



# Posselt's Textile Journal

*A Monthly Journal of the Textile Industries*

## Table of Contents

### WOOL, COTTON, SILK.

Designing and Fabric Structure for Harness Work.....	217
The Manufacture of Turkish Towels, Bath Robes, etc.....	219
Jacquard Designing.....	222
Boiling of Starches for Sizing Yarns and Finishing Cotton Goods.....	225
Take-up Mechanism for Narrow Ware Looms.....	229
A Practical Treatise on the Knowles Fancy Worsted Loom.....	230
Foreign Designs in Worsted Dress Goods and Cloakings.....	232
Cotton Spinning.....	233
Points on Cotton Carding.....	236
Cotton from Field to Factory.....	237
Dictionary of Technical Terms Relating to the Textile Industry.....	239
Points on Loom Fixing.....	240
Workers, Strippers, Fancy and Swift.....	242
Dictionary of Weaves.....	245

### KNITTING:—PROCESSES AND MACHINERY.

A Study of Knitting.....	247
Method of Producing a Nap on Knit Goods.....	248

### DYEING, BLEACHING, FINISHING, ETC.

Testing of Chemicals and Supplies in Textile Mills and Dye Works....	249
Points on Anilinoxydation Black.....	249
An Improved Process of Mordanting Wool.....	250
Machine for Dyeing the Yarn on Cops or Bobbins.....	251
Stains and Defects in Finished Cotton Goods.....	252
Practical Points on the Shear and the Shearing of Woolen and Worsted Goods	254

### TEXTILE ENGINEERING.

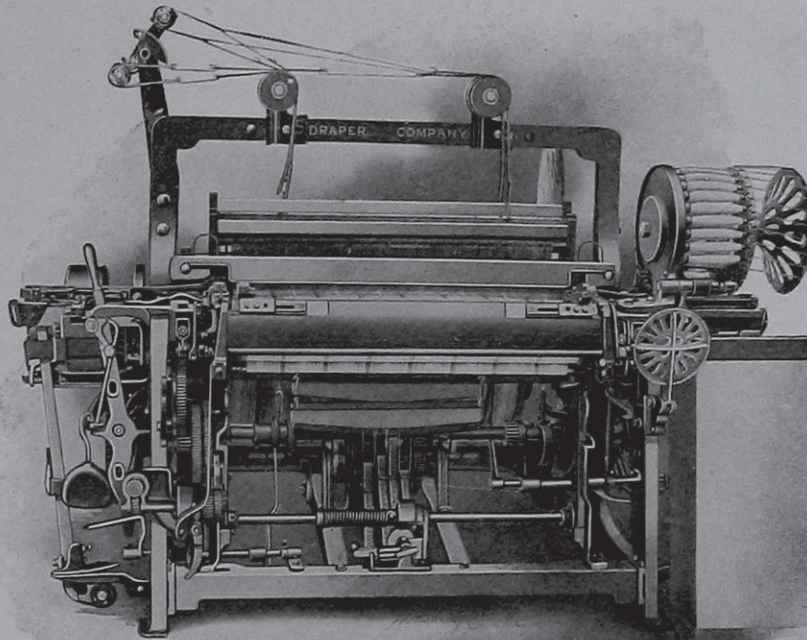
The Electric Drive for Textile Mills.....	ii
The Lighting of Textile Mills.....	x
Mill News.....	xiv
Buyers' Index.....	vi

COPYRIGHTED 1908  
By E. A. POSSELT

Entered as second-class matter February 10, 1908, at the post office at Philadelphia, Pa., under the Act of Congress of March 3, 1879.

**E. A. Posselt, Publisher, 2028 Berks St., Philadelphia, Pa.**

**European Agents: Sampson Low, Marston & Co., Ltd., 100 Southwark Street, London, S. E.**



**This is the Well Known E Model**

---

---

# **NORTHROP LOOM**

**IN ITS LATEST REVISED CONSTRUCTION**

If interested in this or any other models  
of automatic filling-changing looms,

write to

---

---

**DRAPER COMPANY,  
HOPEDALE, - MASSACHUSETTS**

Southern Agent **J. D. CLOUDMAN**, 40 South Forsyth St., ATLANTA, GA.

POSSELT'S  
TEXTILE JOURNAL

A PRACTICAL  
EDUCATIONAL JOURNAL

DEVOTED TO

THE TEXTILE INDUSTRIES

IN THE PRODUCTION OF

COTTON, WOOL, SILK  
From FIBRE to FABRIC

KNIT and WOVEN GOODS

INCLUDING

DYEING, DRYING, BLEACHING and FINISHING

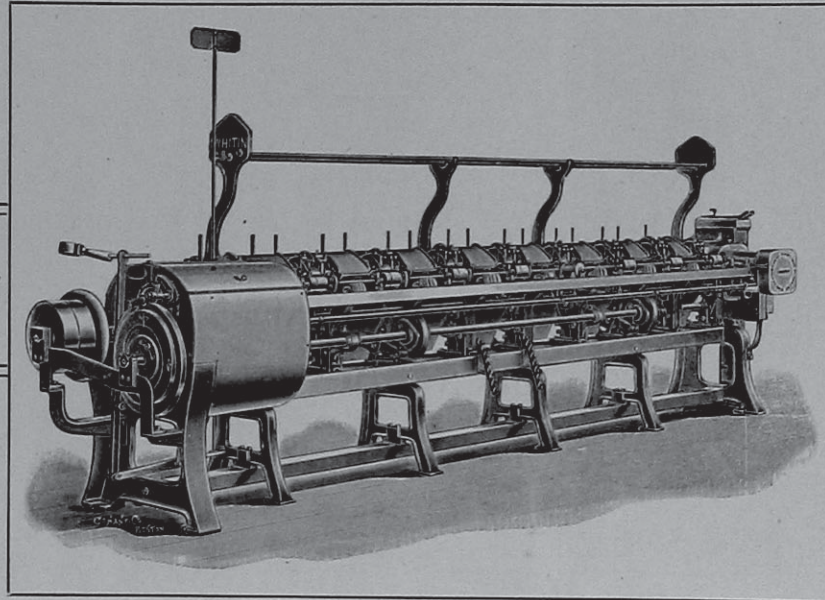
Published at 2028 Berks Street  
PHILADELPHIA, PA.

# THE WHITIN MACHINE WORKS

WHITINSVILLE, MASS.

BUILDERS OF

## COTTON MACHINERY



*High-Speed*

*Comber*

CARDS, COMBERS, DRAWING FRAMES, SPIN-  
NING FRAMES, SPOOLERS  
TWISTERS, REELS, LONG CHAIN QUILLERS,  
LOOMS

SOUTHERN AGENT

STUART W. CRAMER  
CHARLOTTE, N. C., and ATLANTA, GA.

# The METALLIC DRAWING ROLL CO.

SOLE MANUFACTURERS OF

## Patent Metallic Rolls

For Fibrous Materials

*33 Per Cent. More  
Production Guarant-  
eed, at Less Cost*

WRITE FOR PRICES AND  
PARTICULARS

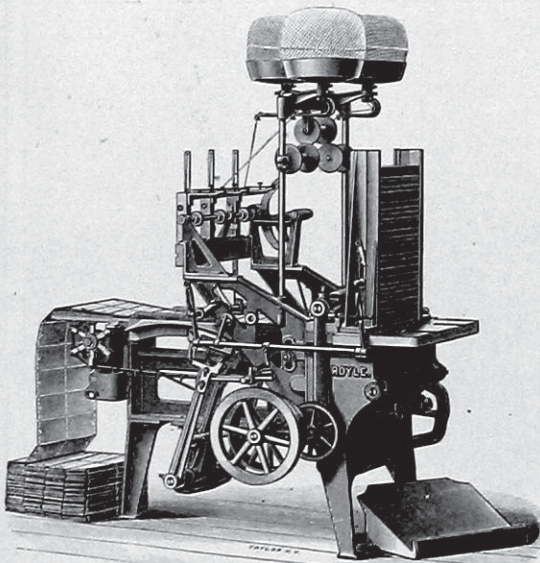
Applied to any make of machine,  
new or old, and successfully on the  
following Carding Room Machinery:

**Silver Lap Machines;  
Ribbon Lap Machines;  
Comber Draw Box; Rail-  
way Heads; Drawing  
Frames, with Electric or  
Mechanical Stop Motion;  
Slubbers; Intermediate  
Frames.**

THE METALLIC DRAWING ROLL CO.,

INDIAN ORCHARD, MASS.

## THE RESULTS



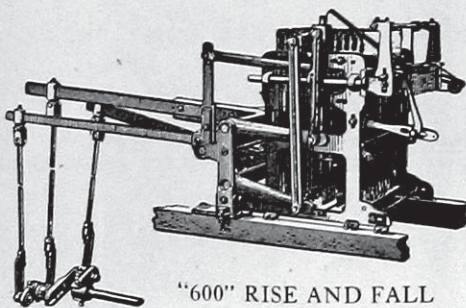
ROYLE'S AUTOMATIC LOCK-STITCH LACER

obtained from the use of one of the Royle Lock-Stitch Lacers is beyond comparison with those from hand lacing. The force of this statement will be appreciated by a moment's consideration of what this machine will do. Running continuously, the Royle Automatic Lock-Stitch Lacer will feed, punch, and lace from 15,000 to 18,000 cards during the ten hours of an ordinary working day.

Catalogue of this and other jacquard-card machinery will be mailed on request

**John Royle & Sons,**

Paterson, N. J., U. S. A.



"600" RISE AND FALL

## "The HALTON JACQUARD"

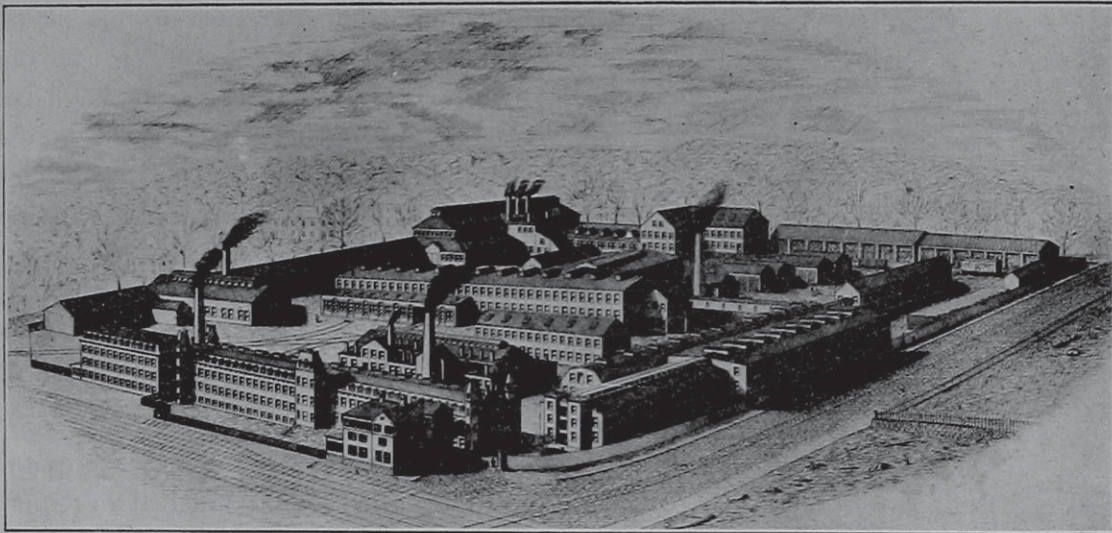
For Fabrics of Every Description  
HARNES BUILDING

**THOMAS HALTON'S SONS**

Allegheny Avenue and C Street, Philadelphia

**MASON MACHINE WORKS**

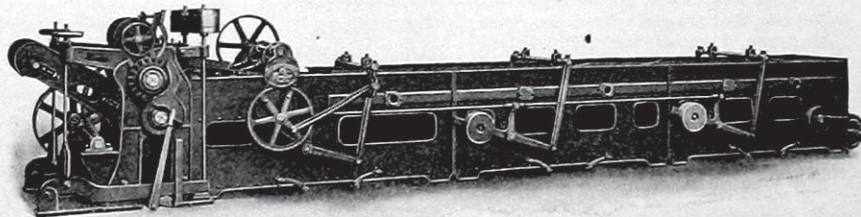
. . . TAUNTON, MASS. . . .



BUILDERS OF  
**COTTON MILL MACHINERY**



**MODEL D**  
**WOOL WASHER**



Not "A Has Been." Not "A Going To Be"  
 but a present day success.  
 Parallel Rake—Large Settling Bowl.  
 Self Contained Flushing Appliance.  
 ASK FOR BULLETIN No. 54.

**CHENEY BROTHERS**

**SILK MANUFACTURERS**  
**SOUTH MANCHESTER, CONNECTICUT**

SALESROOMS:

NEW YORK, 477 Broome Street      BOSTON, 78 Chauncy Street  
 CHICAGO, Heyworth Building      PHILADELPHIA, 929 Chestnut Street  
 SAN FRANCISCO, CAL., 1239 Franklin Street

ALL KINDS OF

**Spun Silk Yarns**

**In the Gray, Dyed or Printed**

ALL KINDS OF

**ORGANZINES, TRAMS and SINGLES**

In the Gum or Dyed, on Spools or on Cones, Warped or in the Hank.

**16 OUNCES TO THE POUND PURE SILK**

**FAST COLORS WARRANTED**

SPECIAL YARNS made to order for all sorts of SILKS or SILK MIXTURE GOODS.

**MANUFACTURERS' ORDERS PROMPTLY EXECUTED**

ALL KINDS OF

**Knitting Silks, Ribbons and Piece Silks Used for Trimming Knit Goods**

## LIST OF ADVERTISERS

Altemus, Jacob K., Philadelphia.....	VII
American Textile Specialty Machinery Co., Providence, R. I.....	XVI
Berge, J. & H., New York.....	XI
Campion, Richard, Philadelphia.....	XI
Chapin, Geo. W., Philadelphia.....	IX
Cheney Brothers, South Manchester, Conn.....	V
Commercial Photo-Engraving Co., Philadelphia.....	XIII
Crompton & Knowles Loom Works, Worcester, Mass.....	Outside back cover
Draper Company, Hopedale, Mass.....	Inside front cover
Farbenfabriken of Elberfeld Co., New York.....	XVI
Firth & Foster Co., Philadelphia.....	IX
Grosser Knitting Machine Co., New York.....	VII
Halton's, Thomas, Sons, Philadelphia.....	III
Howard Brothers Mfg. Co., Worcester, Mass.....	IX
Hunter, James, Machine Co., North Adams, Mass.....	V
Kilburn, Lincoln & Co., Fall River, Mass.....	XI
Kip-Armstrong Company, Pawtucket, R. I.....	XI
Lentz, F. G., & Co., Philadelphia.....	XI
Littauer, Ludwig, New York.....	IX
Mason Machine Works, Taunton, Mass.....	IV
Metallic Drawing Roll Co., Indian Orchard, Mass.....	III
Philadelphia Drying Machinery Co., The, Philadelphia.....	XVI
Queensbury Mills, Worcester, Mass.....	IX
Roessler & Hasslacher Chemical Co., New York.....	XV
Royle, John, & Sons, Paterson, N. J.....	III
Ryle, William, & Co., New York.....	IX
Schaellibaum, Rob., Co., The, Providence, R. I.....	XI
Sipp Electric & Machine Co., Paterson, N. J.....	XIII
Strouse, Theodore & Co., Philadelphia.....	XIV
Weimar Bros., Philadelphia.....	XIII
West Indies Chemical Works, The, New York.....	IX
Whitin Machine Works, The, Whitinsville, Mass.....	II
Wright, Robert A., Philadelphia.....	XIII

## BUYERS' INDEX

<b>Apparatus for the Dye Trade.</b> Berge, J. & H.	Kip-Armstrong Co. Mason Machine Works. Metallic Drawing Roll Co., The. Philadelphia Drying Machinery Co. Schaellibaum, Rob., Co., The. Whitin Machine Works.	<b>Harness Twine.</b> Littauer, Ludwig.
<b>Automatic Feeds for Cotton and Wool Stock.</b> Philadelphia Drying Machinery Co.	<b>Cotton Yarns.</b> Chapin, George W. Littauer, Ludwig. Strouse, Theodore & Co.	<b>Heating and Ventilating Apparatus.</b> Philadelphia Drying Machinery Co.
<b>Belting.</b> Main Belting Co.	<b>Designers.</b> Lentz, F. G. & Co.	<b>Heddles.</b> Howard Brothers Mfg. Co.
<b>Bleachers.</b> Firth & Foster Co.	<b>Drawing Frames.</b> Mason Machine Works. Whitin Machine Works.	<b>Hematine.</b> West Indies Chemical Works, Ltd.
<b>Bleaching Kiers.</b> Philadelphia Drying Machinery Co.	<b>Drying Machinery.</b> Hunter, James, Machine Co. Philadelphia Drying Machinery Co.	<b>Jacquards.</b> Crompton & Knowles Loom Works. Halton's, Thomas, Sons.
<b>Bleaching Materials.</b> Roessler & Hasslacher Chemical Co.	<b>Dust Collectors.</b> Philadelphia Drying Machinery Co.	<b>Jacquard Card Stamping, Lacing and Repeating Machinery.</b> Royle, John & Sons.
<b>Bobbins.</b> Draper Co.	<b>Dyers &amp; Finishers.</b> Firth & Foster Co.	<b>Knitting Machinery.</b> Grosser Knitting Machine Co.
<b>Carbonizing Machinery.</b> Hunter, James, Machine Co. Philadelphia Drying Machinery Co.	<b>Dyeing, Drying, Bleaching and Finishing Machinery.</b> Hunter, James, Machine Co. Philadelphia Drying Machinery Co.	<b>Logwood Crystals.</b> West Indies Chemical Works, Ltd.
<b>Card Clothing.</b> Howard Bros. Mfg. Co.	<b>Dye Sticks.</b> Philadelphia Drying Machinery Co.	<b>Logwood Extracts.</b> West Indies Chemical Works, Ltd.
<b>Card Stampers.</b> Lentz, F. G. & Co.	<b>Dyestuffs.</b> Farbenfabriken of Elberfeld Co.	<b>Looms.</b> Crompton & Knowles Loom Works. Draper Co. Kilburn, Lincoln & Co. Mason Machine Works. Whitin Machine Works.
<b>Carpet Machinery.</b> Altemus, Jacob K. Philadelphia Drying Machinery Co.	<b>Dynamos &amp; Motors.</b> Sipp Electric & Machine Co.	<b>Measuring Devices.</b> Draper Co. Sipp Electric & Machine Co.
<b>Chemicals.</b> Berge, J. & H. Roessler & Hasslacher Chemical Co. West Indies Chemical Works, Ltd.	<b>Electric Fans.</b> Philadelphia Drying Machinery Co.	<b>Metallic Rolls.</b> Metallic Drawing Roll Co., The.
<b>Chroming Machinery.</b> Philadelphia Drying Machinery Co.	<b>Engravers.</b> Commercial Photo-Engraving Co.	<b>Mohair.</b> Littauer, Ludwig. Queensbury Mills.
<b>Cost and Accounting Systems.</b> Wright, R. A.	<b>Grids for Lappers.</b> Schaellibaum, Rob., Co., The.	<b>Mules.</b> Mason Machine Works.
<b>Cotton Combers.</b> Mason Machine Works. Whitin Machine Works.	<b>Harness Builders.</b> Crompton & Knowles Loom Works. Halton's, Thomas, Sons. Lentz, F. G. & Co.	<b>Peroxide of Sodium.</b> Roessler & Hasslacher Chemical Co.
<b>Cotton Machinery.</b> Altemus, Jacob K. Crompton & Knowles Loom Works. Draper Co. Halton's, Thomas, Sons.		<b>Pneumatic Conveyors.</b> Philadelphia Drying Machinery Co.

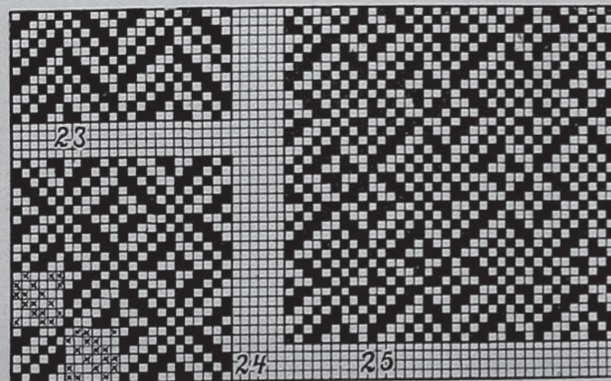


## WOOL, COTTON AND SILK DESIGNING AND FABRIC STRUCTURE FOR HARNESS WORK.

### BROKEN TWILLS.

(Continued from page 179.)

In our previous article we used what we consider as *balanced* even sided twills for our foundation weave. We will now consider broken twill weaves obtained by means of using even sided twills which do not balance, for the foundation for the broken twill. In



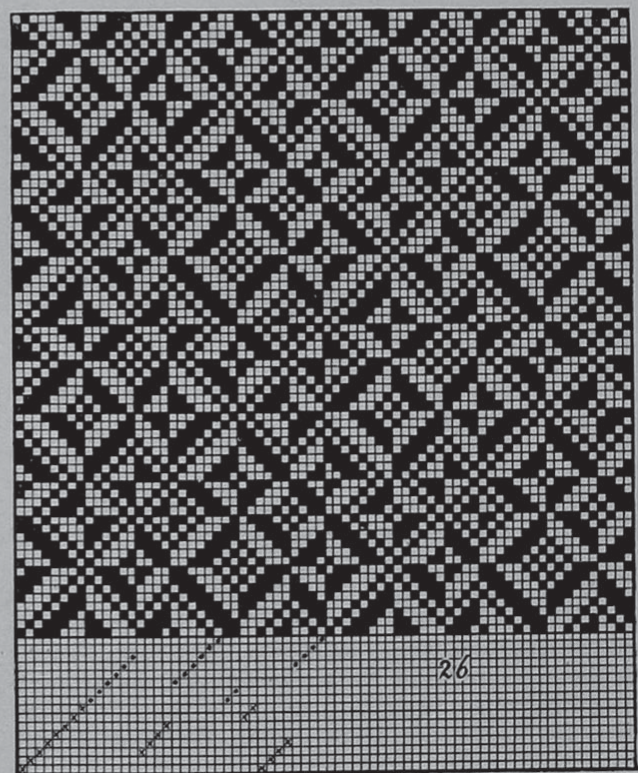
order to explain to the reader what we mean by *balanced* and *unbalanced* even sided twills, in this instance, we mention that in the previously given broken twills, the foundation weave, whether drawn from left to right or right to left, can be woven from the same set of harnesses; for example, the  $\frac{2}{1} \frac{2}{2} \frac{1}{2}$  10-harness foundation twill, whether drafted for a broken twill from left to right or from right to left (see Figs. 11 and 12 on page 177 or Fig. 22 on page 179) can be woven on 10 harnesses, no matter how complicated, *i. e.*, mixed up the drafting from left to right or right to left is arranged, and for which reason we classify this foundation twill as well as every other foundation twill then given in said article (Figs. 3 to and inclusive Fig. 22) as a *balanced* even sided twill, as compared to the even sided foundation twills used in the present article, and when the reader later on will come in contact with two other 10-harness even sided twills (Fig. 27 and 28), either one of which, if used by itself for a broken twill, will require 20 harnesses, *i. e.*, 10 harnesses are required for drafting this 10-harness twill in one direction (for example, left to right) and 10 additional harnesses for drafting this foundation twill in the reverse direction (right to left).

### Broken Twills Having for Their Foundation Unbalanced Even Sided Twills.

Having previously explained what we mean by an unbalanced even sided twill, after obtaining this weave, draft said twill for a certain number of warp threads in one direction and then in the reverse direction, arranging a clear break (risers opposite sinkers) wherever two directions of the twill lines meet; continue this drafting of the twill lines in one direction and then in the reverse direction until repeat for the new weave is obtained.

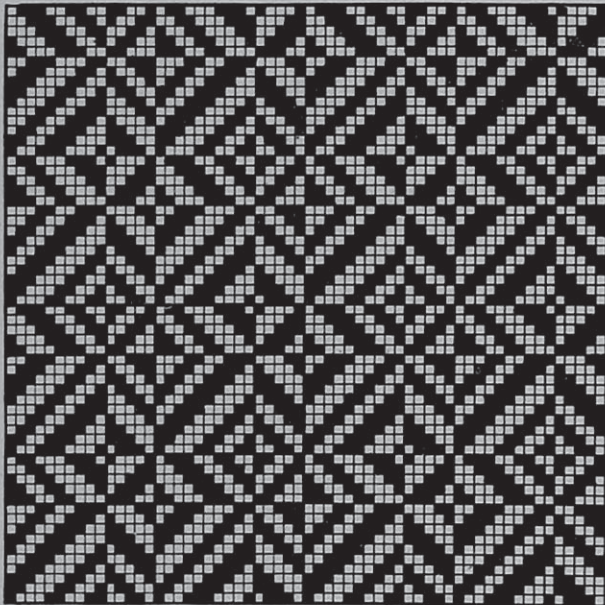
Drafting in this manner only warp ways, as will be readily understood, will result in broken twills broken warp ways only, *i. e.*, stripe effects; whereas if we arrange this drafting of the twill for a certain number of ends in one way and then in the reverse way, both in the direction of warp and filling ways, the result will be broken twills broken warp and filling ways. The seven weaves accompanying this article will readily explain the subject to the reader, and from which he then will be able to design any number of new weaves, as the fashion may require; however, he must never forget that *twice the number of harnesses of the foundation twill are required in the loom for its mate broken twills* (except only a portion of the foundation twill is used in the construction of the broken twill).

Weave Fig. 23 shows us the broken twill, broken warp ways only, obtained from the  $\frac{1}{2} \frac{2}{1}$  6-harness even sided twill. Six warp threads are drafted from left to right to alternate with six warp threads drafted from right to left, the broken twill repeating on 12 warp threads and 6 picks. Naturally in this instance the 12-harness straight draw will be used; however, the effect, for practical work may be too small, and for



which reason in place of drafting only six threads one way, we may have to draft more threads each way before arranging break. This, however, will not increase the number of harnesses required, since it will mean nothing more but drafting more ends on each set of six harnesses, previously to drafting in the same

manner more threads on the other set of six harnesses. We used the small effect (drafting only one repeat of the foundation twill) in order to not take up too much



27

space, one draft in our example standing for any number of threads required to be drafted, provided a wider stripe is required in the woven fabric.

Weave Fig. 24 shows us the broken twill, broken warp and filling ways, having for its foundation the same even sided twill as the previously quoted example. In order to simplify matters to the reader, we have shown in one repeat of this weave the reverse drafting of the foundation twill, both warp and filling ways, in a different kind of type from that drafted the one way. The repeat of the weave is 12 warp threads and 12 picks, two repeats each way being shown in our diagram, to give a better idea of its general effect in the woven cloth. A 12-harness straight draw is required if the weave is used as given, and which is well suited for a small broken up effect. Provided a larger and more pronounced check is required, as will be readily understood, the same as in the previously given example in connection with its stripe effect, the result is readily obtained by drafting each set of six harnesses, two, three or more times over before doing the same with the other set of six harnesses, duplicating at the same time this procedure correspondingly when building the harness chain.

Weave Fig. 25 shows us what we might consider a somewhat more elaborate effect, *i. e.*, a more broken up effect of using the same even sided twill, as used in the previously quoted two examples; the arrangement of drafting in this instance being six ends drafted from left to right to alternate with three ends drafted from right to left. This brings us in contact with the same rule as quoted in connection with the former style of broken twills:

Add threads drafted one way, then add threads drafted the reverse way; divide either sum by repeat of foundation twill and consider only the remainders. If remainders are alike the repeat is at once obtained,

whereas if they differ, subtract the smaller from the larger number. When then the difference equals one-half the repeat of the foundation twill, the drafting then has to be done twice over before repeat for the broken twill is obtained. If the difference is one-third or two-thirds of the foundation twill, you will have to draft three times over before the repeat for the broken twill is obtained, etc.

In our instance we then find

$$6 - 3 = 3 \text{ and}$$

$$6 \div 3 = 2, \text{ i. e., we have in our example to}$$

draft twice over in order to obtain the repeat, a feature readily seen by consulting weave Fig. 25, and which repeats on  $(6 + 3 = 9 \times 2 =)$  18 warp threads and 18 picks. Although 18-harness straight draw will be the proper number of harnesses for us to use, provided the same are at our disposal, at the same time, if necessary, this weave can be drawn on 12 harnesses.

Weave Fig. 26 has for its foundation the  $\frac{1}{3} \frac{3}{1}$  8-harness even sided twill, with the following draft:

8 ends drafted from left to right

6 " " " right to left

4 " " " left to right

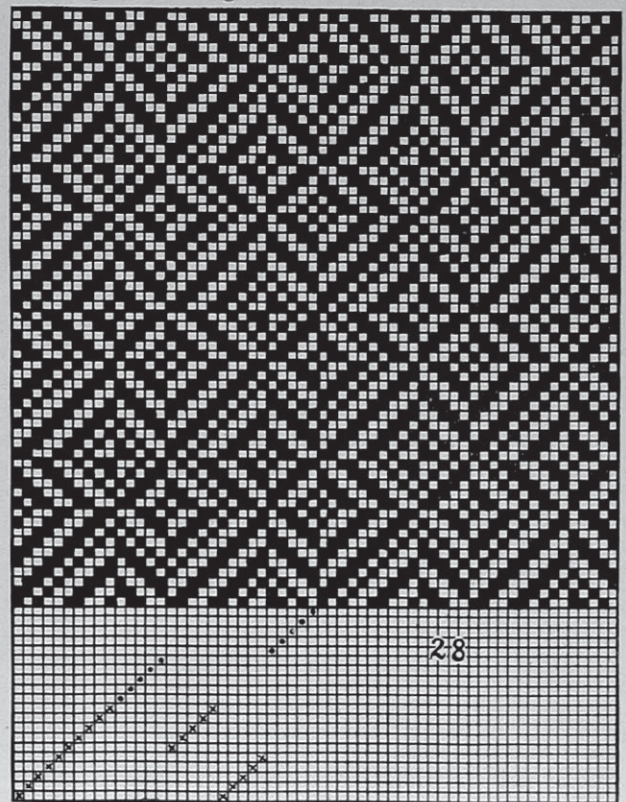
8 " " " right to left

6 " " " left to right and

4 " " " right to left.

$$8 + 4 + 6 = 18 \text{ and}$$

$6 + 8 + 4 = 18$ , or in other words adding all the ends drafted from left to right, as well as those drafted from right to left, gives us 18 ends in either instance.



and for which reason the weave *must and does repeat* on 36 warp threads and 36 picks, *i. e.*, one repeat of the drafting quoted results in the repeat of the broken twill, both warp and filling ways.

In order to show the reader how to make out drawing-in drafts for these weaves in the most practical way, the proper draft for the present example is given below the weave, said draft being shown in two kinds of type, using *cross type* for one, and *dot type* for the other twill. Two repeats of the weave, both warp and filling ways, are given in order to show the complete effect, whereas only one repeat of the draft is given, since this is all that is necessary.

Weave Fig. 27 has for its foundation the  $\frac{3}{2} \frac{2}{2} \frac{1}{3}$  10-harness even sided twill, drafting ten ends in one direction to alternate with five ends drafted in the reverse direction, and which on account of  $10-5=5$ , or one-half the repeat of the foundation twill, will result in  $(10+5=15 \times 2=)$  30 warp threads and 30 picks for the repeat of the broken twill. Two repeats of the weave, both warp and filling ways are given; 20 harnesses are required for the execution of this weave on the loom.

Weave Fig. 28 has for its foundation the  $\frac{2}{2} \frac{2}{2} \frac{1}{1}$  10-harness even sided twill, using the same drafting as in the previously given example, for which reason explanation then given refers also to this weave. Since this weave shows a more broken up effect compared to the former, we have given drawing-in draft (for 20 harnesses) below the weave, and which is the same draft as is necessary for the drafting of weave Fig. 27.

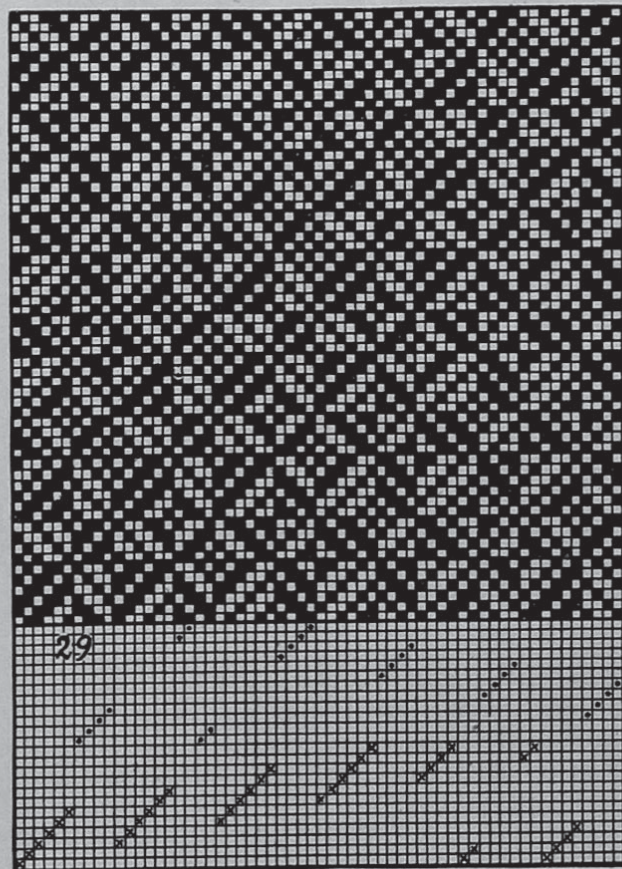
Weave Fig. 29 has for its foundation the  $\frac{2}{1} \frac{1}{1} \frac{2}{2}$  12-harness even sided twill, the final weave showing a somewhat more broken up effect than any one of the examples heretofore given, for the fact that no complete repeat of the foundation twill has been drafted consecutively in one instance, the drafting used being six warp threads of one effect of the even sided twill to alternate with four threads of the other effect of this even sided twill, continuing with this arrangement until repeat of the new weave is obtained. This procedure, *i. e.*, not using the complete repeat of the foundation twill will not permit use of previously quoted rule. The drawing-in draft for this broken twill is given below the weave in *cross type* for one of the twill effects, and in *dot type* for the other twill effect, and will readily explain how to draw the broken twill systematically on 20 harnesses for practical work on the loom, using 12 harnesses for one effect and 12 harnesses for the other effect of the 12-harness even sided foundation twill, previously quoted.

**Questions.**

(1) Construct the broken twill, broken warp ways only, obtained from the  $\frac{3}{3} \frac{2}{2} \frac{1}{1}$  12-harness even sided twill, drafting six ends of one effect of the twill in one direction to alternate with five ends of the other effect of this even sided twill drafted in the other direction; the complete repeat of the stripe being 132 warp threads and 12 picks, calling for 24 harnesses for its execution on the loom. Also make out proper drawing in draft for this weave.

(2) Construct the broken twill, broken warp and filling ways, having the  $\frac{2}{3} \frac{3}{2}$  10-harness even sided twill for its foundation; drafting warp and filling ways six ends in one direction to alternate with three ends drafted in the reverse direction, the weave thus obtained repeating on 90 warp threads and 90 picks.

(3) Make out proper drawing-in draft, for 20 harnesses, for the previously obtained weave, also its harness chain, the latter calling for 20 harnesses and 90 bars.



(4) Construct the broken twill, broken warp and filling ways, having the  $\frac{3}{3} \frac{2}{2} \frac{1}{1}$  12-harness even sided twill for its foundation, and using the following drafting:

- 8 ends from left to right
- 8 " " right to left
- 4 " " left to right
- 4 " " right to left
- 7 " " left to right
- 7 " " right to left

of said even sided twill; the broken twill, on account of drafting the same number of ends in one direction as in the other direction, repeating at the end of the draw quoted, *i. e.*, repeating on 38 warp threads and 38 picks.

**THE MANUFACTURE OF TURKISH TOWELS, BATH ROBES, ETC.**

The same are what we technically call *Terry Pile Fabrics* in which the pile is produced, *i. e.*, raised without the aid of pile wires. They are woven on looms specially constructed for the manufacture of this class of fabrics, known as *terry looms*.

These fabrics are divided into Plain and Fancy structures, the latter being obtained either by coloring, or the weave, or both.

**Plain Structures** are the ones most easily manufac-

tured, comprising at the same time the bulk of this class of terry pile fabrics made. On account of the practical use they are put to (mostly for towelings),

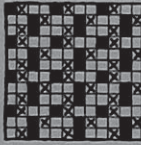


Fig. 1.



Fig. 2.

and when the main question is to produce a serviceable fabric at the lowest possible cost, this will at once explain to the practical man that it would be useless to quote a great variety of weaves, as is sometimes done, since it is only the best terry pile weave (or as termed—turkish towel weave) which finds practical use in the manufacture of these fabrics, and which weave is given in diagram Fig. 1.

Fig. 1<sup>a</sup>

In the manufacture of these fabrics two systems of warp (on two beams) are necessary, one to carry the pile warp for the formation of the loop, and the other to carry the ground warp for forming the body of the fabric. Only one system of filling is used.

In the process of weaving these fabrics, the terry series of the warp is weighted looser than the lower or body series, or its warp beam arranged to let off the proper length of pile warp required at every third (the tight) pick, so as in either case to allow the loops to be formed on the surface of the fabric, by the lay swinging or being driven fully up to the fell of the cloth every third pick, the two previously inserted picks having been but partially beaten up. The three picks so interwoven slide on the ground warp, which is held under a tight tension during the entire process of weaving.

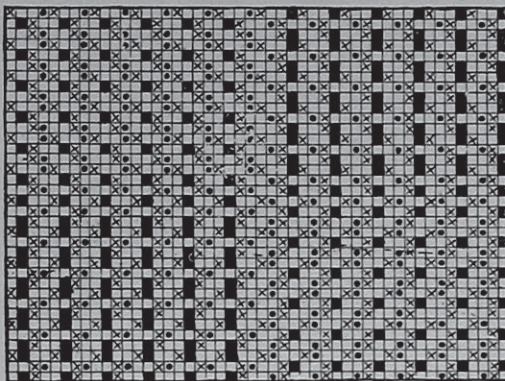


Fig. 3.

As will be readily understood by any person who ever used a turkish towel, loops are wanted on both sides of the fabric, since when a person has either taken a bath or even only washed himself, and is wet, he will be in no humor to examine the turkish towel he is to use, to ascertain which is the face or back

of it, *i. e.*, which side has the terry pile and is soft and will readily absorb the water from the body, and which he ought to use vice versa the common woven coarse rough side present provided only one system of pile warp was used in connection with turkish towels, hence no special reference to such weaves will be necessary, any more than to leave ground warp threads in Fig. 1 undisturbed and arrange pile warp all uniform  $2\text{ up } 1\text{ down}$ .

With reference to our weave Fig. 1, the following construction has been observed:

1 end pile warp to interlace with the filling  $2\text{ down } 1\text{ up}$ , hence forming a loop on the back of the cloth in the loom,

1 end ground warp,

1 end pile warp to interlace with the filling  $2\text{ up } 1\text{ down}$ , hence forming a loop on the face of the cloth in the loom,

1 end ground warp,

4 ends and 3 picks in the repeat of the pattern.

The terry or pile warp is shown by *full black* type, whereas *cross* type is used for indicating the ground warp.

Diagram Fig. 1<sup>a</sup> shows us a plan of the interlacing of the cloth woven with this weave, the left hand portion of said diagram showing in black the loops as formed by the face pile warp threads (weaving  $2\text{ up } 1\text{ down}$ ) and in shaded the loops as formed by the back pile warp threads (weaving  $2\text{ down } 1\text{ up}$ ), the ground warp being not shown for sake of clearness; whereas the right hand portion of the diagram shows, by means of dotted lines, the interlacing of said ground warp with the filling, the pile warp threads being omitted in this instance. The filling is shown by circles, numbered as to one repeat of the weave.

Weave Fig. 2 shows us the previously given weave arranged for producing a higher pile, *i. e.*, using in this instance 4 picks to the round, as compared to the 3 picks to the round used before. Explanations given then also refer to the present weave, and since a corresponding crochet type is used in both weaves, no special explanation is required, any more than that the pile warp is driven up by the reed on every fourth pick.

**Fancy Effects Produced by Coloring.** Diagram Fig. 1<sup>a</sup> will also show us a chance for a color effect if such ever should come under consideration, *i. e.*, that by dressing the pile warp one end of color #1 to alternate with one end of color #2, we may give each side of the fabric a different color, a feature actually shown in our illustration.

Another chance for producing a fancy effect, if such should be required (but not for towelings) is to use all terry warp of one color and the ground warp and the filling of another color.

Still another chance for fancy effect, in connection with these plain woven terry pile structures consists in arranging a fancy dressing of the pile warp (stripes), either for one side or both sides of the fabric; in the latter case the coloring may be the same for both sides or differ.

**Fancy Effects Produced by Weave and Color.** The principle observed in constructing these weaves consists in arranging each pile warp thread to interlace part the time on the face and part the time on the back of the structure, dressing every alternate pile warp thread one color and every other pile warp thread another color. By arranging these exchanges of the pile warp after a given design, new effects are produced. Fig. 3 shows us what we term a clear check-board effect, produced by two colors in the pile warp; the arrangement of the warp being:

1 end ground (see <i>cross</i> type)	}	$\times 6 = 24$ ends
1 " pile—color #1 (see <i>full black</i> type)		
1 " ground		
1 " pile—color #2 (see <i>dot</i> type)		
1 " ground	}	$\times 6 = 24$ ends
1 " pile—color #2		
1 " ground		
1 " pile—color #1		

Repeat of arrangement: 48 ends

Considering our weave more in detail and dividing it into the four squares necessary to form one repeat of any checkerboard effect, we find that every alternate square is formed with five loops of each of the six threads of color #1 ( $5 \times 6 = 30$  loops) for face, and with the same number of loops of color #2 for back; the other two squares showing 30 loops of color #2 for face with the same number of loops of color #1 for the back.

The change for the pile warp from face to back in every instance is arranged for *1 up 1 down 1 up 1 down*, *i. e.*, extends over four picks and what we will consider as a tight exchange, apt to show in said picks a slight line (empty space in fabric—no loops formed on either side for four picks) filling ways in the fabric.

This tight exchange between the checks has been reduced in weave Fig. 4 to what we may consider as two picks only, and which here has no chance to show any cross stripes. Loops for face and back are in this weave the same for each square, as quoted in the previously given example, *i. e.*, 30 loops for each on either side of square in fabric.

Selection of crochet type as to ground and pile warps in weave Fig. 4 corresponds to that used in weave Fig. 3, hence no special explanation as to dressing (the same) etc., is required.

Diagram Fig. 5 shows us the interlacing of two pile warp threads throughout the entire repeat of weave Fig. 4. In said diagram the pile thread shown in black refers to the interlacing of warp thread 2 (or 6, 10, 14, 18 or 22) in weave Fig. 4, and as shown there in *full black* type (considering pick 1 as the bottom pick in the diagram), whereas the pile thread shown shaded in diagram Fig. 5 refers to the interlacing of warp thread 4 (or 8, 12, 16, 20 or 24) in weave Fig. 4, shown then by means of *dot* type.

In Fig. 6 a check is shown in which only every alternate square on face and back of the fabric has

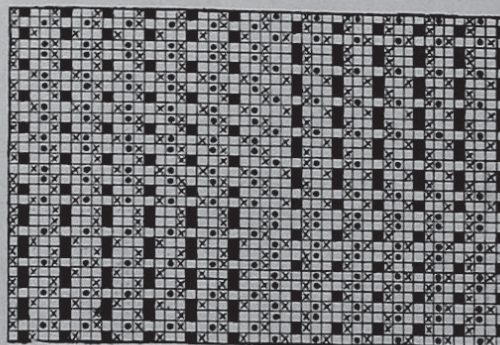


Fig. 4.

loops, every alternate square presenting regular interlacing (plain—2 picks in a shed to alternate with 1 pick in a shed).



Fig. 5

The arrangement of the warp is:

2 ends ground	}	$\times 6 = 18$ ends
1 end pile — color #1		
2 ends ground	}	$\times 6 = 18$ "
1 end pile — color #2		

Repeat in dressing 36 ends

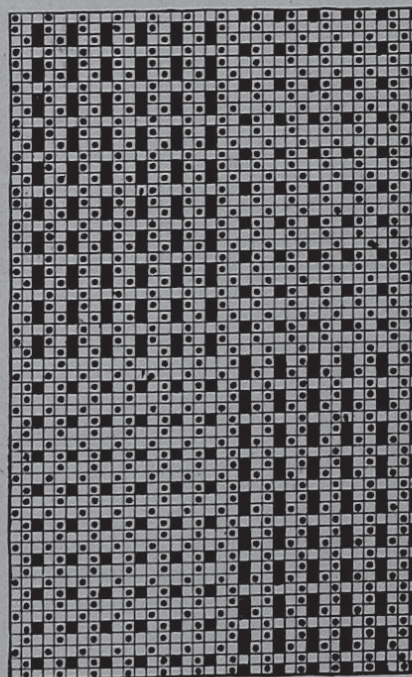


Fig. 6.

The pile warp is shown by *full black* type and the ground warp by *dot* type.

### JACQUARD DESIGNING.

(Continued from page 186.)

When the regular *satin settings* are used, it is important that the individual figures are placed at approximately uniform distance apart, and for which reason, as previously mentioned, the regular 5, 8, 10 and 13-leaf satins are the four best settings to use, for the fact that in these settings (see diagrams *a*, *c*, *e* and *g* in Fig. 18) the twill line of the interlacings of warp and filling in the weave, and which corre-

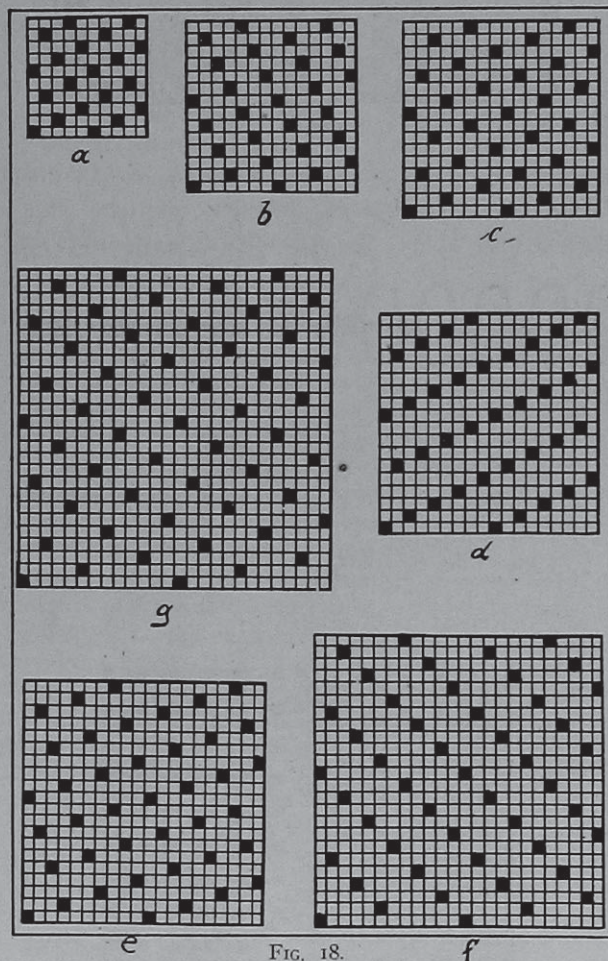


FIG. 18.

sponds to the placing of the figures in the sketch in the jacquard design, if considered in one direction, is crossed by another line of said figures, about equally as prominent, the latter, however, running in the opposite direction.

This feature is not the case, if examining our 7, 9 and 12-leaf satins (see diagrams *b*, *f*, and *d* in Fig. 18) and where the interlacings, and which again correspond to the placing of the figures in the repeat of the jacquard design, form a distinct diagonal line in one direction only, a feature which will show in the fabric and usually is not desired; except in special cases, when for example, the figure is longer in one direction than in the other or when there is a great difference between the width and length of the repeat in the pattern, and when then such a satin setting may

be found necessary to be used in order to produce a uniform distribution of such figures over the face of the fabric.

We will now explain this principle of satin settings in connection with a few illustrations.

Fig. 20 shows us a small floral design, set after the 5-leaf satin principle, two repeats each way of the design being given. Square *a*, *b*, *c* and *d* shows one repeat of the complete design, the size of which in the fabric, as will be readily understood, is regulated by the size of the jacquard machine at our disposal, as well as the texture of the cloth under consideration.

Having obtained the repeat of our pattern, we then divide the same in five equal parts, width ways, in the fabric, as indicated by numerals of reference 1, 2, 3, 4 and 5 on the bottom of the design.

We next have to divide the repeat of the pattern, length ways, also in five equal parts.

Provided the affair, as is the case in connection with our example, has reference to a repeat of a pattern, repeating on the square, *i. e.*, the same distance width ways as length ways, we naturally will obtain five equal squares in a longitudinal direction as well as in a vertical direction; the dividing of our example length ways, being again shown by means of numerals of reference 1, 2, 3, 4 and 5, as placed on the left hand side of the design.

Should the affair, however, refer to a design not repeating entirely on a square basis, *i. e.*, the repeat length ways of the design being different than that width ways, either longer or shorter, the size of the divisions made width ways and length ways will vary on the sketching paper, in turn resulting in rectangles in place of the squares (as is the case in connection with our example) when connecting the division marks (see dotted lines) and which represent the lines on the point paper when laying out the basis for our 5-leaf satin.

Having obtained these (5 × 5) 25 small squares, shown in dotted outlines in our sketch, we then place one figure in every square selected according to the 5-leaf satin weave, every square in the sketch referring to one square on the point paper.

In our sketch Fig. 20, we have placed this figure always in the same position, a feature which, however, is not always the case, such position being frequently changed, in order to present a more broken up effect in the complete design, a feature readily explained in connection with sketch Fig. 21, showing again the same figure as used in the previously given example, set after the 5-leaf satin setting, the position of each figure in every instance, however, being changed, giving in turn to the complete design a totally different (more pleasing) appearance. The same, as in the previously given example, one repeat of the pattern is indicated by means of letters of reference *a*, *b*, *c* and *d*.

The squaring off in five parts each way of this repeat is indicated both ways by means of numerals of reference 1, 2, 3, 4 and 5, on bottom and left hand side of sketch, the same as was done in the previous

sketch, and the division points connected by means of dot and dash lines. The setting being again the 5-leaf satin setting, the figures are placed in the same squares as in the previous example; however, their position is changed, in order to obtain the greatest possible variety of positions, thus: First find the centre of each square by drawing the two diagonals. From the centre of the middle square draw a circle. Divide this circle into five equal parts by means of the lines  $B A$ ,  $C A$ ,  $D A$ ,  $E A$  and  $F A$ , and on these

for an 8-leaf satin setting, and which is a setting more conveniently used, not only on account of the even distribution of the figures by means of *this* satin setting, but also on account of the handy way in which the design can be reproduced, a feature which will be readily seen by examining fabric sketch Fig. 23 more in detail, showing that if the repeat be bi-sectioned in both directions, the figure in opposite corners will correspond, *i. e.*, be exactly the same, a feature readily demonstrated when mentioning that positions of



FIG. 20

lines place the figures with the line always bi-sectioning the figures at the same place. Thus these figures will each present a different direction. Be careful not to place one of the figures on an exactly horizontal position, since this will spoil the effect of the design.

Fig. 22 shows us another fabric sketch of a figure placed by means of the 5-leaf satin setting, each figure in this instance being placed again in a different position, in order to produce a most pleasing effect and besides prevent any possible chance for striping.

Having thoroughly explained these 5-leaf satin setting of figures in connection with the previously given examples, no special reference to the present fabric sketch will be necessary, which in this instance is more particularly given to show the application of one figure to several settings, a feature we will refer to as we go along in connection with our lesson.

Fig. 23 shows us the same design, as given in connection with fabric sketch Fig. 22, this time arranged

figures 1 and 5 correspond, and which are the two figures previously referred to. Consequently, the other figures in the repeat of the pattern will correspond in the same manner, *i. e.*, figure 4 is identically the same figure, and placed in the same position as figure 8, figure 7 corresponds to figure 3, and finally figure 2 in the first portion of the repeat to figure 6 in the other portion of the repeat; the design being nothing more but the same figure set in four different positions, in connection with the 8-leaf satin plan of setting, starting to duplicate the affair exactly as found in the left hand lower corner *a*, at the dotted corner *b*, and which is the point of meeting of the two imaginary lines drawn from the centre of each repeat, both ways.

Another advantage to this 8-leaf satin setting, is that the boundary lines of the repeat can be drawn in such positions that the figure is cut in the same way at the top and bottom and at the sides, and for

which reason the design can be made to appear uniform, no matter from which side seen, may it be either

obtained from it on the card stamping machine, either by cutting the design in two and reversing the parts,

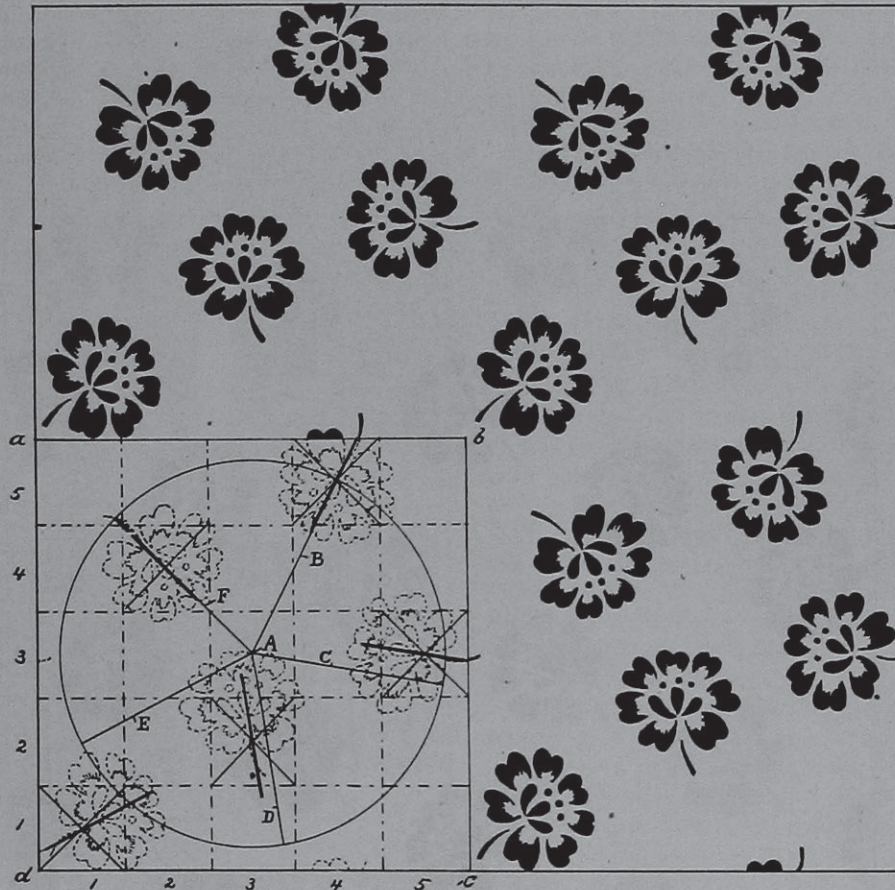


FIG. 21

viewed from the top or from the bottom. This feature in connection with 8-leaf satin setting is frequently made use of by the designer in order to

or by turning the design around; the first method referred to being used when the figure is turned in two or four directions, the latter system being resorted to when one figure is turned in four directions. Another advantage in connection with the latter method, is that in case of full-up patterns, or when needles are cast out equally on either end of the machine, then the second half of the set of cards can be produced direct on the repeater from the first half.



FIG. 22

shorten his work by half, or only having to produce half of the complete repeat, the other half being then

Another reason why fabric sketch Fig. 23 has been prepared, is to show the student how one figure can be arranged for different settings, a feature which without question will be readily understood by him if comparing fabric sketches 22 and 23; although in the latter instance, we left more ground to show, in preparing the sketch, compared to the former example, a feature which, however, is of no consideration in the present instance, since it will be readily understood that we either might have set the figures closer together in connection with the 8-leaf satin setting, or that we might have set the figures further apart in connection with the 5-leaf satin setting, and when then in either case, fabric sketches 22 and 23 would more closely resemble each other in their general appearance.

(To be continued.)



**THE IMPORTANCE OF PROPER BOILING OF THE  
VARIOUS STARCHES FOR SIZING YARNS  
AND FINISHING OF COTTON GOODS.**

Starch is one of the most important by-products used by a cotton mill, both in the preparation of the warp for the loom (sizing) as well as the woven fabric for the market (finishing). In both instances, its purpose is that of a stiffening and binding agent, without it at the same time materially adding to the weight of the yarn or cloth. For the latter purpose special *Filler* or *Weighters* are added to the size. Starches are also frequently used to give to the finished cloth a peculiar feel or finish.

starch is capable of undergoing, varies with the different kinds; the size and shape of granules of the various kinds of starches also differ, a feature which thus permits us (by means of the microscope) to ascertain what kind a lot of starch under consideration is, or belongs to. Starch as seen by the naked eye shows it to be a white shiny powder of a peculiar touch or feel to the hand. If some of it is placed between paper, and pressed, a crackling sound will be noticed, some kinds of starch making a louder sound than others.

Starch is insoluble in cold water, but when heated to about 150° F. the granules of starch begin to



FIG. 23

The importance of sizing warps in a cotton mill cannot be disputed, since warps not sized, in order to weave well, demand the use of the best of cotton fibre, and besides a considerable excess of twist; and when it must be remembered that the latter item has everything to do with the fineness and softness of the finished fabric, in fact in a great many instances is not permissible at all without deteriorating, or changing, a certain class of goods, making them unsalable at regular price.

Starch is a vegetable product, it being present (more or less) in all plants, more particular in its roots, stems and seed, existing there in the shape of small granules, forming a nutritious reserve for the plant to draw upon for its life. Although the chemical properties of starches are alike, the changes which

swell until their outer cell, consisting of cellulose, and possessing an organized structure not acted upon by water, burst, liberating the inside constituent of the starch, *i. e.*, the amidine, which is soluble in water and with it forms the starch paste. Examining carefully a solution of starch, you will see the remnants of the cellulose floating about.

The proper boiling of the starch (and its additions for weighting, softening, etc., as the case requires) is of the greatest importance, both for sizing of warps as well as finishing of cloth, a feature which, however, is frequently lost sight of in many a cotton mill, considering the affair simply as a unimportant process, which can be done in any old haphazard way; sometimes for sake of saving in wages being performed by a boy and when then a good prepared

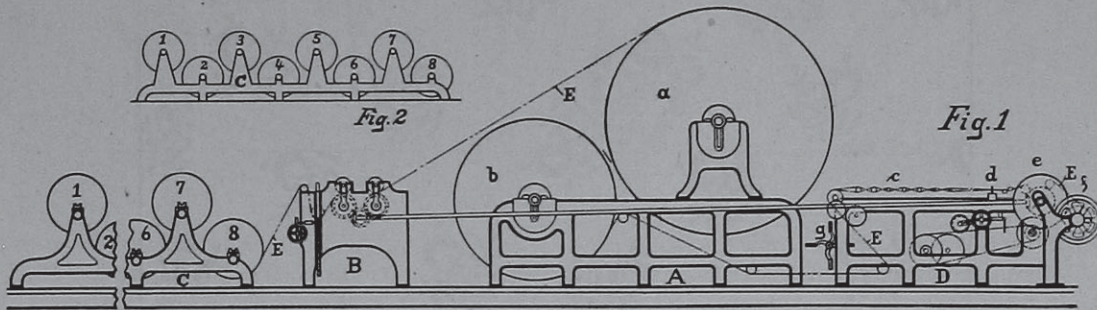
starch may be considered more of an accident. More often, however, the foundation is then laid for a poorly weaving warp or a too light or too heavy a finish.

It must be remembered that the boiling of the size is the important item in the sizing and finishing department of the mill, and not only the machinery, and it is to this that the overseer will have to look after, himself, except he has it in the hands of a reliable, careful person, who knows what he is doing, also the reason why. No fast rules for boiling the starch can be given, since in connection with the sizing of warps, there are different methods of making said warps in use, like chain sizing, scotch tape dressing, the ordinary cylinder slasher, the single cylinder slasher or tape dresser; besides there is a light, medium and heavy sizing practiced. With reference to the finishing room, the variety of kinds of starch required is still greater, also the variety of construction of the machinery, on account of the different class of goods and finishes we then come in contact with and when what would hold good in one case may not do in another. The by-products then used with the starch, for filling or weighting purposes, softening, and antiseptics, all must then be taken into consideration. For this reason the boiling, *i. e.*, preparing of the starch and its composition must be studied in con-

as long as the size does not boil, the color remains a dull affair, a beautiful blue only being noticed after the complete amalgamation of the starch with the water, etc., has been accomplished, *i. e.*, sufficiently boiled. The dull blue, previously referred to, although well mixed in the size was caused by the presence of the many undissolved granules of starch, which not only dull the color, but at the same time have no adhesive properties, hence a double disadvantage. However, if boiling is overdone too long and too excessive, the starch will also lose in adhesiveness, it being then transposed into soluble starch, dextrine, etc., and which have less adhesiveness.

Maize, Wheat and Rice Starch are generally used for sizing and finishing purposes only as a plain boiled starch, used on account of their adhesive and covering properties. Don't boil them too long. To know the proper moment requires experience. A good plan to test for it, is to insert a smooth wooden stick from 2 to 2½ inches wide in the mass, pull it out and hold it in an oblique direction. The quickness with which the mass will drain off the stick, whether it will leave in drops or in a slimy thread, and its transparency which then can be readily noticed, will soon tell the proper time when sufficient boiling has been done.

Matters, however, differ when using Farina or potato starch and which is the one most used, since



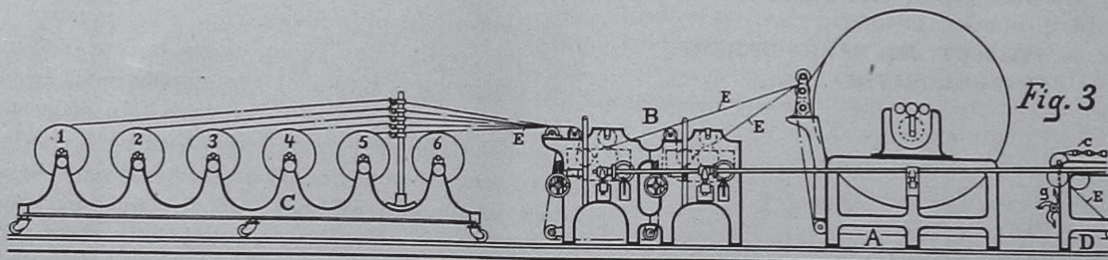
nection with every new material that comes under the hand of the overseer, whether new yarns, cloth, or finishes, or the starch and its additions itself. Only points of general information can be given. If boiling with direct steam, it is necessary to place a water outlet just previously to where the steam enters the size or starch kettle, in order to only use a dry steam and this under an even pressure, so that for a certain time a known quantity of condensed water enters into a known quantity of already boiled size or starch mixture in the kettle. It might make the latter too thin, and to add fresh starch to an already boiled mixture, in order to make it thicker, remains always a questionable procedure. Many overseers consider a hot soaking of the starch as boiling. Real boiling will be noticed by the composition being of an even thickness and when it begins to become transparent, a feature more readily noticed if a blue dye has been added to the mass, for tinting, *i. e.*, a blue dye is sometimes used, in very small proportions, for the purpose of tinting, *i. e.*, correcting a tendency to yellowness in the mixing, and when said blue dye changes the starch to a bluish white. In this instance,

it produces a paste which has greater binding properties. If used for finishing processes, it gives a firm, crisp finish, as well as a good feel to the fabric, without adding a great deal of extra weight. It yields a much more transparent, viscid mass. If boiled with acids or chloride of lime, it will rather increase the binding properties of the plain farina paste, being extensively used when fabrics have to be filled or weighted very heavily. As a rule, farina reaches the mill in a fairly pure state and free from nitrogenous matter. Another point in favor of farina is that its paste is not liable to mildew, and for which reason it is the safest ingredient to use for starch for finishing purposes.

The advantages of using farina are not only the formation of starch, *i. e.*, size, but also its property to quickly change in dextrine or soluble starch, a feature which brought this starch most prominently in favor with sizing of yarn where quick work is required, *i. e.*, where the size has only little time to penetrate into the thread, and for which reason a thin and not a thick size must be used. Dextrine used alone has not sufficient adhesiveness, hence the demand

for farina, to which by proper boiling, both thinness and adhesiveness can be imparted to. One part farina to six parts water will result in a paste so thick that it only can be boiled in a kettle provided with mechanical means for stirring; continuing the boiling will thin the paste until finally it will become watery. The

the weather. It is specially adapted to be used in connection with farina. As mentioned before, diastafor is now used extensively on the Continent and beginning to be introduced in England. It is now also introduced here by The American Diamalt Co., Riverside, Cincinnati, Ohio.



starch has then changed into soluble starch and partly into dextrine, in which condition, however, the size is of little value, no adhesive properties, for which reason boiling is only carried on so far until about half is paste and the other half soluble starch or dextrine. To push this half boiling, acids or chloride of lime are used, and when then said boiling can be readily noticed, however, the acids with the exception of oxalic acid must be neutralized. Chloride of lime has the disadvantage of its smell. With reference to size for yarns, the amount of boiling the farina depends upon the texture of the warp in the loom, the counts, quality and twist of the yarn, hence experience a necessary factor. On account of producing a thinner starch than wheat and maize, farina also finds extensive use in the finishing department. If used in connection with wheat starch, it will, if boiled somewhat less longer, although not raising the consistency of the paste, increase its adhesive as well as covering properties, items of importance in connection with heavy sizing.

THE ORDINARY CYLINDER SLASHER consists of a machine with suitable iron frame made either continuously or in sections, containing one or two copper cylinders of different sizes made from the best heavy copper; also a starch box with the necessary sizing roll and the other attachments required for carrying the yarn through the machine with as little tension or strain as possible. It must also be remarked here that it is very desirable to dry the yarn at as low a steam pressure on the cylinders as possible, to preserve its elasticity and strength.

A new solvent for starch, and which is used extensively on the Continent already is *Diastafor*, which is a malt preparation of very high diastatic power, and is claimed, has proven superior to chemical or mechanical treatment in the conversion of starch into soluble form. Not only is it free from acid and fatty substances, but at the same time has no action upon the cotton fibre nor on fast dyes the cotton yarn has been dyed with. Since it is completely soluble in lukewarm water, it naturally is ready at once for use, overcoming in this way disadvantages connected with other ingredients, being a conveniently used preparation for the mill; its employment assuring economy, time and labor, besides satisfactory results. It is used in the preparation of supple and closely adherent finishes, the starch being converted by its fermentation into soluble starch dextrine and maltose; additions of salts, fats, etc., giving it a basis for its use for special finishes. It does not dust or harden by exposure, and naturally is of special advantage with fabrics requiring napping, like flannels, etc.; again in connection with calendering, the dressing then takes a high lustre and will stand considerable resistance to the influence of

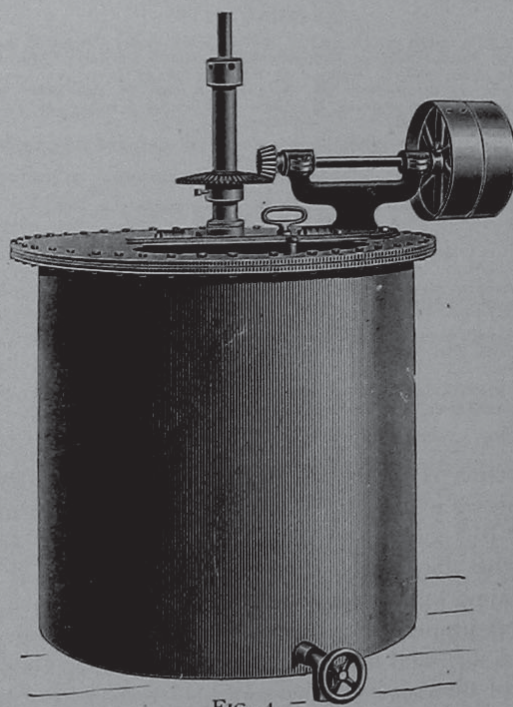


Fig. 1 shows, in its side elevation, the latest make of the Cylinder Slasher, as built by the Textile-Finishing Machinery Co. Examining this illustration we notice that the side frame of the machine is made (if so desired) in sections, a feature which has the advantage over the continuous frame machine that it makes it easier to erect and align such a machine in the mill.

# Possett's Textile Journal

*A Monthly Journal of the Textile Industries*

PUBLISHED MONTHLY BY

E. A. POSSELT, 2028 BERKS STREET,  
PHILADELPHIA, PA.

#### SUBSCRIPTION RATES:

United States and Mexico, \$3.00 per year.

Other Countries in the Postal Union, \$4.00 per year.

Single Copies, 25 cents.

This Journal is published on the tenth of each month.

Postage prepaid by the Publisher.

Subscriptions begin with the number following the date on which the subscription is received at this office.

In writing about subscriptions, always give your full name and address.

When writing for changes in address, always give the old address as well as the new address to which copies are to be sent.

Money should not be paid to agents or solicitors unless they can show authority from this office. This Journal cannot be responsible for money paid to unauthorized persons.

Subscriptions are payable in advance. Money can be sent by check, draft, money order or in registered letter. Make all drafts, checks, money orders, etc., payable to E. A. POSSELT, Publisher, 2028 Berks Street, Philadelphia, Pa.

#### ADVERTISING RATES:

WANTS, FOR SALE, ETC. If set solid under Classified Advertisements, Special Notices, Help Wanted, Situations Wanted, Machinery for Sale, Etc., will be inserted at the rate of 25 cents per line, for each issue, if the answers are to come in care of this office to be forwarded; 20 cents per line, if replies are directed to advertiser. Count 10 words to one line.

Payment must be made in advance for all transient advertisements.

Rates for Regular Advertisements will be furnished on application.

COPY FOR ADVERTISEMENTS must reach this office not later than the 25th of month preceding date of issue, to insure proper attention.

ALL COMMUNICATIONS WILL BE CONSIDERED AS CONFIDENTIAL.

Letters to receive attention must be accompanied by the signature of the sender, but this will not be published unless so requested.

We will always be glad to receive articles of a practical nature relating to the textile industries, and will publish such as are available.

EUROPEAN AGENTS: Sampson Low Marston & Co., Ltd., 100 Southwark Street, London, S E., England.

Section *A* of the machine carries the two drying cylinders *a* and *b*, the usual standard measurement of which is 7 and 5 feet diameter respectively  $\times$  about 60 inches face each. They are strongly, and at the same time lightly constructed, the heads being made of steel properly braced, while the joint between the copper shell and head are so made that by having the edge of the copper turned and held between the head on the outside and a ring on the inside, with through bolts, that it is quite impossible to blow it out, even under excessive pressures. These cylinders are also fitted with patent spiral scoops which take out every bit of water and air so that the lowest amount of steam pressure can be used in drying the yarn, which in turn means that the yarn is dried at a very low temperature and the size not baked on.

The other sections of the machine are: *B* is the

section for holding the size box, which is usually a double jacketed copper box and contains seamless copper electro plated balanced rolls. *C* is the creel section, which in the usual construction of the machine provides bearings in its side frames for holding eight beams, arranged in two rows of four beams each. Only beams number 1, 7 and 8 are shown (besides portions of beams number 2 and 6) the central portion of the creel section being shown broken out, in order to bring the diagram of the complete Slasher within compass of the width of the page. In order to illustrate the complete creel section, detail illustration Fig. 2 is given (being drawn on a reduced scale to Fig. 1) and which will at once explain itself by means of numerals of reference selected to correspond with those used in connection with Fig. 1. *D* is the head stock, i. e., head section of the machine, the frame work of it holding the rods *c* and reed *d* (expanding comb) both being necessary for separating the sized threads, also the mechanism *e* for winding the yarn on the loom beam *f*. Fans *g* at the entering-end of the head stock, are placed there for cooling purposes.

The yarn, as taken from the beams in the creel section *C* then passes through size box *B* then in turn nearly all around drying cylinders *a* and *b*, then through the head stock *D* and finally on the loom beam *f*, as shown by means of broken line *E*.

For regulating the speed of the machine and also for removing as far as possible the tension on the yarn, special drivings and friction devices are used, known as the McCarthy Friction Drive and the Pacific Wind. The McCarthy Friction Drive is a mechanism for driving the Slasher Cylinders direct from side shaft, thus enabling all tension required to drive cylinders to be removed from the yarn, in turn allowing very light warps to be sized and dried without breakage or excessive strain. It is provided with friction attachments to regulate perfectly the speed of the cylinder to accommodate the sets required to be dressed. In making up sets for weaving, experience has proved that the ordinary arrangement of slasher can do good work to a certain limit, but when that limit is reached, it becomes necessary to use some such arrangements as the McCarthy Drive to do satisfactory work at a certain and constant speed. This arrangement will dress yarns of any number of threads, doing its work thoroughly and perfectly. It can be readily attached to any yarn slasher and requires but little out-lay. Its importance can be readily understood by those having experience with light warps or a small number of ends.

THE SINGLE CYLINDER SLASHER, frequently termed a *Tape Dresser* is shown in its end elevation in Fig. 3. While very similar to the double or two cylinder slasher, it is gotten up especially for dressing warps or yarn for ticking, gingham and all pattern work where it is desirable to use lease reeds at the size box. The particular machine represented was designed to take the place of what has been largely known as a *Scotch Tape Dresser*. In this illustration *A* is the drying section, with its drying cylinder; *B* the size box