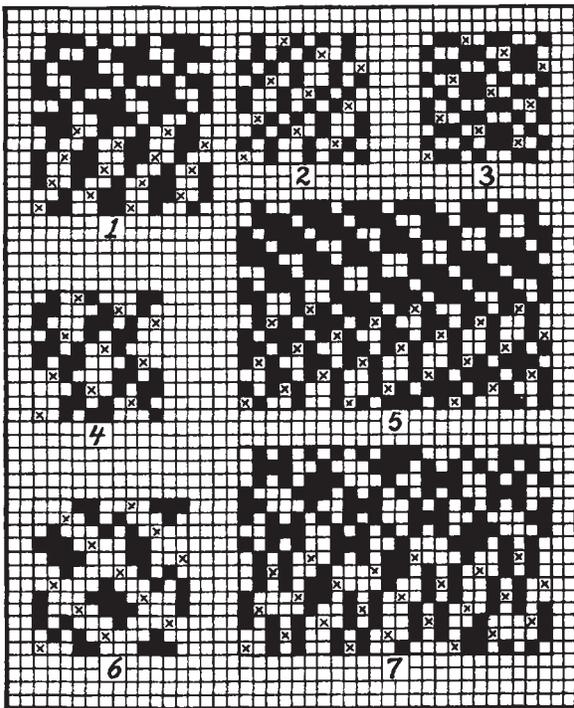


Fig. 6 has for its foundation the 12-harness satin. The counting-off is $1^3_3^1_3$ for the eleven picks between two satin spots. Two warp-threads are counted, beginning with the pick above the satin spot, upwards to alternate with two warp-threads, beginning with the pick before the satin spot and counting down-



wards, *i. e.*, 4 warp-threads form one set, and which number (4) is evenly divisible into 12, the satin foundation, hence the repeat of the crêpe weave 12 warp-threads and 12 picks. One repeat of the weave is given.

Fig. 7 has for its foundation the 8-harness satin. The counting-off is done with $1^3_3^1$ for the seven picks between two satin spots. Alternately three warp-threads are counted upwards and three warp-threads downwards, *i. e.*, 6 ends in one set, which number in connection with 8, the basis of the foundation weave, gives us 24 as the lowest possible multiple of these two numbers, hence repeat of weave 24 warp-threads and 8 picks. Two repeats in height of weave are given.

DRAWING-IN DRAFTS, REED AND HEDDLE CALCULATIONS.

The same are most important items, and besides proper equipment form the backbone of quality and production in the weave room. Many a time a poor drawing-in draft has been the cause of trouble to the weaver, in some instances requiring the cutting of the warp out of its harness, and re-drawing it. The trouble may have been that the warp was set too close in the harness and started chafing, again certain harnesses in a fancy draw may have been placed in the wrong position in the set. In other cases, in order to possibly save one or two harnesses, a fancy drawing-in draft may have been made too complicated for the weaver to keep track of, where as one

or two additional harnesses would have considerably simplified matters.

With reference to poor reeding—this may have passed the weave room, but many a finisher will remember those stripes or streaks in the coloring of a fancy fabric that made the piece a second. Two warp-threads in a weave of two different colors but interlacing the same with the filling throughout the repeat of the weave, if not separated by the dent wire, no doubt will have accomplished it. Again, few fixers will forget warps they had to cut out that chafe and would not weave in the one reed but run fair when re-drawn in another number.

In some fancy drawing-in drafts, a few stray plain or colored ends used in a large repeat of pattern, but interlacing different than the rest of the warp-threads, may show skips on the face of the cloth—a few ends may have been put on the back harness or harnesses, the front being crowded with regular weaving warp-threads, and when said rear harness or harnesses may not have been able to raise its warp-threads sufficient to either raise or lower them to the proper level of the shed on account of fibres of adjoining threads holding them just above or below the nose of the shuttle. Placing such a harness or harnesses next to the reed will solve the trouble, except the difference of interlacing is too radical and when two-beam work only will do.

With reference as how to produce the proper drawing-in draft for a fancy weave, ascertain the lowest number of harnesses that will weave the pattern, after which experience will guide you as to whether it is advisable to use the lowest number of harnesses possible, or use more harnesses, provided they are at your disposal.

How to Make Out the Drawing-in Draft for a Fancy Weave for the Least Number of Harnesses Possible.

RULE: Ascertain the repeat of the weave, after which examine (on the point paper) each warp thread separately (one after the other) as to its rotation of interlacing in the filling.

Every warp thread interlacing the same (in the same picks throughout the entire repeat of the weave) as one before, can be drawn on that particular harness, whereas every warp thread interlacing different, requires a new harness. This rule will hold good for any weave, single or double cloth.

To give a clear understanding of the subject, Fig. 1 is given. In the same

Diagram A represents a fancy weave repeating on 95 warp threads and 6 picks.

Diagram B illustrates its drawing-in draft necessary to produce this weave on 14 harness (being the lowest number of harness possible to reduce this weave.)

In this drawing-in draft, the harnesses are represented by means of horizontal lines below the weave, each line representing one harness; there being consequently fourteen of these lines given to illustrate the fourteen harnesses used in the loom. The different warp threads of the weave, in connection with this

drawing-in draft, are shown by means of vertical lines extending from each warp thread in the weave plan and ending by means of a dot on the respective harness on which the warp thread in question has to be drawn, and when in connection with draw given, the following drafting takes place: 1, 2, 3, 4, 5, 6, 1, 2, 5, 2, 2, etc.

Representing a drawing-in draft by means of these horizontal lines below the weave, as shown in diagram *B* certainly is a most excellent plan to represent a drawing-in draft and is practiced in a great many mills; however, there are other methods in use for accomplishing the same result, using in a great many instances the point paper below the weave, and when then every row of squares width ways on the point paper represent one harness, the lowest situated horizontal row of squares representing the first harness, the next row the second harness, and so on, until finally ending with the last harness used with the horizontal row of squares nearest to the weave, *i. e.*, below the weave. Either numerals of reference corresponding to the respective harness are used for indicating the drafting; or the rotation of rows of squares, *i. e.*, the number of harnesses, can be numbered outside the draft and when then a *dot*, *cross* or any other mark may be used for indicating on which harness to draft the respective thread on. This method will be used, when dealing with the next drawing-in draft.

To represent the drawing-in draft running from the bottom to the top on the plan corresponds with the practical work of drawing-in the warp for the loom, considering the drawer-in sitting in front of our drawing-in draft, the draw given being then a top plan view of his work.

When making out a drawing-in draft in this way we must know the number of harnesses a weave will

at our disposal (except we use too small a piece of point paper to work on).

For making out, *i. e.*, drafting, the fancy draw, always begin at the left hand side of your weave, and work toward the right, as is indicated by numerals for warp threads 1 to 95, on top of weave *A* in Fig. 1. The numerals on the left of draft *B* in Fig. 1 indicate the rotation of the harnesses, respectively harness 1 to 14.

Examining our weave, the repeat of which is 95 warp-threads and 6 picks, we find, beginning with number 1 warp-thread, that the second warp-thread works different from the first; the first warp thread interlaces *3 up 3 down* in one repeat of the weave, *i. e.*, six picks, whereas the second warp thread interlaces in the same number of picks, *1 down 3 up 2 down*, and for which reason we draw this warp thread on number 2 harness. In the same manner we have to proceed (using new harnesses every time) with warp threads 3, 4, 5 and 6. Warp thread 7 we find to interlace corresponding to the first warp thread, and for this reason we draw the same on number 1 harness. Continuing to examine the first 64 warp threads of the weave, in this manner, we find that the weave thus far requires 6 harnesses only.

Warp thread number 65 interlaces different than any one before, consequently, we put it on number 7 harness.

Warp thread number 66 interlaces different again, thus requiring a new harness. Number 8 harness would have been the next harness called upon to use in rotation, however, in order to keep the different foundations of the fancy weave together (warp threads interlacing either *3 up 3 down* or *4 up 2 down* or *2 up 4 down*) and finding four different interlacings of *4 up 2 down* (later on in the weave) used, we

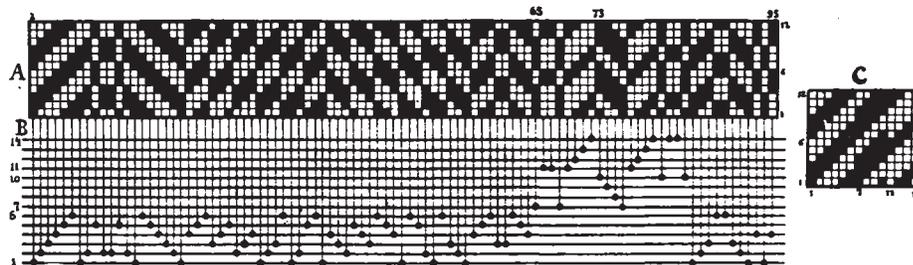


Fig. 1.

take, since otherwise we might run our draw into the weave, *i. e.*, being possible short of harnesses on the point paper when drafting the last warp-threads in the repeat of the weave, for which reason, when making out a drawing-in draft and not knowing the number of harnesses it will take, it will be advisable to always leave a surplus of horizontal rows of squares between the weave and the supposed ending of the draw, *i. e.*, not to fall short of harnesses required on the point paper, when making out the draw. This is the reason why some designers draft their draws from top to the bottom (rear to front) on the point paper, and when the trouble previously referred to is not met with, since we then have plenty of space on the point paper

reserved harnesses 7, 8, 9 and 10 for these ends and have drawn warp thread 66 on number 11 harness, thus reserving harnesses 1 to 6 for all the *3 up 3 down* interlacings found in our weave, harnesses 7 to 10 for all the *4 up 2 down* interlacings found in our weave and harnesses 11 to 14 for all the *2 up 4 down* interlacings found in the weave.

Example given will not only explain the drafting of a weave, but also be a guide how to keep the proper threads in a fancy weave in sections together so as to simplify the work for the weaver.

A careful consideration of this drawing-in draft for better work on the loom may induce us to transpose this draft somewhat, *i. e.*, starting the same to

begin with warp-thread 65 on the first harness in place of using harness 7 for it. This then would bring harnesses 7 to 14 with the least heddles in front, or next to the reed, and harnesses 1 to 6 which are the heaviest loaded with heddles, in the rear of the set. The latter thus will open the shed perfectly on account of the quantity of heddles on each harness, whereas the harnesses weaving the fancy effect of 4 and 2, and of which there are only a few heddles to one harness, are more direct under the influence of the shedding motion of the loom.

Not always the lowest number of harnesses is made use of, since frequently too many heddles, consistent with good work on the loom, would be required for

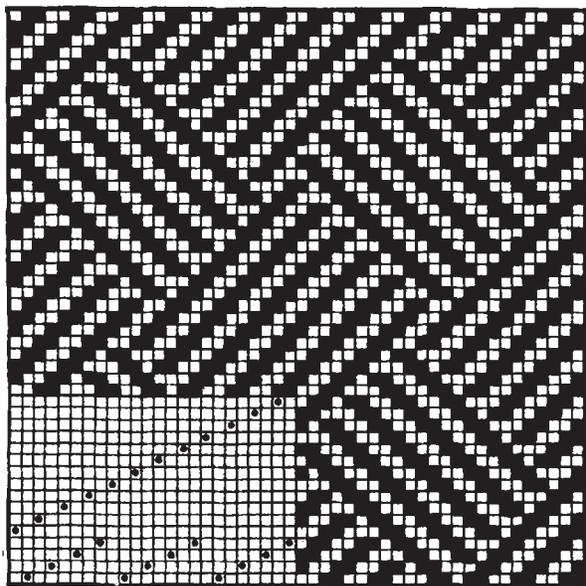


Fig. 2

a certain harness, and for which reason two or more harnesses in place of one may then be used, if within compass of the loom.

To simplify a drawing-in draft for the drawer-in and more particularly for the weaver, in many cases may be the reason for not reducing a fancy weave to its lowest number of harnesses possible to weave it.

How to Make Out the Harness Chain.

Rule: Reproduce the interlacing of each warp-thread only when called for the first time by a different harness in the drawing-in draft, taking the harnesses as called for in the drawing-in draft for this purpose in rotation, beginning with harness 1.

Diagram C, Fig. 1, illustrates the procedure, it being the harness chain required for weaving on 14 harnesses, by means of draft B, weave A. Chain draft C is numbered corresponding to the harnesses in drawing-in draft B.

Ascertaining Number of Heddles for Each Harness.

Rule: Count the number of threads drawn on each harness in one repeat of the drawing-in draft and multiply this number in every instance by the number of patterns, *i. e.*, repeats of drafts in the complete warp.

Example: Ascertain number of heddles to use

for each harness in connection with drawing-in draft B, Fig. 1, using 5700 ends in the warp.

$5700 \div 95$ (ends in one repeat of pattern) = 60 repeats of pattern in warp.

The number of ends drawn in one repeat of the pattern on each harness multiplied with the repeats of patterns in warp, gives us the number of heddles required for each harness, thus:

Harness	1	drawn	13	times	$\times 60 = 780$	heddles
"	2	"	14	"	" = 840	"
"	3	"	12	"	" = 720	"
"	4	"	12	"	" = 720	"
"	5	"	12	"	" = 720	"
"	6	"	12	"	" = 720	"
"	7	"	3	"	" = 180	"
"	8	"	once	"	" = 60	"
"	9	"	once	"	" = 60	"
"	10	"	3	"	" = 180	"
"	11	"	4	"	" = 240	"
"	12	"	twice	"	" = 120	"
"	13	"	"	"	" = 120	"
"	14	"	4	"	" = 240	"

Proof: 5700 heddles.

Making Out the Drawing-in Draft on Point Paper.

As mentioned before, the point paper can be also used for the making out of the drawing-in draft.

Fig. 2 is given to illustrate the same, showing in the lower left hand corner, by means of *dot* type, the drawing-in draft of an entwining twill, repeating on 24 warp-threads, reduced to 16 harness. This weave could have been reduced to 14 harness, but in that instance the first four harnesses would have been reduced to two harnesses only, with the consequent trouble of too many heddles for these two harnesses, again 16 harness are as conveniently handled in the loom as 14 would.

In place of the *dots* used in our drawing-in draft, we may use *crosses* or *numerals*.

A Test for Fibres Containing Ligno-Cellulose.

By E. R. Darling.

The ligno-cellulose fibres which are used to any great extent in the textile industry can be limited to two, jute and hemp. These are both bast fibres, and, of the two, jute gives a much more intense color reaction with the reagent than does hemp.

The reagent consists of five per cent para-nitraniline dissolved in conc. hydrochloric acid (sp. gr. 1.18, corresponding to 35.5 per cent HCl).

The sample is first placed in the solution for about one minute. It is then removed and washed with water. If jute, it will be an intense red, whereas if hemp it will be of a much lighter color.

The reagent now most commonly used for this determination is one per cent of phloroglucin dissolved in a solution of alcohol and conc. hydrochloric acid. This is a much more expensive preparation than the para-nitraniline and will not keep longer than three months. On the other hand, the para-nitraniline solution is very stable, and will not deteriorate under ordinary conditions.