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# Posselt's Textile Journal

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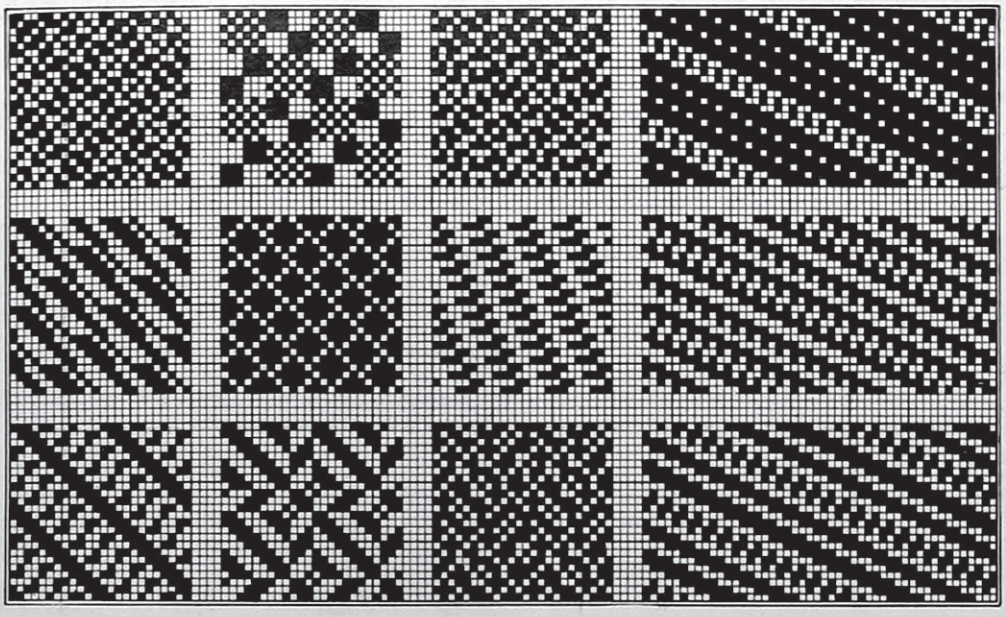
# DICTIONARY OF WEAVES.*

TWELVE HARNESS



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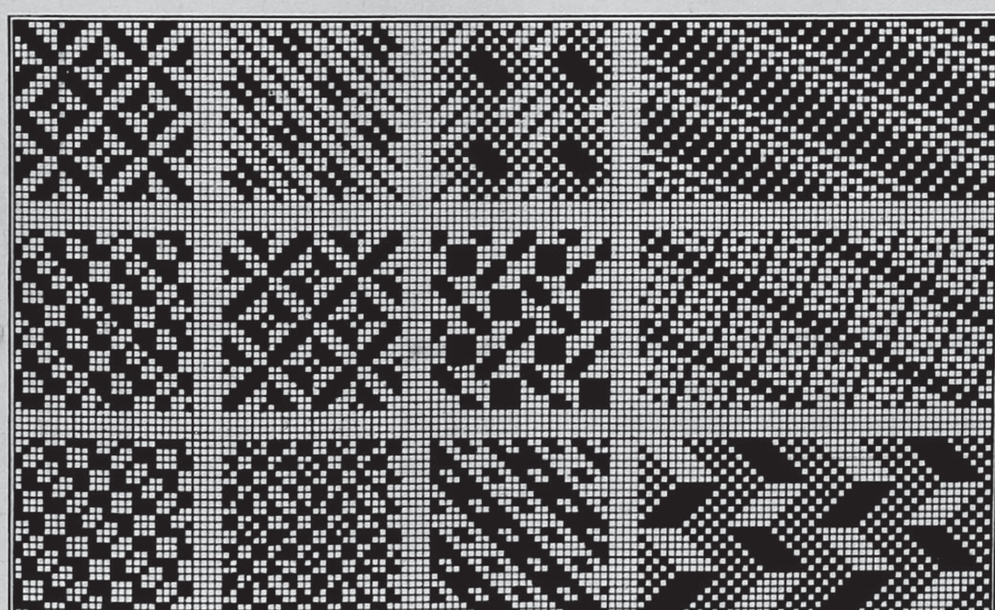
TWELVE HARNESS



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*Complete, this Dictionary will contain over TWENTY THOUSAND PRACTICAL WEAVES, taken from woven Fabrics. About Two Thousand of them have thus far appeared, and can be obtained by ordering back numbers.

# POSSELT'S TEXTILE JOURNAL

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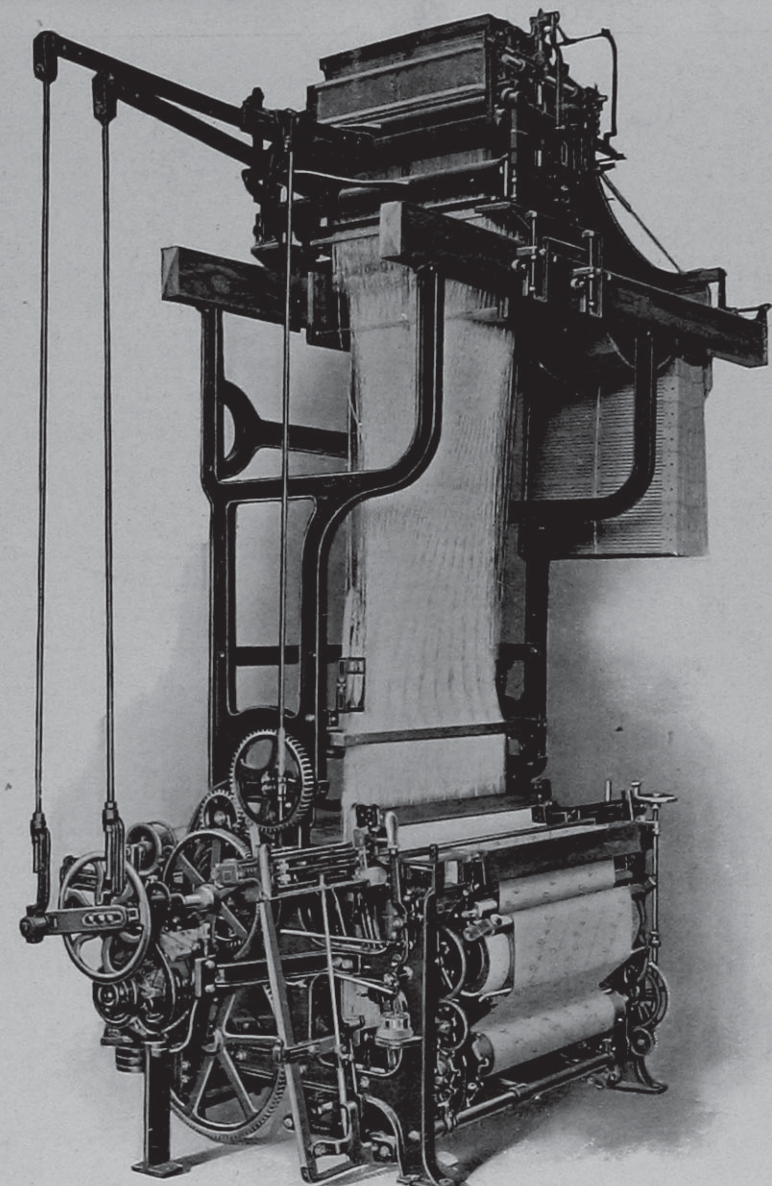


C. & K. JACQUARD SILK LOOM WITH MOTOR DRIVE

# Posselt's Textile Journal

Vol. V. August, 1909. No. 2.

## RIBBONS, TRIMMINGS, EDGINGS, ETC.

(*Continued from page 22.*)

**The Twist in the Yarn and its Influence upon the Cloth.**

Threads, in which you take out twist if twisting the thread between your fingers to the left hand side, and in which you add twist by twisting said thread towards the right hand side, are technically known as *right hand twist;* vice versa threads which untwist if turned to the right hand side, and in which twist is added if twisted to the left hand side, are known as *left hand twist.*

Fig. 106$^a$ shows right hand twist, warp yarn;
Fig. 106$^b$ shows right hand twist, filling yarn;
Fig. 107$^a$ is a left hand twist, warp yarn, and
Fig. 107$^b$ is a left hand twist, filling yarn.

Provided we use in a fabric, warp and filling yarn spun with a hard twist, it will be advisable to use the same direction of twist for both systems of threads, since then the spirals of the twist of warp and filling will cross, in turn slightly raising the warp in the fabric.

Provided we use for the warp yarn a different twist than that used for the filling, the spirals of the twist of the warp and filling will then, more or less, interlock with each other, giving in turn a flat appearance to the face of the fabric.

Besides points given, you must take into consideration with the direction of the twist in the yarn, the direction of the twill in the weave.

Diagram Fig. 108 shows us the 4-harness even sided twill, with its twill line running from left to right, *i. e.,* a right hand twill as we call it; used in connection with a right hand twist warp yarn. The twist of the yarn in this instance runs the proper way, *i. e.,* against the direction of the twill in the weave. Using the other direction of twist for the warp yarn, *i. e.,* a warp yarn twisted to the left, in connection with the same direction twill in the weave, would then have the direction of twist in the warp yarn run in the same direction as the twill in the weave, a feature you have to omit wherever possible.

For the filling we have used right hand twist yarn, in order that the spirals of the twist in the filling run against the spirals of the twist in the warp yarn.

Diagram Fig. 109 shows us a pointed twill executed with its proper selection of twist for the warp yarn, *i. e.,* we changed the direction of the twist used for the warp yarn with the change in direction of the twill in the weave. This will explain that in order to properly bring up these pointed twill effects, *i. e.,* one direction of twill as prominent as the other, both kinds of twist (right and left hand twist yarn) must be used.

Of the greatest of importance in the manufacture of ribbons having pearl edges (loop effects produced by floating filling outside the edges of the ribbon), is the direction of the twist of the filling. These pearl edges, to suit the pattern desired, are produced either on one or on both sides of the ribbon by inserting horse hair threads, or steel or brass wires next to the warp threads of the ribbon in the reed. These wires or horse hair threads are secured on one of their

Fig.106$^a$

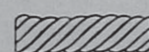


Fig.106$^b$

Fig.107$^a$

Fig.107$^b$

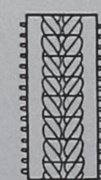


Fig.112$^a$

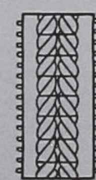


Fig.112$^b$

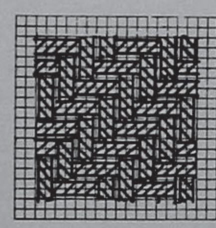


Fig.108

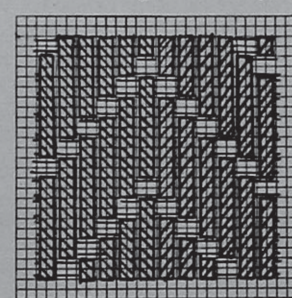


Fig.109

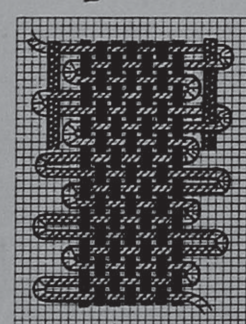


Fig.110

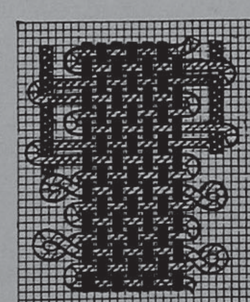


Fig.111

ends to the framing in the rear of the loom. Either wire is then drawn into a heddle eye of a respective harness, and then passed through the reed, close to the side of the fabric, the wire extending close to the breast beam, and after which it then pulls itself during the progress of weaving, automatically out of the loops of the woven fabric. These wires or horse hairs, are raised or lowered by the respective harnesses they are threaded to, to suit the desired shape, number, and length of loops desired in the fabric. The filling is laid during weaving around these horse hairs or wires. The take-up of the loom draws the fabric, as mentioned before, out of the respective horse hairs or wires, in turn forming the characteristic loops to the fabric.

Two kinds of loops are produced; (a) such as form an open eye, and (b) such where the eye twists itself. As a rule, the first mentioned loops are those desired.

Using a right hand twist filling, and wanting to produce an open loop, have the wires as forming the loop, in the upper part of the shed when the shuttle enters from the right hand side, since then the position of the filling around the wires equals untwisting of the filling. Again if you want to produce with right hand twist filling, twisted loops, have your wires out of the two picks which form the loop in the upper shed when the shuttle enters from the left hand side. Position of the filling around the wire then equals additional twist to the filling while forming the loop, the latter then hitting itself, as we say, *upon its head*.

With a left twist filling, in order to obtain an open loop, the wires on both sides of the ribbon must be in the upper shed when the shuttle enters from the left, the reverse entering of the shuttle having to take place when a twisted loop is required.

Diagram Fig. 110 shows us a fabric sketch of a taffeta ribbon, with open loops, using a right hand twist for the filling. In the upper part of the illustration, the wire, as forming the loop is shown dotted white on a black background, so as to distinguish them from the warp threads.

The warp thread nearest the wire, in every instance, must be in the lower shed when the wire is raised, and vice versa, otherwise this warp thread would interlace in the loop.

Fig. 111 shows us a fabric sketch of a taffeta ribbon, containing twisted loops, using a right hand twist yarn for the filling. The same as in the previously quoted example, the upper part of the illustration shows the wire (shaded) as used for the forming of the loop.

Fancy effects, produced in connection with heavy counts of yarns, containing pronounced curves of twist, are frequently used for the formation of special effects on the face of ribbons, for example, cotton threads twisted with spun silk threads or mercerized cotton, etc. Using two such effect threads, one twisted to the left, one twisted to the right, will produce the pattern as shown in sketch Diagram Fig. $112^a$. If we change the position of both threads, the result will be the effect shown in Fig. $112^b$. The more lustrous the material used for these yarns, the more prominent the curves of the twist will appear to the eye, on account of the reflection of the light.

Using hard twisted warp or filling of one direction of twist, the weight of which if compared to the other threads of the fabric is considerably heavier (for example, metal twists), the ribbon then will roll itself in the direction of the twist of said threads. To prevent this, have a right hand twisted thread alternate with a left hand twisted thread.

*(To be continued.)*

## THE CROMPTON & KNOWLES RIBBON LOOM.

### The Construction and Mounting of the Lay.

The lay of the ribbon, *i. e.*, narrow ware loom, is of considerable length, varying from ten to twenty feet or more. On account of this length and its required rigidity, it has been necessary to use for it a solid wooden beam of considerable size, some five inches or more in thickness and in height.

In the Crompton & Knowles Ribbon, *i. e.*, Narrow Ware Loom, this wooden beam, forming the lay, is done away with, substituting in place of it a metal bar, of angle shape in cross section, termed an *angle iron*, giving in turn greater rigidity to the lay and preventing its getting out of line. Combined with this angle iron bar is a wooden bar, detachably secured thereto by screws upon its front side, and which bar has a longitudinal recess therein, to receive the reciprocating rack.

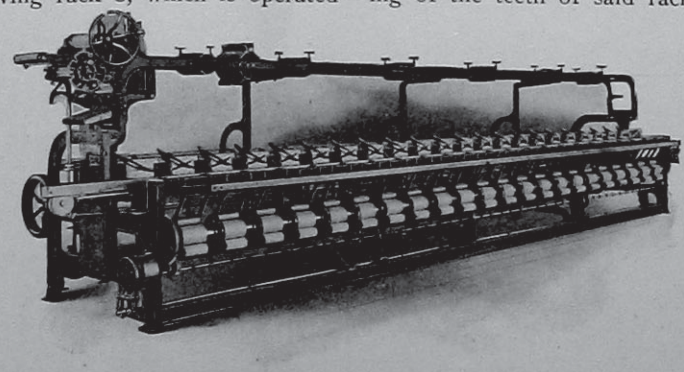
In order to remove the rack, in connection with the Crompton & Knowles Ribbon Loom, it is then only necessary to remove the screws which attach the wooden bar carrying the rack to the angle iron bar, and allow said bar to drop down onto the lower surface of the angle iron bar, so that it can be moved outwardly and the rack raised out of it.

Of the accompanying illustrations, Figure *A* is a front view of the right hand end of the lay and the upper part of a lay sword, etc., looking in the direction of the arrow *a*, Fig. *B*. The latter illustration is a section on line *x* — *x*, Fig. *A*, looking in the direction of arrow *b*, same figure. Fig. *C* corresponds to Fig. *A*, but shows the bar carrying the rack dropped down to allow of the removal of the rack and also shows an adjusting screw for the rack. Fig. *D* is a vertical section on line *y* — *y*, Fig. *C*, looking in the direction of arrow *c*, same figure. Fig. *E* corresponds to Fig *A*, but shows the improvements applied to a loom having drop shuttles, in this instance three banks of shuttles. Fig. *F* is an end view and partial section on line *z* — *z*, Fig. *E*, looking in the direction of arrow *d*, same figure. Fig. *G* is a top view of the lay, shown in Fig. *E*, looking in the direction of arrow *e*, same figure; and Fig. *H*, is a detached view of the angle iron bar, taken on line *o* — *o*, Fig. *E*.

With reference to our illustrations Figs. *A*, *B*, *C* and *D*, numeral of reference 1 indicates the upper part of the lay sword, connected and operated in the ordinary way. Two or more lay swords are employed, according to the width of the loom. The upper part of these lay swords have upon their upper ends, at their front sides, extensions or brackets 1′, forming surfaces to receive an angle iron bar 2, of angle shape in cross section, of iron or steel, and which forms the lay beam of the loom. This angle iron bar 2, is rigidly secured to the bracket 1′, on the upper end of the lay 1, by bolts 3, through its lower surface, and by bolts 4 at its rear side. The angle iron bar 2 extends the full width of the loom, and forms the lay beam, taking the place of the ordinarily used wooden beam.

Extending along the front side of the vertical portion of the angle iron bar 2, is a bar 6, adjustably connected to the former by screws 7, extending through elongated openings 6', in the bar 6, and screwed into the vertical portion of the angle iron bar 2.

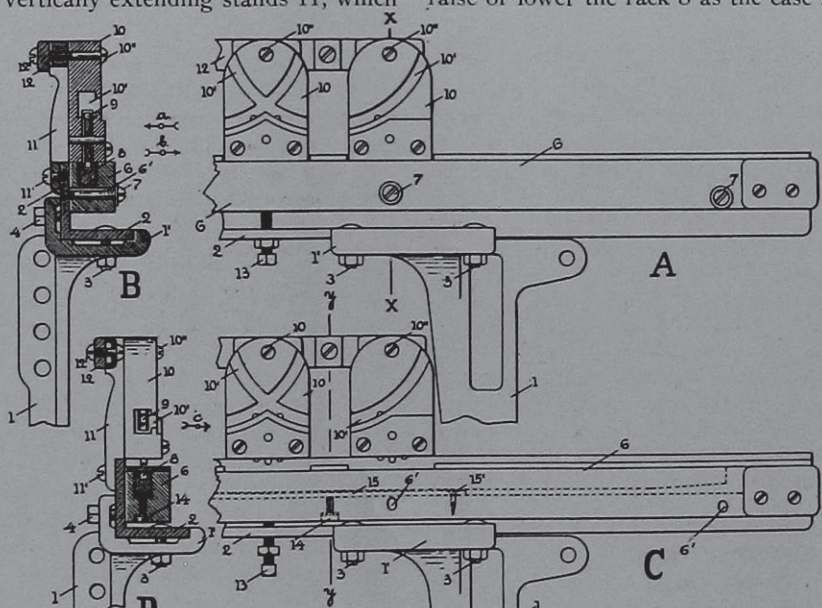
The upper side of the bar 6 is recessed, to receive the longitudinally moving rack 8, which is operated



THE CROMPTON & KNOWLES SILK RIBBON LOOM.

by mechanism, as was illustrated and explained on page 104 of Vol. IV, No. 4.

The rack 8 engages and drives a series of pinions 9, which engage and operate the swivel shuttles (not shown) causing them to move in the guides 10' of the guide blocks 10, in the usual way. The guide blocks 10 are secured at their upper ends by screws 10" to the upper end of vertically extending stands 11, which




are secured at their lower ends, by screws 11', to the upper part of the vertically extending part of the angle iron bar 2. A rail 12, secured to the upper part of the stands 11, by screws 12', extends transversely across the loom and forms a hand rail.

Screws 13 are for adjusting bar 6, as carrying the rack 8, the holding screws 7 being for this work turned out, and after the bar 6 is adjusted they are turned in, so as to secure the bar in its adjusted position.

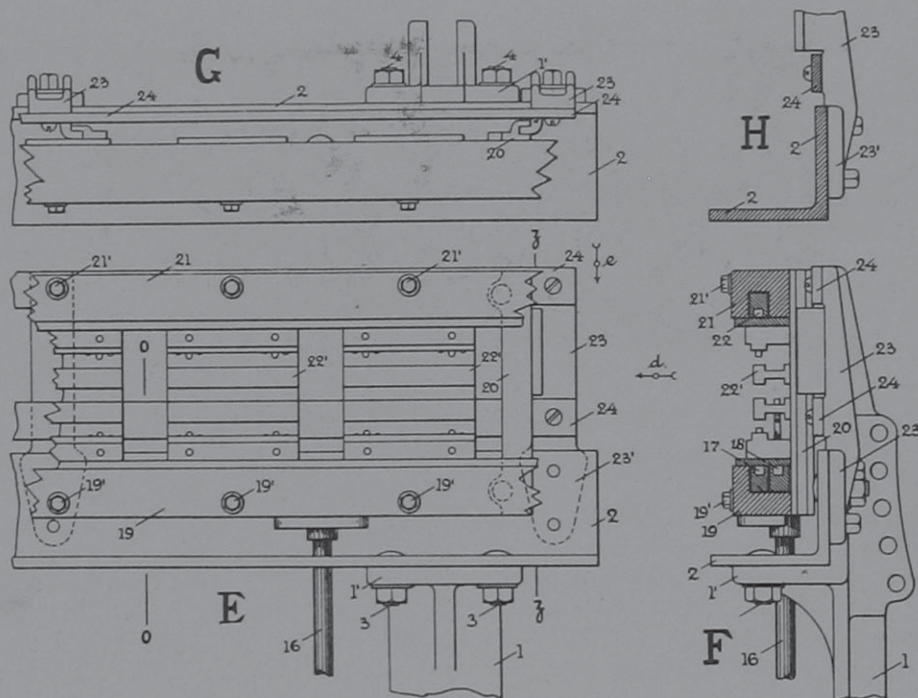
In Figs. *C* and *D*, are shown means for adjusting the vertical position of the rack 8, independently of any adjustment of the bar 6, in which it is supported, such adjustment being required to regulate the meshing of the teeth of said rack with the teeth of the pinions 9. Said means for adjustment, consists in an adjusting screw 14, turning in a threaded hole in the lower part of the bar 6 and bearing at its upper end against a yielding strip 15, which extends under the lower part of the rack 8 and is secured at each end by a screw 15' to the bar 6. By turning the screw 14, in or out, the strip 15 is raised or lowered, to thus raise or lower the rack 8 as the case may require.

When it is desired to remove the rack 8, the screws 7 are removed, to allow the bar 6 to drop down, (as shown in Fig. *C*) the adjusting screws 13 being also turned down. When the bar 6 is in its lowered position, as shown in Fig. *C*, it may be readily removed from the front of the lay, to remove the rack 8.

Figs. *E*, *F*, *G* and *H*, show this lay applied to a ribbon loom having drop swivel shuttles, in this instance three banks of swivel shuttles. In said figures, the same numerals of reference are used to designate the same parts shown in Figs. 1 to 4.

In addition to said parts, 16 indicates the operating rod of the shuttle rails, 17 and 18 reciprocating moving racks for the two lower banks of shuttles carried in a bar 19, which is secured by screws 19′ to the lower ends of the vertically moving stands 20.

As a rule, the regular 45 deg. twill forms the harness chain for the curved twill, the drafting (drawing-in) for the various sections of twills corresponding to the systems of steep twills or reclining twills under consideration.




The latter are adapted to have a vertical up or down motion between suitably arranged guides, through the up and down motion of the rod 16, and they have at their upper ends a bar 21, secured thereto by screws 21′, which bar carries the rack 22 for the upper set of shuttles.

Intermediate the upper bar 21, carrying the rack 22, and the lower bar 19, carrying the racks 17 and 18, are arranged the guide ways or tracks 22′, for the longitudinally moving swivel shuttles (not shown). The lower ends 23′ of stands 23 are secured to the rear vertical part of the angle iron bar 2, which forms the lay beam. These stands 23 have secured thereto the transversely extending bars 24, which support and form the guides for the vertically moving shuttle racks, etc.

*(To be continued.)*

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## DESIGNING AND FABRIC STRUCTURE FOR HARNESS WORK.

### Curved Twills.

These weaves are a combination of our regular 45 deg. twills, steep twills and reclining twills, or in other words are a combination of 27, 45, 63, 70, 75 and 80 deg. twills, the latter two systems of twills being only very little used, and are merely quoted since they may be met with in connection with one or the other curved twills and where such combination twills may have been used.

The regular, *i. e.*, 45 deg. twills, are the foundation for this system of fancy twills, the different draftings for steep twills, as well as reclining twills, forming the basis for constructing the curve of the weave.

The construction of these weaves is best explained by means of the accompanying six examples, a study of which will instruct the student how to design any curved twill, as the case may require.

Fig. 1 has for its foundation the $\frac{5}{3}$ 8-harness twill. The construction of the weave is readily seen by consulting the draft given in *dot* type, below the weave, the same illustrating the following drafting:

4 warp threads 45 deg. twill,
4 warp threads 63 deg. twill,
4 warp threads 70 deg. twill, and
4 warp threads 63 deg. twill.
—
16 ends in repeat of draft.

Repeat of Weave: 16 warp threads and 8 picks.

Drawing in Draft: 8-harness, fancy draw (see *dot* type below weave).

Harness Chain: The $\frac{5}{3}$ 8-harness regular twill.

Weave Fig. 2 has for its foundation the $\frac{3}{3}$ 6-harness regular twill, drafted for the curved twill thus:

4 warp threads 45 deg. twill to alternate with 4 warp threads of 63 deg. twill grading; 8 warp threads in repeat of draft.

Repeat of Weave: 8 warp threads and 6 picks.

Drawing in Draft: 5-harness fancy draw (see *dot* type below weave).

Harness Chain: Five warp threads of the $\frac{3}{3}$ 6-harness regular twill, the 5th harness of said regular twill not being called upon by the curved twill, hence is to be omitted in the harness chain.

Weave Fig. 3 has for its foundation, the $\frac{4}{4}$ 8-

harness regular twill, the drafting for the curved twill being:

8 warp threads 45 deg. twill,
8 warp threads 63 deg. twill,
4 warp threads 45 deg. twill, and
4 warp threads 63 deg. twill.
—

24 warp threads are used for the repeat of the arrangement of drafting, the complete fancy drawing in draft, however, calling for 48 warp threads, it taking two repeats of the above quoted drafting to make up the complete draft for the drawing-in girl.

Repeat of Weave: 44 warp threads and 8 picks.

Drawing in Draft: 8-harness fancy draw (see *dot* type below weave).

Harness Chain: $\frac{4}{4}$ 8-harness regular twill.

27° Twills. Until now we have used in the construction of these Curved Twills, only regular and steep twills. In connection with more elaborate curved twills, use is also made of Reclining Twills, *i. e.,* twills of 27 deg. grading. No explanations of the construction of these twills have been previously given in connection with our lessons, for the fact that their use is very limited, using them in connection with other twills in the formation of curved twills, *i. e.,* the present lesson, being the place where these reclining twills are mostly used. They actually are nothing else but having two warp threads interlace alike with the filling, a feature which will give to these twills in the fabric, provided they are used alone, a flat appearance, not enough grading in the twill, except we use them with an excessively high warp texture. This system of reclining twills will explain itself to the reader in connection with the next three examples of fancy curved twills.

Weave Fig. 4 shows us a curved twill weave, having for its foundation the $\frac{4}{4}$ 8-harness regular twill, and which weave naturally in practical work will be the weave to be used for the harness chain. The drafting of the curved twill from the foundation twill, by means of the fancy draw given below the weave is thus:

4 warp threads 63 deg. twill,
4 warp threads 45 deg. twill,
4 warp threads 27 deg. twill,
4 warp threads 45 deg. twill,
4 warp threads 63 deg. twill,
4 warp threads 45 deg. twill,
4 warp threads 27 deg. twill,
4 warp threads 45 deg. twill,
4 warp threads 63 deg. twill,
4 warp threads 45 deg. twill,
4 warp threads 27 deg. twill,
4 warp threads 45 deg. twill,
4 warp threads 63 deg. twill,
4 warp threads 45 deg. twill,
4 warp threads 27 deg. twill, and
4 warp threads 45 deg. twill.
—

64 warp threads in repeat of draft.

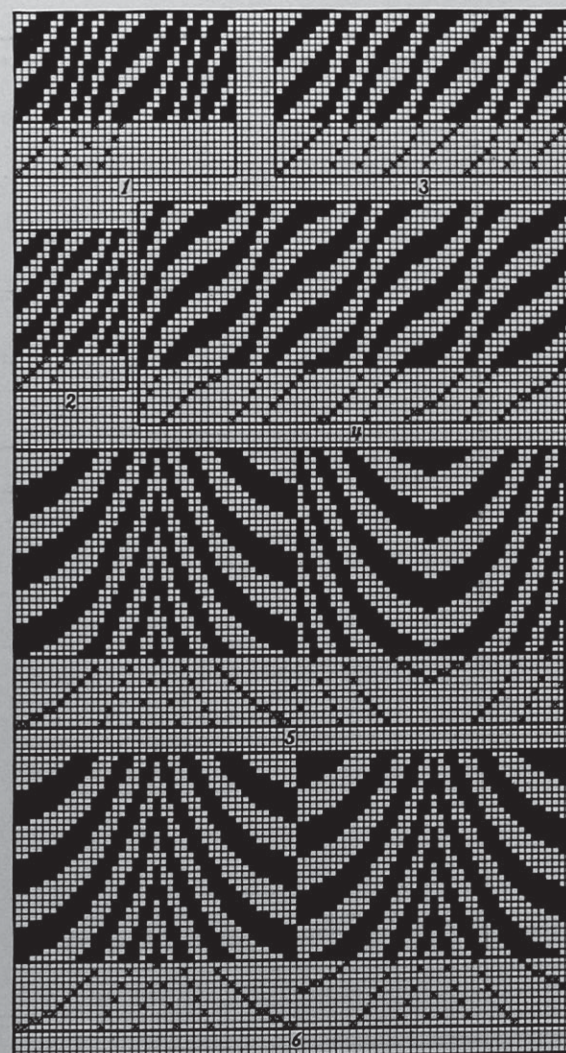
Repeat of Weave: 64 warp threads and 8 picks.

Drawing in Draft: 8-harness fancy draw (see *dot* type below weave).

Weave Fig. 5 illustrates a broken curved twill, *i. e.,* a fancy weave of this curved twill system, the same having for its foundation the $\frac{5}{5}$ 10-harness regular twill, the curved twill being obtained from it by drafting thus:

6 warp threads 27 deg. twill,
6 warp threads 45 deg. twill,
6 warp threads 63 deg. twill, and
3 warp threads 70 deg. twill.

This closes the drafting of the foundation twill for that portion of the new curved twill as is run-



ning from the left to the right, the last warp thread of the 70 deg. twill system being in this instance the point thread. Considering this thread over again for drafting for the next portion of the curved twill, we then find drafting previously quoted simply reversed thus:

4 warp threads 70 deg. twill,
6 warp threads 63 deg. twill,
6 warp threads 45 deg. twill, and
6 warp threads 27 deg. twill.

Now a complete break in the curved twill appears.

Considering the next effect of the curved twill, we find drafting done as follows:

4 warp threads 70 deg. twill,
6 warp threads 63 deg. twill,
5 warp threads 45 deg. twill, and
6 warp threads 27 deg. twill,

the last two warp threads of the 27 deg. twill forming again the point for reversing the drafting, and quoting these two warp threads over again, the drafting in the opposite direction from before, is continued thus:

6 warp threads 27 deg. twill,
6 warp threads 45 deg. twill,
6 warp threads 63 deg. twill, and
3 warp threads 70 deg. twill,

in this instance making again a solid break between the first and last thread of the complete weave, which in this instance repeats on 81 warp threads and 10 picks, and which by means of the fancy drawing in draft, as given below the weave in *dot* type, can be woven on 10-harness, using the $\frac{5}{5}$ 10-harness regular twill for the harness chain.

Weave Fig. 6 shows us a change of effect of the previously given example of a fancy broken curved twill weave, calling for:

Repeat of Weave: 82 warp threads and 10 picks.
Harness Chain: $\frac{5}{5}$ 10-harness regular twill.

**Question:**

Construct the following curved twill:

Foundation weave: $\frac{4}{3}\frac{1}{2}\frac{1}{2}$ 13-harness regular twill.

Draft as follows:

6 ends, 70 deg.; 6 ends, 63 deg.; 1 end, 45 deg.; 1 end, 63 deg.; 1 end, 45 deg.; 1 end, 63 deg.; 1 end, 45 deg.; 1 end, 63 deg.; 2 ends, 45 deg.; 1 end, 63 deg.; 2 ends, 45 deg.; 1 end, 63 deg.; 6 ends, 45 deg.; 2 ends, 27 deg.; 2 ends, 45 deg.; 2 ends, 27 deg.; 1 end, 45 deg.; 2 ends, 27 deg.; 1 end, 45 deg.; 8 ends, 27 deg.; 1 end, 45 deg.; 2 ends, 27 deg.; 1 end, 45 deg.; 2 ends, 27 deg.; 2 ends, 45 deg.; 2 ends, 27 deg.; 8 ends, 45 deg.; 1 end, 63 deg.; 2 ends, 45 deg.; 1 end, 63 deg.; 2 ends, 45 deg.; 1 end, 63 deg.; 1 end, 45 deg.; 1 end, 63 deg.; 1 end, 45 deg.; 1 end, 63 deg.; 1 end, 45 deg.; 6 ends, 63 deg., and 3 ends, 70 deg.

Repeat of Curved Twill: 87 warp threads and 13 picks.

## THE MANUFACTURE OF OVER COATINGS AND CLOAKINGS.

### B. Fur Cloth.

(3) Fur Cloth Weaves for Heavy Weight Fabrics.

(*Continued from page 23.*)

In connection with sub-division of twills having pile and binder picks, we had then shown the construction of weaves for fur cloth fabrics in which the pile pick (face filling) interlaces alternately for a certain number of warp threads, and then floats. Such weaves can be applied for heavier weight fabrics by adding a backing pick in place of the binder pick. This procedure is explained by means of weaves Figs. 52 to 56.

The arrangement used in connection with weave Fig. 52, is one pick face to alternate with one pick back; the weave for the body structure of the fabric, *i. e.*, the weave for the back, is the 8-leaf satin, warp effect; the weave as used for the face is the 8-leaf double satin, filling effect.

Weave Fig. 54 has again for the back weave the 8-leaf satin, warp effect, the face weave being shown by itself in Fig. 53.

The arrangement of face to back in weaves Figs. 54 and 56, is two picks face to alternate with one pick back.

Weave Fig. 56 has for its ground, *i. e.,* the backing weave, the 13-leaf satin, warp effect. The face for this fur cloth weave (Fig. 56) is shown separated in Fig. 55.

In the previously explained fur cloth weaves, where one pick face alternates with one pick back, we then selected the float for the face and back alike.

In some instances a long, hairy nap is required, which in turn calls for an extra long float for the face pick. If in such an instance we would use the same long float for the back, the fabric is apt not to have sufficient strength, for which reason we must select weaves having a shorter float on the back. Such arrangements are shown in weaves Figs. 57, 58 and 59.

Weave Fig. 57 has for its back weave the 5-leaf satin, warp effect, and for its face the 10-leaf satin, filling effect.

Weave Fig. 58 has for its back weave the 6-harness $\frac{5}{1}$ twill, and for its face weave the 12-leaf satin, filling effect.

Weave Fig. 59 has for its back weave the 7-leaf satin, warp effect, and for its face weave the 14-leaf satin, filling effect.

(4) Fur-Cloth Weaves made with two Systems of Warp.

This system of weaves is little used, hence only two examples are given. Such weaves can only be used for medium weight fabrics.

For the construction of weave Fig. 60, the 5-leaf satin is used for face and back, and for weave Fig. 61, the 7-leaf satin.

Sometimes it may happen that the weight in fur cloth fabrics must be increased by means of back warp, back filling, and stuffer filling, but such cases are rare.

Valuable Points.

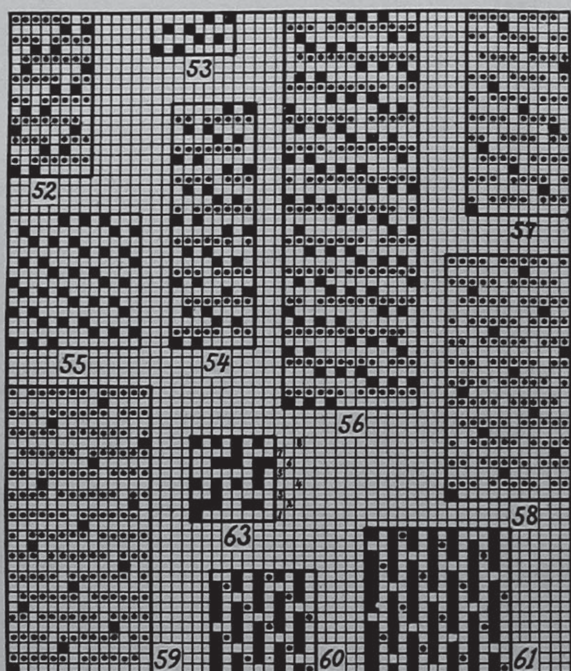
The warp, in every instance, with the exception of the last two quoted weaves (Figs. 60 and 61), is not visible on the face of the fabric, resting imbedded in the structure, serving to bind the fur producing filling to the structure of the fabric. For this reason the raw materials used for the warp yarn must be strong. There is no need for it to be of an extra fine quality.

The point the manufacturer must most carefully keep in his mind is the selection of the proper stock for the filling, both with reference to fineness of stock, as well as proper length of staple, so that the finisher can produce the required fur to the face of the fabric.

Provided a short fur only is required, do not select a material with too long a staple, since if you would do this, excessive clipping of the nap on the shear would be required, with its consequent waste of material, loss in weight to the fabric, etc.

When selecting the raw material, consider carefully the length of the floats of face filling. Remember that provided the staple of the raw material used in the construction of the face filling is short, the same may not cover the length of the filling floats in the fabric, and when the teasels then will tear such fibres completely out of the thread, producing in this manner an excessive amount of gig flocks, which means not only a total loss to the manufacturer, but at the same time, it will bring down the weight of the fabric below the standard required.

The fibres constituting the filling, have to fasten themselves with one of their ends at the point of inter-




lacing, with the warp, permitting the free end to be pulled out, *i. e.*, gigged out of the thread, a procedure which means the forming of the pile.

The material to use for the back filling depends upon the required fineness of the fabric, remembering however, that a stiff coarse stock will hurt the handling of the fabric.

For warp take a good, sound, medium quality of stock, since upon it, the strength of the fabric depends considerably. In an average, 4 to 4½ run are the counts used, in connection with a hard twist to the yarn.

Average counts most frequently met with in connection with the face filling, are from 2 to 3 run, and this with as soft a twist as possible. In many instances, in order to produce a fuller and stronger fabric, the face filling is spun in fine counts and used 2-ply, to average the counts mentioned before. For example, by preference, use a 2-ply 4 run yarn, in place of a single 2 run. It will give the teasels a better chance to raise the nap, resulting in a fuller nap, and besides in a stronger fabric, since the required nap is raised with less gigging, *i. e.*, less wear to the fabric structure.

For backing do not use too hard a twist, so as not to influence the softness of the fabric; however use enough twist in the yarn to give the fabric its required strength.

With reference to finish, remember that the softness of the fabric is the main feature, taking into consideration that a fabric will always get harder, the longer you have to scour and full it, for which reason plan your fabric so as to shorten both operations to their lowest possible duration, consistent with good work. See to it that your wool is well scoured previous to carding, and use a good lubricant in picking, so that the fabric is readily scoured, and at the same time will full quickly. Do not lay fabrics any wider in the reed than is necessary, so that the work for the fuller is made as easy as possible for him.

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## THE MANUFACTURE OF DAMASK TABLE CLOTH.

The same are what we term *single cloth* structures, the bulk of them being made in cotton, some of the best grades in linen.

They all require for their execution the Jacquard Machine, although, off and on, an exceptional case may be met with, in a cheap fabric structure, being made on a dobby loom. We will, in our article, not consider the latter method of designing.

Practically speaking, Damask Table Cloth fabrics are made either

On a Single Cloth Jacquard Harness, or,

On a Jacquard with Compound Harnesses attached.

### The Single Cloth Jacquard Harness.

To illustrate this subject, *i. e.*, to show how to tie-up a Jacquard harness for this class of work, the accompanying illustration Fig. 1 is given, showing in the upper portion of the diagram the details for the tie-up, *viz:*

(1) The *bottom board* (*A, B, C, D*) of the Jacquard Machine;

(2) the first row of the *Neck cords* (1 to 12) for the centre sections; the last cord (400) for the latter; showing also the first (401) and the last (604) neck cord as used for the border. *Margin* and *Selvage*, as used in connection with these fabrics, are omitted since they only call for simple work; showing them would unnecessarily mix up our illustration, more particular that of the Jacquard harness, since the more lines drawn, the more confusing the matter. Due reference to the latter, however, will be taken later on in explanations and calculations given.

(3) The Jacquard harness, showing the complete *Leashes* for the Neck cords quoted before, showing also the threading of the *Harness cords* into their proper holes in,

(4) The *Compart board*, also termed *Comber board* or *Cumber board* (*E, F, G, H*), we using the first term, since the harness cords are threaded into the various compartments or sections of the respective board.

Below the tie-up thus referred to, a corresponding fabric sketch of a Damask Table Cloth is given, and which calls for

Six (6) Divisions tied up *straight through* (1 to 400, six times over = 2400 harness cords and warp threads required) for producing the Centre portion of the fabric.

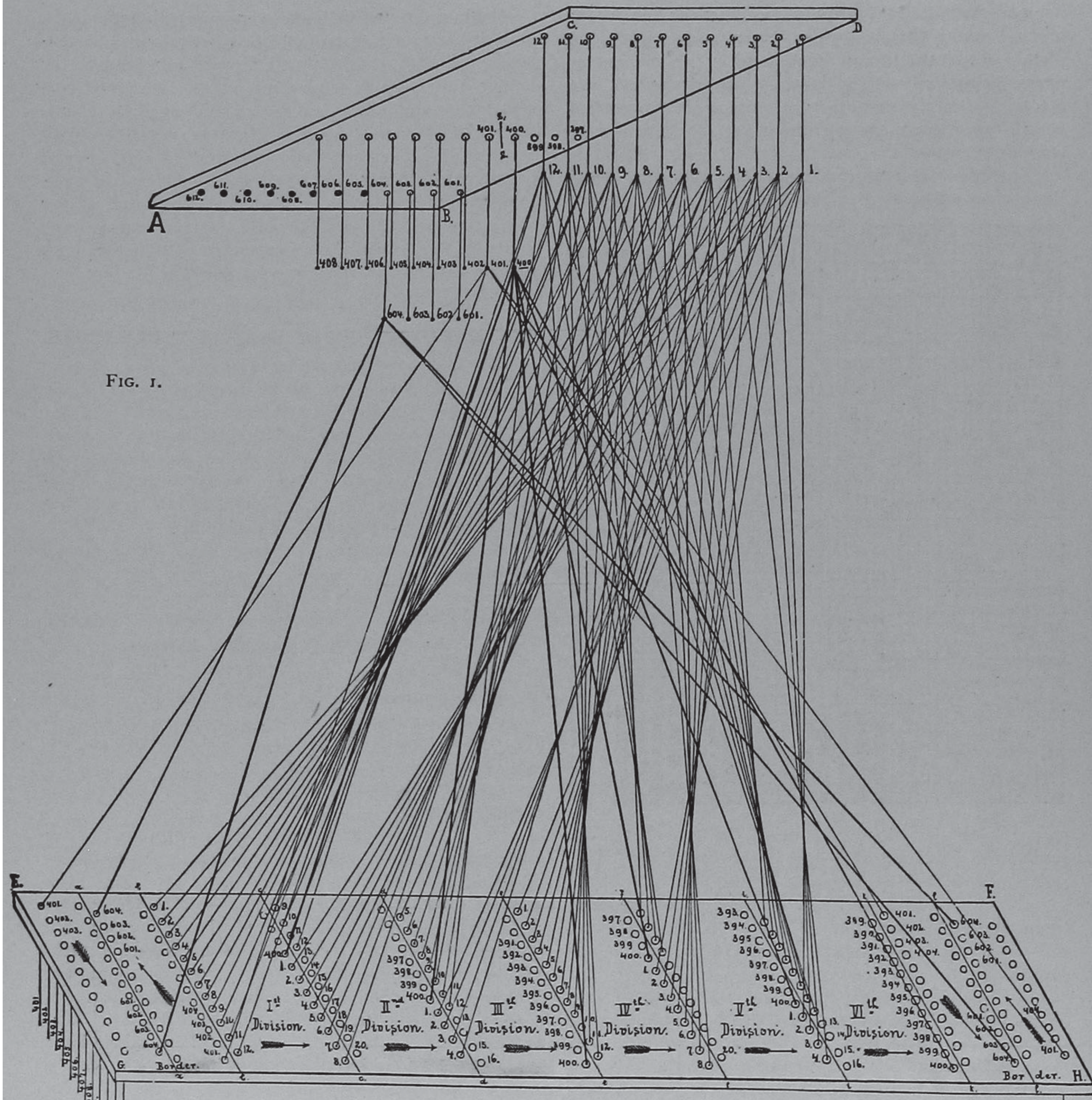
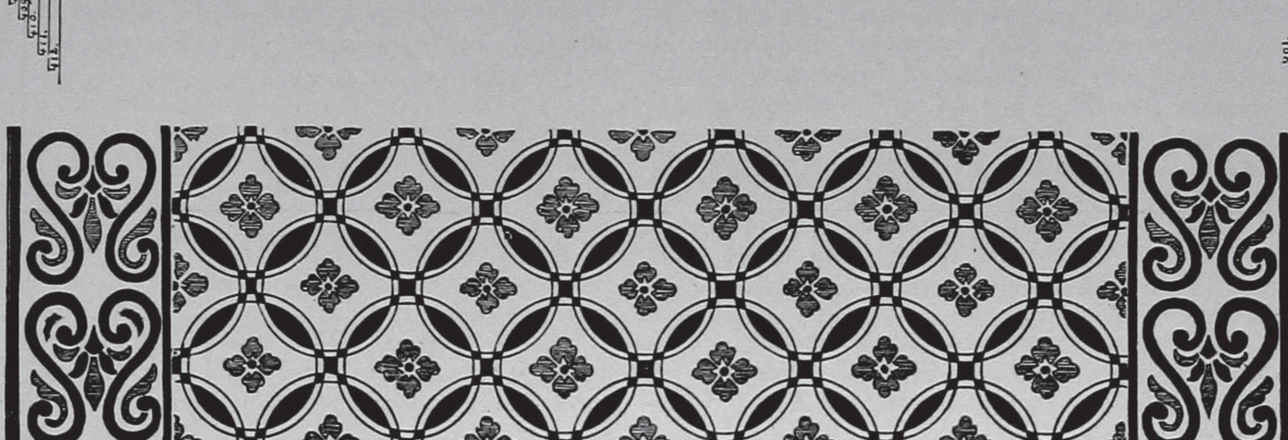

A
B.
C.
D
E.
F.
G.
H.
Border.
Ist Division.
IInd Division.
IIIrd Division.
IVth Division.
Vth Division.
VIth Division.
Border.

Fig. 1.



The Borders call for a *point tie-up* (401 to 604 through and return = (204 × 2 =) 408, twice, on account of two borders = 816 harness cords and warp threads required) for producing the two borders of the fabric.

The two Margins and Selvages of the fabric, as previously mentioned, are not shown in diagram of the tie-up, neither in fabric sketch; diagram Fig. 2, being designed to illustrate subject and permit proper calculations, later on to be made.

Holes, in compart board, indicated by numerals of references 401 to and inclusive 412, refer to the first (left hand) row of our selvage.

For the Margin, we only used 8 holes of the 12 row deep compart board, since, as a rule, the 8-harness satin, filling effect, is the weave used for these margins. Five repeats, *i. e.,* five rows in the compart board are used = 8 × 5 = 40 harness cords and warp threads are required for the margin on either side of the table cloth = 80 harness cords and warp threads needed for both margins in the fabric. Neck cords 605 to and including 612 (not shown, but holes in bottom board of Machine being correspondingly numbered) are used for these margins.

For Selvage we used one complete row of the compart board, see $1^s$ to $12^s$ respectively. The selvage is always interlacing with the plain weave, hence from 2 to 12 needles, hooks and neck cords may be used for this work; 12 being a good number to use in connection with our tie-up, since this will use up the remaining row of the Jacquard Machine, *i.e.,* every needle and hook of a full 600-Jacquard Machine is brought in use, and which is always the best, no needles and hooks remaining idle or to be taken out of the machine, with its consequent chance for breakage, or extra labor respectively for the loom fixer, in taking out needles and hooks, not called for. Double ends may be used throughout the entire selvage, or only in connection with the last two, four or six ends.

JACQUARD MACHINE:

| | |
|---|---|
| 400 | needles for Centre. |
| 204 | " " Border. |
| 8 | " " Margin. |
| 12 | " " Selvage. |
| 624 | needles total, and which comprise a 600-Jacquard Machine complete; 52 rows × 12 = 624. |

WARP THREADS TO USE IN FABRIC:

| | |
|---|---|
| 2400 | ends for the six Centre Divisions. |
| 816 | " " " two Borders. |
| 80 | " " " two Margins. |
| 48 | " " " two Selvages, using 12 double ends for each side. |
| 3344 | ends to use in warp. |

The tie-up thus explained is one of the most frequently met with tie-ups in the manufacture of our medium classes of table covers, *i. e.,* those as comprising the bulk of these fabrics in the market.

The fabric sketch given below the tie-up, had to be selected to suit the latter, so as to bring the complete tie-up within the compass of the page, we using for this reason a small geometrical figure, whereas in

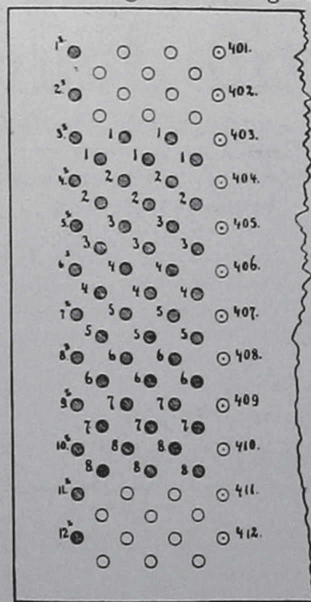



FIG. 2

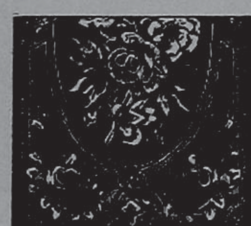
practical work, as a rule, we will find floral designs more satisfactory to use; they will look better and will sell better. (*To be continued*)

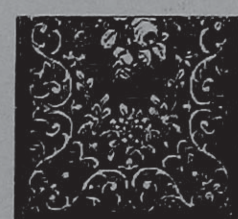
WHITIN MACHINERY FOR THE SOUTH.

The Harriet Cotton Mill No. 2, of Henderson, N. C., is having 10,000 Whitin spindles, 32 Whitin cards and drawing and necessary machinery for same installed; to be in operation by September.

**New Rug Designs.**

We herewith reproduce two new Rug Designs,





just patented by John Bromley & Sons, of Philadelphia.