



6 Motion Front with Enzor Net.

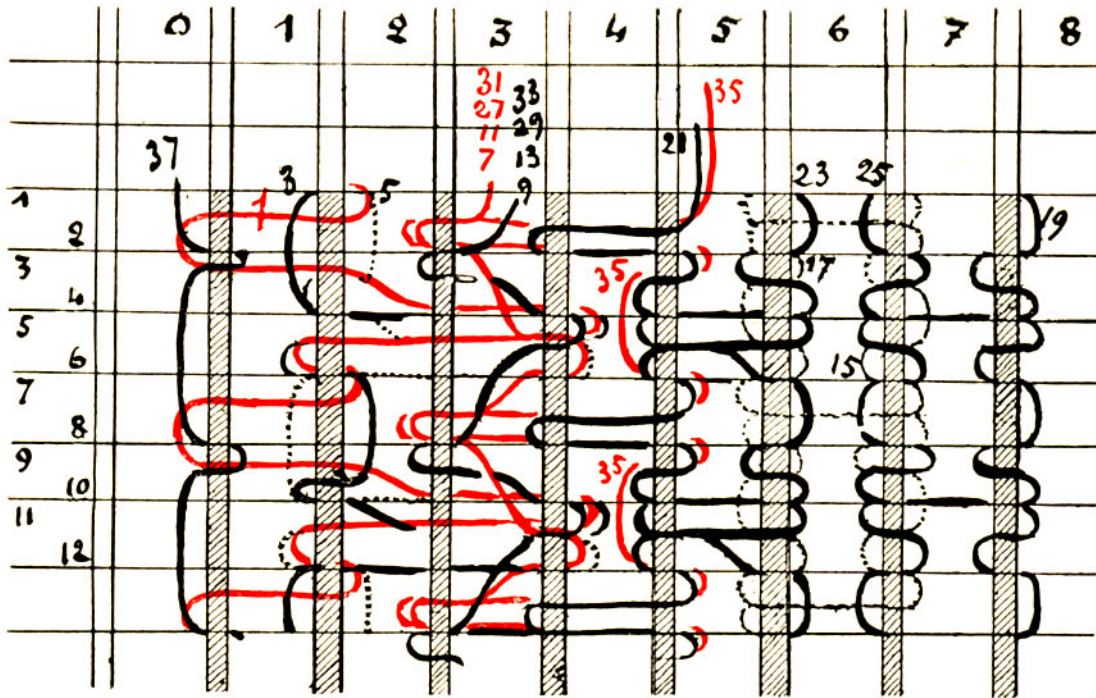


FIG. 63.

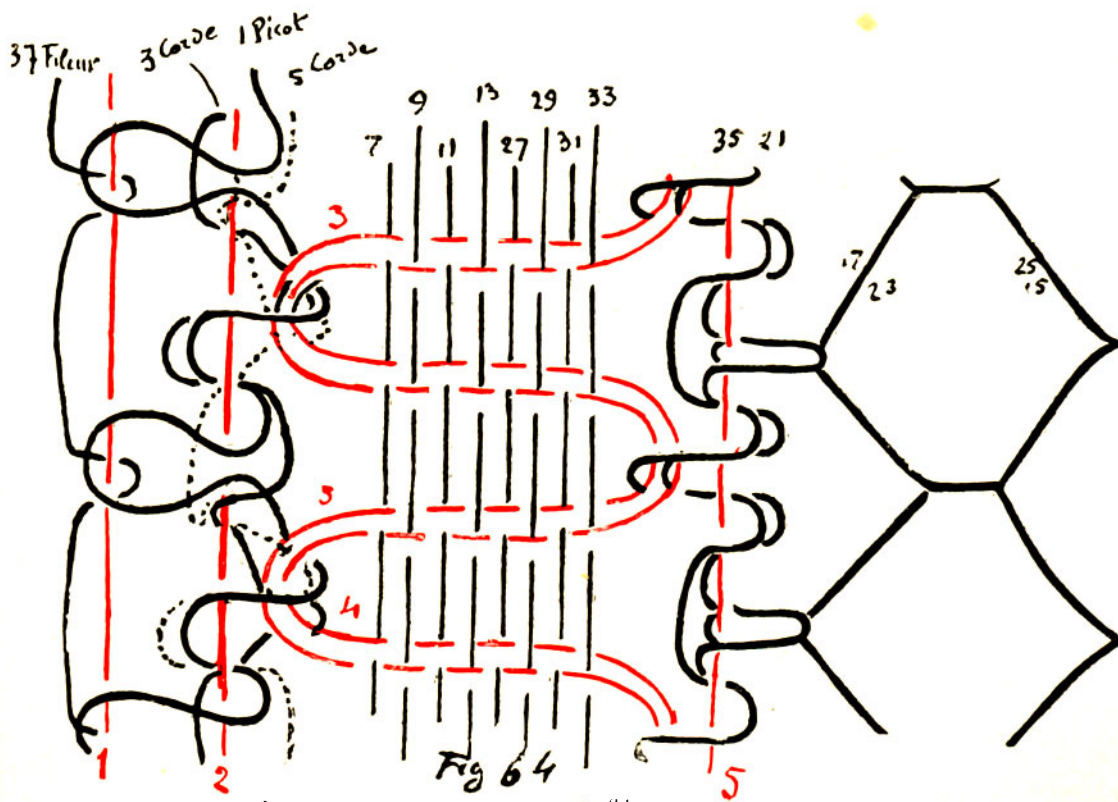


FIG. 64.

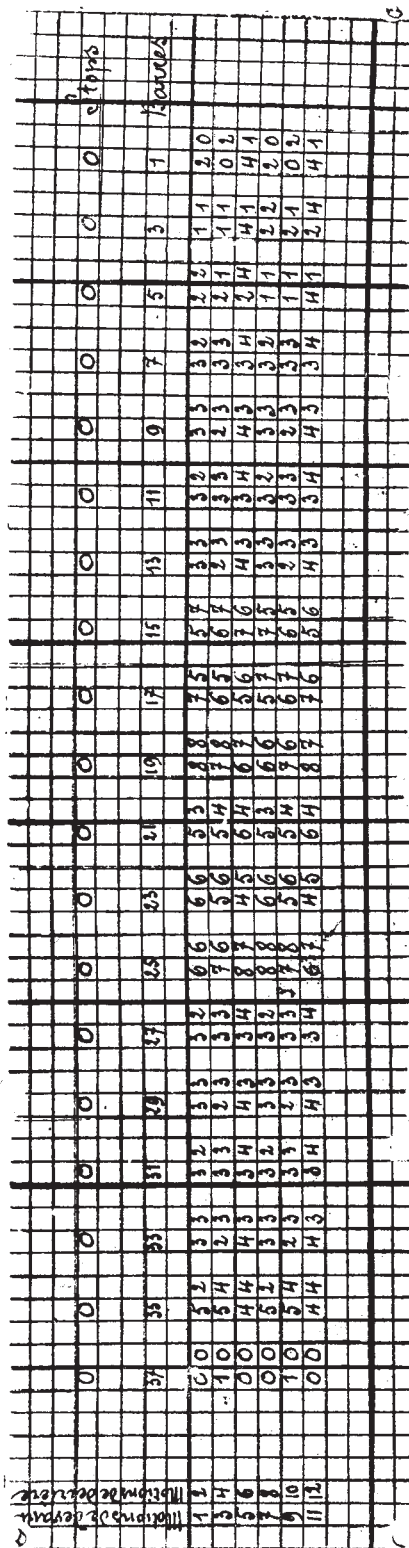


Fig. 65.

The front that we represent here is a 6 motion front, so called because every 6 motions a purl is formed (Fig. 63 and figure sheet, Fig. 65.)

This front is composed of a purl, 8 band threads, and threads called ticking or lining threads.

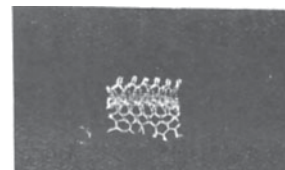
In our draught (Fig. 63) we show 2 holes of 6 motion enzor net, of which we have already given the work.

Having made No. 1 purl and No. 3 corder rise on No. 5 card to take bobbin 4, and having also made No. 5 corder rise on card No. 6, the bobbins 3 and 4, being medium slack, are drawn to bobbin No. 2 owing to tension on beams 1, 3 and 5.

On No. 2 card, No. 35 thread, which we call the drag, falls to take bobbin No. 3, in rising again meets No. 4, and brings both up to bobbin No. 5.

Our Fig. 63, called a sketch, gives the bobbin numbers in red, and shows the movements of bobbins 3 and 4.

The purl falling to stop 2 motions in the back, and rising again in the back, thus passing over the bobbins, would not be held in its place if it were not for thread No. 37, called a lacer, holding it on bobbin No. 1. On No. 2 card this thread, being in front of the purl, passes over it and under the bobbin; on No. 3 card it passes over the bobbin and over the purl, thus holding it in its place.



Aspect of 6 motion front with Enzor net, representing Fig. 64.

When the lace is finished and the lacer drawn, the bobbin on which the purl was held, and called the separation bobbin, falls out.

We cannot too strongly insist on the pupil decomposing with strings the sketches of the fronts that we have ourselves decomposed, and thus given the aspect of the lace considerably enlarged.

**Bobbin Twists and Crosses.**

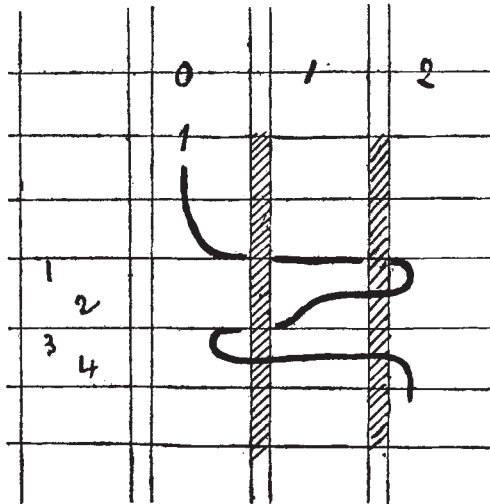


FIG. 66.

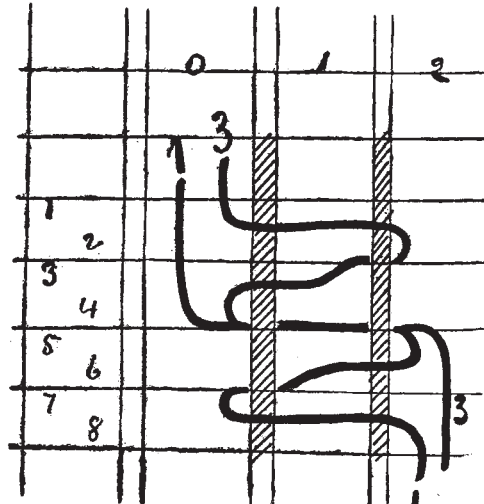


FIG. 68

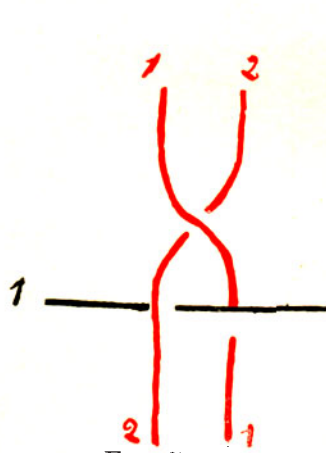


FIG. 67.

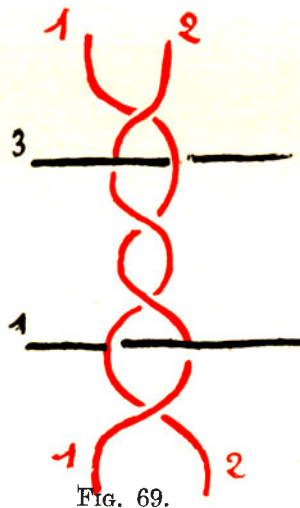


FIG. 69.

In the Enzor net we have shown what a cross is when made by 2 threads crossing each other.

Fig. 66 represents the work of a single thread taking 2 bobbins and causing them to make a cross in 4 motions (see Fig. 67).

Fig. 68 gives the work of 2 threads, 1 and 3 taking 2 bobbins and

causing them to make 2 crosses and one twist (Fig. 69).

It will be easy for the pupil to reproduce this work with strings and see for himself the effect produced by putting tension on the strings representing the threads and loosening those representing the bobbins. This will give him a clear comprehension of the work of fronts with bobbin crosses and twists, which we will show later on.

In Figs. 67 and 69 the bobbins are shown in red.



### 8 Motion Front with Crosses.

The Fig. 70 represented here gives an 8 motion front having the same disposition (or set out) of threads as Fig. 52.

This front only shows a cross at the beginning and end of a scallop, and does not have any during the straight part of the front.

No. 3 bobbin changes place with No. 4, and remains in that position, for, though one division or series of threads makes a cross, the other division undoes it (see Fig. 72).

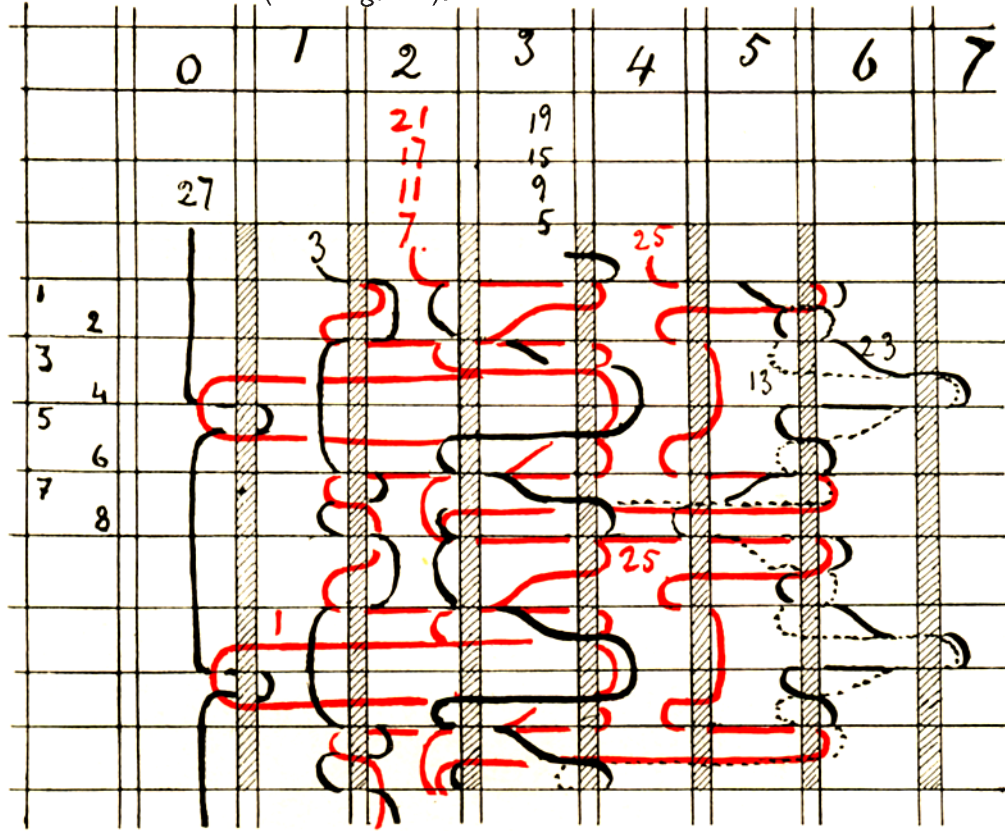


FIG. 70.

		0	0	0	0	0	0	0	0	0	0	0	0	0
		27	25	23	21	19	17	15	13	11	9	7	5	3
1	2	0 0	6 4	6 5	4 3	2 2	4 3	2 2	5 6	4 3	2 2	4 3	2 2	2 2
3	4	0 0	5 5	6 7	2 4	3 4	2 4	3 4	5 7	2 4	3 4	2 4	3 4	1 1
5	6	1 0	5 4	5 6	4 3	4 2	4 3	4 2	6 5	4 3	4 2	4 3	4 2	1 1
7	8	0 0	6 2	5 2	2 2	3 4	2 2	3 4	6 4	2 2	3 4	2 2	3 4	2 1

FIG. 71.



### 8 Motion Front.

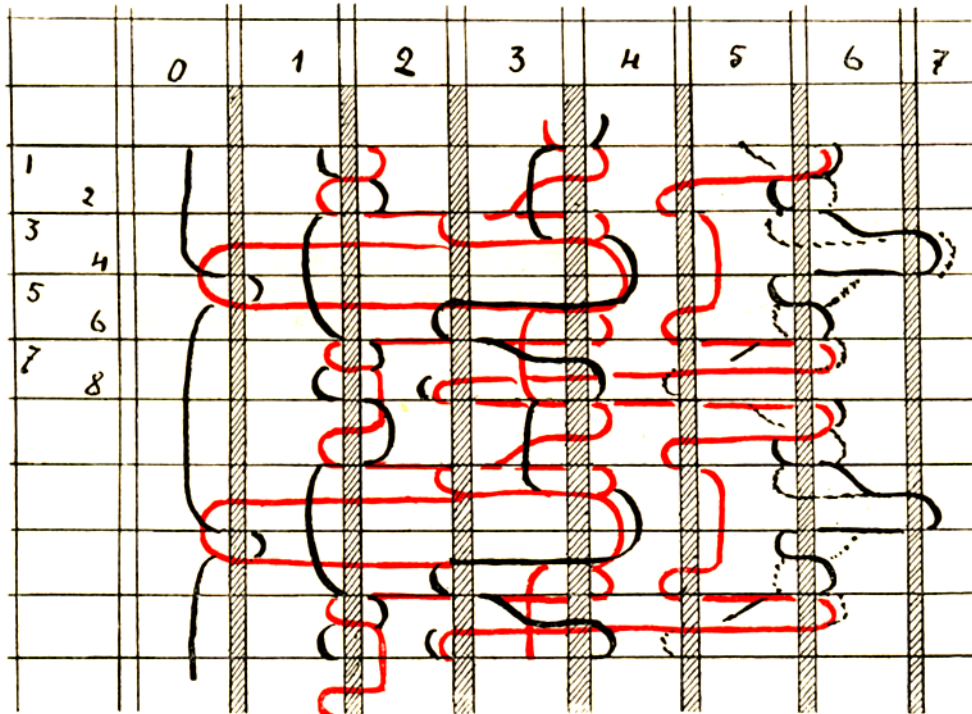


FIG. 73.

This front does not differ in aspect from the other similar ones, except that the work of the band threads differ in that they do not throw off.

We simply give it an example of thread pssing.



Aspect of an 8 Motion Front.

### 10 Motion Front.

This front is the same as the one represented in Fig. 70, in 8 motions ; it only differs in work by the 2 motions added. The aspect of the finished front is the same.

It can be made in 12, 14, and 16 motions by adding the required motions as in the examples already described.

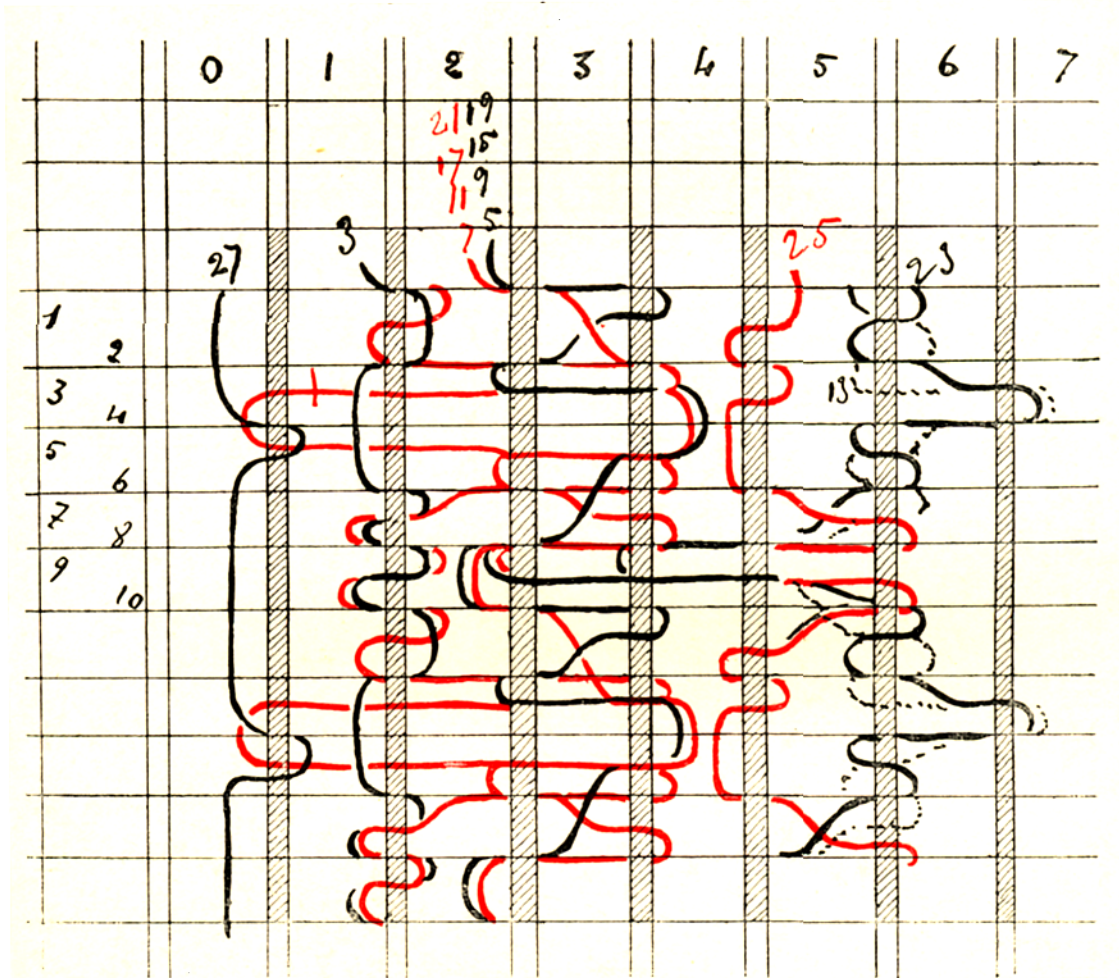


FIG. 74.



Aspect of a 10 Motion Front.



10 Motion Front with Visible Crosses.

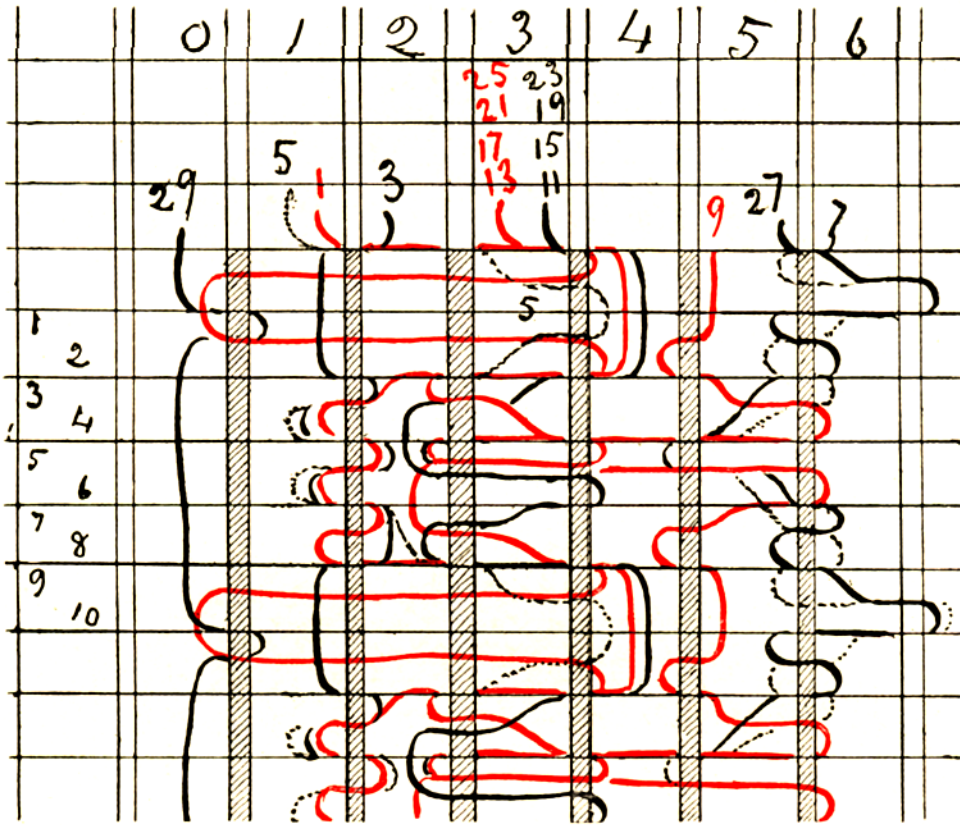


FIG. 75.

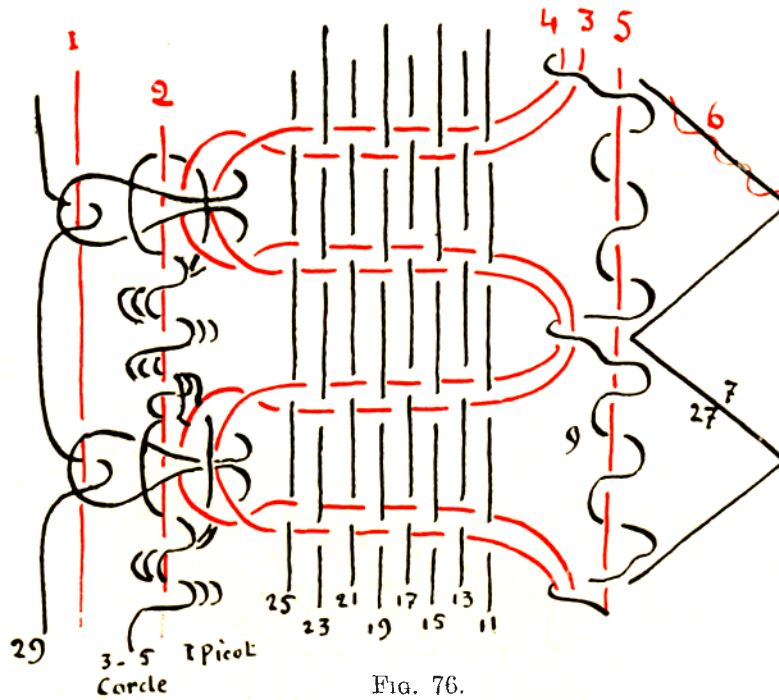
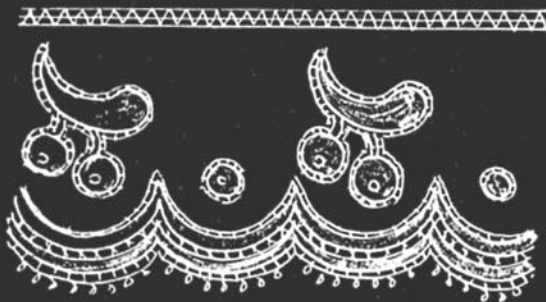


FIG. 76.







### 12 Motion Front with crosses, 9 band threads.

Our Fig. 78 represents a 12 motion front with crosses.

We have put 9 band threads, of which one, the lowest No. 11, takes No. 6 bobbin and forms a ticking.

The set out is the same as in the preceding front, that is the front threads work at the bottom and the back threads at the top, also the drag thread is at back of all.

This front is used for stiffer qualities than the preceding ones and follows the quality of the net to which it is adapted, and of which we have indicated on the draught the beginning of a square or hole. (See Figs. 78 and 79).

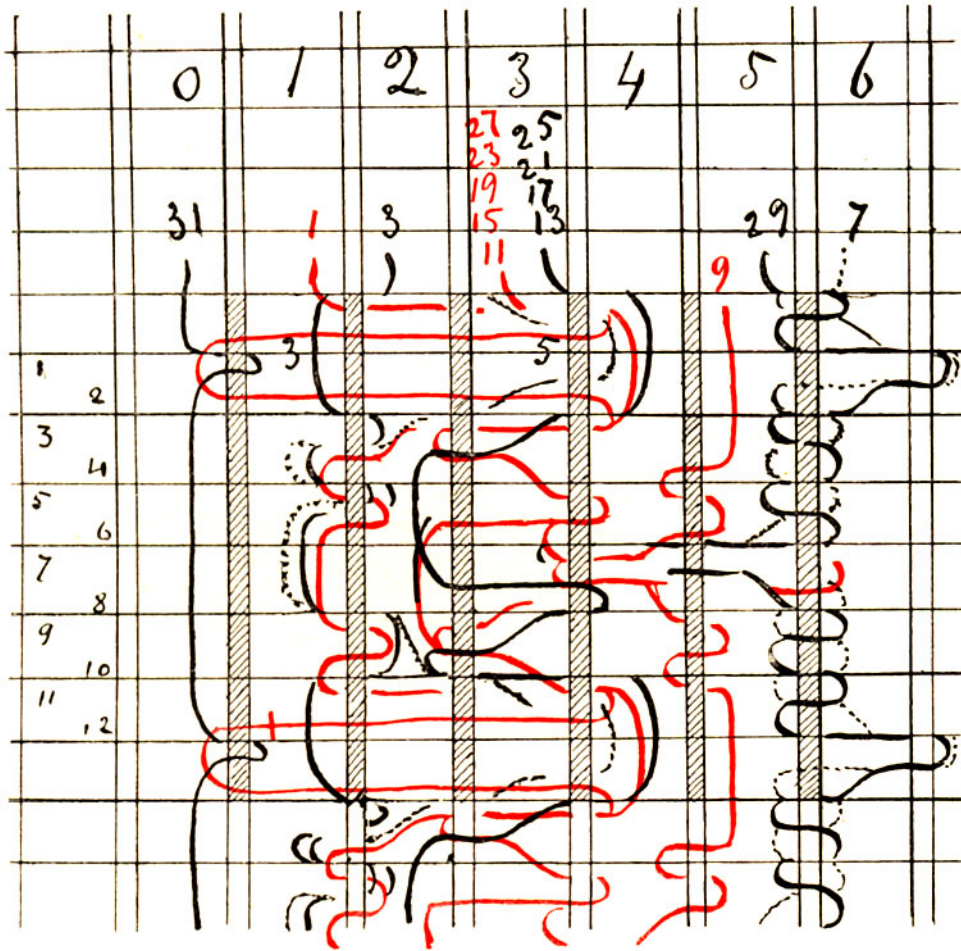


FIG. 78.





14, Motion Front with crosses, 9 band threads.

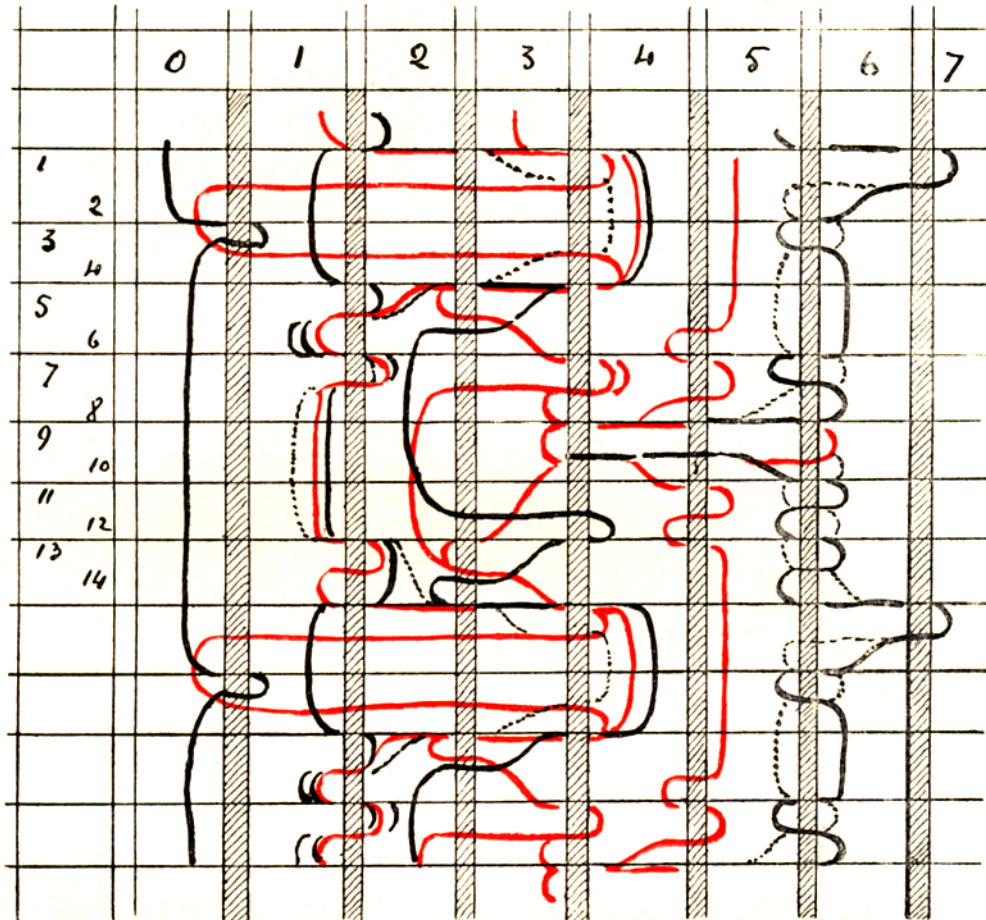


FIG. 80.

We give this 14 motion front as an example. It only differs from the preceding one by the added motions, the set out is the same.



Aspect of a 14 motion with visible crosses.

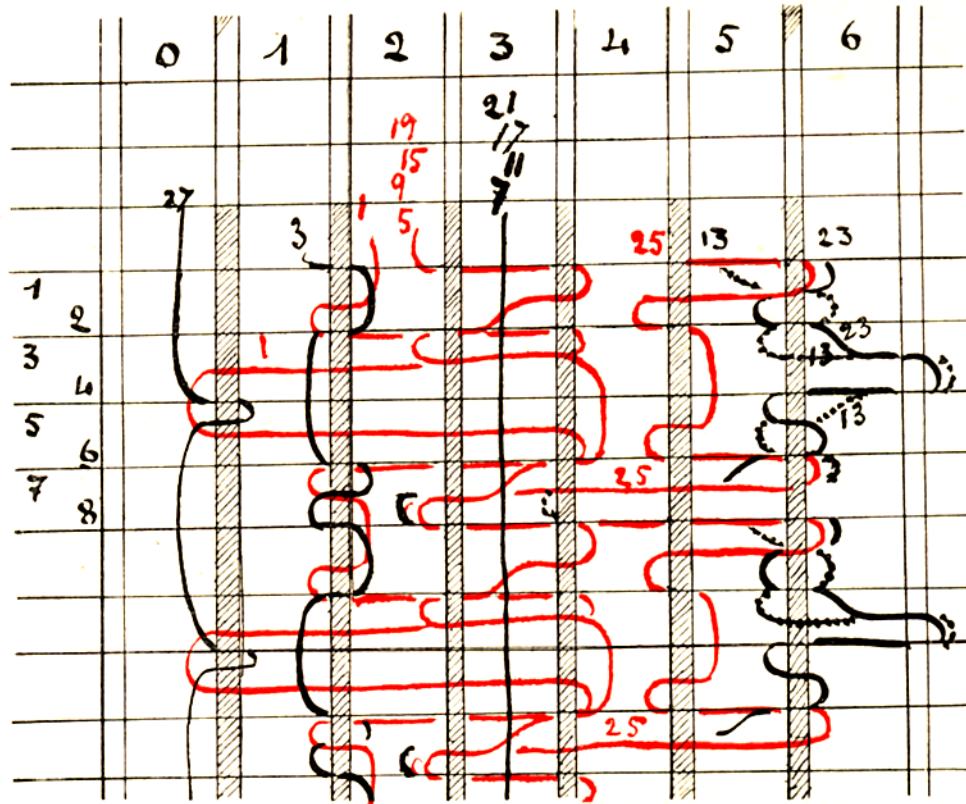


FIG. 81.

This 8 motion front presents the peculiarity that the crosses instead of being apparent are hidden under the ties.

We have, as in the other fronts, 8 threads in 2 series, the back threads beginning at the bottom.

You will notice that the series 7-11, 17 and 21, remain straight in the carriage No. 3, whereas the other series makes the bobbins cross (Figs. 81, 83, and sheet Fig. 82).

Stops	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Carries	47	25	23	21	19	17	15	13	11	9	7	5	3	1
12	00	64	65	33	43	33	43	56	33	43	33	43	22	21
14	00	55	67	33	24	33	24	57	33	24	33	24	11	40
16	10	54	56	33	44	33	44	65	33	44	33	44	11	04
18	00	62	52	33	32	33	32	63	33	32	33	33	21	12

FIG. 82.

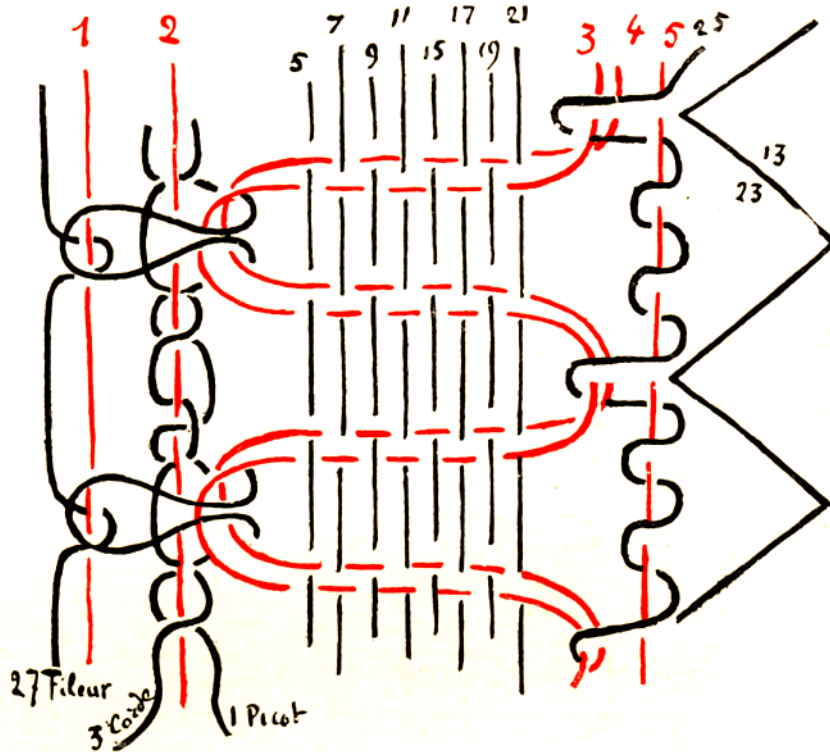


FIG. 83.

In the front before us the drag thread No. 25 should always be in front of the band threads.

We do not recommend the work of this front, which has the defect of coting, because, the series 7, 11, 17 and 21 remaining straight, though crossed by the other series, are subject to coting and it requires better yarns to make this front.



Aspect of an 8 motion front with hidden crosses.



10 Motion Front with 2 Corders.

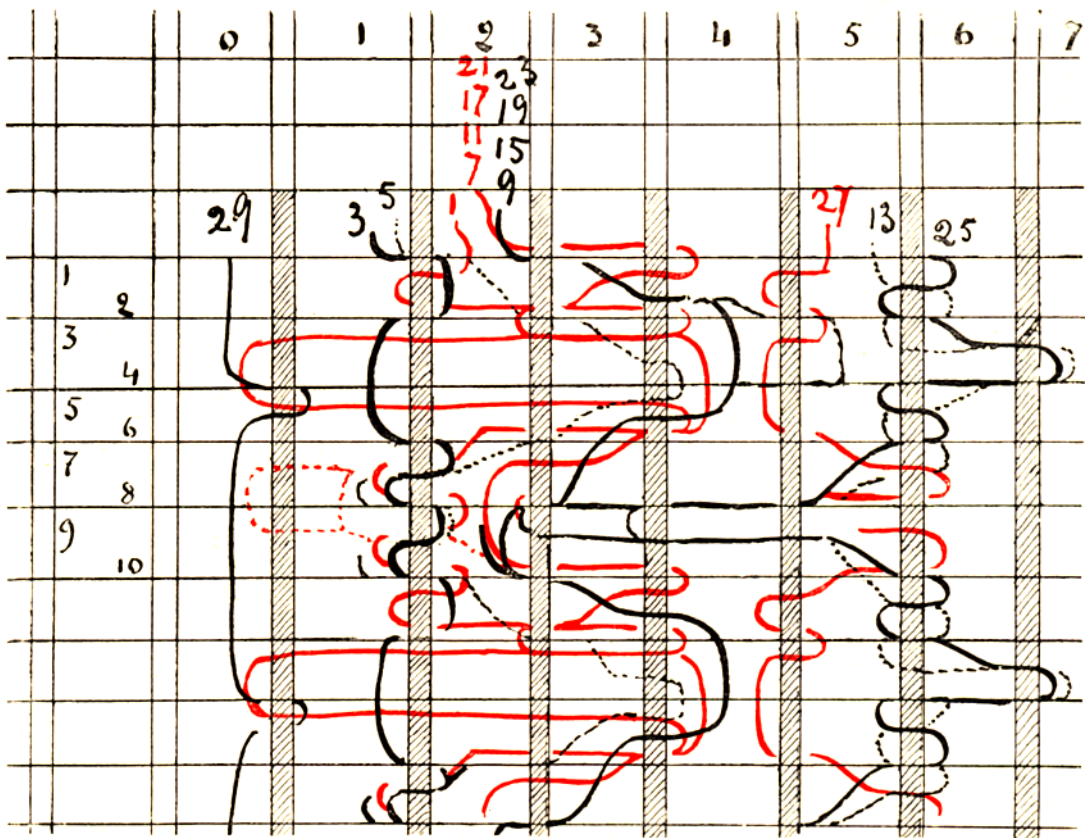


FIG. 84.

The 10 motion front (Fig. 84) when finished, is similar to the 8 motion front (Fig. 81), but there is a difference in the work.

We have put one thread more as corder, this makes the purl or corder bobbin thicker.

Instead of making the series of threads 9, 15, 19 and 23 work straight, we throw them off (See Fig. 84).

Throw off bar 7 on cards 8 and 9 by falling 1 or 2 gaits.

Throw off also No. 23 on cards 3 and 4, this gives the band a regular width and helps the bobbin to deliver for the whole band in general.

This cut is very good for the regular working of the machine.



Aspect of a 10 motion front with hidden crosses.

### 12 Motion Front.

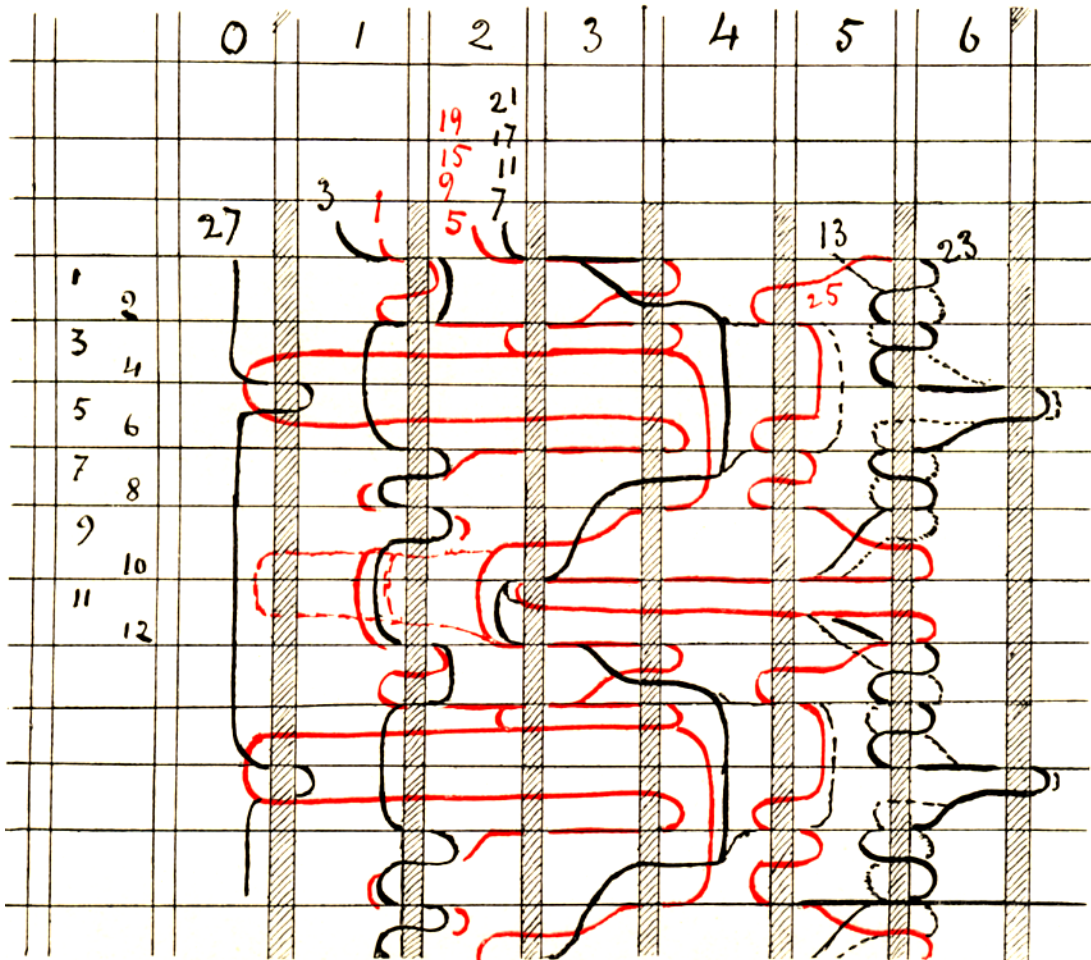


FIG. 83.

This front is similar to the preceding 10 motion front, less the extra corder, it is used for stiffer goods than the 10 motions.



Aspect of a 12 motion front with hidden ties.

16 Motion Front with Visible Crosses produced by the Front Ticking Thread.

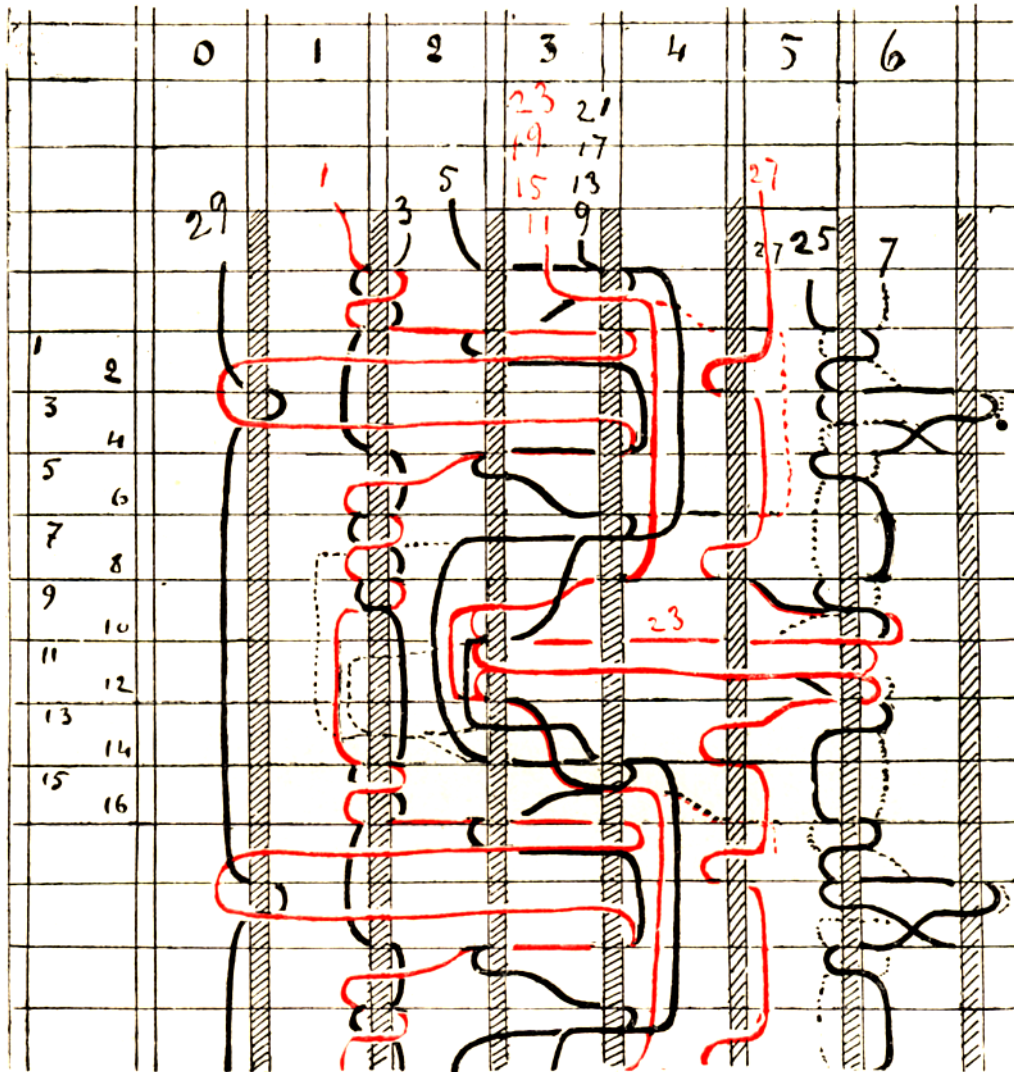


FIG. 86.

This 16 motion front presents a bobbin cross produced by thread No. 5. It is made with 8 threads in two series in same passes as the front described (Fig. 55), (see Fig. 87) representing the sketch of Fig. 86. This sketch is correct except that we have omitted to show thread 23 rising into the tie joining the front with the net.

Thread No. 5 is called the front ticking thread.

We have punctuated the threads that throw off.

16 Motion Front, crosses made by the Front Ticking Thread.

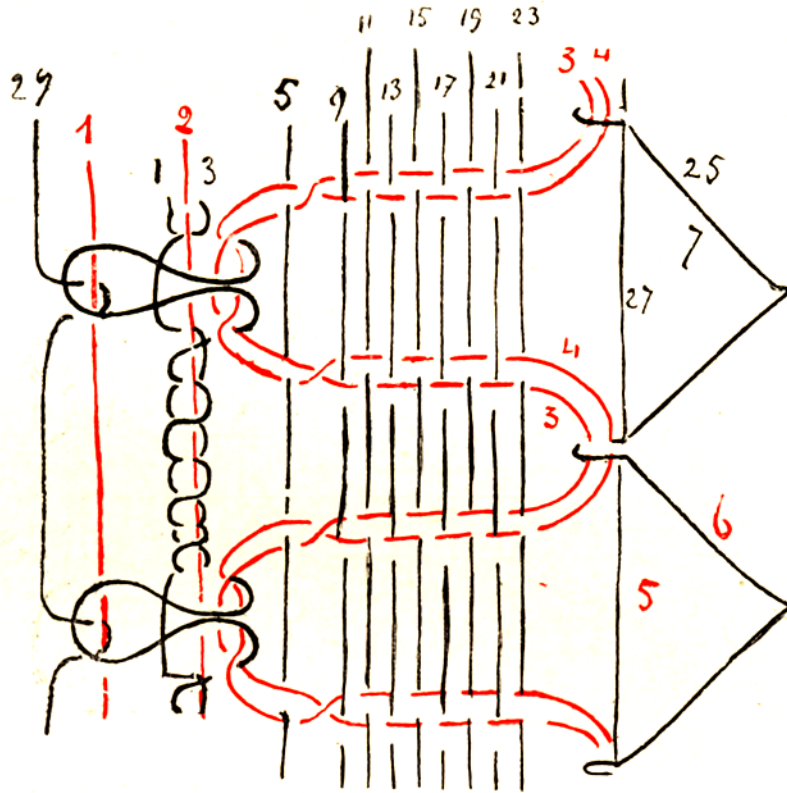


Fig. 87.

Stops	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Threads	29	27	25	23	21	19	17	15	13	11	9	7	5	3	1			
2	0 0	5 4	6 5	5 5	4 4	4 4	4 4	4 4	4 4	4 4	4 4	4 4	5 6	2 4	1 1	4 0		
4	1 0	5 5	7 6	5 5	4 4	4 4	4 4	4 4	4 4	4 4	4 4	4 4	7 5	4 4	1 1	0 4		
6	0 0	5 5	5 6	5 5	4 4	4 4	4 4	4 4	4 4	4 4	4 4	4 4	6 5	2 3	2 2	2 1		
8	0 0	5 4	6 6	4 4	4 3	4 4	4 3	4 4	4 3	4 4	4 3	4 4	4 3	5 5	4 1	1 2	3 1	
10	0 0	5 6	5 6	3 2	3 3	3 2	3 3	3 2	3 3	3 2	3 3	3 2	3 3	6 5	1 4	1 2	3 1	
12	0 0	2 6	2 5	6 2	2 2	2 2	2 2	2 2	2 2	2 2	2 2	2 2	2 2	2 1	3 6	1 1	2 2	1 1
14	0 0	5 4	6 5	3 3	2 3	3 3	2 3	3 3	2 3	3 3	2 3	3 3	1 3	5 6	1 2	2 2	1 1	
16	0 0	5 5	5 5	3 4	4 4	3 4	4 4	3 4	4 4	3 4	4 4	3 4	4 4	6 6	4 3	1 2	2 1	

Fig. 88.



Aspect of a 16 motion front with crosses.



14 Motion Front, Crosses produced by Front Ticking Thread.

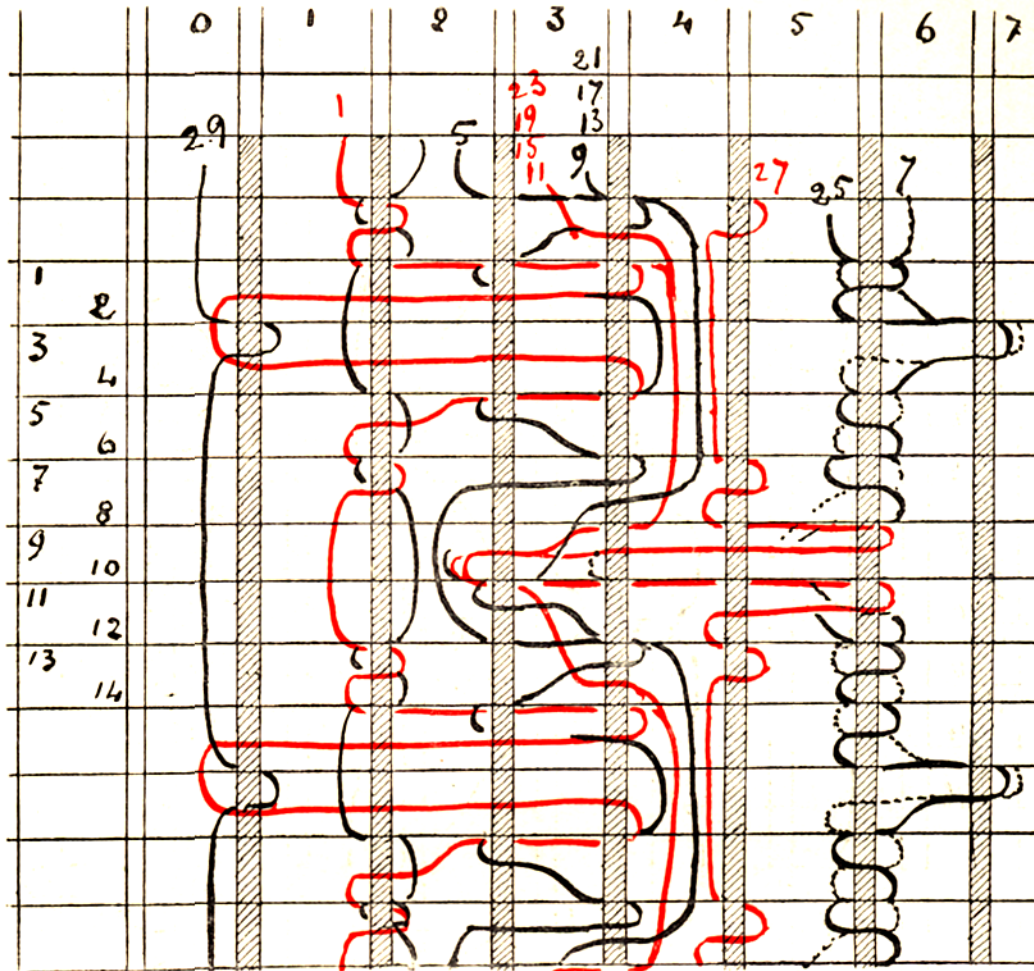
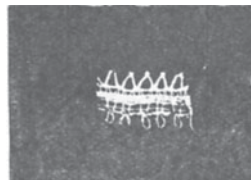


Fig. 89.

This 14 motion is similar when finished to the 16 motion and gives the same bobbin cross. The set out of the bars does not change.

These fronts are very much used, it being generally recognised that they work well in the machine. The sketch (Fig. 87) gives the exact work of the draught (Fig. 89).

Fig. 89.



Aspect of 14 motion front with crosses.



16 Motion Front with bobbin twists and 2 Front Ticking Threads working straight.

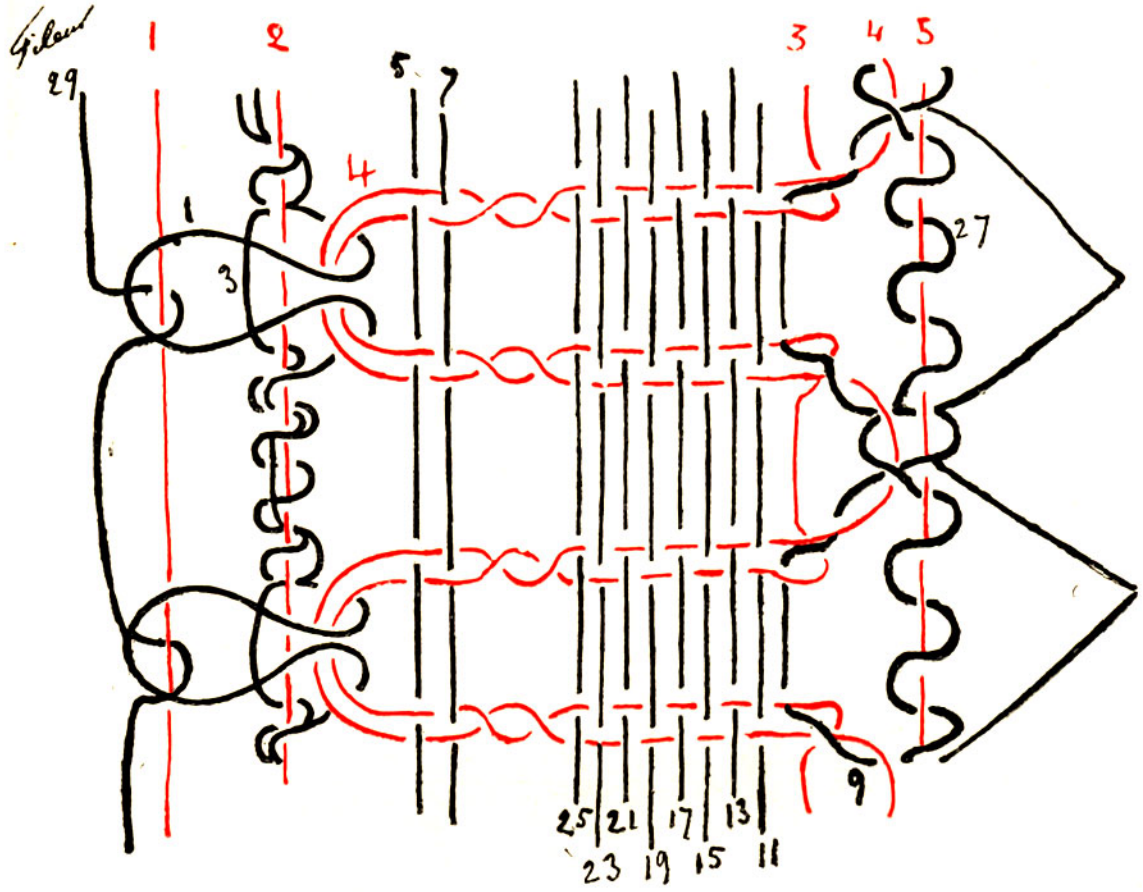
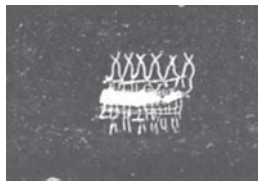


FIG. 92.

In Fig. 92 we give the work of a 16 motion front and 9 band threads. With the work of the band threads 5 and 7, we make 2 bobbin twists (Fig. 92).

The aspect of this front is more lacy than the preceding ones.



Aspect of a 16 motion front, with 2 front ticking threads.



28 Motion Front with bobbin twists above and below  
and 2 Front Ticking Threads.

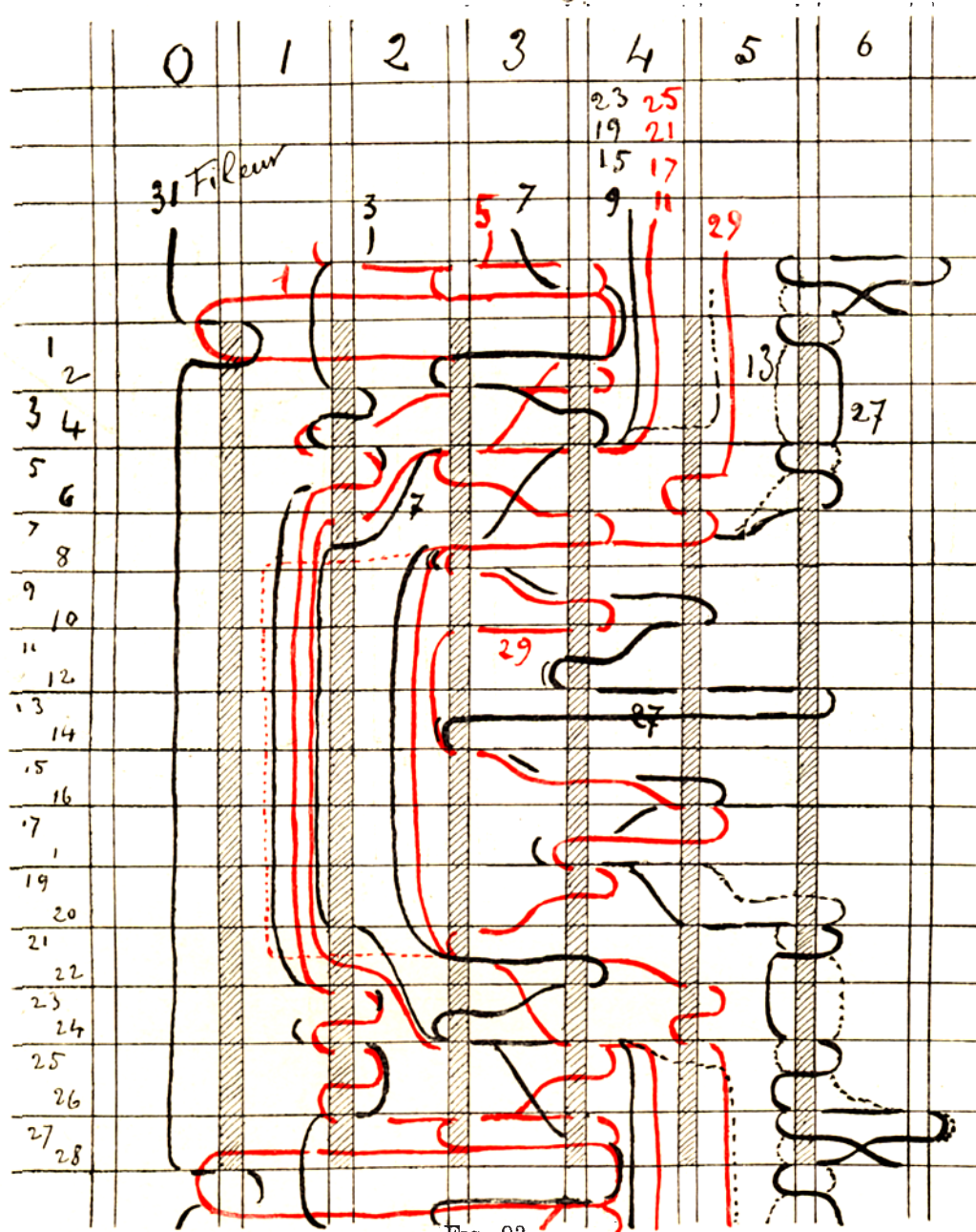


FIG. 93.

The 28 motion front given here has a more lacy aspect because of the bobbin twists above and below the front. It is naturally used for stiffer qualities than the other fronts.

It will be noticed that bobbin No. 5 is crossed by bobbins Nos. 3 and 4, and thus forms a ticking.

It is necessary to always use an even number of band threads for the crosses to be made regularly.





26 Motion Front with Crosses above and below the front.

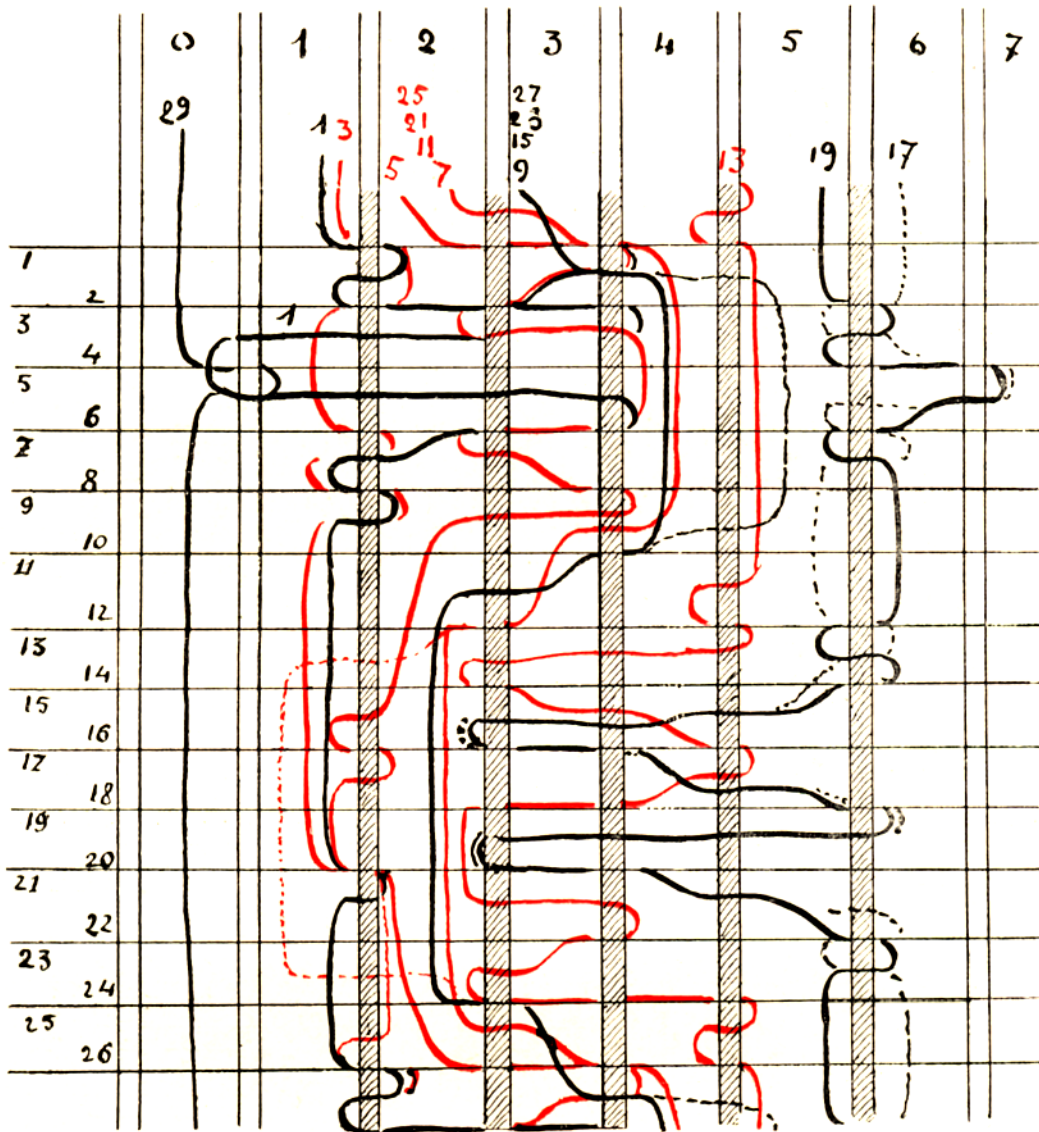


FIG. 96.

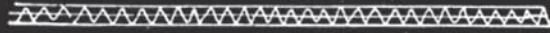
This 26 motion front has a bobbin cross above and below the band.

Bobbins 3 and 4 cross bobbin 5, which thus makes a ticking with No. 13 thread (see Fig. 97 and sheet Fig. 98.) The band threads which throw off are punctuated on the draught (Fig. 96).



Aspect of a 26 motion.





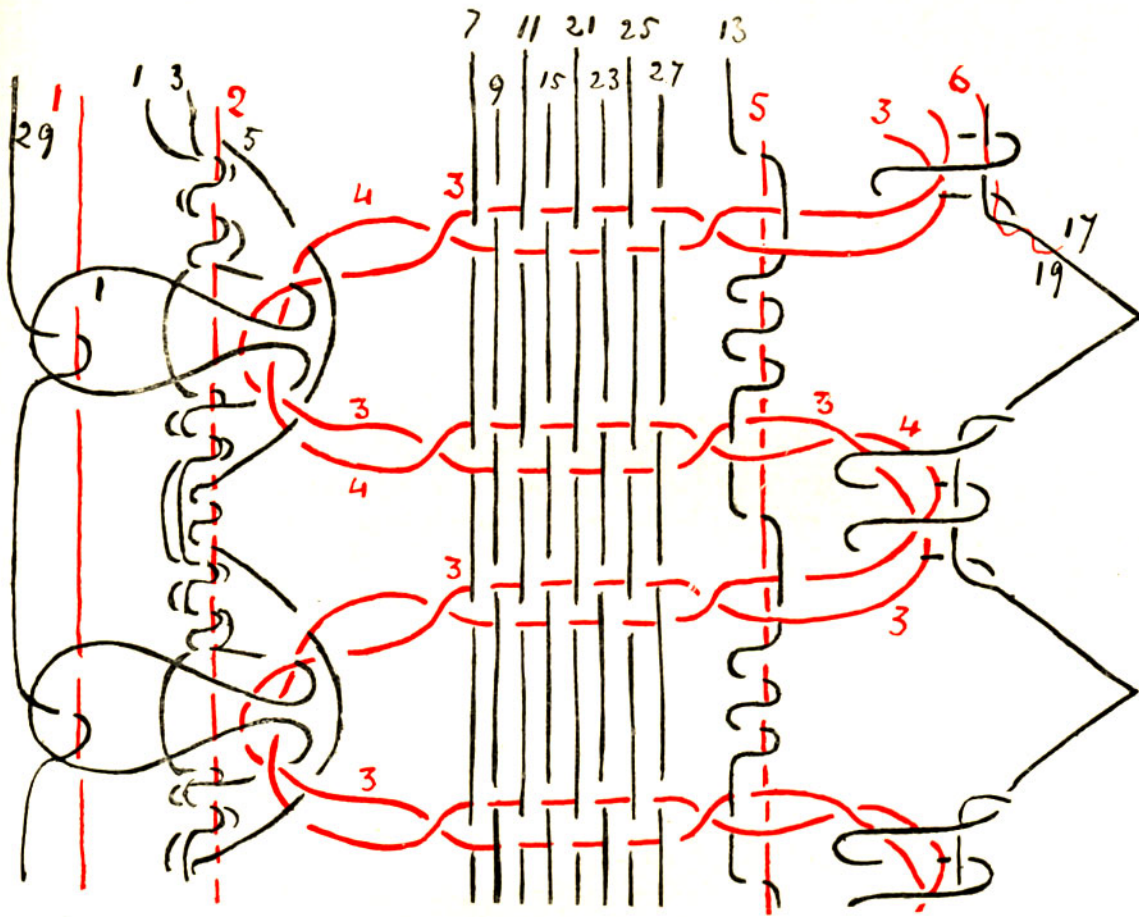


Fig. 97.

Mittels der Wolfsstange		Stapel															Stapel						
Wolfsstange		29	27	25	23	21	19	17	15	13	11	9	7	5	3	1	Wolfsstange						
1	2	0	0	3	5	4	4	4	4	5	5	4	4	3	4	4	4	3	2	2	2	1	
3	4	0	0	5	5	4	4	4	4	6	5	5	6	4	4	4	4	4	4	4	4	4	0
5	6	1	0	5	5	4	4	4	4	7	6	7	5	4	4	4	4	4	4	4	4	4	0
7	8	0	0	5	5	4	4	4	4	5	6	6	5	4	4	4	4	4	4	4	4	4	0
9	10	0	0	5	4	4	3	4	4	6	6	5	5	4	3	4	4	4	4	3	4	2	1
11	12	0	0	3	2	3	3	3	2	6	6	5	5	3	2	3	3	3	2	3	2	2	1
13	14	0	0	2	2	2	2	2	2	5	6	6	5	4	3	2	2	2	2	2	2	2	1
15	16	0	0	2	2	2	2	2	2	5	2	5	2	3	4	2	2	2	2	1	1	1	1
17	18	0	0	2	2	2	2	2	2	4	5	4	5	2	3	4	2	2	2	2	2	1	1
19	20	0	0	2	2	2	2	2	2	6	2	6	2	2	2	2	2	2	2	2	2	2	1
21	22	0	0	2	2	2	2	2	2	4	5	4	6	2	2	2	2	2	2	2	2	2	1
23	24	0	0	2	2	2	2	2	2	6	5	5	6	2	2	3	2	2	2	2	2	2	1
25	26	0	0	5	3	3	3	3	3	5	5	6	6	3	3	5	4	2	3	3	3	2	1

Fig. 98.



8 Motion Front, gimped and tickined.

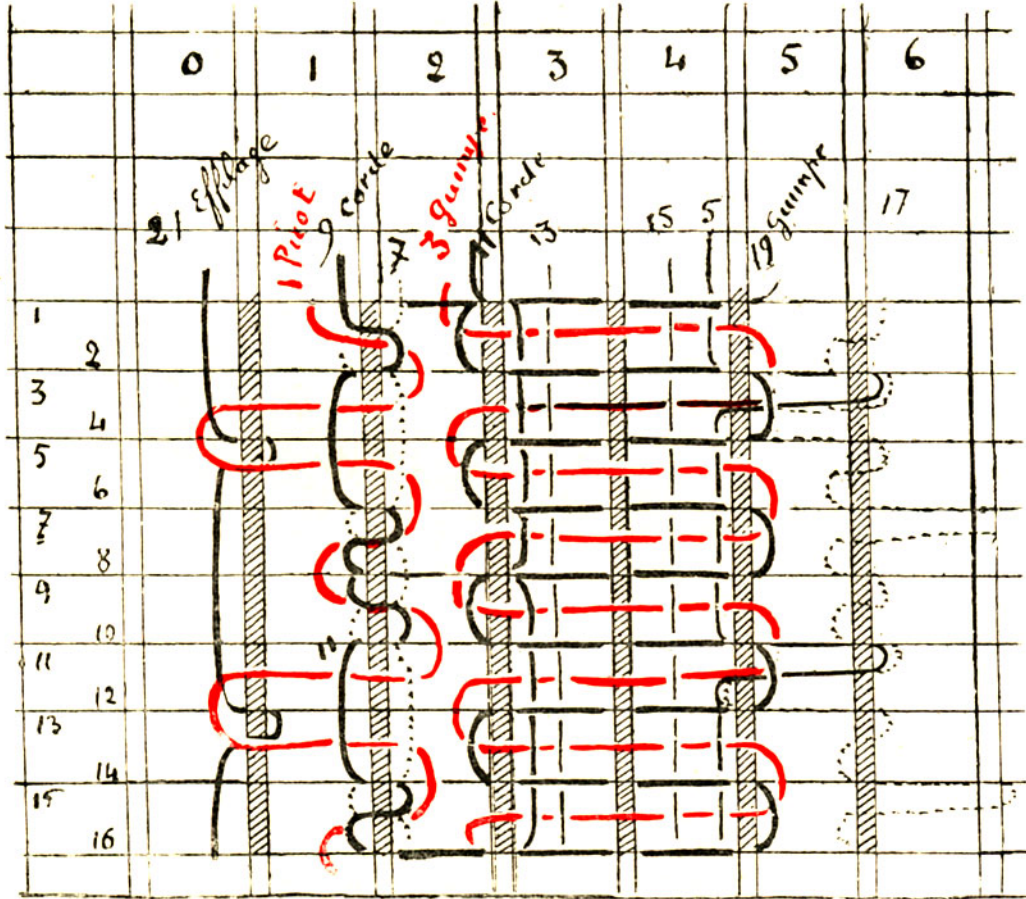


FIG. 99.

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18				
1	0	0	2	2	6	5	4	4	3	3	3	3	1	2	2	1	4	4	2	5	1	2	
3	4	0	0	5	5	6	4	4	4	3	3	3	3	1	1	2	2	6	4	5	2	2	0
5	6	1	0	2	2	6	5	4	4	3	3	3	3	1	1	2	2	4	4	2	5	0	2
7	8	0	0	5	5	7	5	4	4	3	3	3	3	2	1	1	2	4	4	5	2	2	1
9	10	0	0	2	2	6	5	4	4	3	3	1	2	3	3	2	1	4	4	2	5	1	2
11	12	0	0	5	5	6	4	4	4	3	3	1	1	3	3	2	2	6	4	5	2	2	0
13	14	1	0	2	2	6	5	4	4	3	3	1	1	3	3	2	2	4	4	2	5	0	2
15	16	0	0	5	5	7	5	4	4	3	3	2	1	3	3	1	2	4	4	5	2	2	1

FIG. 100

This 8 motion front represents a gimped and tickined front with square net.

We put 2 corders, 9 and 11, crossing each other alternately, thus forming a ticking and another corder, No. 7, nipping the purl and the cross made by 9 and 11.

A front gimp, No. 19, and a back gimp, No. 3 (Fig. 99). The threads 13 and 15 being at the back of gimp No. 19, and in front of gimp No. 3, pass above and below these latter.

Decompose this work with strings.

The quality of the front is about 33 racks for 11.50 metres on a 9 point. The yarns used are 100/2 for gimps and 140/2 for nets.

### WEAVER or BACK EDGE.

The top part of a breadth of lace is usually thus called.

We understand by the term breadth, or lace, (either hand or machine made) a pattern composed of a front, nets and motifs, terminated by a selvedge and another thread crossing from right to left and vice versa, called a Weaver or Zigzag, and one or more straight threads crossing the weaver.

We term allover, a pattern composed of motifs on net not divided by a back edge, except a certain class of allover made in recent years, whose width is determined by the caprice of fashion, such as the allover known as the 18-inch allover.

There are a number of back edges, we will give the preference to those ordinarily used in Valenciennes.

#### 6 Motion Back Edge with Selvedge Bobbin.

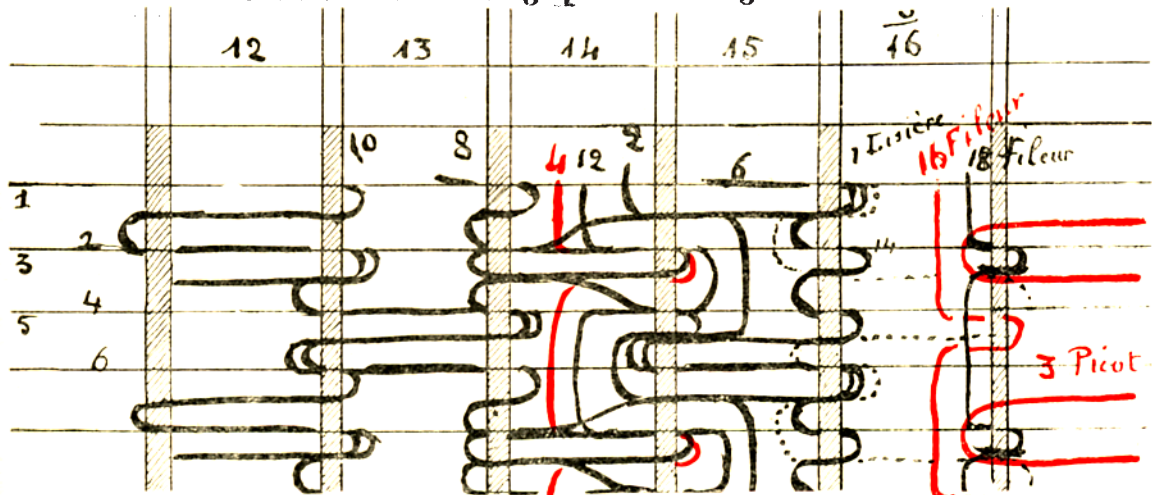


Fig. 101.

We give (Fig. 101) the work of a 6 motion back edge with 2 selvage threads twisting on bobbin No. 16, this allows 3 straight threads to be used.

Threads Nos. 2, 4, 12, indicated on the draught, becomes straight.

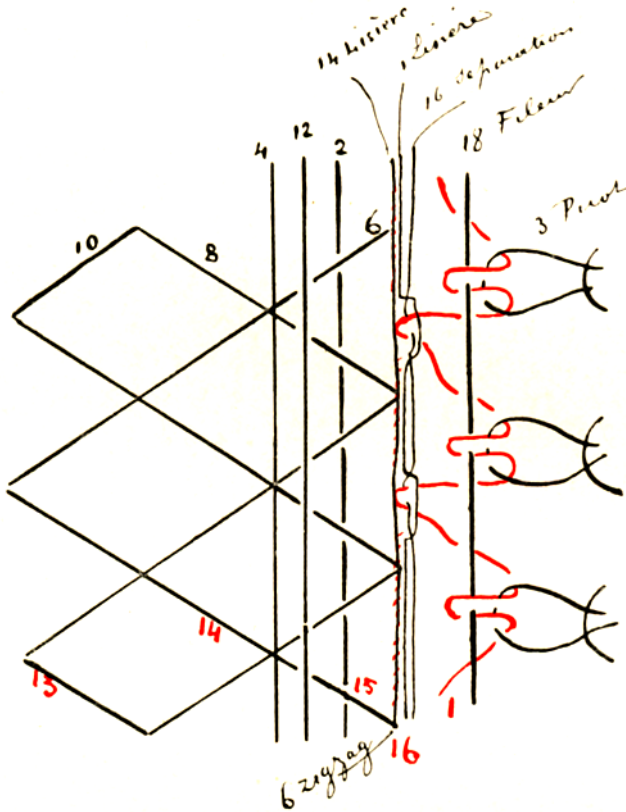


FIG. 102.

Fig. 103 gives the work of the figure sheet.

The bobbins are marked red on the sketch (Fig. 102) as also the work of No. 1 bobbin.

When the 2 lacers, numbered 16 and 18, are drawn, No. 1 bobbin falls out.

The selvage threads 1 and 14 should be heavily weighted. These beams require special springs as also the lacers.

One generally uses stronger yarn for the weaver thread, and also for the straight threads.

So as to have a sufficiently wide weaver it is usual to spring No. 15 bobbin medium slack.

Stops		0	0	0	0	0	0	0	0	0	0
Barres		18	10	14	12	10	8	6	4	2	1
1	2	16 10	16 10	16 15	14 14	13 11	14 13	16 14	14 14	14 15	1 0
3	4	17 16	16 16	16 15	15 15	13 12	15 13	13 14	15 14	15 15	0 2
5	6	16 16	17 16	16 14	14 14	14 12	14 12	15 14	14 14	15 14	2 0

FIG. 103.



Aspect of 6 motion back edge with square net.

The separation bobbin No. 1 should be tight, so as not to lose width in the breadth.

The yarns used are 40/2 for selvages and 60/2 for laces

This back edge is also used with 6 motion enzor net.

For the weaver beam, we use the same spring as for the net beams.

**6 Motion Back Edge without Selvidge Bobbin.**

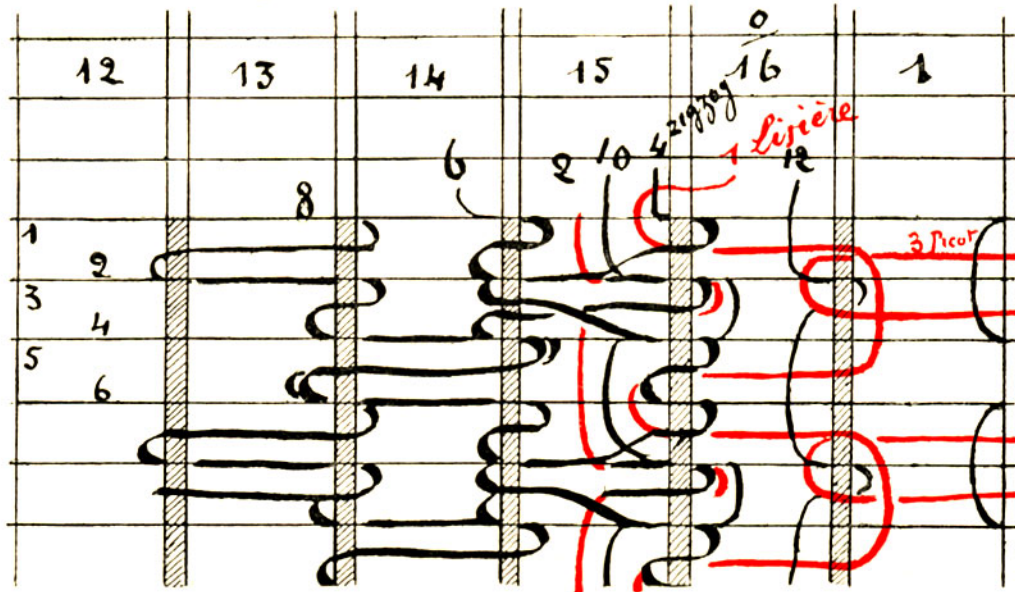


FIG. 104.

Motions		Steps	0	0	0	0	0	0	0
Motions		Steps	12	10	8	6	4	2	1
1	2		16 16	15 15	14 12	15 14	16 15	15 15	0 2
3	4		17 16	16 16	14 13	16 14	14 15	16 15	2 2
5	6		16 16	15 15	15 13	15 12	16 15	15 15	2 0

FIG. 105.

In this back edge No. 1 selvage should be sprung very tight. Being drawn to the weaver it forms its point.



In Fig. 106 we have indicated the numbers of the bobbins in red.

This back edge is used for slack goods, for example, with 6 motion enzor net.

The yarns used are 40/2 for selvages, and 80/2 for straight ups.

Only 2 straight-ups can be used with this back edge, the lacing is not the same as in the Weaver (Fig. 102).

Make this with strings, so as to see the effect of bobbin No. 1.

Lacer No. 12 represented (Fig. 106), having little tension, passes through the purl.

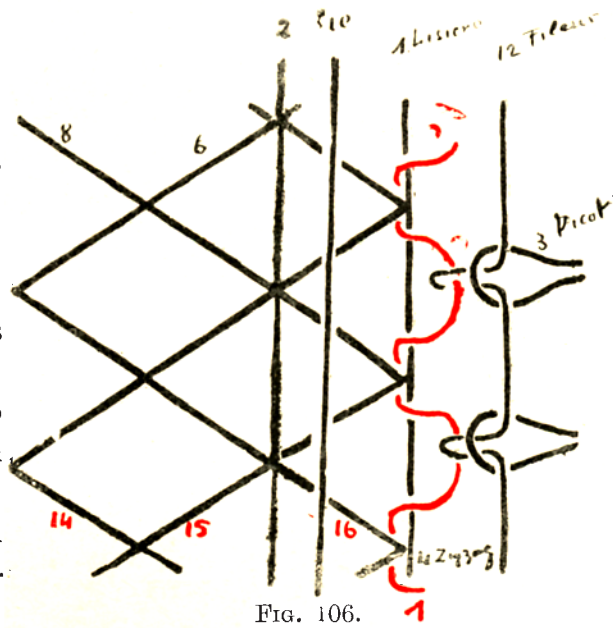


FIG. 106.

### 8 Motion Back Edge.

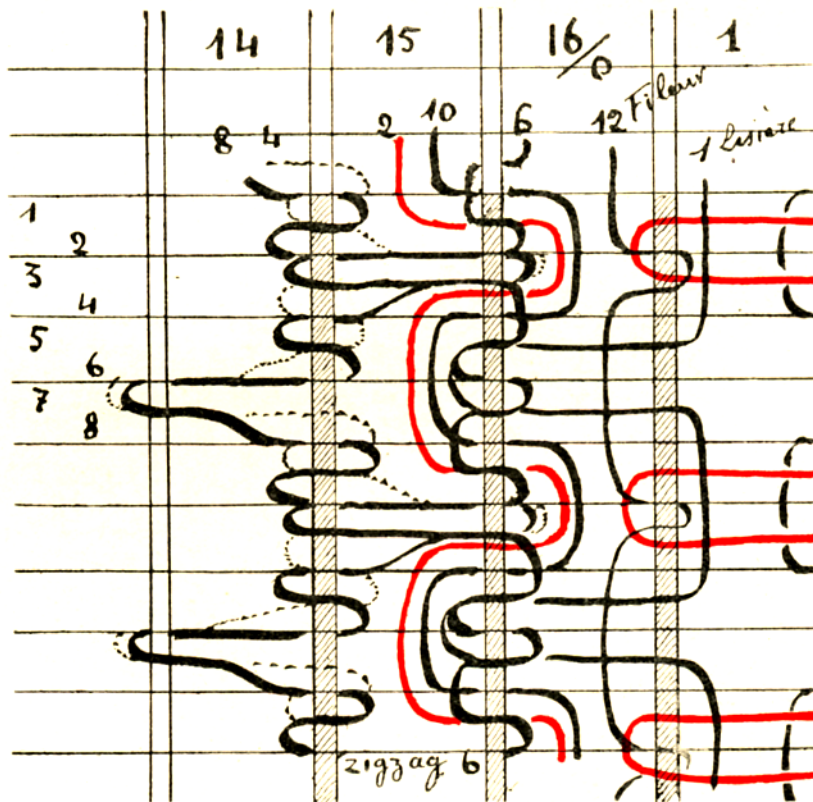


FIG. 107.

Steps	0	0	0	0	0	0	0
Bars	12	10	8	6	4	2	1
2	16 16	16 16	15 14	15 16	14 15	15 16	17 17
4	17 16	16 16	16 15	14 16	16 14	16 15	17 17
6	16 16	15 15	14 15	16 15	15 14	15 15	17 15
8	16 16	15 15	13 14	16 15	13 15	15 15	15 17

FIG. 108.

This 8 motion back edge is composed of two straight threads, one selvedge, and a weaver. This thread should always be interposed between the two net threads 4 and 8. If we put it either in front or at back of these two threads, the tie would be defective (Fig. 107).

This back edge can also be made with the 8 motion net, one thread per bobbin, and the 8 motion Enzor net (sketch Fig. 109 and figure sheet No. 108).

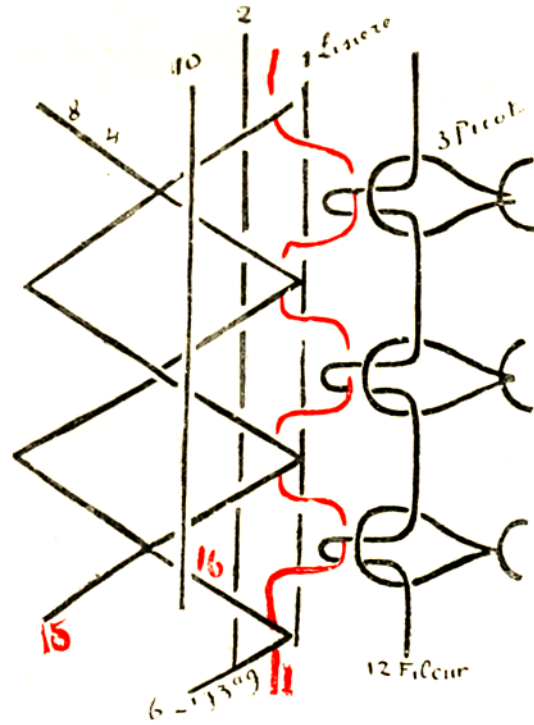


FIG. 109



Aspect of 8 motion back with 2 straight threads.

10 Motion Back Edge.

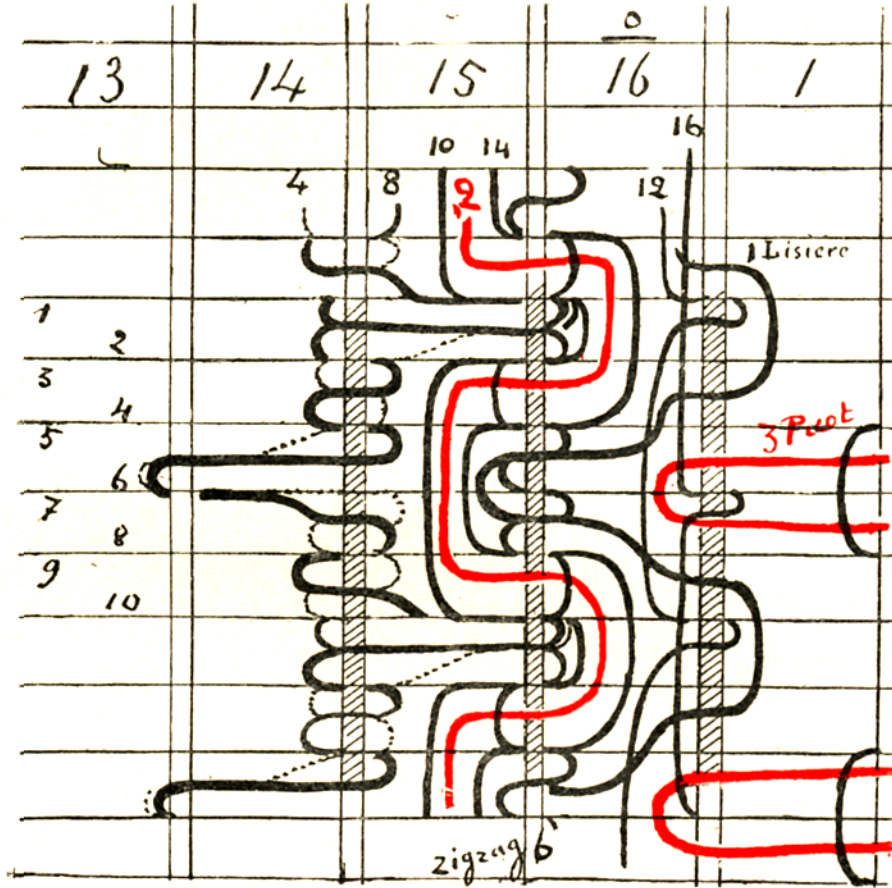


FIG. 110.

Motions	Steps	0	0	0	0	0	0	0	0
Motions	Steps	16	14	12	10	8	6	4	2
1 2		16 16	16 16	17 16	16 16	16 14	14 16	16 15	16 16
3 4		16 16	16 16	16 16	15 15	15 14	15 15	14 15	16 15
5 6		16 16	15 15	16 16	15 15	15 13	16 15	14 13	15 15
7 8		17 16	15 15	16 16	15 15	14 15	16 15	15 14	15 15
9 10		16 16	16 16	16 16	15 15	14 15	16 16	15 14	15 16

FIG. 111.

With this 10 motion back edge, three straight threads can be used and one selvidge.

We show at Fig 110 the work of the lacers and of No. 1 bobbin in red (Fig. 111 bis.)

Do the work of this lacer with strings.

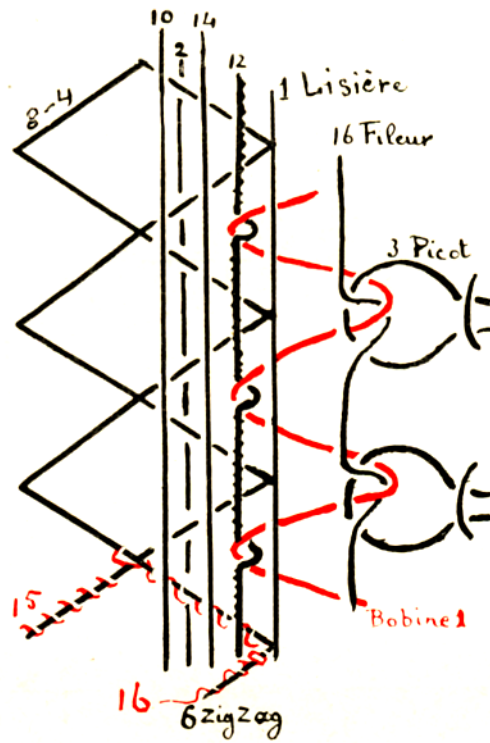


FIG. 111 bis.



Aspect of 10 motion back edge with 3 straight ups.



10 Motion Back Edge with 2 Chain Threads.

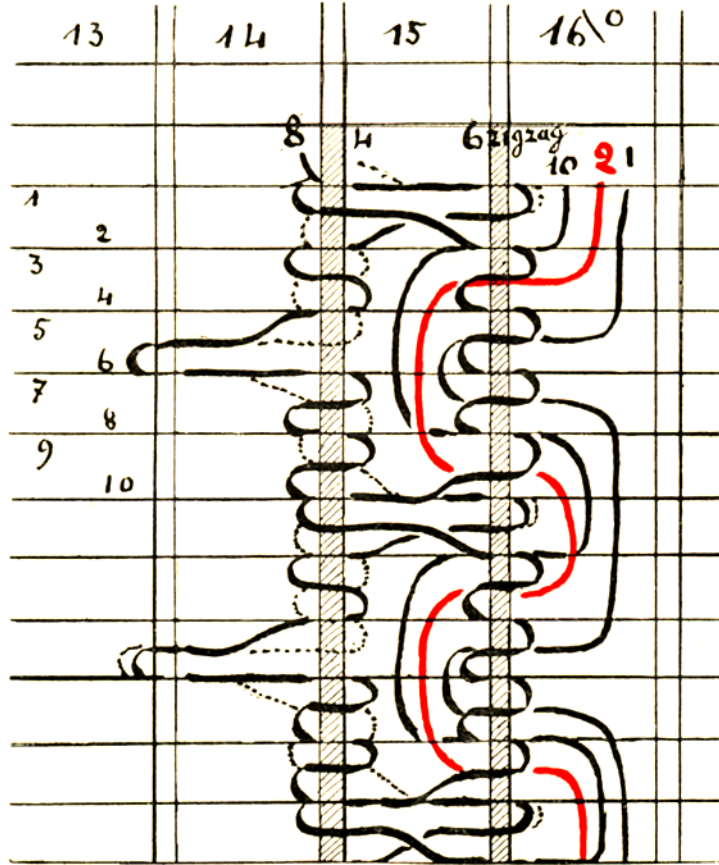


FIG. 112.

		0	0	0	0	0	0	Stops
		10	8	6	4	2	1	Starts
1	2	15 16	14 15	13 14	12 13	11 12	10 11	
3	4	15 15	14 15	13 15	12 14	11 15	10 16	
5	6	15 15	14 13	13 15	12 13	11 15	10 15	
7	8	15 15	15 14	14 15	13 14	12 15	11 16	
9	10	16 16	15 14	14 15	13 15	12 16	11 16	

FIG. 113.

With this 10 motion back edge 2 chain threads, 2 and 10 can be used instead of 2 straight ups (Fig. 114).

For this back edge as well as for the others we have used even threads. As a general principle, the odd numbers work at bottom of the breadth, and the even numbers at the top.

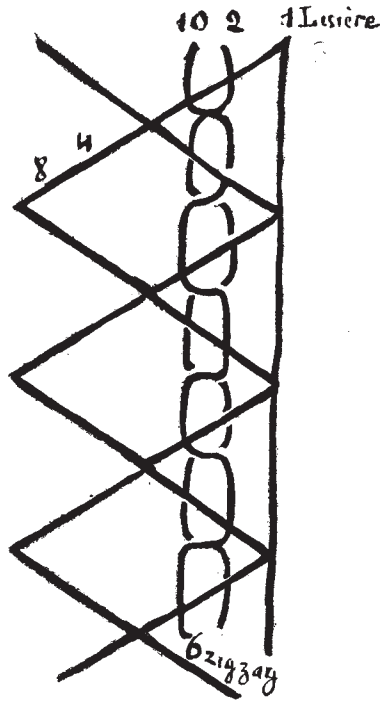


FIG. 114.

### 12 Motion Back Edge with 3 Straight Ups.

This 12 motion back edge only differs from the 10 motion by one twist on cards 11 and 12, No. 6 thread (Fig. 115).

The lacing is not the same as Fig. 110 ; here we only have one lacer.

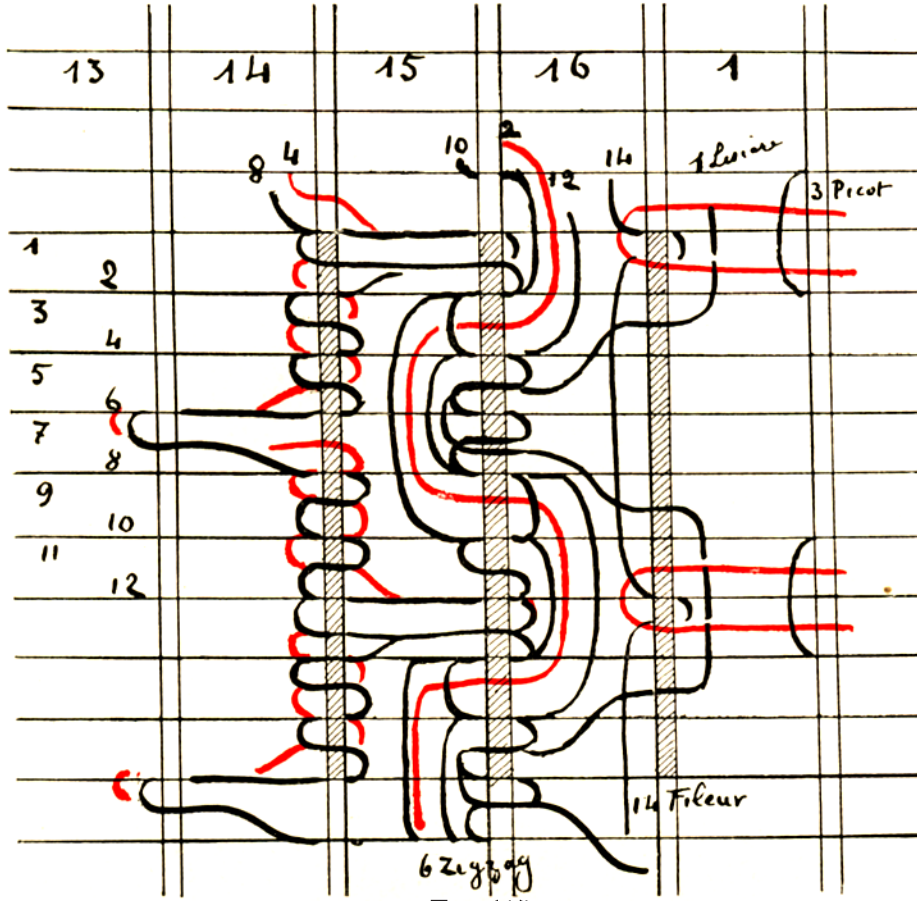


Fig. 115.

Steps	0	0	0	0	0	0	0	0
Threads	14	12	10	8	6	4	2	1
1	17 10	16 16	16 16	16 15	14	16 14	16 16	17 17
2	16 16	16 16	15 15	14 15	15	15 14	16 15	17 16
3	16 16	15 15	15 15	14 15	16	15 14	15 15	16 15
4	16 16	15 15	15 15	13 14	16	13 15	15 15	15 16
5	16 16	16 16	15 15	15 14	16	14 16	15 16	16 17
6	16 16	16 16	16 16	15 14	15	14 15	16 16	17 17

Fig. 116.





### 14 Motion Back Edge with 4 Straight Threads.

The 14 motion back edge (Fig. 118) allows the use of 4 straight ups which give the pattern a finer look.

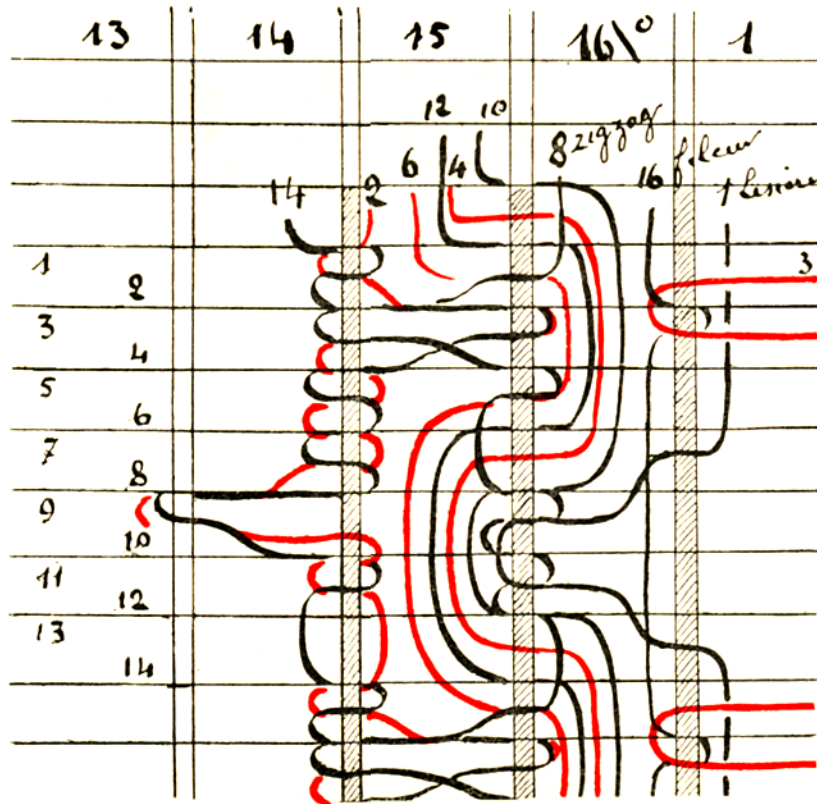


Fig. 118.

Stops	0	0	0	0	0	0	0	0	0	
Threads	16	14	12	10	8	6	4	2	1	
1	16 16	15 15	16 16	16 16	16 16	15 15	15 16	16 16	14 15	17 17
2	17 16	16 15	16 16	16 16	16 16	14 15	16 16	16 16	16 14	17 17
3	16 16	17 15	16 16	16 16	16 16	16 15	16 15	16 16	15 14	17 17
4	16 16	14 15	15 15	16 16	15 15	15 15	15 15	16 15	15 14	17 16
5	16 16	13 14	15 15	15 15	16 15	15 15	15 15	15 15	13 15	16 15
6	16 16	15 14	15 15	15 15	16 15	15 15	15 15	15 15	14 15	15 16
7	16 16	14 14	15 15	16 16	16 16	15 15	15 16	15 15	15 15	16 17

Fig. 119.

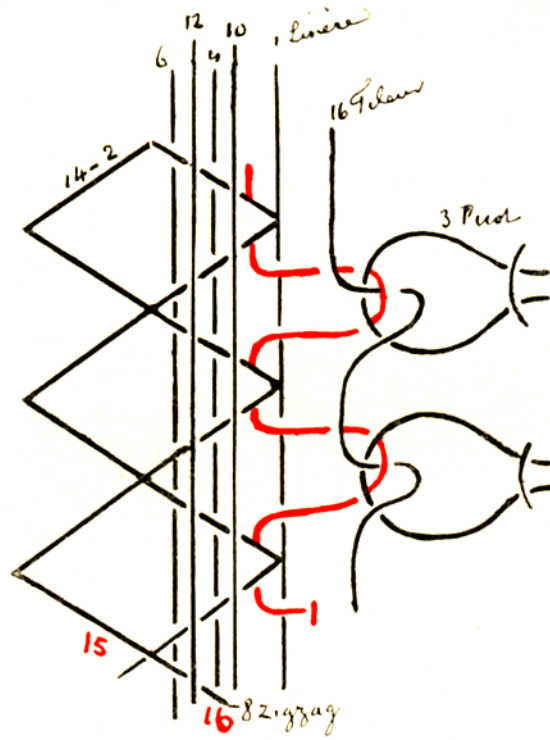
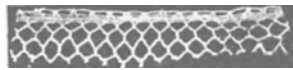


FIG. 120.



Aspect of a 14 motion back edge with 4 straight ups.