XIV FRICTION BRAKE

The friction brake permits a fine adjustment of the warp tension. (The ratchet wheels and dogs give a more or less uniform tension, depending on the correspondance of the teeth on the wheels and the diameter of the beam.)

The friction brake is particularly appreciated on fine material, on fibers without elasticity as linen and fine wool.

It has a flat steel wire band, called a wire brake circle, wound several times around a metal friction wheel, which is attached to the end of the warp beam. One end of the wire circle is attached directly to the loom. The other end is attached to a coil spring which pulls it straight down. The greater the pulling power applied to the wire brake circle the stronger the brake action.

IMPORTANT: When putting the brake circle on the friction wheel do not attempt to uncoil it or disturb it's natural coil in any way. If uncoiled or bent the brake will not operate properly and the wire circle must be removed from the loom. When removed from the loom, one can attempt to recoil it by winding it on a round object of a smaller diameter than the friction wheel.

To install or remove the warp beam from the loom, insert or extract the friction wheel from the wire brake circle. (fig. 486)

It is also important to check the wire brake circle to insure that none of the coils overlap each other and that they are all in their proper place on the friction wheel. These items are critical to the proper operation of the brake.

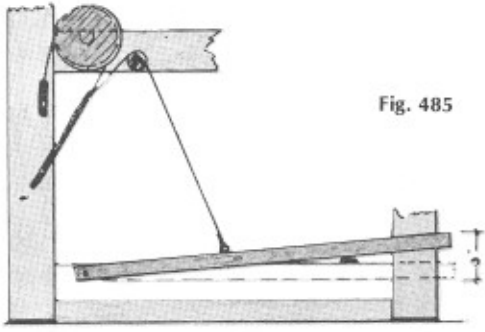

Fig. 485

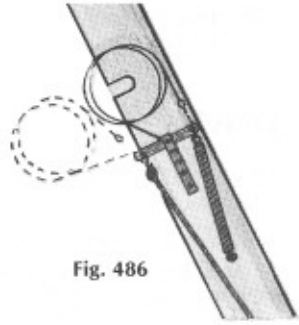

Fig. 486

The beam must turn clock-wise to roll the warp.

On older looms or on those which have had excessive use, you may find that the brake does not hold properly. This is usually caused by dirt, lint, or grease on the wire circle and friction wheel. The metal parts should be cleaned with a cleaning solvent. If the brake still does not hold properly, check the friction wheel as it may have worn very smooth. In this instance, use a small flat file to score or rough the surface of the friction wheel to allow the wire circle to grip.

Depending on the style of loom you have, the brake system may be released as follows:

— By depressing the brake, release lever. It can be held in down released position by a small catch installed for this purpose on the front of the loom.

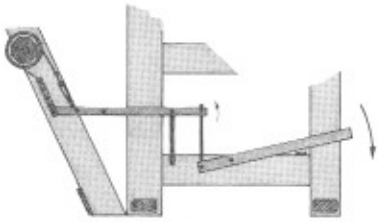

Fig. 487

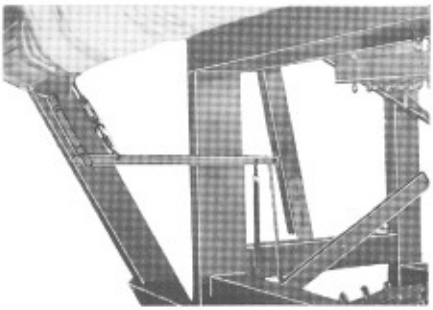

Fig. 489

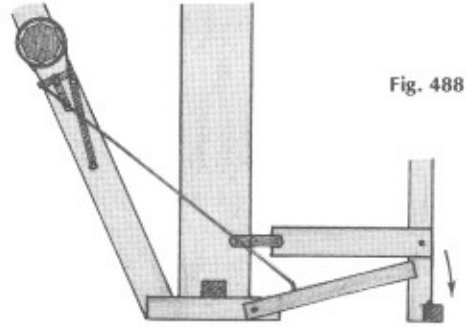

Fig. 488

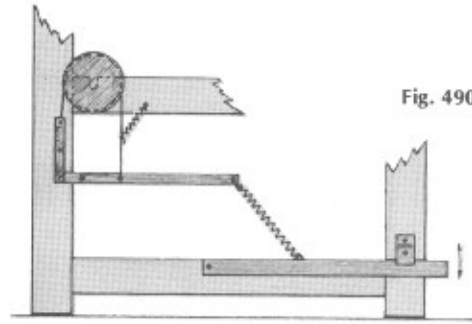

Fig. 490

— By releasing the brake release lever from it's mechanical stop and allowing the brake lever to raise.

WARNING: Never put grease, oil or any type of lubricant on the brake system, as it will cause it to slip.

Weaving

— If your loom is equipped with the friction brake as illustrated in figures 485, 487, 488 or 489, to advance the warp:

Press the brake release lever with very gentle and steady pressure as you would apply the brake on an automobile. Rotate the cloth beam at the same time. Allow the brake to lock in place by taking your foot off the lever. Continue rotating the cloth beam to the next notch in the ratchet wheel. If the tension is too great, apply very slight, gentle pressure of the foot brake release until the desired tension is reached.

— If your loom is equipped with friction brake as illustrated on figure 490, to advance the warp:

Release the brake treadle very gently, controlling it with your foot to keep enough tension to prevent the warp from unrolling too fast, rotate the cloth beam at the same time. Depress the brake release lever and lock the brake in place. Continue to rotate the cloth beam to the next notch in the ratchet gear. If the tension is too great, very gently release it by a slight pumping action on the brake release lever until the proper tension is reached. Lock the brake lever in down position.

XV DOUBLE WARP BEAM

There are some warps where maintaining an even tension presents a problem, and it is necessary to divide the warp. We give a few examples and suggestions.

First: Warps with both fine and heavy threads, often used in drapes and upholstery, can be successfully combined on one warp beam, provided no more than two or three fine threads are between the heavy threads. Warp sticks should be used every 10 cm. (4") as the warp is beamed to keep the warp layers well separated and prevent uneven build-up of heavy and light warp threads.

Second: If your draft produces repeated warp floats on the same warp ends; while the other ends always interweave, the take-up on the floating ends will not be the same as on the interwoven ends. This can be corrected by opening the shed that raises the floating warp ends and inserting a rod under these ends behind the harnesses. Slide the rod back until it is under the warp beam and suspend weights from it until these threads are under the same tension as the rest of the warp. (Figs. 495 and 496)

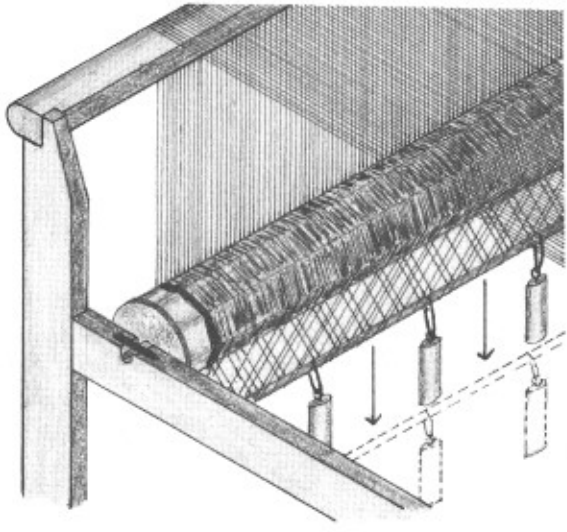

Fig. 495

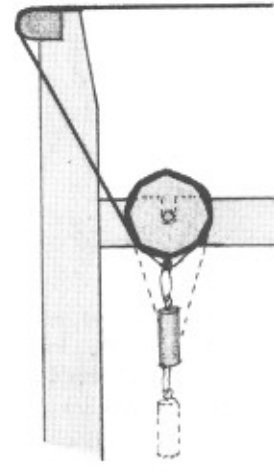

Fig. 496

Third: When mixing threads of different elasticities, such as wool or cotton with linen or silk, the more elastic threads will stretch more under the tension and you will have a poor shed. The solution is the same as in the second example.

On a long warp, these solutions to even tension are not sufficient or satisfactory, and we would recommend an extra warp beam*. The warps should be made separately.

An extra warp beam is useful with several techniques, and a necessity for supplementary warp patterning, and for articles requiring warp loops.

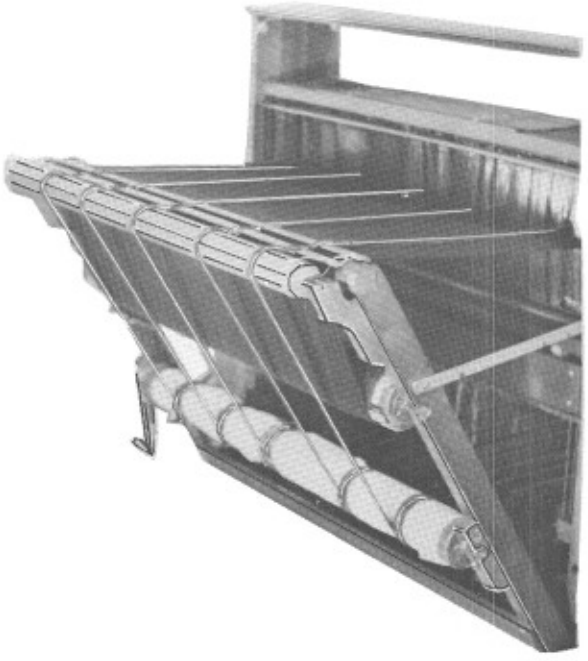

Fig. 497

Install the second beam lower than the regular one at a reasonable distance to be able to put a long warp on each beam, or one sectional warp beam. Follow the instructions supplied with the second warp beam.

A second breast beam has to be attached at the rear of the loom, at about 15 mm. (1/2") higher than the regular breast beam and towards the outside of the loom to allow heavy threads to pass freely between both (minimum 2 cm. (3/4") (Fig. 497)

It is necessary to have both warps entirely separated up to the harnesses and to have different tensions in the techniques where a warp must be released more frequently than the other. The warp which should be released more frequently should be on the second warp beam.

* Much more of this technique will be found in "Master Weaver Library" — Volume 5.

FLYING SHUTTLE

The **flying shuttle beater** is only recommended for weaving material wider than a person can easily reach, that is if you can not throw the shuttle and catch in on the other side. The maximum of a throw usually lies between 90 to 120 cm. (36" to 45"). On a narrow material, the flying shuttle is not faster than the hand shuttle.

The shuttle: It should have metal tips on both ends to preserve the tips. The yarn should leave from one end of the shuttle from a quill which is well filled up.

The best results would be obtained if there was a special designed shuttle for every yarn. But since this is quite impossible for the numerous yarns, we are trying to adjust our shuttles to the most used yarns (wool, cotton and man-made fibers).

The quill should be filled cone-like (see fig. 205, page 11) with the thread running off at one end. This enables the thread to run without resistance. If the smooth run of the thread is blocked, the shuttle might have been thrown out of its trajectory and then out of the loom. A light resistance of the unwinding of the thread may also cause the edge of the material to pull in, while a too loose flow will leave loops on the selvedge.

If the quill empties too fast, especially by linen, silk or nylon, glue a piece of fur at the inside of the shuttle, toward the outgoing end (short haired fur, even artificial fur will do). How far you line the shuttle depends on how slippery your weft thread is. Most shuttles have the possibility of an adjustment, which enables you to give more or less tension according to your thread. The holes in the shuttle, through which the thread runs can be blocked partly with a heavy woolen thread or a fine piece of material to press a little against the running weft thread.

There is no general rule for the adjusting. It depends on the yarn used and the humidity of the room.

OPERATION

The weaver always holds the handle with the same hand, the other hand is on the middle of the beater.

The movement of throwing the shuttle is made either by the wrist turning the handle, or by moving the handle from left to right, or right to left, depending in which side the shuttle is.

It takes practice to get used to this type of weaving. You have to control the rhythm of your movements, to cooperate the throwing of the shuttle, the beating and the changing of the shed.

To change the shuttle for an other color, pull the beater in front, don't open the shed, pull your shuttle smoothly over the material in front of you and let it rest there. Push the new shuttle into the shuttle box.

XVI UNDERSTANDING WEAVING

The following two projects, when completed, will give you a selection of samples and will help you to understand how to design different projects. It will further teach you how to easily modify the texture, even with the same threading, by changing colors.

First project

For the first project we recommend a cotton warp, as it is durable, easily workable and inexpensive. We suggest the weaving of place mats, using them as an exercice to understand weaving at its best. The instructions are given in both the English and metric systems. We shall make the warp long enough to allow for a practice section, followed by four place mats. Following the instructions, select either the metric or English warping procedure. Do not mix them. Use light and strong colored thread.

Warping metric system

You will need:

For the warp: 2/74 Tex, 100 gr. light and 100 gr. dark
For the weft: Same color as the warp

Piece for exercice: 1 meter	1 meter
4 place mats at 50 cm. each: 2 meters	2 meters
	3 meters

Loss at the beginning to tie on the loom: 20 cm.	20 cm
Loss at the end to tie on the loom: 50 cm.	50 cm
6% take-up of warp while weaving: 18 cm. (6% of 300 cm.)	18 cm
	88 cm
	3.88 meters (app. 4 m.)

Width in reed: 34 cm
Reed: 5 dents per cm., 2 threads per dent
Threads X Dents X Cm width = Ends of warp
2 X 5 X 34 = 340
340 threads of 4 m. long = 1400 m. of cotton
Tex N 2/74 cotton is 6757 m. per kg. (See page 105)
6757 m. = 1000 gr.
1400 m. = $\frac{1000 \times 1400}{6757}$ = 207 (makes 208 grams of cotton)
208 grams for 340 ends of your warp is needed.

Warping English system

You will need:

For the warp: 8/2 cotton, 1/4 lb. light and 1/4 lb. dark
For the weft: Same color as the warp
Piece for exercice: 40 inches — 40"
4 place mats at 20" each: 80 inches — 80"
120" or 3 1/3 yards

Loss at the beginning to tie on loom: 8 inches — 8"
Loss at the end to tie on loom: 20 inches — 20"
6% take-up of warp while weaving: 7 inches (6% of 120") — 7"
35"
155" (app. 4 1/3 yards)

Width in reed: 14" + 4 threads
Reed: 12 dents per inch, 2 threads per dent

Threads X Dents X Inches width + 4 threads = Ends of warp
2 X 12 X 14" + 4 = 340

340 threads of 4 1/3 yards long = 1473 yards of cotton
English count 8/2 cotton is 3360 yards per pound. (See table page 105)
3360 yards = 1 lb.

$$1473 \text{ yards} = \frac{1 \text{ lb.} \times 1473}{3360} = \frac{1473}{3360} = \text{App. } 1/2 \text{ lb.}$$

1/2 lb. for 340 ends of your warp is needed.

Warping direction

We assume you use the warping frame.

Take a string the length of your warp which is 4 m. (4 1/3 yards) and place it on the warping frame, using the cross pegs on top and bottom of the frame.

Take four bobbins of cotton of your chosen color: 2 light (grey) and 2 dark (red).

Parts 1 and 2: Use 4 threads (2 dark, 2 light). Make 30 single times or 15 round trips.

4 threads warped at the same time
X 2 bunches of 4 threads per crossing
8 threads per crossing
X 15 crossings
120 threads

Part 3: Use 2 threads of a same color, leaving the two others of the other color free on the last peg. Make one round trip with light threads and one round trip with dark threads. Repeat this 12 times. Then, make one round trip with light threads.

12 times
X 2 runs at each time

24 runs for light thread
+ 24 runs for dark thread (same as for light thread)

48 runs
X 2 threads per run

96 threads
+ 4 last light threads

100 threads at the centre

Then, repeat parts 1 and 2 for the other border with four threads that gives 120 threads.

Total: Parts 1 and 2 = 120 ends
Part 3 = 100 ends
Parts 4 and 5 = 120 ends
340 ends

Now beam and thread your loom by following the instructions starting on page 44.

Warp: X = Dark thread
● = Light thread

Weave about 10 cm (4") of each treadling, always finishing your pattern. After finishing all your samples, place a cardboard of 3 cm (1 1/4") in your shed; this will provide the unwoven warp ends for your place mat fringe.

Weaving direction

To make these designs, use two shuttles (one with the light thread and another with dark thread). Start by the right hand side.

Follow numbers of shuts of each color, according to the pattern given with treadling.

For each change of color, cross the two shuttles to keep the two threads on the border. This requires attention on beginning but becomes soon a habit.

* When the warp thread on the border is not taken by the weft, leave it free for the time of weaving. When weaving is finished, cut it and enter the ends on the edge.

Treadling

	Use treadles	
A (Tabby)	5 - 6	Use dark shuttle only.
B (Tabby)	5 - 6	Use light shuttle only.
C (Tabby)	5 - 6	Follow the order of color as in the 1st part of the threading by alterning your two shuttles.
D (Tabby)	5 - 6	Follow the order of color as in the 2nd part of the threading, that is two light threads and two dark threads.
E (Tabby)	5 - 6	Follow the order of color as in the 3rd part of the threading, that is four light threads and four dark threads.
F	1 - 3	Basket weave with one dark thread followed by a light thread on same shed.
G	1 - 3	Basket weave with two dark threads on same shed, and two light threads on next shed.

** Note when using harnesses Nos 1 and 2 together (treadle 1) or harnesses 3 and 4 together (treadle 3), the warp is always 2 threads together.

H	1 - 2 - 3 - 4	Follow the order of color as in the 2nd part of the threading, that is two light threads and two dark threads.
I	1 - 2 - 3 - 4	Follow the order of color as in the 3rd part of the threading, that is four light threads and four dark threads.

The place mats

Select your favorite sample(s) and design it (them) into a place mat of 44 cm. (17 1/4"). Then, use the 6 cm (2 1/2") cardboard for your fringe and start the second place mat. When you have finished the four place mats, cut the 6 cm (2 1/2") warp exactly in the middle. So you get a 3 cm (1 1/4") fringe on each side. Place a stitching with a sewing machine or by hand at the first and last pick of each place mat to have it securely finished.

The place mat piece (as illustrated on page 101) has been made as follows: 6 cm (2 1/2") as sample A (tabby and log cabin), 33 cm (13") as sample C and 6 cm (2 1/2") as sample A (tabby and log cabin).

Note: This weaving is a balanced count, which means the same number of weft threads as warp threads per cm. or inch, which is 24 × 24 per inch or 10 X 10 per cm. This has to be taken into consideration when beating.