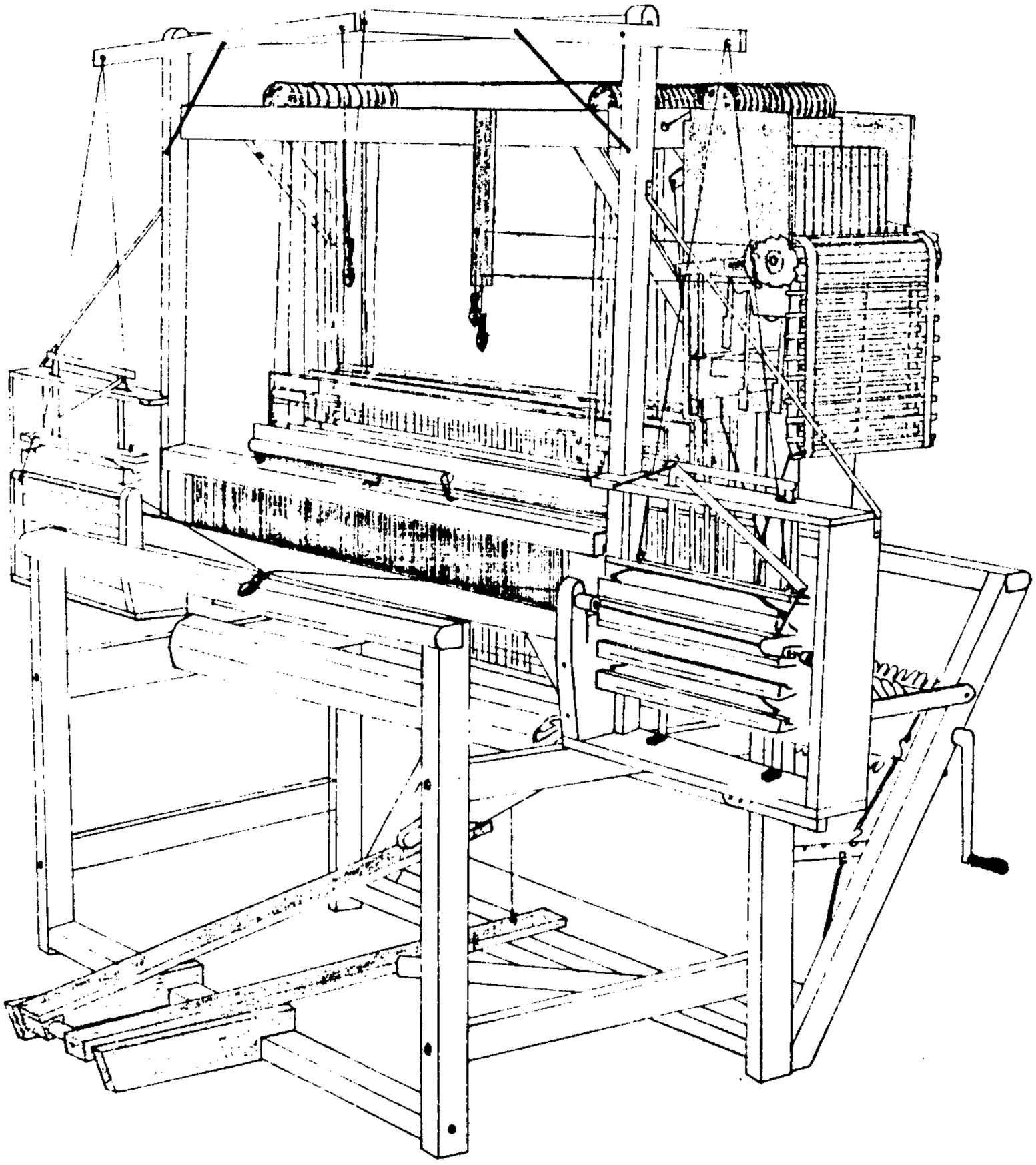
DOBBY



1986-06-01

Leclerc Inc.
L'Islet, Qué., Canada

ASSEMBLY INSTRUCTIONS FOR DOBBY MECHANISM

If your loom is already assembled, you will have to remove the harness frames, the jacks or the rollers (in counter-balanced system), the beater, the breast beam, the cloth beam, the treadle set and the lam support.

Loosen the two (2) bolts that are on the right upper cross-member side, without undoing them entirely. Install your Dobby by placing the "A" iron fitting on the bolts. The washers must be between the iron fitting and the bolt heads. Tighten the bolts firmly (fig. 1). DO NOT REMOVE THE ADHESIVE TAPE.

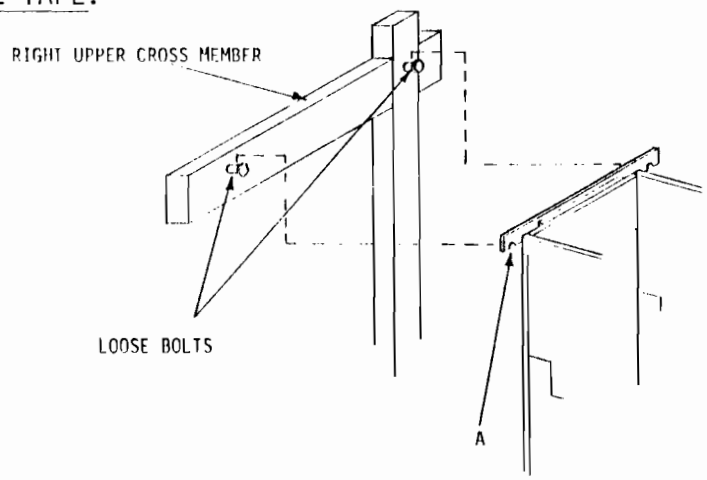


Fig.1

Place the iron fitting "B" on the right-hand side middle post of your loom (Fig. 2) and insert the ¼" X 1¼" flat headed screw in the hole that is on the back board, and then in the hole of the "B" iron fitting. Put a ¼" nut and tighten it slightly. Then tighten the bolt in the middle of iron fitting to clamp it to the post. Fasten the flat headed screw firmly until its head is flush with the board, so that the movable board can work properly.

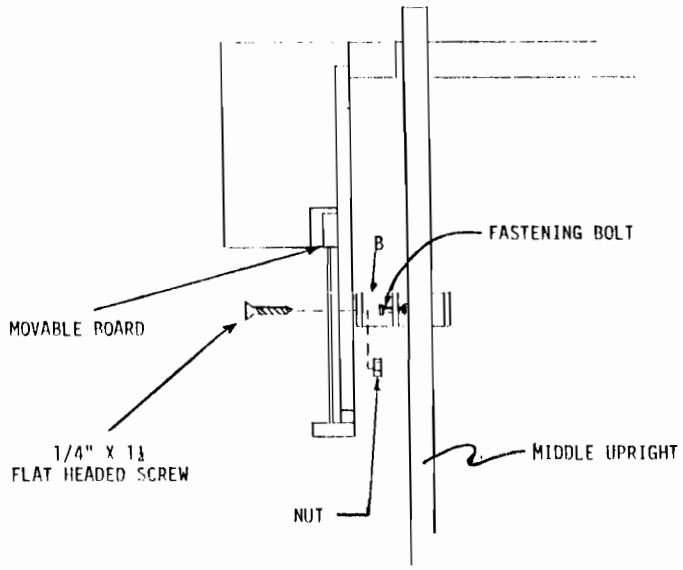
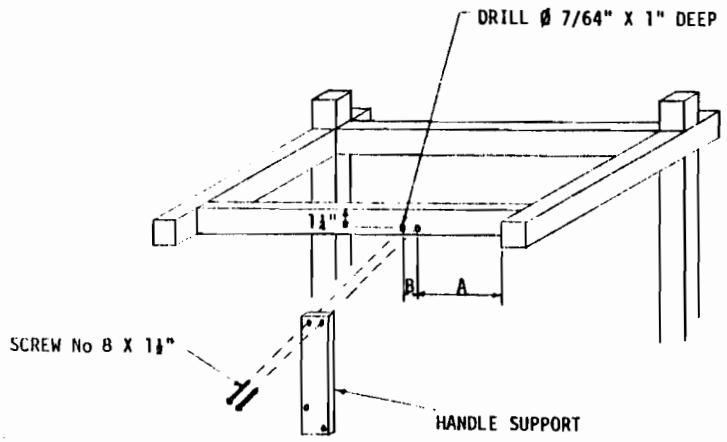


Fig.2

With a 7/64" drill bit, make two (2) 1" deep holes on the front part of the upper cross-member. The position of the holes depends on the width of your loom. Refer to the table accompanying Figure 3. Screw the handle support with two (2) No 8 X 1½" screws.



	COLONIAL 45"	COLONIAL 60"
A	13 5/8"	21 1/8"
B	13/16"	13/16"

Fig. 3

Ask someone to hold the pulley support under the lateral cross-members Figure 4 (A). The left end of the support, once in place, must be flush with the outside of the lateral cross-member. The distance between the pulley support and the middle post is shown on Figure 4 (B). By using the iron fittings as drilling guides, make four (4) ¾" deep holes with an 11/64" drill bit. Fasten the pulley support with four (4) No 12 X ¾" screws. (These holes may be already drilled).

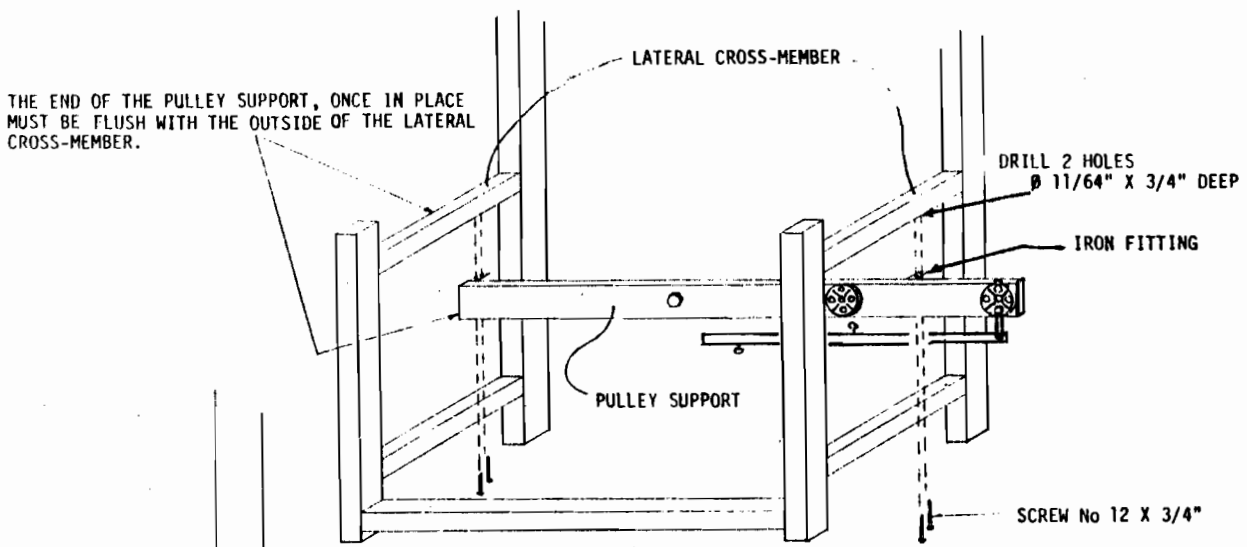


Fig. 4-A

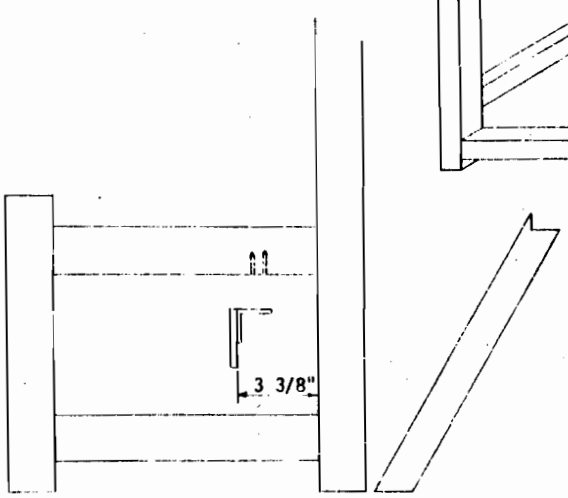
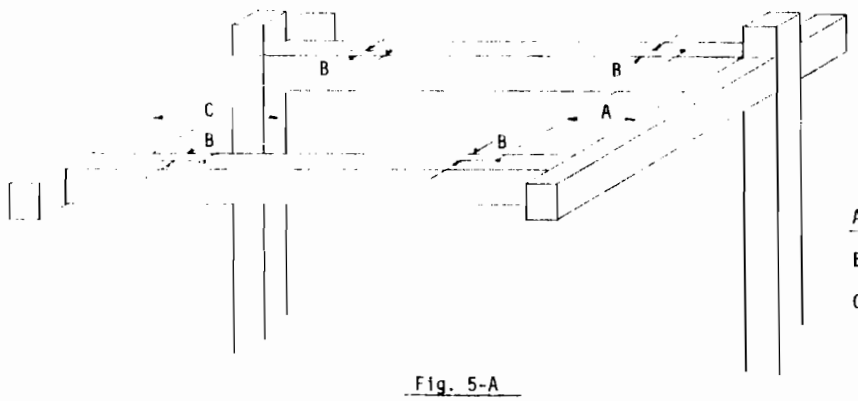


Fig. 4-B



	COLONIAL 45"	COLONIAL 60"
A	4 5/8"	6 5/8"
B	1/2"	1/2"
C	8 1/8"	10 1/8"

Fig. 5-A

With a 11/64" drill bit, make two (2) ¾" deep holes on each of the two (2) upper cross-members. The position of the holes depends on the width of your loom. Refer to the table accompanying Figure 5 (A). Attach each of the two (2) central pulley shafts with two (2) semi-circular iron fittings and two (2) No 12 X ¾" screws (Fig. 5-B).

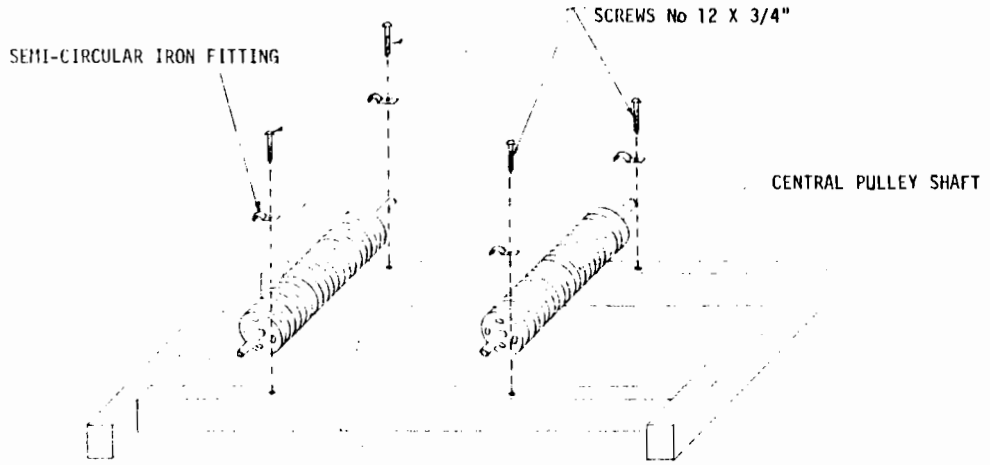


Fig. 5-B

Now you must assemble the treadle set using the two (2) new treadles. To do so, remove the treadle rod by taking off the push nut and the ½" washer, and pull on the other end of the rod.

If your treadle set has six (6) treadles, go to the next paragraph. If not, do as follows. Remove the board that holds the three (3) treadle blocks by unscrewing the six (6) screws. Replace it by the 16¾" long board that was provided with your Colonial 1. Tighten the six (6) screws. You will also need the 17¾" treadle rod that was provided with your loom.

Insert the treadle rod in the blocks by placing the four (4) spacers and the two (2) treadles as shown on Figure 6. Place a ½" washer and a new push nut on each end of the rod. Install the assembled treadle set on the loom with the same bolts.

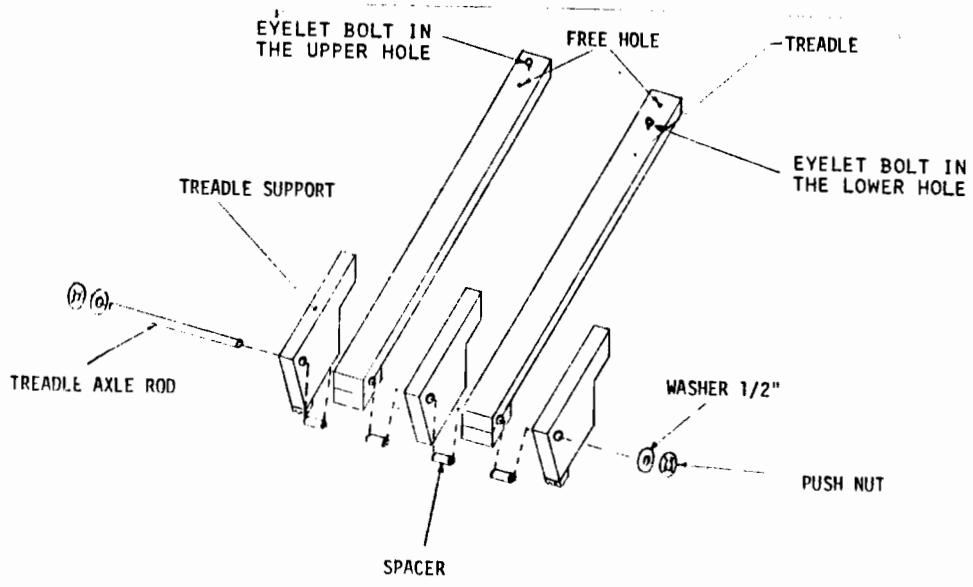


Fig. 6

Remove the hooks from under the harness frames (Fig. 7).

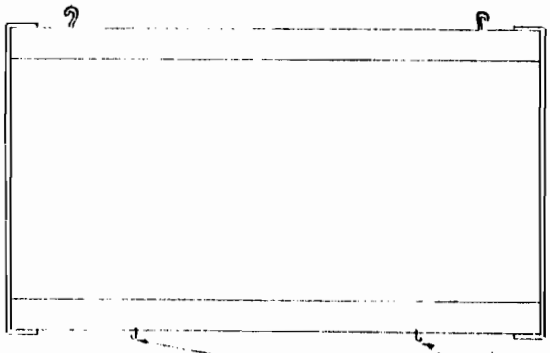


Fig. 7

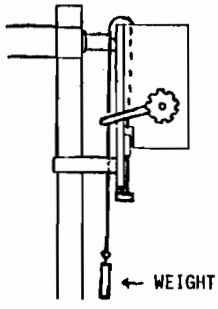


Fig. 7b

Hook the gray weight to the loop cords coming from the outside pulleys on the dobby (the ends of these cords are tying to the screws of the movable board). Later, you will adjust the height to be equal to the top of harness frames (Fig. 7b).

Remove the packaging around the steel cables in the Dobby box. Each cable should pass over the pulleys and a loop cord should be attached to each end of the steel cables. To do this, you must thread the end of the loop cord through the eye of the steel cable then, the first loop of the other end of the same cord and pull it so that a knot is formed. Insert one of the loops of each loop cord into the hooks of the harness frames to hang them up. You can adjust the height of your harness frames by using the appropriate loops (Fig. **8**). Remove the adhesive tape.

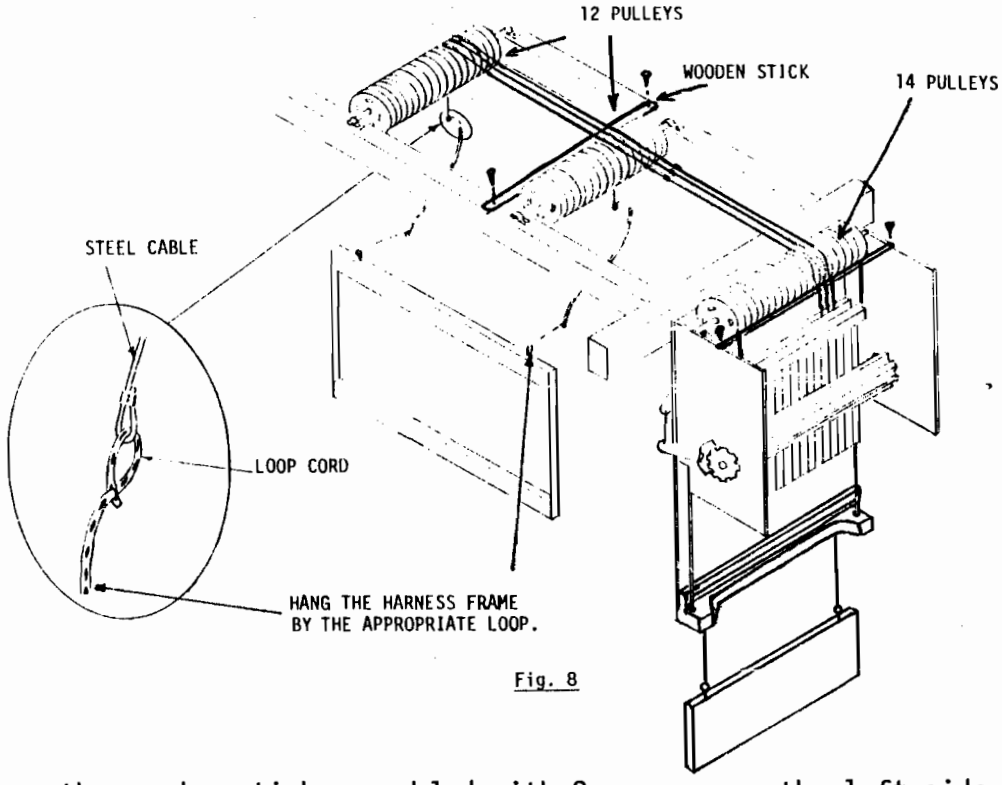


Fig. 8

Screw the wooden stick assembled with 2 screws, on the left side of the middle pulleys, closest to the pulleys. It is to prevent the cables to go out. (Fig. 8)

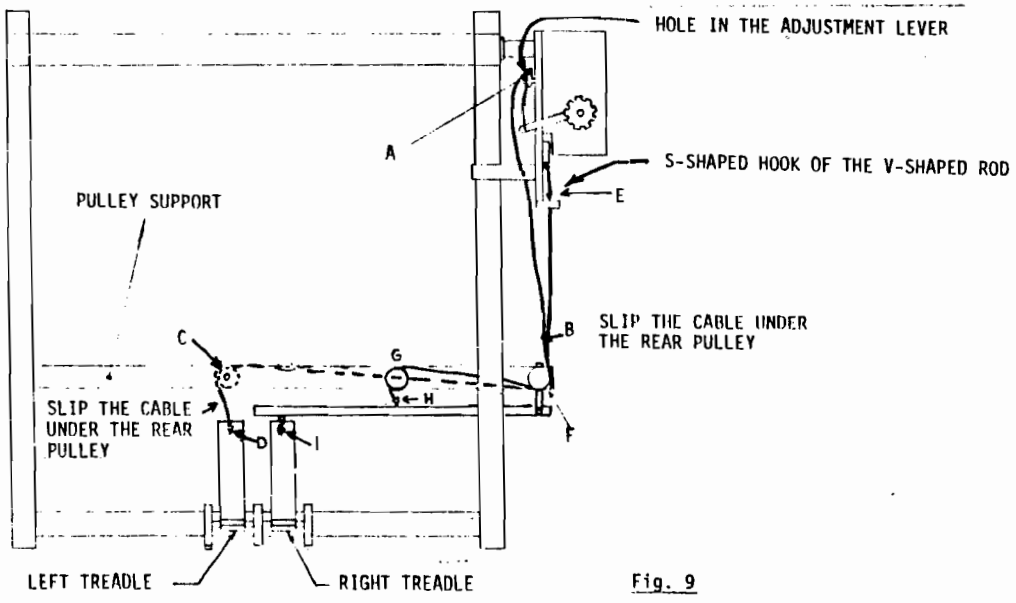


Fig. 9

Take the longuest of the two (2) steel cables. Attach one of its ends to the S-shaped hook of the adjustment lever, in back of the Dobby Figure 9 (A). Thread this cable under the outside pulley (on the rubber piece), which is in back of the pulley support Figure 9 (B), and then on the interior pulley, which is also in back of the pulley support Figure 9 (C). Attach the S-shaped hook of the cable to the eyelet bolt of the left treadle Figure 9 (D). Take the other steel cable and attach one of its ends to the S-shaped hook of the V-shaped rod which is under the movable board Figure 9 (E). Thread the cable under the outside pulley in front of the pulley support Figure 9 (F), then onto the interior pulley, which is also in front of the pulley support Figure 9 (G). Attach the cable to the hook of the wooden lever Figure 9 (H), then hook the S-shaped hook of the lever to the eyelet bolt of the right treadle Figure 9 (I). Flatten all the S-shaped hooks so that the cables can no longer be removed.

DOBBY OPERATION

Leclerc SINCE 1876

1. DESCRIPTION

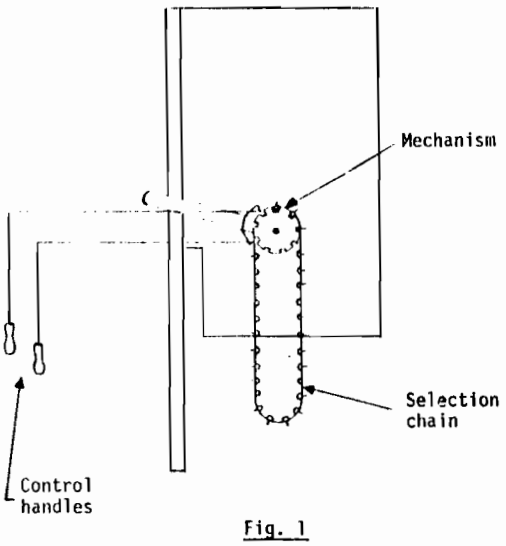


Fig. 1

The main parts of the Dobby are (Fig. 1):

- The selection chain on which the program is prepared.

- The mechanism which operates the programmed chain.

- The control handles which control the direction of rotation of the chain.

Only two (2) treadles operate the system for any weave. The left treadle advances the chain for the next shed. The right treadle lifts the harnesses which have been selected by the chain.

The selection chain consists of two (2) perforated plastic straps of thirty-four (34) holes each, thirty-two (32) cross bars, sixty-four (64) wood screws to attach the chain to the straps and approximatively three-hundreds (300) $\frac{3}{4}$" round-headed screw No 8 to program with (and a wooden gauge for screwing).

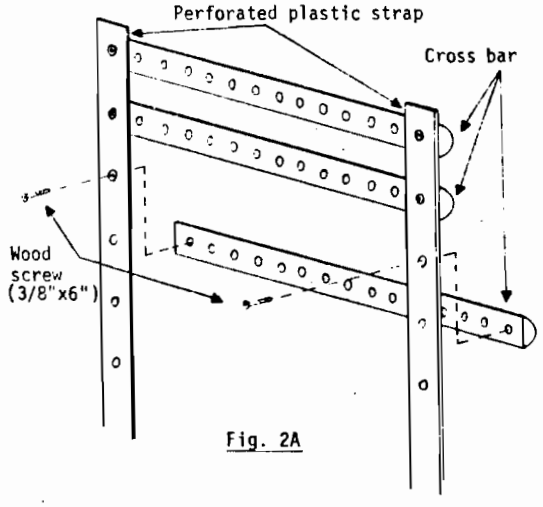
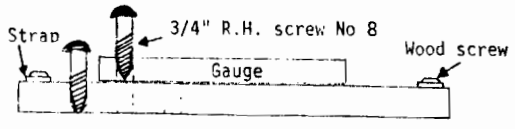


Fig. 2A



The space between the screw and the cross bar must be 3/8"

Fig. 2B

On each bar, there are fourteen (14) holes*. Twelve (12) of them are for pegs and the two (2) small end ones are for fastening the bars to the straps.

To assemble the selection chain, fasten the bars to the two (2) straps. Insert the wood screws to the ends without forcing them (Fig. 2A).

To prepare the program, place the scewing gauge on the hole of the cross bar, place a screw, and screw until the head of the screw touch the screwing gauge. The space between the screw and the cross bar must be 3/8". (Fig. 2B)

* On the sixteen (16) harness ELITE loom, the bars have eighteen (18) holes.

Take one of the two (2) direction handles Figure 10 (A) and thread the cord in the upper eyelet of the handle support Figure 10 (B), then in the upper hole of the training arm Figure 10 (C). Make a single knot at the end of the cord. Take the other handle and insert the cord into the lower eyelet of the handle support Figure 10 (D), then into the lower hole of the direction handle Figure 10 (E). Make a knot at the end of the cord.

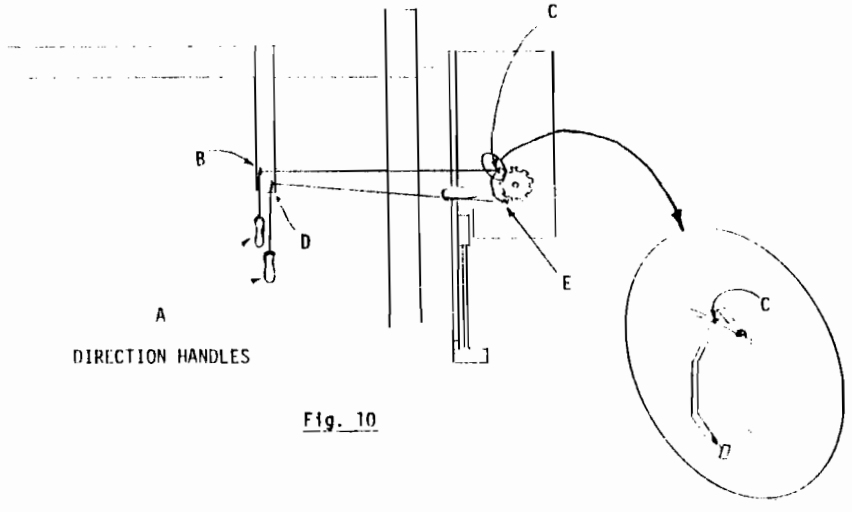


Fig. 10

Put the cloth beam, the beater, and the breast beam back into their place.

With the regular tie-up being replaced by the program on the selection chain, you will not have to memorize the threadling when weaving.

Each bar on the selection chain represents one treadle or one shed, so When programming you should use as many bars as there are sheds to be opened for one pattern repeat. From then on the pattern will be repeated automatically after a complete turn of the chain, eliminating treadling errors.

However, if your pattern is symmetrical, you can simply program half of it. When the first half of the pattern is completed, reverse the rotation of the chain by pulling on one of the two control handles on the right hand side in front of you. When the pattern is completed, reverse again for half of the next pattern, then reverse again to complete this pattern and so on the end of the project.

The minimum number of bars on the selection chain is thirty-two (32) to make a complete turn around the roller (cylinder). There is no limit to the length of the chain. You can put up to hundred (100) bars on it as is, or raise the Dobby head or add an attachment to look after very long chains, according to your pattern needs.

To fasten the ends of the straps together, there should be two (2) free holes at one end of each strap which will fasten to the other end, using the same screws which hold the first cross bar.

Example, tabby weaving requires only two (2) cross bars but to have enough weight for a good rotating motion write the program sixteen (16) times.

If the program takes six (6) bars, one can repeat it five (5) times, which will require thirty (30) bars, and leave two (2) bars at each end of the program, so treadle three (3) times before throwing the shuttle and the program will start again.

For any pattern of over thirty-two (32) bars, another strap has to be added and two (2) joins are then made in the strap. You can purchase extra straps, bars, and screws from NILUS LECLERC INC.

2. ASSEMBLING THE SELECTION CHAIN

Once you know the required number of cross bars for your pattern, place the parts on a table, with the bars round side down. Fasten the straps on top of the first bars starting with the first hole on each strap. Continue fastening the required number of bars ensuring that at least two free holes remain after the last bar (Fig. 3).

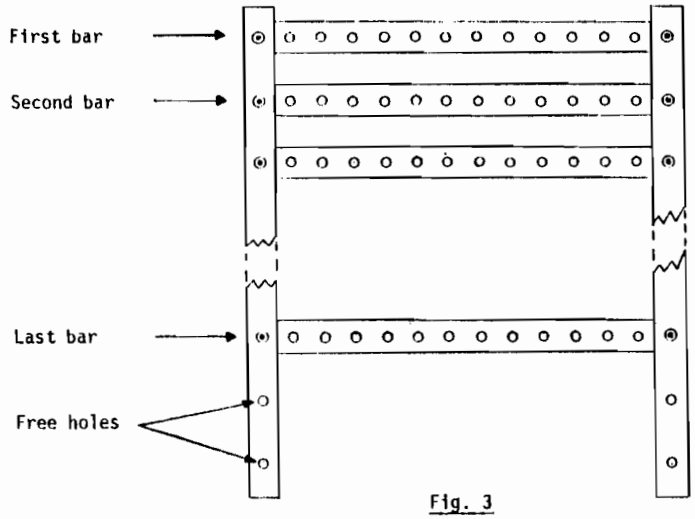


Fig. 3

Place the chain on the Dobby by placing the first cross bar on the notch of the Dobby roller (cylinder). Figure 4 (A). Then rotate the roller by hand to roll the chain onto the Dobby, then between the roller and the wooden round cross bar, and then between the roller and the rounded piece of wood. Figure 4 (B). When the last bar is on top of the roller, place the other end of the chain on the roller on the empty notch next to the first end already on the roller. Figure 4 (C). Remove the screws from the first two cross bars on one strap, overlap the strap and refasten the two screws thus holding the two ends of the strap onto the two cross bars. Repeat this operation for the other side. To remove the chain, just unscrew those two cross bars.

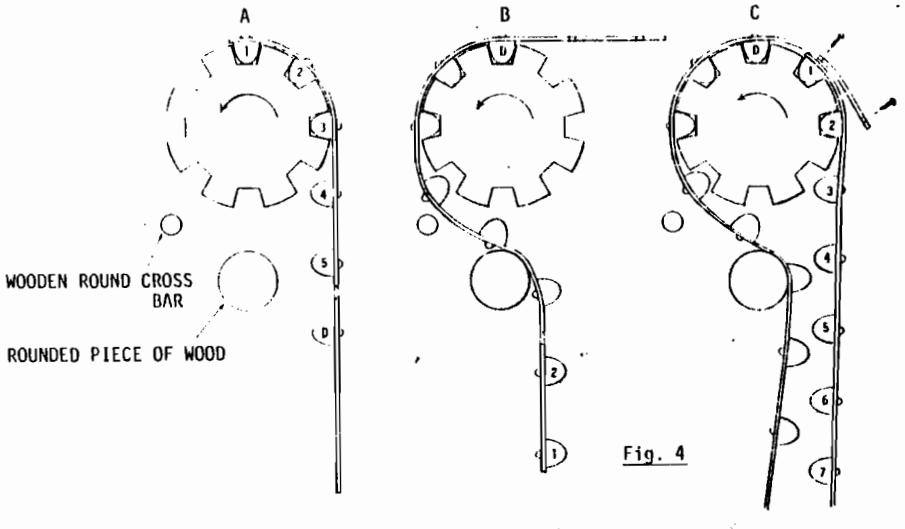


Fig. 4

3. PROGRAMMING OF THE SELECTION CHAIN

The program can be prepared while standing beside the loom with the harness chain in place on the Dobby or by placing the chain flat on a table.

Each vertical row represents a harness.

Each chain bar represents a lamm or a shed. (Fig. 5).

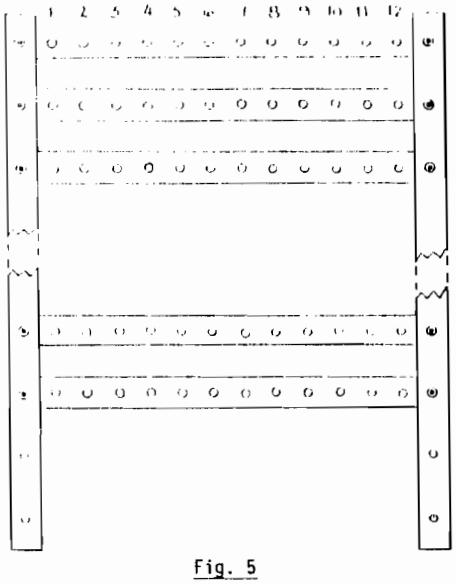


Fig. 5

To program the harness chain it is important to remember that each of the twelve (12) holes in the cross bars represents one harness, so each vertical row of the chain refers to one harness. They are in the same order as the harnesses on the loom. The far left hole is the first harness loom. The second row of holes refers to the second harness and so on.

Each cross bar represents a weaving shed.

On the 16-harness Elite loom, there are sixteen (16) rows of holes on the Dobby chain.

If you only work with four (4) harnesses, use the first four (4) rows of holes on the left hand side of the chain. If you need eight (8) harnesses, use eight (8) rows of holes at the left hand side.

To understand how to program the Dobby mechanism, let us start with some very simple patterns.

Example 1

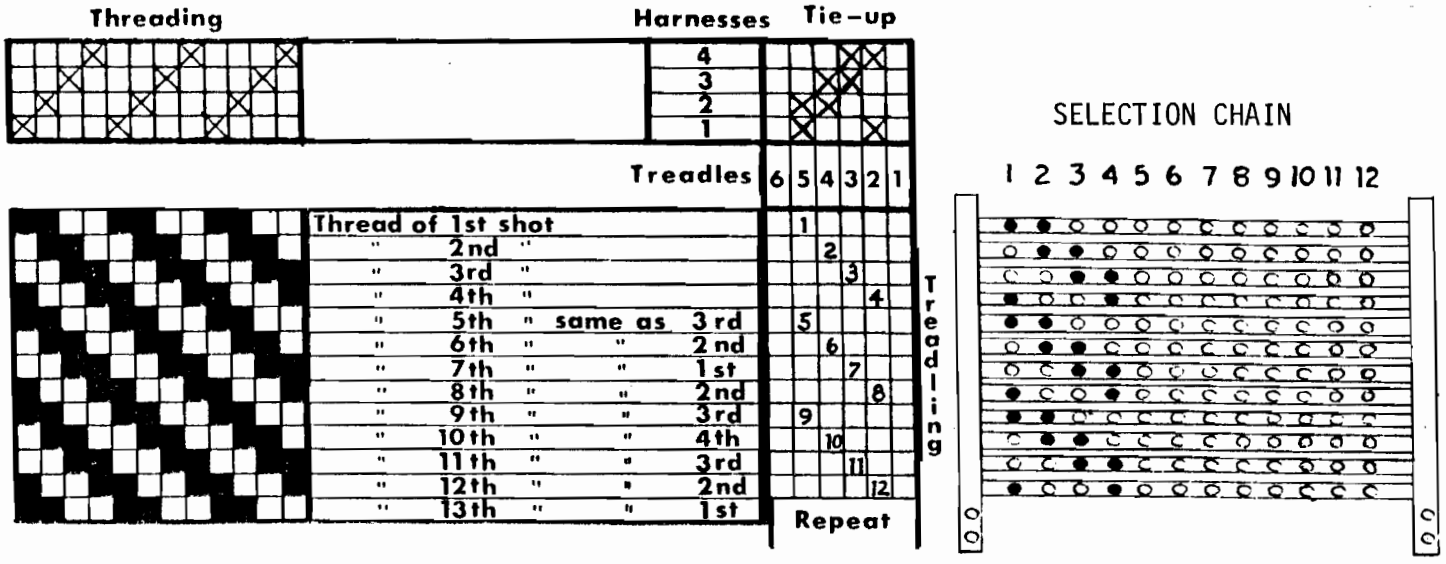


Fig. 10

The step by step way :

1. Choose your draft. In this example, this is twill.

2. As each bar represents a shed, it is necessary to transfer the tie-up of treadles to cross bars of the selection chain with $\frac{3}{4}$" screws. A screw takes the place of the cord in a tie-up.

In this example, for the first shed, harnesses one (1) and two (2) are to be tied to a treadle. To program the Dobby, place screws in the first and second holes of the first chain bar. This represents the first treadle to be used. The second shed is made up of harnesses two (2) and three (3). Just place 2 screws, one in the second hole and one in the third hole on the second bar. Continue in this way to replace the third treadle by the third cross bar by placing screws in holes three (3) and four (4) and on the fourth cross bar, insert screws into holes one (1) anf four (4).

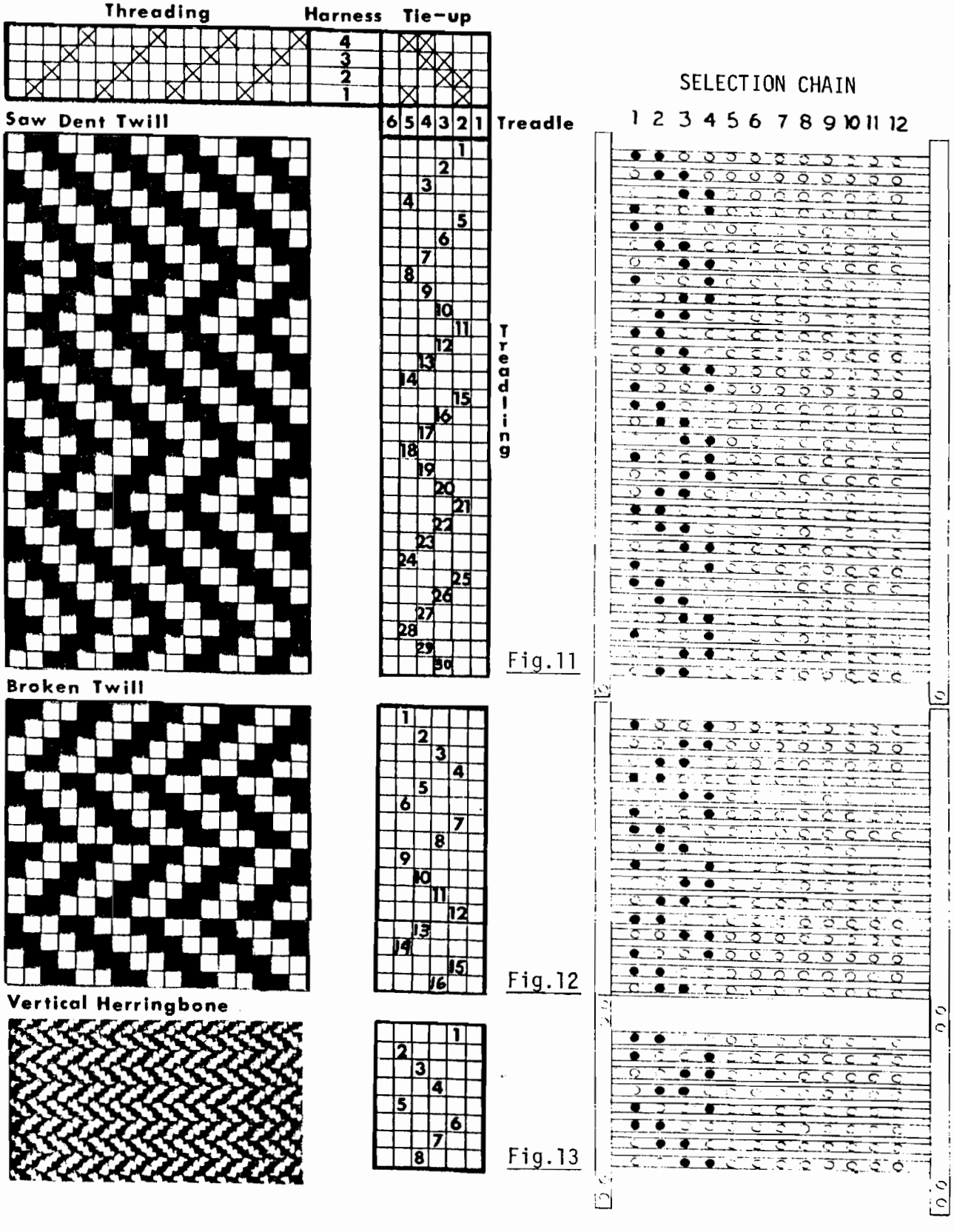
This is all you need for twill as only four (4) treadles were required. To make a complete turn of the Dobby roller (cylinder), it is necessary to have a minimum of twelve (12) cross bars so repeat the tie-up three (3) more times. If you do not want to cut the straps, repeat the tie-up seven (7) times which will use twenty-eight (28) cross bars, leave two (2) cross bars free and press on the left treadle to advance the selection chain past the two (2) empty cross bars when you reach them each time.

3. If you have removed the selection chain from the Dobby, put it back onto the Dobby as explained in Fig. 4.

Here are a few very easy 4-harness patterns.

Example 2

Compare the programs with the corresponding tie-ups. Chain selection simply consists of pegging the holes indicating the harnesses to be used for each treadling within the repeat.



Ref. "Warp and Weave" book

Example 3 Eight-harness twill

In this pattern, the beginning of the selection chain is similar to the tie-up as the treadling starts at the right hand side. So the first shed is shafts 1 - 7 - 8.

The program repeats itself twice from right to left and twice from left to right.

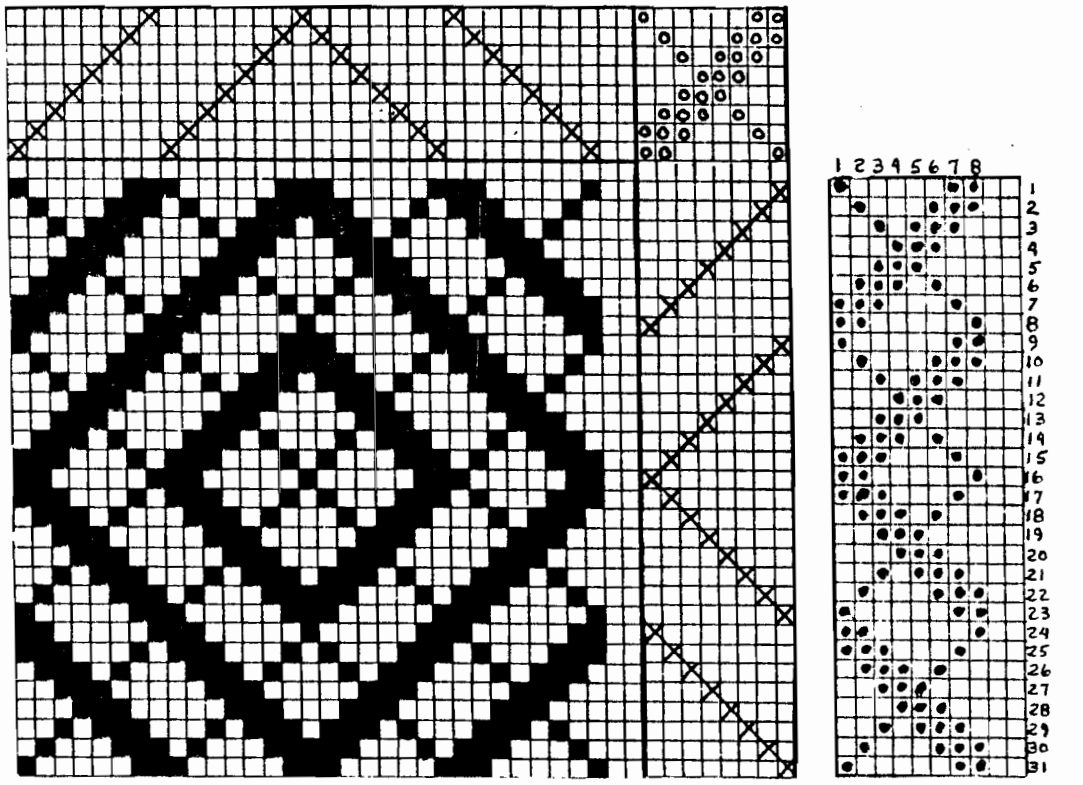


Fig. 14 Treadling Selection chain

Ref. "Master Weaver" vol. 10, p. 21

Example 4

The tie-up is similar to figure 14.

The threading is broken and the treadling is as drawn in.

The treadling which requires much concentration is greatly simplified by the Dobby mechanism.

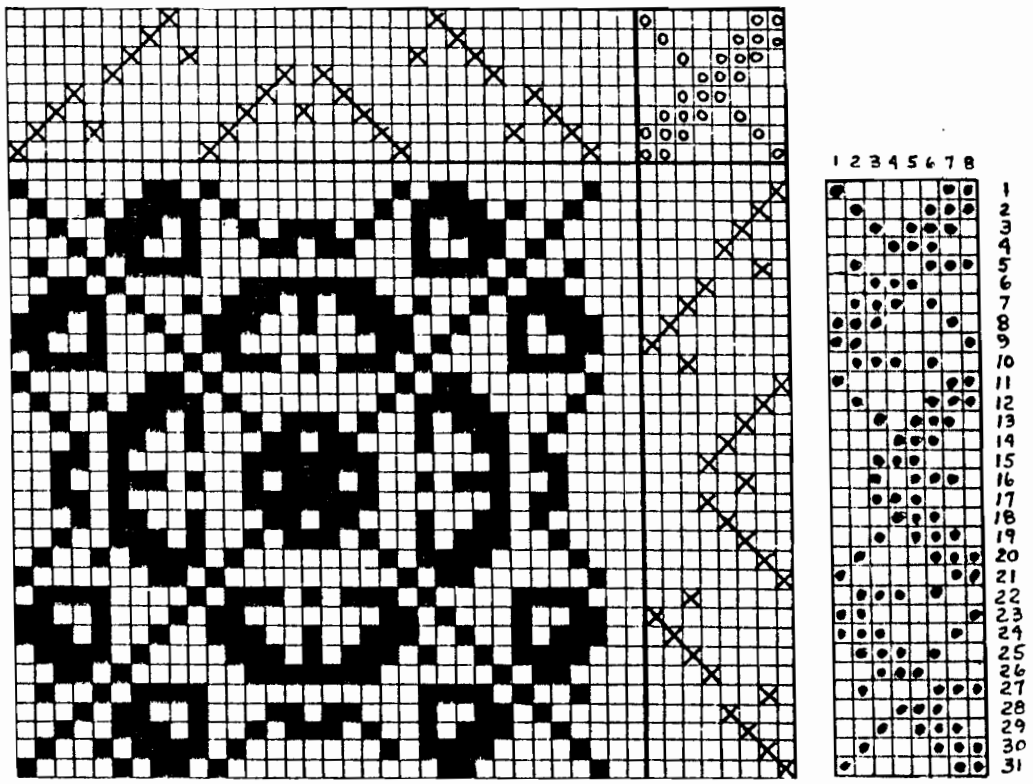


Fig. 15 Treadling Selection chain

Ref. "Master Weaver" vol. 10, p. 24

Example 5

Here is a more complex pattern.

With a conventional eight-shaft loom, sixteen (16) treadles would be required to weave this material and a compound treadling is almost impossible to devise.

This weave can be done very easily using a Dobby mechanism. It requires only sixteen (16) cross bars to program it.

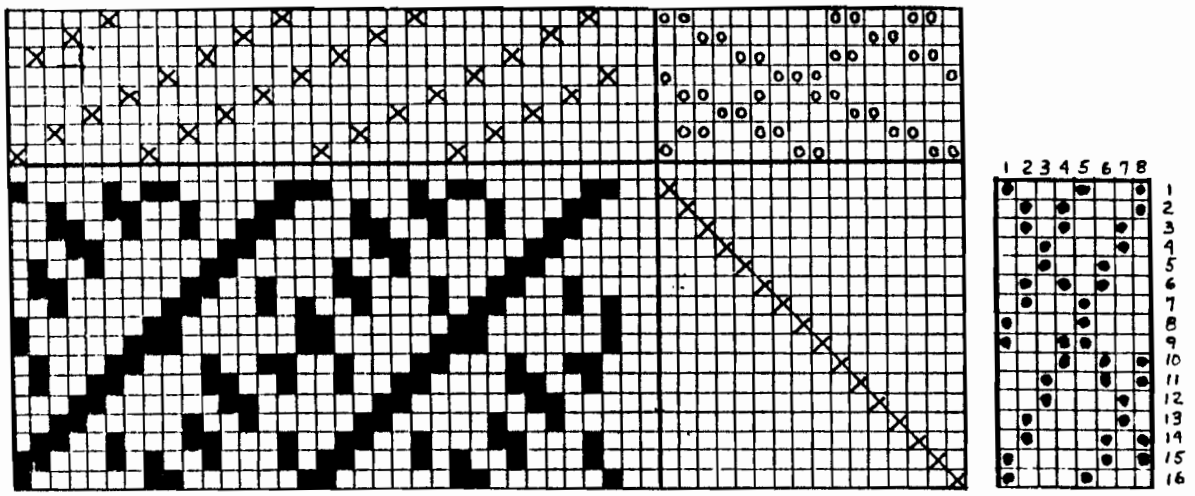


Fig. 16 Treadling Selection chain

Ref. "Master Weaver" vol. 10, p. 28

Example 6

Here is a 12-shaft Diamond Twill. Essentially, there is no difference between the 8-shaft, and the 12-shaft Diamond Twill, except that there is a larger choice of patterns. The principle behind it is the same but the patterns become so large that we can hardly print a full drawdown.

This draft is only a schematic and can be applied to any number of shaft.

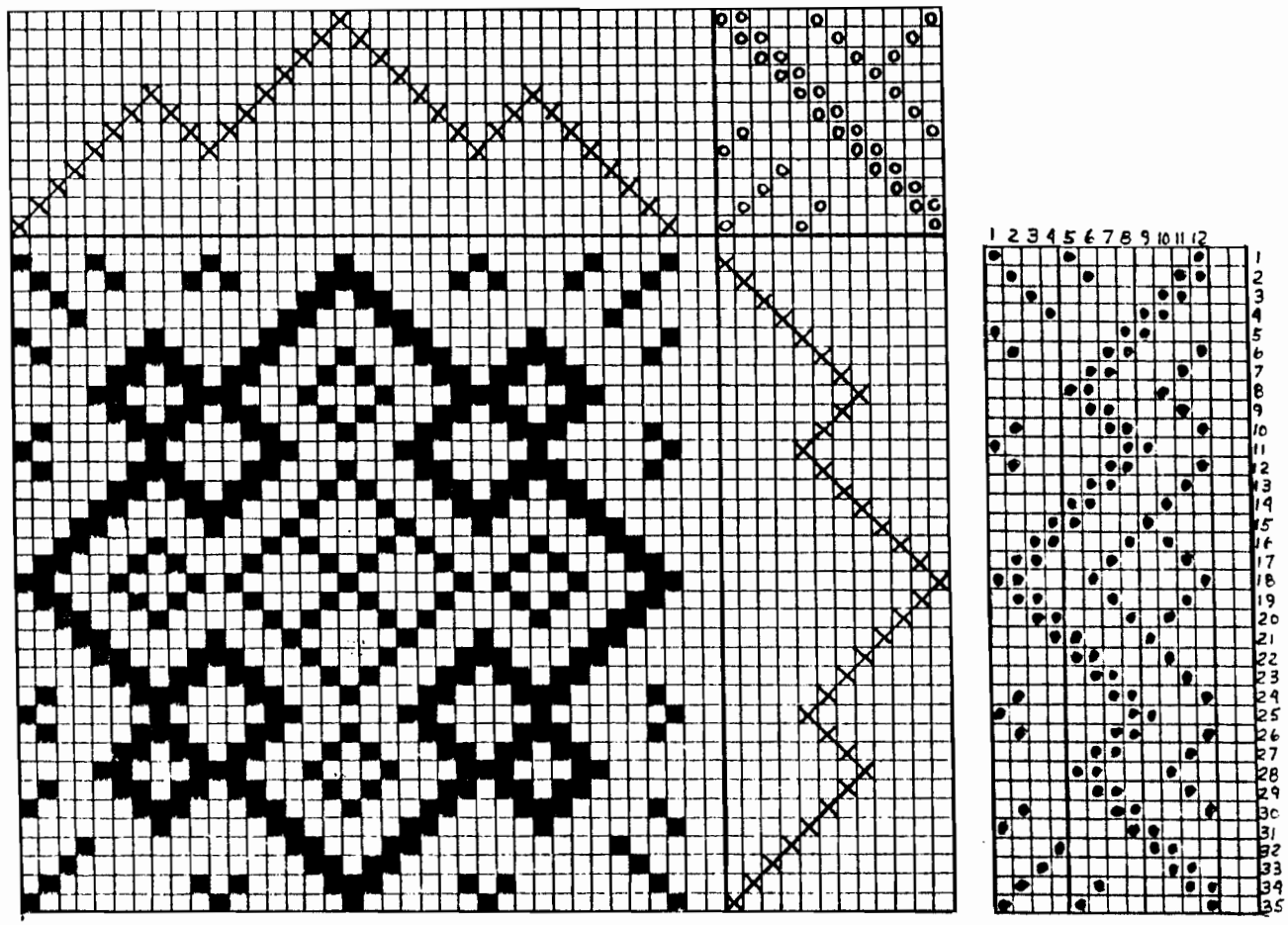


Fig. 17 Treadling Selection chain

Ref. "Master Weaver" vol. 10, p. 80

Example 7

Twelve-shaft Diamond Twill

All Diamond Twills of this type will have long floats and can be woven either as fine satins, that is using very fine yarn and a close sett or with a tabby binder.

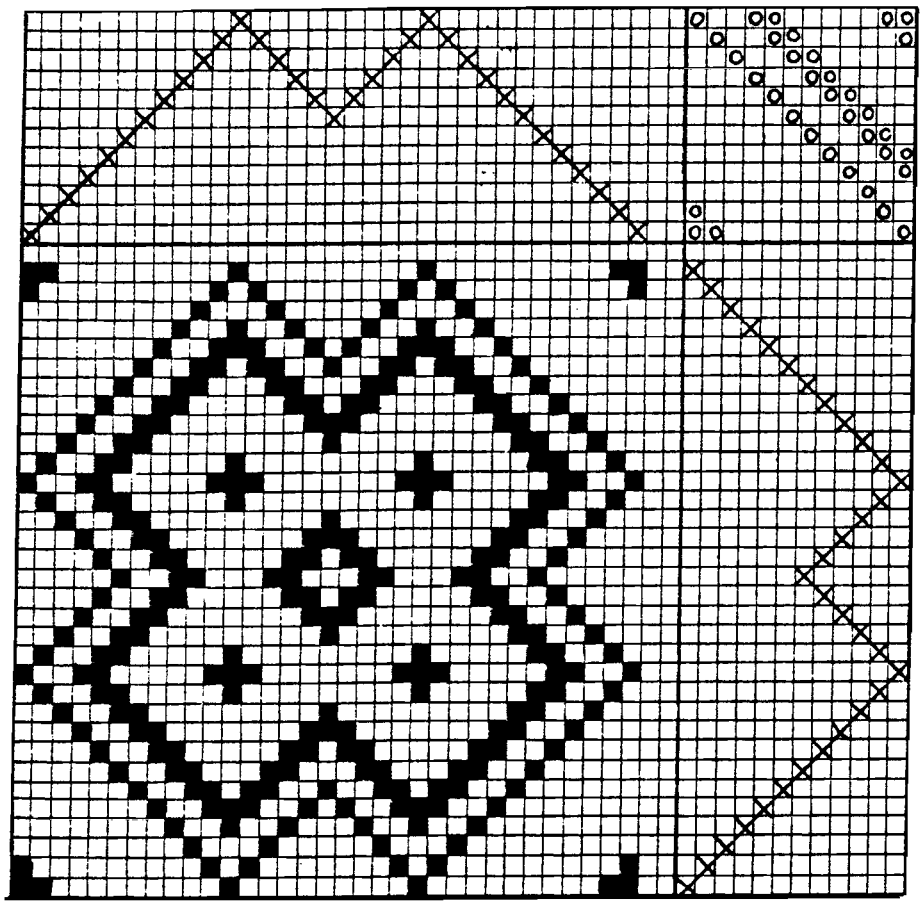
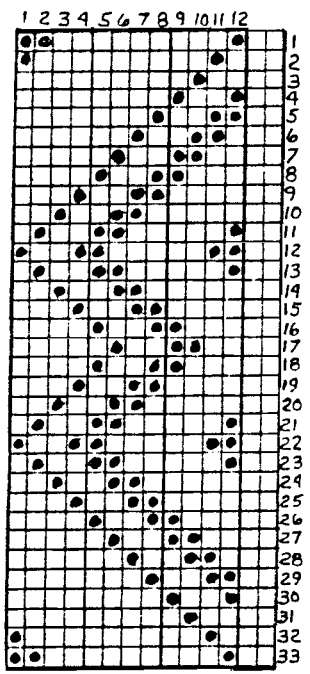
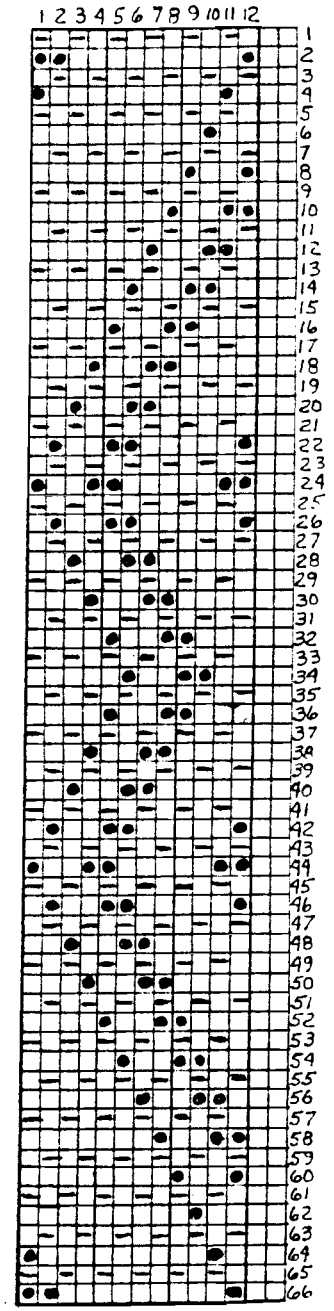


Fig. 18



Treadling



Selection chain program Dobby without tabby

Selection chain with tabby

Ref. "Master Weaver" vol. 10, p. 81

Example 8

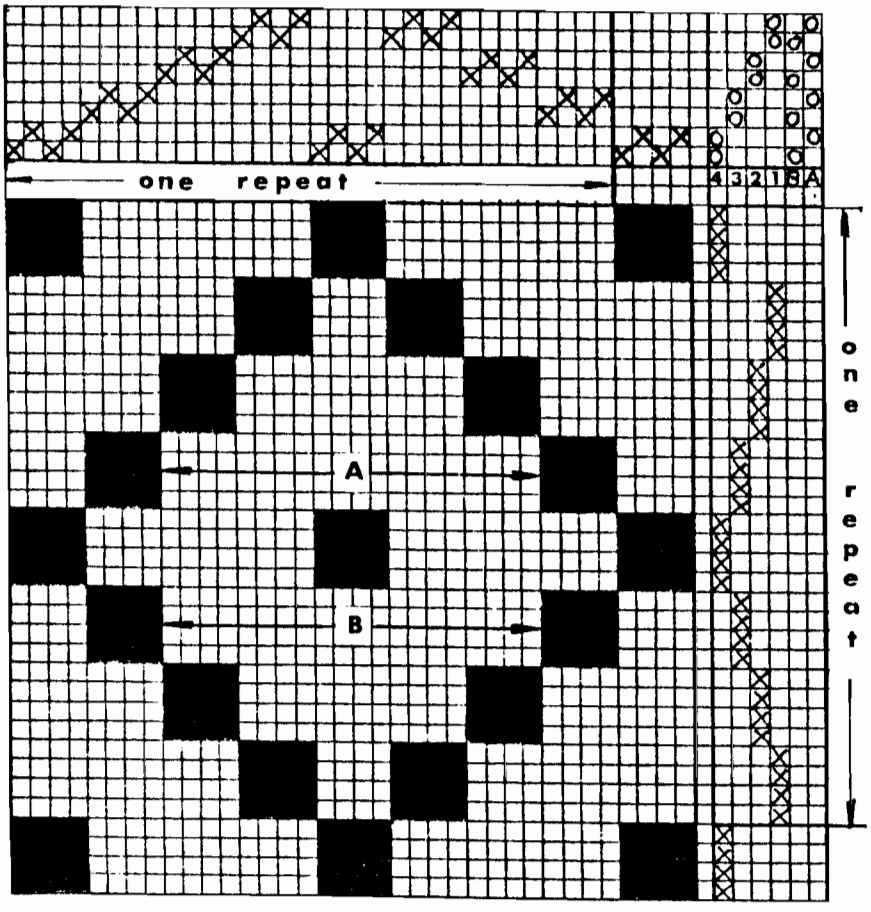
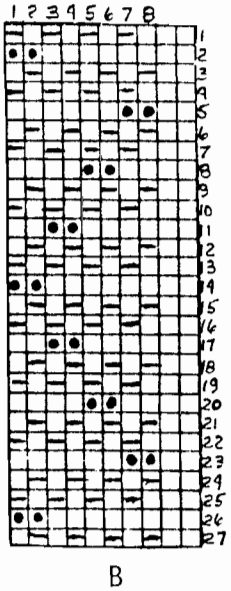
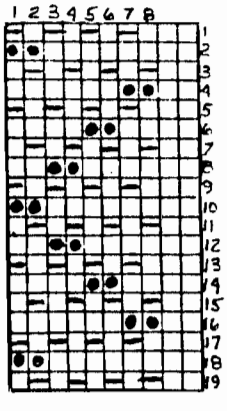


Fig. 19 Treadling



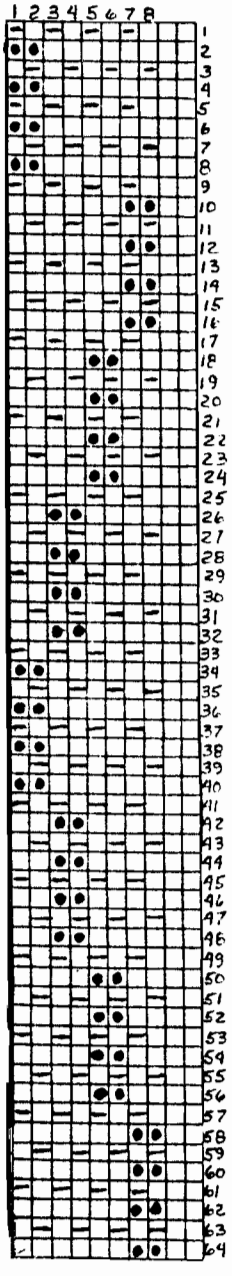
B



C

Tabby bar : ⊡

Pattern bar : ⊡



Selection chain A

Ref. "Master Weaver" vol. 7, p. 66

Example 8

There are different ways to program the Dobby for a long and complex pattern.

Figure 19 shows a 4-block pattern with a regular threading, tie-up, and treadling.

The complete program with tabby requires sixty-four (64) cross bars Figure 19 (A). If you use this complete program, the pattern will repeat automatically after each complete rotation of the selection chain.

To simplify the selection chain, you can write each block only once and reverse the Dobby roller (cylinder) after every two shots (one shot of pattern and one shot of tabby) Figure 19 (B) and 19 (C).

"B" needs a rotation of the Dobby chain in both directions after every two threads in the same block. You throw a pattern shot, a tabby shot and reverse the rotation of the Dobby chain (twice in the two directions) which will give four (4) shots of pattern thread.

After the fourth pattern shot (without throwing a shot of tabby) reverse the rotation, treadle once on the left threadle to advance the pattern without throwing a shot, press the left treadle a second time and then open the shed and throw the tabby shot (this starts the next block with the correct tabby shot).

Repeat this procedure for every block with an even number of pattern shots.

This program requires twenty-seven (27) cross bars and a great amount of concentration.

"C" is a program for an odd number of pattern threads. It is simple and requires only nineteen (19) cross bars and the same concentration as "B", that is to say the rotation has to change after each tabby shot except after the last pattern shot of the block where you throw the tabby shot and are then ready for the first shot in the next block without reversing the rotation. Repeat this operation for each block.

This program cannot be used for an even number of pattern shots, as it will give two shots of tabby in the same shed.

If you weave a coverlet or tablecloth, etc. which has a border at each end, as in Colonial Overshot or Summer and Winter, etc., the border program can be made on one chain, and the balance of the pattern on another chain.

After the weaving of first border is completed, you change the chain to weave the central pattern, and come back to the border chain when it is required. If necessary, reverse the direction of the selection chain to reverse the pattern.