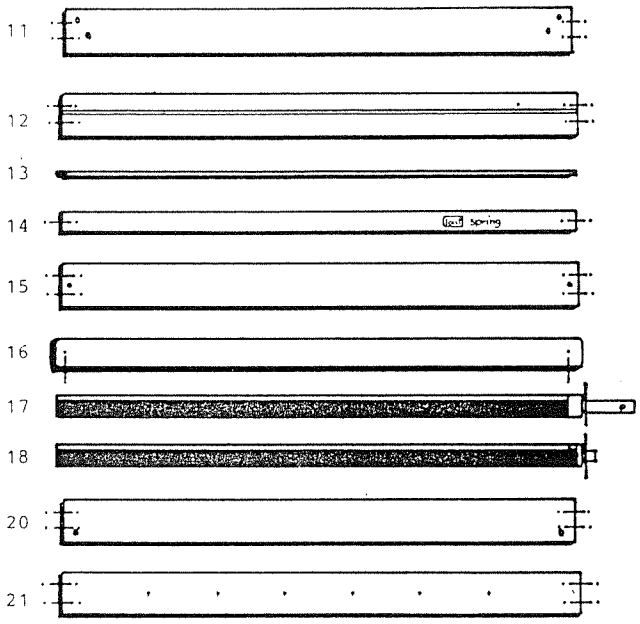
Assembly is broken down into sections to simplify the process. For each section is a hardware bag. Do not open these bags before you get at that specific section. If you cannot proceed with assembly, rebox the parts. A list of what is required for each step in the process is given at the start of the instructions for that step, along with a rough estimate of how long each section of the assembly will take. You may break the assembly down into smaller, manageable steps, doing only as much as you have time to do. There is a little line in the margin where you can check off each step as you complete it.

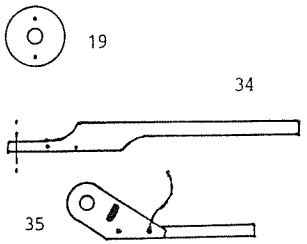
First lay out all the parts on the floor, numbering them to correspond with the list of parts, using a soft lead pencil wich you can later erase, or use yellow post-it stickers as markers.

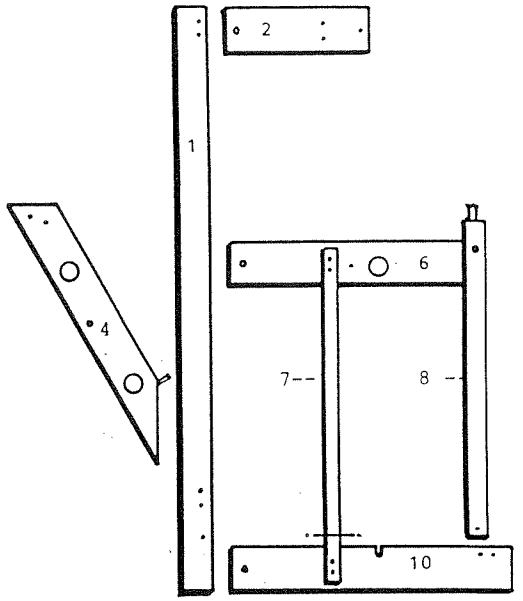
List of parts

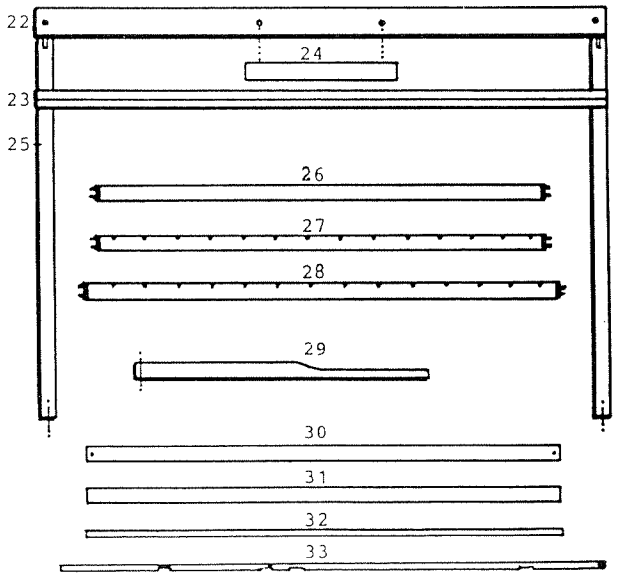
1 - main vertical pieces (L=R)
2 - top side pieces (L=R)
3 - warp beam support (L)
4 - warp beam support (R)
5 - middle side piece (L)
6 - middle side piece (R)
7 - vertical supports (L=R)
8 - floating arms (L=R)
9 - base side (L)
10 - base side (R)
11 - back castle piece (raddle)
12 - front castle piece
13 - shelf
14 - shelf front
15 - back beam
16 - breast beam
17 - warp beam
18 - cloth beam
19 - brake drum
20 - middle horizontal rail
21 - foot rail
22 - top beater bar
23 - lower beater bar
24 - beater handle
25 - beater side supports (L=R)
26 - shaft bars (8X)
27 - upper lams (4X)
28 - lower lams (4X)
29 - treadles (6X)
30 - lease sticks (2X)
31 - apron rods (2X)
32 - warp sticks (16X)
33 - measuring rods (2X)
34 - brake lever
35 - cloth beam lever

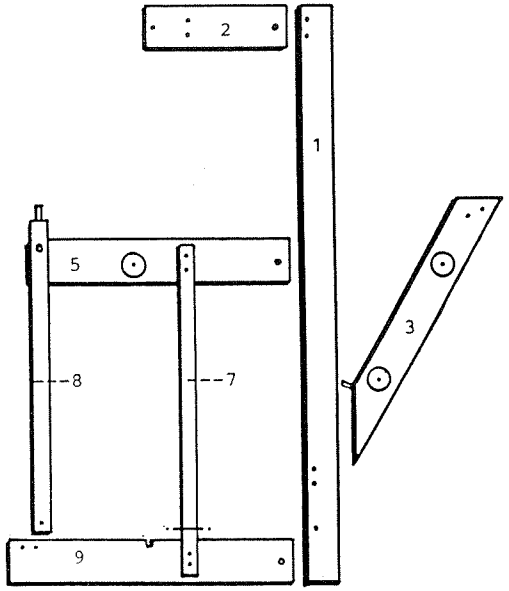
1 reed 10 dpi (40/10 cm)
600 heddles for Spring 90
800 heddles for Spring 110
heddles are 39cm long
hardware bags A, B, C, D, E, F, G, H and 5

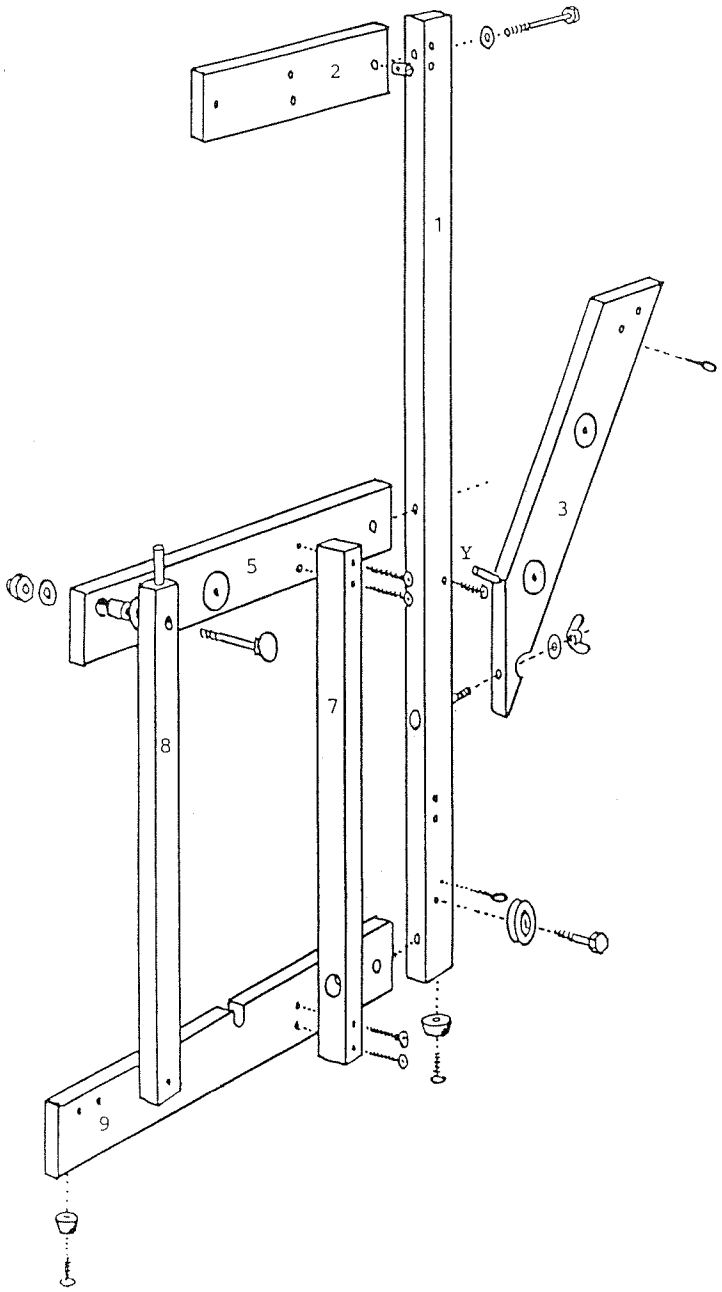

11
12
13
14
15
16
17
18
20
21

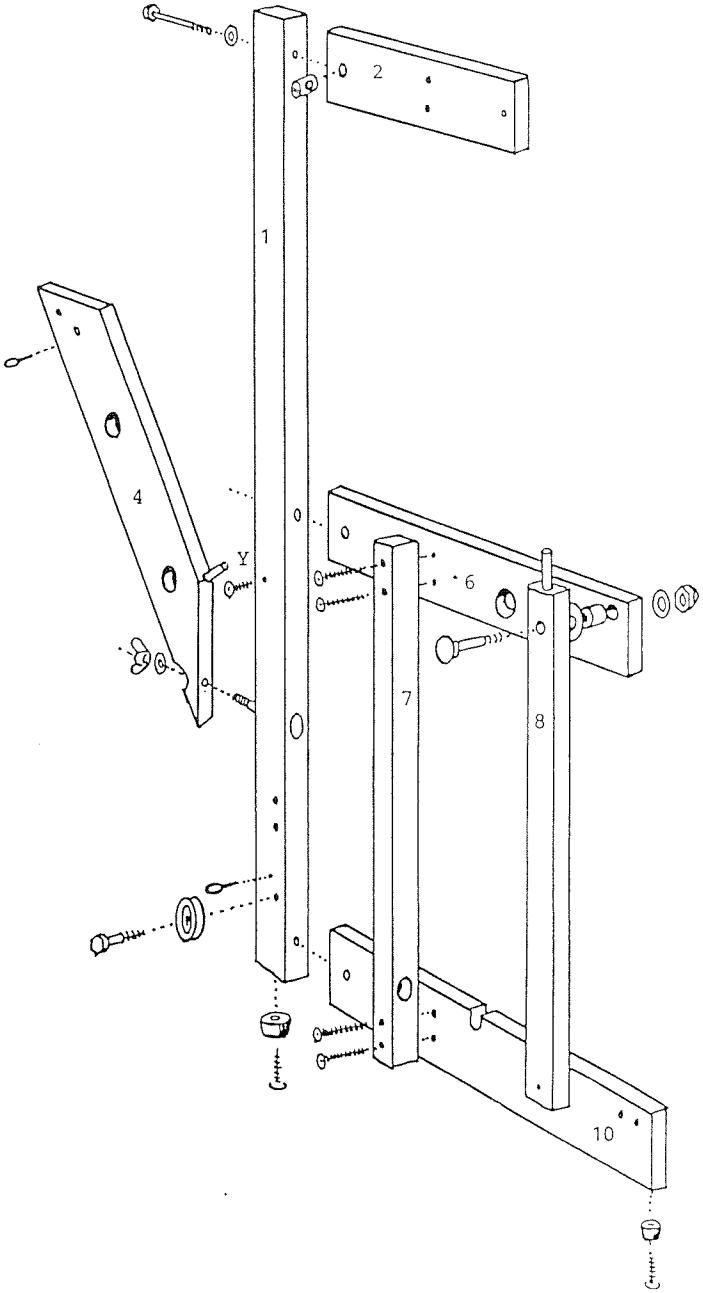

19
34
35


2
1
6
4
7
8
10


22
24
23
25
26
27
28
29
30
31
32
33


2
1
5
3
8
7
9


2
1
3
Y
5
8
7
9


2
1
4
Y
6
7
8
10

Assembly of side pieces (1 1/2 hour)

--- Move pieces 1 up to and including 10 and hardware bag A to a large working area (4'x4'). Open hardware bag A and sort the contents out:

2 small and 2 large rubber feet
6 screws 1" long
8 screws 2" long
2 black rollers
2 lag bolts
6 bolts with washer and barrel nut
2 carriage bolts with washer and wing nut
2 carriage bolts with 1 bushing, 2 washers and 1 cap nut each
4 screw eyes
1 screw driver
1 wrench

The square part of the head of a carriage bolt should be inserted into the wood. You may carefully use a hammer for that job, if the bolt is not long enough to do it by tightening the nut. The alternative is to remove a washer to allow enough of the bolt to protude to be caught with the nut. When the nut is tightened down, the head of the carriage bolt will sink into the wood. Remove the nut to replace the washer. Replace the nut and fasten it until the head of the carriage bolt is pulled into the wood, leaving only the rounded head above the surface.

--- Fasten the large rubber feet to the bottom of both main vertical pieces, 1, using the 1" screws. The pilot holes are already drilled to help you.

--- Fasten the remaining smaller rubber feet to the bottoms of the base side pieces, 9 and 10. Again, the pilot holes assist you.

--- Attach the side pieces, 2, 5, 6, 9 and 10 to the main vertical pieces. Consult the diagram to see how the pieces are turned. Do not tighten the bolts fully.

--- Screw the vertical supports, 7, to each side piece, with the large hole down and the smaller holes facing back. Each vertical support requires four, 2" long wood screws. Again, the pilot holes in pieces 5 and 9, and 6 and 10 assist you.

--- Fasten the floating arms, 8 to each side, using the carriage bolts with washers, bushing and cap nut. Be sure that the larger washers are between the floating arms and the middle side pieces. Now the arms must swing free.

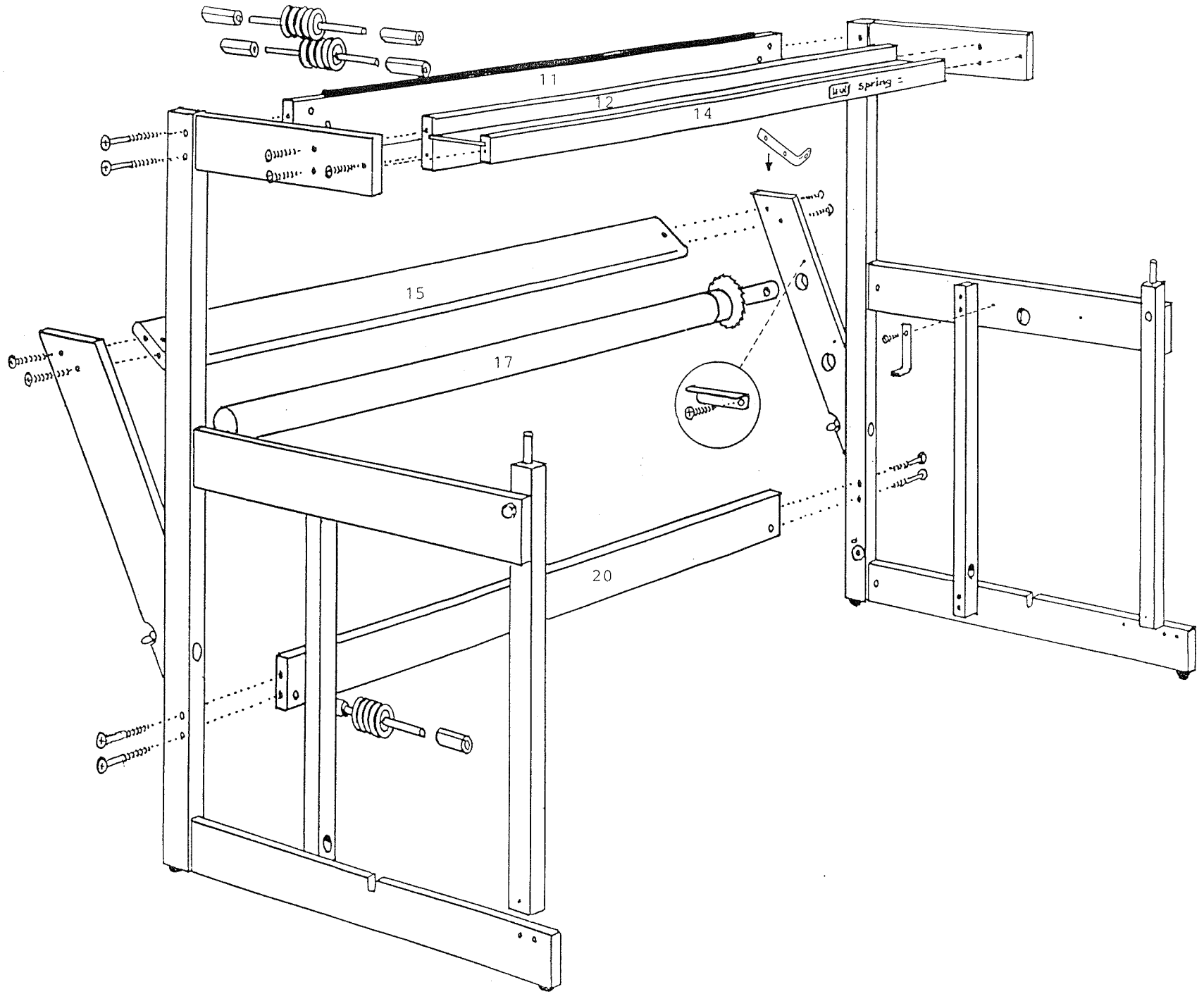
--- Pieces 3 and 4, the warp beam holders, have a plastic rod coming out of the wood. Insert these rods into the holes at the back of the main vertical pieces. Fasten the lower point of these beam holders with the carriage bolts with washer and wingnut as shown in the diagram.

---Secure the plastic pieces by screwing the 1" screws into the holes marked Y in the diagram.

---Install two of the small screw eyes in the pilot holes near the bottom of the vertical main pieces. The other two has to be screwed into the pilot holes at the back side of the warp beam holders, These screw eyes are intended to secure the lease sticks to, if you want them in during the weaving. If the lease sticks are allowed to move foreward as the warp is advanced, they will interfere with the action of the loom: The shed will be shallower, more effort is required to make the shed and extra, unecessary tension will be placed on the warp.

--- Fasten the black rollers to the vertical main pieces, just below the screw eyes using the lagbolts. after the bolts are tightened, unscrew them 1/2 turn. The rollers should now turn freely.

There, you have completed the assembly of the sides of your new Spring loom.


11
12
14
15
17
20

Assembling the frame and rollers (1hour)

Set aside pieces 11, 12, 13, 14, 15, 17 and 20. These pieces will join the completed loom sides you have just assembled. Open hardware bag B and put all like parts together:

10 screws 2" long
8 screws 3" long
2 screws 1" long
2 screw eyes
1 large and 1 small ratchet
1 bracket (looks like the large ratchet)
6 axles
12 plastic spacers
24 black rollers

--- Srew the screw eyes into the pilot holes at the back side (they will face the back of the loom) of the back castle piece, 11.

--- Pick out four of the 3" long screws and use them to fasten the back castle piece, 11 to the side pieces, 1. Now for the first time, your new loom will stand by itself !

--- Insert four of the axles into the holes of the back castle piece, 11. Push them in as far as they will go. If you have a four shaft loom, put one transparent spacer and four black rollers on each axle and then slip another spacer on. If you have an extension to make it an eight shaft loom, put eight rollers on each axle and then slip a spacer on. If you assemble a twelve shaft Spring loom, you don't need the spacers, but twelve rollers on each axle.

--- Slip the front castle piece, 12, onto the protruded ends of the four axles one by one. Mount the front castle piece to upper side pieces, 2, using four of the 2" screws. Be sure, the screw holes line up with the pilot holes in the ends of the front castle piece.

--- Now you may fully tighten the six bolts, that connect the side pieces to the main vertical pieces.

--- Slip the shelf bottom, 13, into the slot in 12 and fit the shelf front, 14, in place, so that the shelf bottom is held. Fasten the shelf front, 14, to the top side pieces using two of the 2" screws.

--- Insert the remaining two axles into the vertical side pieces, 7. They fit into the holes wich face the back of the loom. There are two of such holes on each piece, use the inner holes. Put on rollers and spacers corresponding with the other four axles.

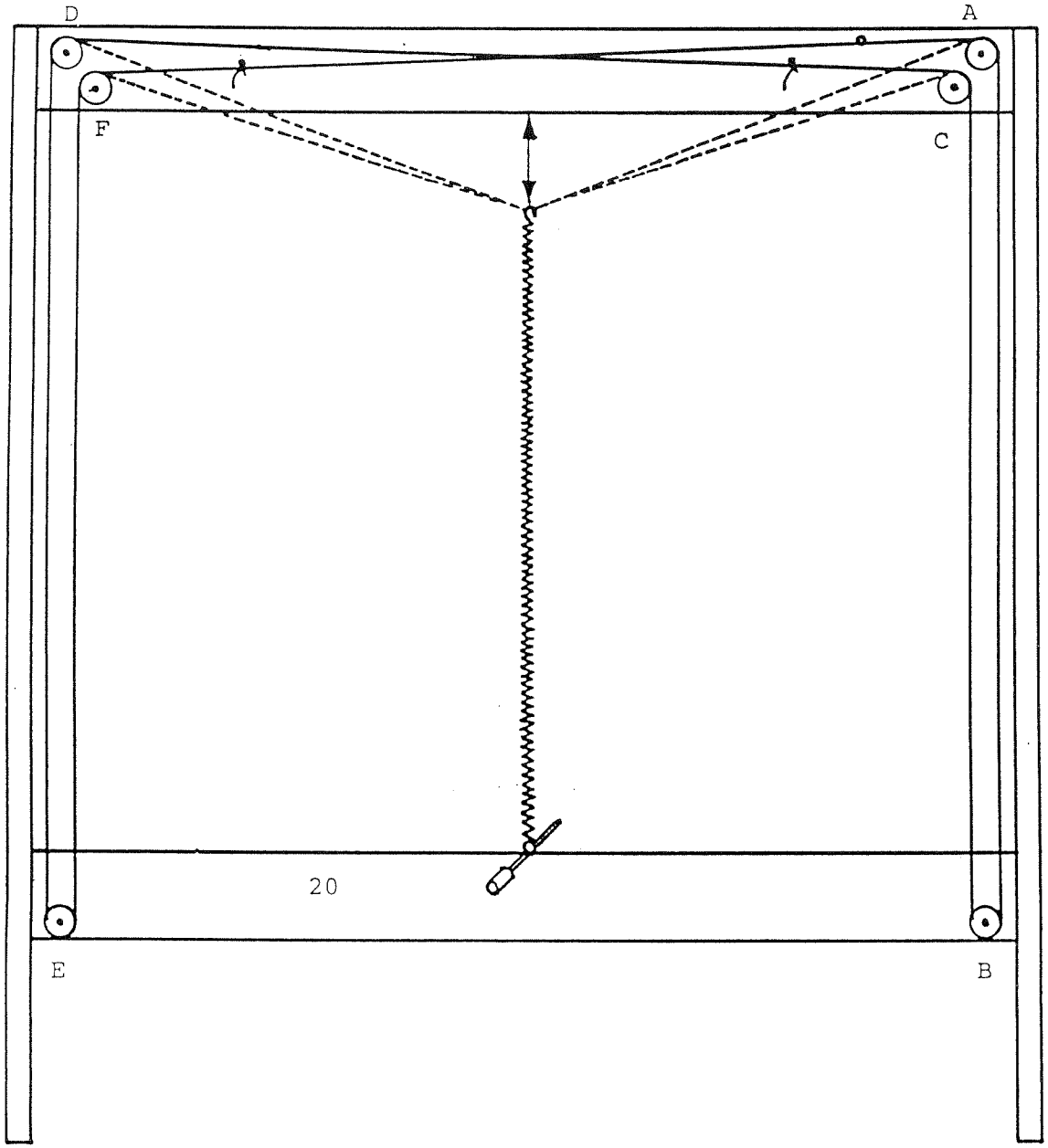
--- Position the back horizontal rail, part 20, so that the axles fit into it and the pilot holes line up with the screwholes in the side pieces, 1. Use the remaining four longer screws to fasten the horizontal rail to the sides of the loom.

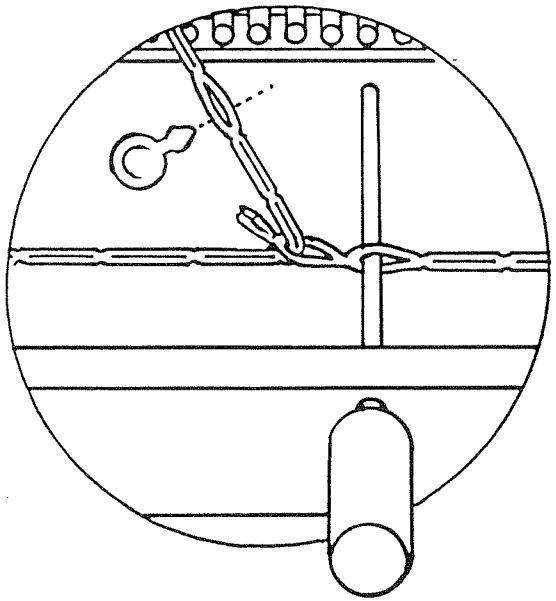
--- Insert the warp beam, 17, in the holes of the warp beam supports, 3 and 4. The supports will flex enough to allow you to slip the warp beam in place, if you unscrew the wingnuts. If your loom has two warp beams, this is the time to insert the second warp beam, below, first and then the first warp beam on top.

--- Retighten the wing nuts again and position the back beam, part 15, between the warp beam supports and fasten it with the four remaining 2" screws. At the same moment you have to use this screws at the right side to attach the metal bracket to the warp beam support, see diagram.

--- Finally, install the ratchets. The small one goes just above the rachet wheel on the warp beam. The large one goes where the cloth beam will be, see diagram. Fasten them with the 1" screws tightly and then back off by 1/2 turn, so the ratchets are free to move as the ratchet wheels turn.

Now you have completed the assembly of the frame of your loom. Next we will install the cords that make the continuous loops, mentioned in the section about the parallel countermarch system.


D
A
F
C
20
E
B



Installing the parallel cords (1/2 hour)

Open hardware bag C and remove the contents. Inside you will find a sort of knitting needle with a wooden handle, called the locking pin here, four nylon pegs and four pre-cut long cords. If you are assembling an eight or twelve shaft Spring, you need in this stage the pegs and the cords from the extension kits too. Place the nylon pegs on the shelf in the top of your loom, so they will be handy when you need them.

--- Work the locking pin through the hole in the front castle piece. Put the tip into the second loop from the end of one of the cords and then into the little hole in the back castle piece. Run the cord over the first rollers of the six axles, starting over upper roller A and then successively over roller B, C, D, E and F, back to the locking pin, making a cross in the center of the castle. Bring the free end of the cord through the last loop, just beyond the locking pin and secure with one of the nylon pegs. See diagram.

--- Install the remaining cords the same way

--- Remove the locking pin, open hardware bag D, remove one of the long springs. It has a hook at one end and a cord attached to the other end. To check the tension of the cords, hook the spring over one of the crossed parallel cords and stretch it down to the top of the horizontal rail, 20. The distance between the bottom line of the castle and the cross in the cord must be between 1 5/8" and 2" for a Spring 90 and between 2 1/8" and 2 1/2" for a Spring 110. If it is not, adjust the length of the cord by moving the nylon peg in the end, designated the free end, of the cord.

--- Adjust the length of the other cords, in order to get about the same tension on all the parallel cords.

The cords need to have so much tension that they don't slip off a roller when the shafts are in action. On the other hand, the higher the tension, the more power the shaft action takes. When shaft bars and lams are attached to the cords, as pointed out later on, it will shorten the cords about one cord loop.

--- Shift the cords so that the pegged joints alternate, the first on the left of the cross, about 8" from the rollers F, the second on the right of the cross, about 8" from the rollers C. To reach this point, you have to shift the peg over the rollers A, B and C. Shift the third cord like the first, etc.

Attaching the warp tension regulator (1/4 hour)

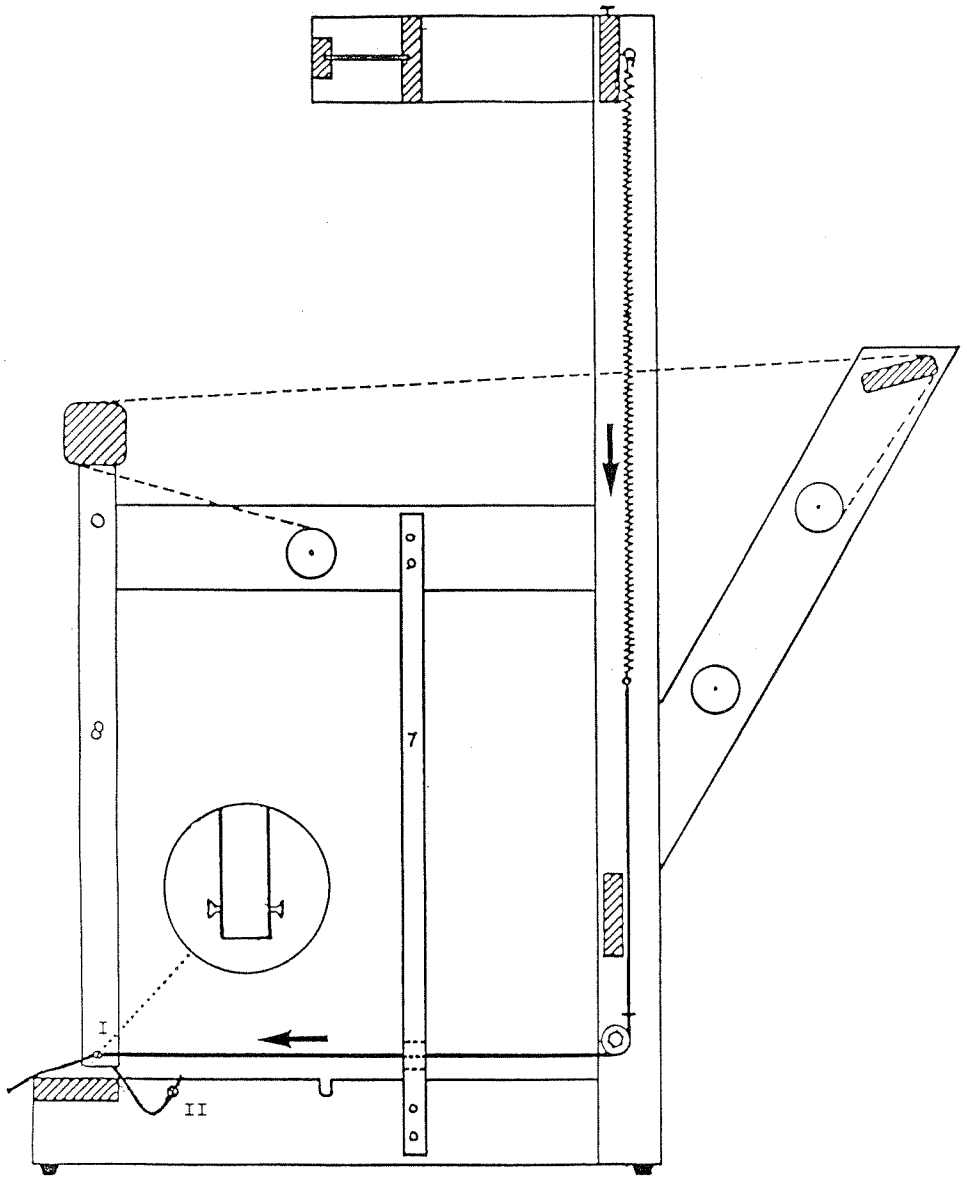
The system you are about to install is what gives the Spring loom its name and is one of its nicest features. When weaving is in progress, the creation of the shed puts extra tension on the warp of a loom. The Spring is designed so that the extra tension for the most part is taken by the springs, leaving the warp at almost constant tension all the time.

You opened hardware bag D in the last section. Return to it and find besides the two springs with there cords, six screws and two short cords

--- Screw four of the small screws into the pilot holes at the bottom of both floating arms 8. The other two have to be screwed into the pilot holes in the base side pieces, labelled II in the diagram. The heads of these six screws have to project about 3/16".

--- The springs with their attached cords will be installed now. Secure the hook end through the screw eye on the back of the castle, bring the attached cord down through the screw eye directly below and over the roller just below it. Attach the free end of this cord to the screw protruding from the insite of floating arm 8. Install the other spring at the other side of the loom the same way.

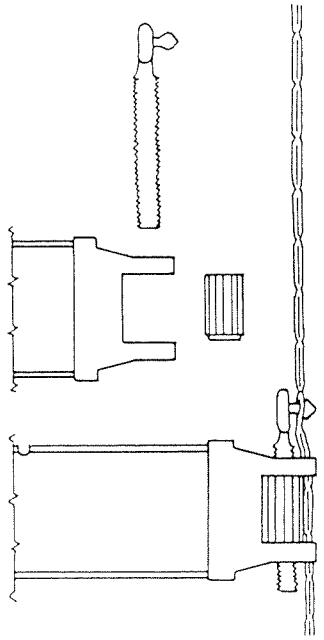
--- The screws at the outsite of the floating arm and at the inside of the base side piece have to be connected with the remaining short cords on both sides of the loom.



How the warp tension regulator works

When you tie the warp to the cloth beam, the breast beam has to be protected from moving, in order to get an even tension on the warp. When you release the springs by taking them off the screw eyes, the short cords you just installed will block the breastbeam in a backward position, so you can tie the warp to the apron rod of the cloth beam . Than take the tension from the warp and attach the springs again. Tighten the warp by beaming, so that the floating arms are vertical. Now judge the warp tension; if you want more or less tension for your weaving, tighten or loosen the spring cords, adjust the floating arms in the vertical position by adjusting the warp tension and judge this tension again. Repeat this if necessary. Take care that there is about the same tension on both springs (same extension)

During the weaving, each time you advance the warp, tighten it so that the floating arms are vertical, thus guaranteeing that the warp tension is always the same. Constant warp tension will allow you to weave more even cloth. No matter what loom you use, advance the warp frequently by small amounts for the best results.



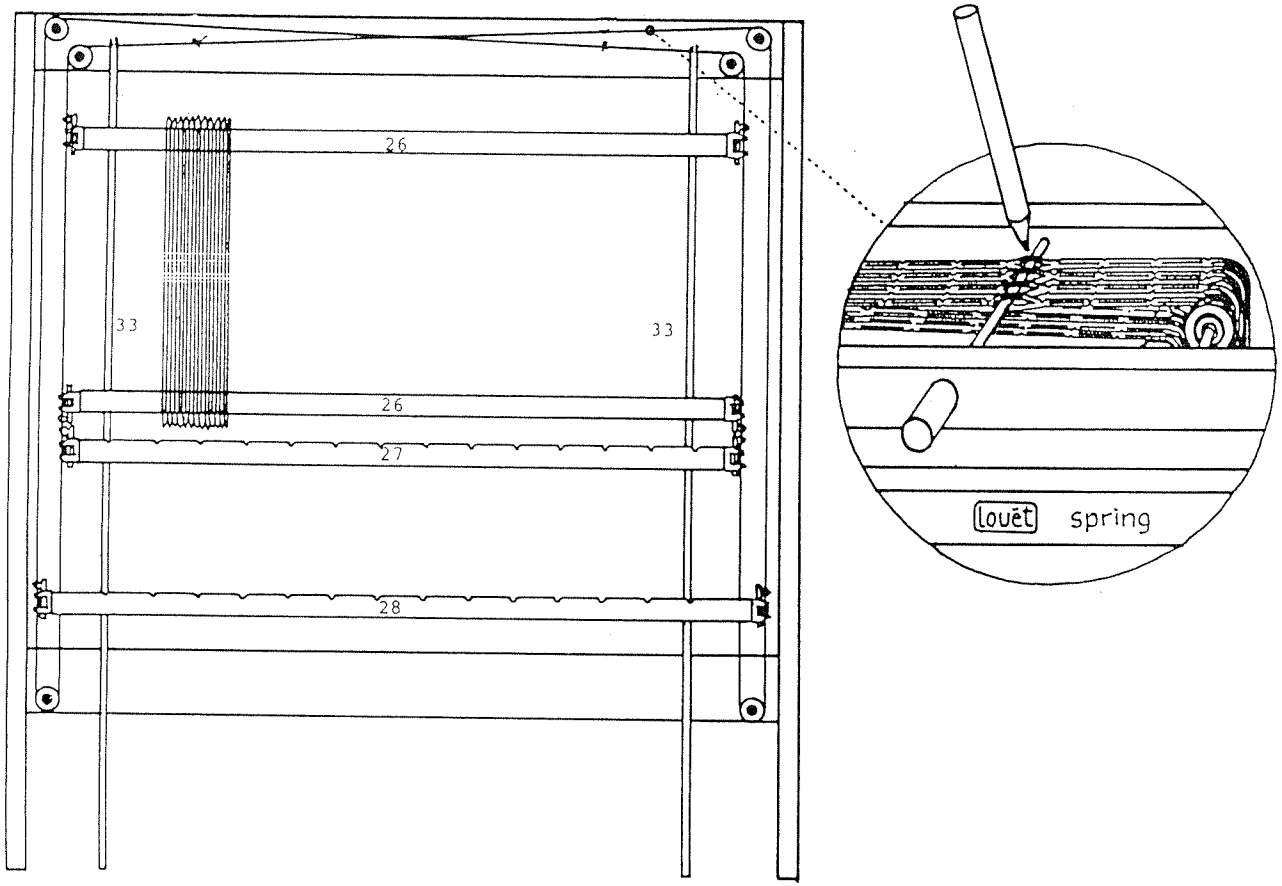
Assembling the shafts and lams

(1-2 1/2 hours, depending on the number of shafts)

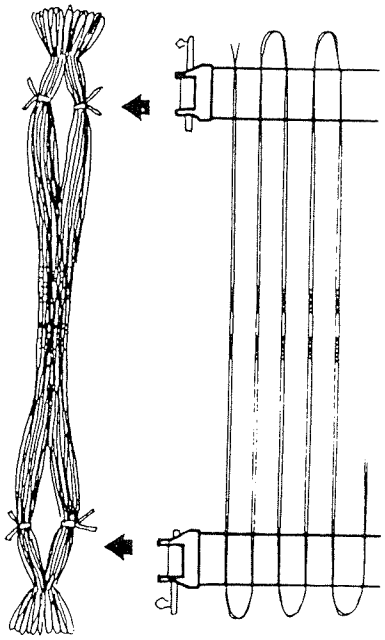
Open hardware bag 5. In it you will find 32 black adjusting hooks and 32 white knurled nuts.

--- Insert the adjusting hook into the end of the shaft bar as shown and fasten it in place with the knurled nut. Install adjusting hooks into both ends of all shaft bars, the beak-like tops of the hooks at the same side of the bars, pointing to the outside. Unlike the shaft bars, the lams have a direction: The side with the grooves in it is the top.

--- Install the adjusting hooks with the knurled nuts in all the lam bars, the tops of the hooks at the topside of the lams.


26
33
33
26
27
28

louët
spring



For hanging the shafts and lams, you will need the measuring rods, 33, the bundles of texsolv heddles, the locking pin and a marking pen.

--- Insert the locking pin through the hole of the front castle piece, then through the loops of the upper cords and into the hole in back of the loom, after you have checked that the knots are still located at about 8" from the rollers.

--- Mark the loops held by the locking pin. You will refer to these loops again. Each time you want to control and adjust the heights of the heddle bars and lams, the parallel cords should be locked in this position. If you don't weave on all shafts it is comfortable to lock the shafts that are not in use.

--- Slide the groove at the top of the measuring rods, 33, over the backmost cord near the lower roller, one on each side. See diagram.

The notches in the measuring rods indicate the heights of the heddle bars and lams.

--- Slide a bundle of heddles over a heddle bar, then hang it on the parallel cord by popping the beak-like pegs on either side into loops, so that the heddle bar is hanging about the height, marked by the measuring rods. Slip a second heddle bar through the bottom of the heddle bundle and pop it into the cord at the indicated height. Notice that the beak-like pegs are on the upper edge of the upper heddle bar and on the lower edge of the lower heddle bar.

--- Untie the heddle bundle and spread the heddles over the shaft.

--- Hang a shorter, upper lam from the inside cord, using the first cord loop below the lower heddle bar.

--- Hang a longer, lower lam from the outer cords, so that the inner cord passes behind it.

--- Hang all shafts and lams the same way.

You may need to divide the heddle bundles, because you need another number then one hundred heddles on a shaft. The way to do this is to pass the lease sticks through the ends of a bundle, untie the bundle, split it, tie the smaller bundles again and cut them apart. When you need to remove heddles from a shaft, secure the bundle by tying it in four places to avoid tangling the heddles.

--- Fine tune the height of the heddle bars and lams so that they match the notches in the measuring rods by using the white, knurled nuts. If necessary reposition the adjusting hook into another loop. Double check to be sure that the notched edges of the lams face up.

When you release the tension of a parallel cord, by taking it off a roller, it will be easyer to pop a heddle bar off and in the loop of the cord, each time you need to add or remove heddles. Don't forget to replace the cord on the roller again.

It is helpful to have marked the loops that you use to attach the upper heddle bars.

Installing the cloth beam and attaching the tie-up cords to the beams (1/4 hour)

Besides the cloth beam,18, you need the cloth beam lever in this section. Open hardware bag E and take out the cords and the short screw (5/8"). The remaining contents you will need for next section.

--- Insert the wooden end of the cloth beam into the hole in the cloth beam lever, so that the ratchet matches the ratchet wheel.

--- Install the cloth beam; spread the sides of the loom a little and insert the beam into the holes.

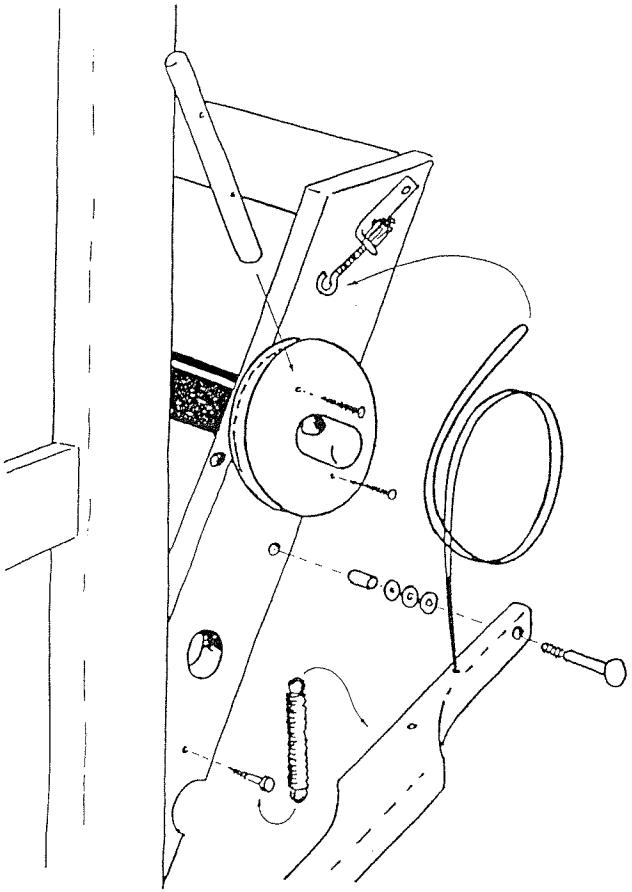
--- Screw the short screw into the pilot hole in the middle side piece near the cloth beam lever and attach the cord of the lever to the screw head.

When the breastbeam is installed, the cloth beam will be securely held in place because the sides of the loom can no longer be spread. When you tie-up the treadles, or want to change the tie-up, it is comfortable to remove the breastbeam and cloth beam.

The cords in hardware bag E are intend to attach the apron rods to the warp and cloth beam. There come 6 cords with a Spring 90 and 8 cords with a Spring 110 loom.They are precut at the same length.

--- Attach one end of a cord to the first screw head on the beam and the other end to the second screw head. Attach next cord to the next pair of screw heads, and so on.

--- Use a larkshead knot, see diagram, to attach the cords to the apron rods. Each of them has three or four marks on them to show where the loops should lie.



Assembling the brake on the warp beam (1/2 hour)

Now you need the brake lever, 34, the brake drum, 19 and the remaining hardware from bag E:

1 round wooden stick
1 spring
1 lag bolt
2 screws 1 1/2 " long
1 metal bushing
4 washers
1 carriage bolt
1 cap nut
1 threaded hook
1 knurled metal nut
1 brake cable

--- Slip the thread end of the large hook through the hole in the metal piece that you attached earlier at the warp beam holder and secure it with the knurled metal nut.

--- Slide the brake drum over the end of the warp beam and fasten it there with the round stick and two screws. Use the pilot holes in the brake drum.

--- Screw the lag bolt into the pilot hole, just so deep that the thread disappears in the wood.

--- Lace the brake cable through the smaller hole of the brake lever, starting at the side where the metal hook protrudes.

--- Attach the brake lever to the warp beam holder; insert the carriage bolt into the larger hole at the end of the lever, then slide on three of the washers and the metal bushing, Insert the end of the bolt with bushing into the hole in the warp beam holder, Fasten it with the remaining washer and cap nut.

--- Mount the spring by slipping one loop over the head of the lagbolt and then the other over the hook of the brake lever. Lift the lever, wrap the cable over the brake drum and slip it over the hook, you installed earlier.

--- Adjust the brake lever in a horizontal position; lift the lever and tension the cable by fastening the knurled nut.

The ratchet and ratchet wheel of the warp beam are extra. If you use the brake on the warp beam, while weaving, just turn the ratchet out of duty. When you are warping the loom it is easyer to use the ratchet wheel and release the brake by removing the cable from the drum.

If you need to release the cloth beam for beaming the warp backward, while weaving, first release the tension of the warp by lifting the brake lever and then turn both ratchets of the cloth beam out of duty.

Treadle assembly (1/2 hour)

Bring out the footrail, 21, the treadles and the contents of hardware bag F:

4 wooden mounting blocks
4 screws 3" long
4 screws 2" long
24 screws 5/8" long
3 axles
3 nylon spacers.

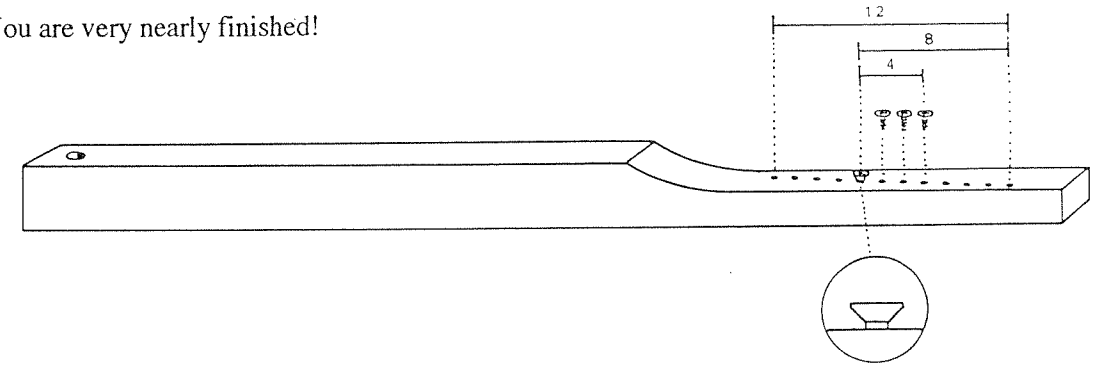
If you are assembling an eight or twelve shaft Spring, you need the hardware and treadles of the extension kit too.

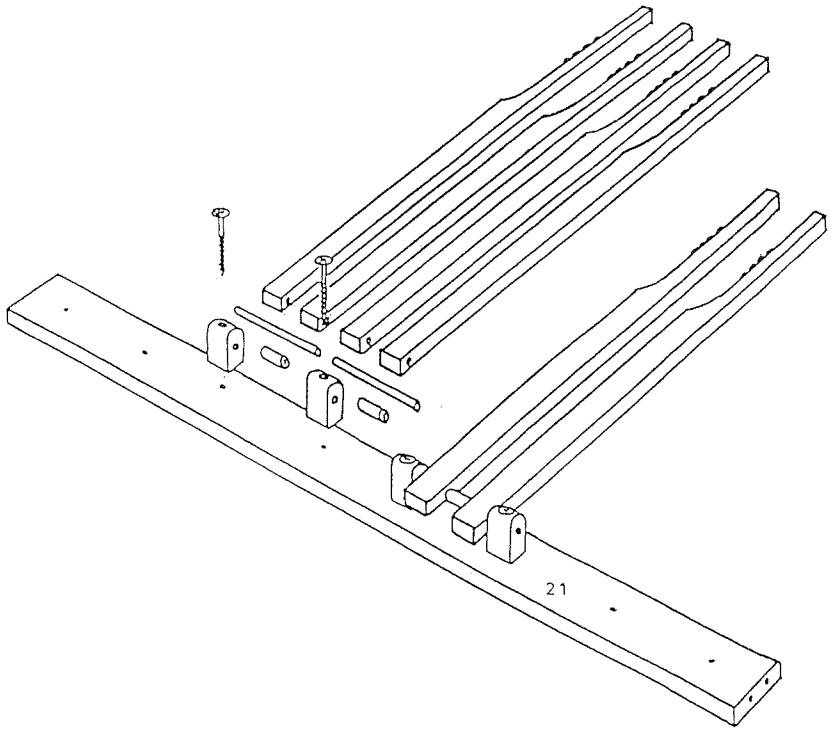
--- The treadles have a series of small pilot holes, drilled along their curved sides. If your loom has twelve shafts, you will screw a small screw into all the holes. If your loom has eight shafts, you will screw a small screw into the first eight holes, counted from the narrow end of the treadle. If your loom has four shafts, you will only use the center four holes for the screws. Leave the head of each screw exposed for about 3/16". Repeat this procedure for each treadle.

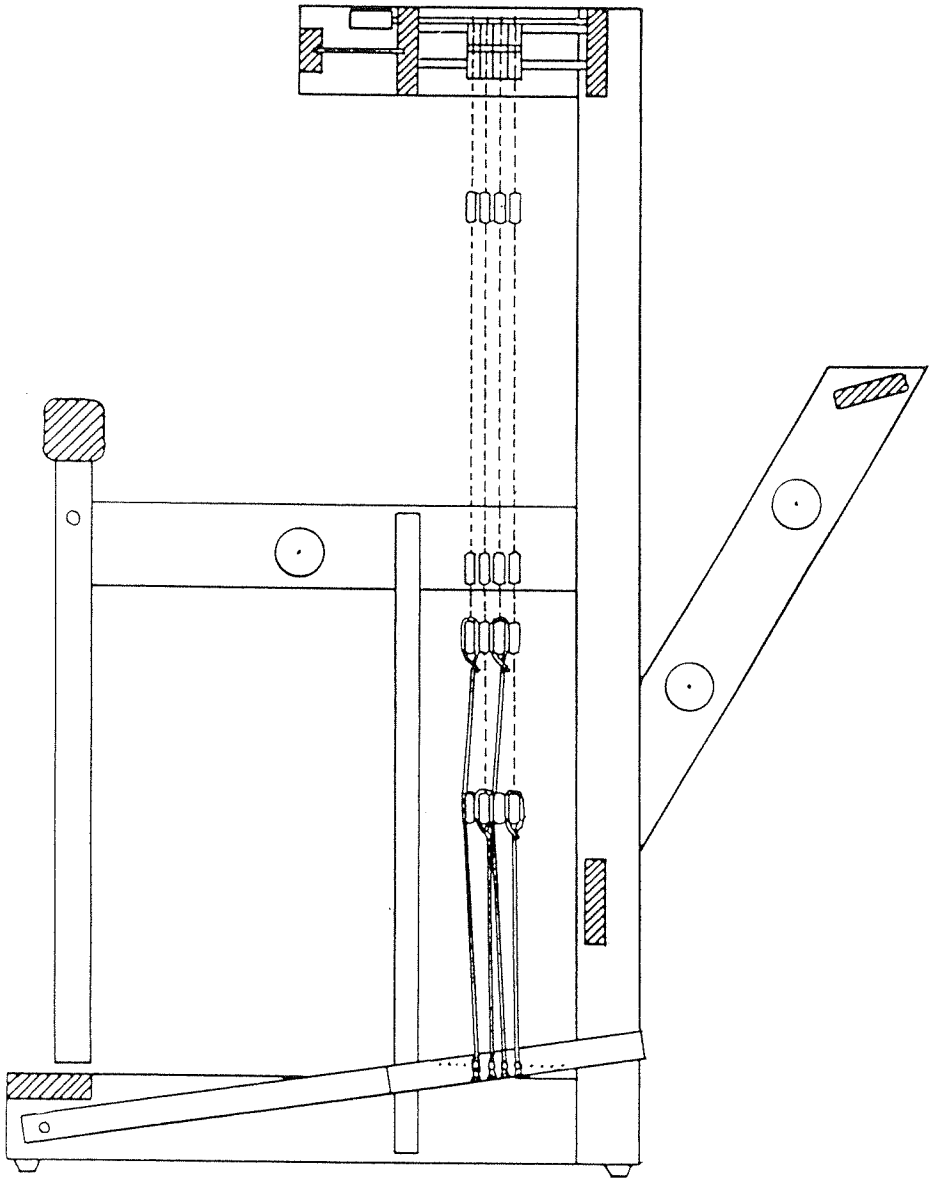
--- Assemble the treadles two at the time. Turn the treadles so that the side with the newly-installed screws face left. Slide an axle into a treadle, through a spacer and through another treadle. Slip a mounting block on each side of the axle. Drive a 3" long screw through the hole in the mounting blocks and fasten them into the pilot holes of the footrail.

--- Install the other treadles, two by two. If you are mounting less then the fourteen treadles of a twelve shaft Spring, do mind that you leave the same number of pilot holes unused at both sides.
--- Turn the footrail and treadles over, check that the screws in the treadles now face right and mount the footrail to the loom, using the 2" screws.

You are very nearly finished!







Tying the treadles

Bag G contains 18 longer cords to attach the upper lams and 18 shorter cords to attach the lower lams. These cords are precut at the right lenght and if you consistently use the loop at 1/2" from the end as the first loop, the tie-up will have the proper lenght, without any adjustment.

The upper lams pull the shafts down, they correspond to the X in the tie-up portion of a weaving draft. If only O's are shown, the blank spaces are tied as if marked X. The lower lams lift the shafts and correspond to the O in the tie-up. If only X's are shown, the blank squares are tied as if marked O. You may find it helpful to mark the lower lams O and the Upper lams X.

--- Use the locking pin to keep the parallel cords stationary (it may be still in place from other steps). Be sure that all lams are hanging parallel and are at the same heigth.

--- Loop the cord around the lam and pass the free end through the last loop in the other end. Cinch down after the loop is positioned in one of the grooves in the lam. Notice that ties from the upper lams pass in front of the lower lams.

--- To tie a particular lam to a particular treadle, simply slip the last eye of the cord onto the corresponding screw on the side of the treadle.

All shafts will be tied to all treadles used, some to rise and some to fall. If you want to change the tie-up, only unhook the cords from the screw heads and slide the cord over the lam to the groove where you need it. You may leave the left over cords looped over the lams at the sides.

Assembling the beater (1/2 hour)

Bring together the beater bars,22 and 23, the beater handle, 24, the beater supports,25 and the remaining hardware bag H, wich contains:

2 swiveling beater feet, 2 bolts with washer and barrel nut, 2 lagbolts, 2 carriage bolts with washer and wing nut, 2 metal spacers, 2 rubber beater stops, 2 screws and 4 washers.

--- Attach handle, 24, to the top beater bar, 22, with lag bolts, washers and metal bushings for spacers, as shown in the diagram.

--- Screw the swiveling beater feet into the bottom of the beater supports, 25.

These beater feets may be used to adjust the height of the beater. The shed is made by warp ends that rise and ends that are pulled down. The shuttle race ouhgt to be just at the height of the lowered ends, so they just lie against the little wooden shelf that helps support the shuttle as it flies one from selvedge to other. The feet may be unscrewed to raise the shuttle race or srewed further in to lower it.

--- Attach the lower beater bar, 23, to the beater supports, with the bolts, washers and barrel nuts.

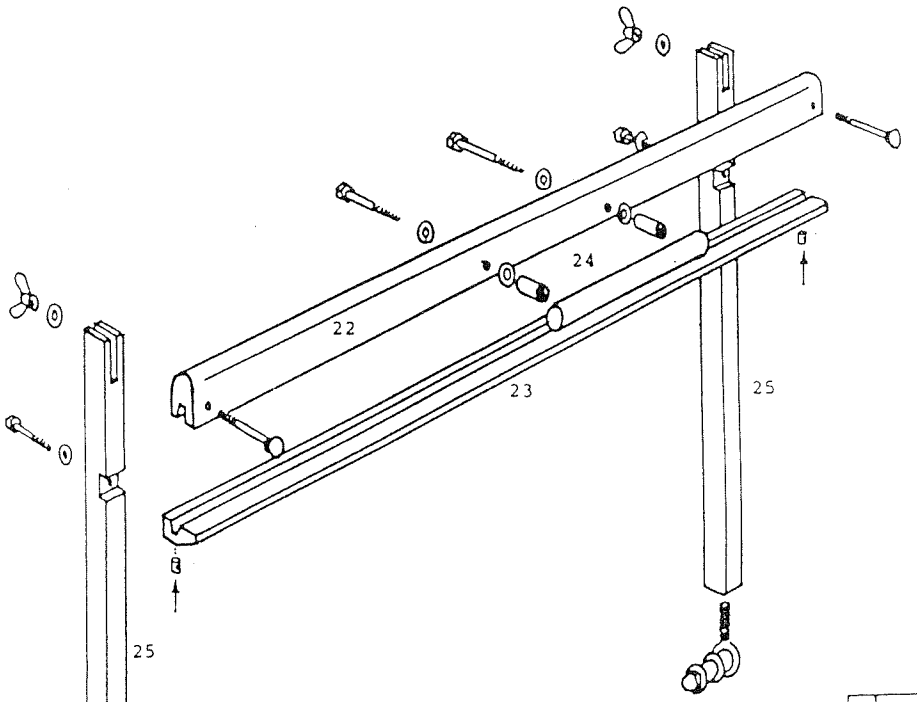
--- Attach the top beater bar, 22, to the beater supports with the carriage bolts, washers and wing nuts.

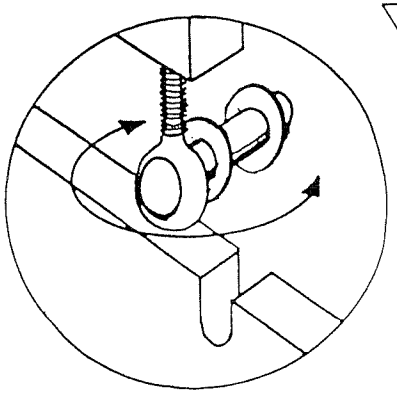
--- Srew the rubber beater stops on the outside of the middle side pieces. Two pilot holes have been drilled on each side. The one toward the back is to be used if your loom has four or eight shafts. the nearer one is intended for looms with the full complement of twelve shafts.

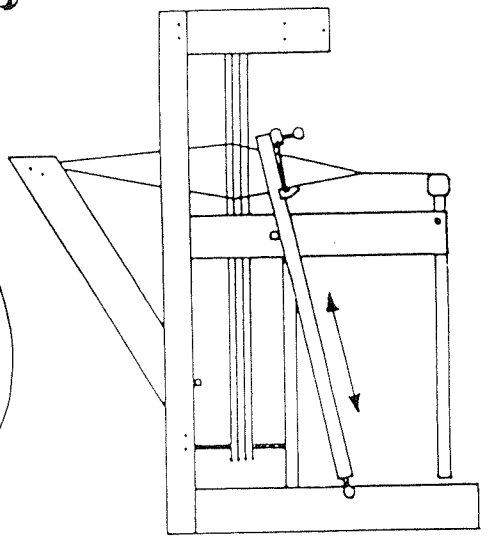
--- Set up the beater in the loom, slipping in the beater feet to the notches in the base side pieces.

--- Finally, slip the breastbeam, 16, down over the two metal rods at the top of the floating arms.

There! you 've done it. Your loom is assembled and ready to warp.







Maintenance

Your Spring loom is easy to maintain. One month after it was assembled, retighten all screws, bolts and nuts, except the screws that were meant to protrude. Thereafter, check two or three times a year on bolts and screws that need to be retightened. Don't forget the screws at the bottom side, that keep the treadles.

To fold your loom

If your loom is warped, release the tension, by lifting the brake lever. Undo the wingnuts that hold the warp beam supports in place. The plastic rod will bend enough to allow you to move the warpbeam forward, by tensioning the warp, or keep it folded with a piece of twine if there is no warp on the loom.

When things do not work smoothly

The shed is to small

May be caused by:
- The treadles are tied too high or too low.
- The lams are adjusted too high or too low.
- The shafts are adjusted too high or too low.
- The lease sticks are between the shafts and the back beam.
- The beater is adjusted too high.
- The cloth should be advanced to the cloth beam.
- The upper and lower lam cords may be crossed over each other.

The treadles won't move

May be caused by:
- The locking pin is still in the parallel cords.
- An error in tying up the treadles: The treadle is tied to both the upper and lower lam of the same shaft.

One or more shafts are difficult to move

May be caused by:
-The parallel cord may have slipped off one or more rollers.
-The parallel cord is too tight.

During tying up the warp, the tension on the warp stays irregular

May be caused by:
- The springs of the tension regulator have not been unhooked from the screw eyes.
- One of the short cords that lock the floating arms is not attached.
- One of the warp beam supports is not compleetly fixed with the wing nut.

The cloth cannot be beamed

May be caused by:
- One of the ratchets of the cloth beam is not in the ratchet wheel.
-The ratchet of the warp beam is in the ratchet wheel, so releasing the brake won't release the warp.
- The apron bar of the cloth beam is caught on one of the floating arms of the tensioning device.

The shed is not equal all the way across the warp

May be caused by:
-The shafts or lams are not level. Check by inserting the locking pin and levelling them.

The cloth is slented

May be caused by:
-The tension on the spring of the tensioning device is not adjusted about the same.
- One of the cords of the springs is slipped off the roller.
- One of the warp beam supports is not fixed with the wing nut.
- The beater is not adjusted on the same level at both sides.