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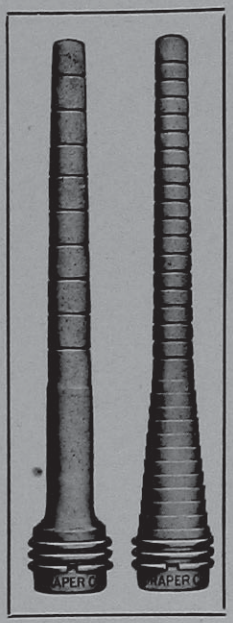
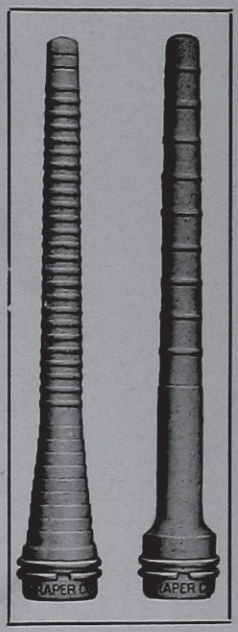
NORTHROP LOOM BOBBINS





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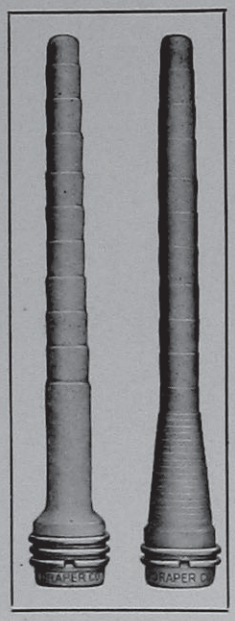

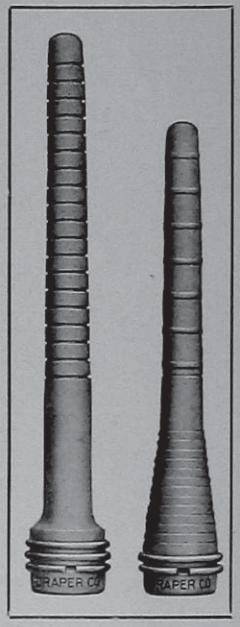

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2. Men's Work Shirts.—Sears, Roebuck & Co., Chicago, Ill.

3. Coats, Vests, Trousers, Suits, Rain Coats and Overcoats.—Michaels, Stern & Co., New York.

5. Hosiery.—E. M. Townsend & Co., New York.

6. Oiled Clothing.—Western Oiled Clothing Co., Kansas City, Mo.

(*Continued on page 108.*)

Posselt's Textile Journal

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PRACTICAL IDEAS ON THE NORTHROP "MODEL E" LOOM.

By E. T. Saulnier, *Master Weaver.*

(Continued from page 34.)

Picking Motion.

The same is one of the most important parts of any loom, on account of the power consumed, wear on loom and supplies, as well as the steady running of the

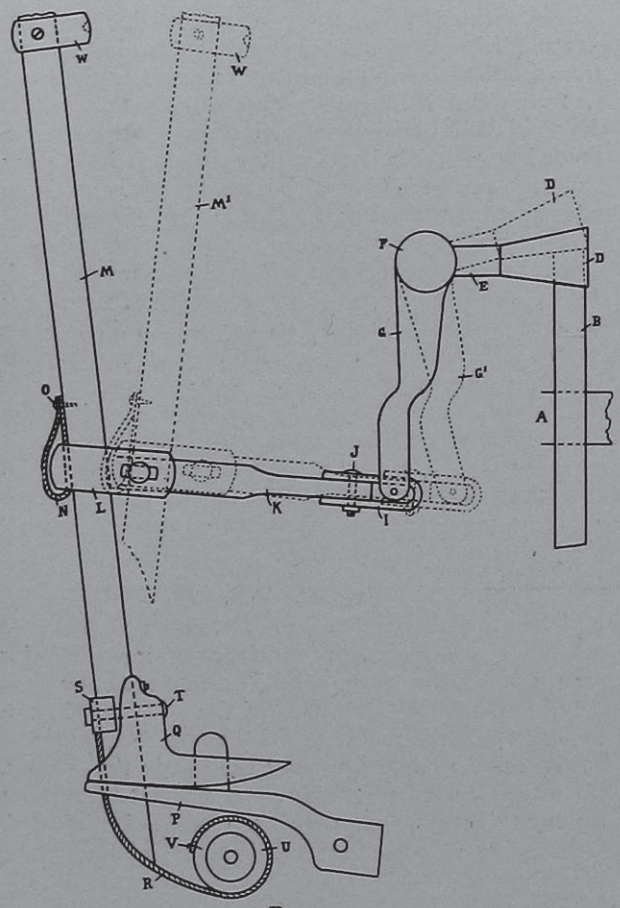


FIG. 1.

loom. To have the picking motion work to its best, the fixer must understand the principles of its construction and operation.

To explain this, as well as to indicate the positioning of the various parts in the loom, in order to get the best results, the accompanying two diagrams are given, and of which

Fig. 1 shows us a view of the various parts of the complete picking motion, seen when standing in front of the loom.

Fig. 2 is a detail view, showing pick cam, pick ball, picking shaft and its arm; the parts are shown in their working position, in side view, compared to Fig. 1.

The essential parts of the picking motion are: Cam, pick ball, picking shaft, picking arm, short or inside lug strap, lug arm, outside lug strap, power strap, picker stick and the parallel motion.

We will now describe the working of the motion, quoting at the same time, letters of reference accompanying the illustrations, and which are selected to correspond in both diagrams.

A is the cam shaft, as carrying cam *B*, arrow *C* indicating the rotation of the latter. Cam *B* operates with its face against pick ball *D*, which revolves on a stud *E* cast onto the picking shaft *F*. Secured to the latter is the picking arm *G*, which has its stirrup *H* embraced by the short lug strap *I*, as is secured by means of bolt *J* to the wooden lug arm *K*, outside lug strap *L* connecting the latter with the picker stick *M*. Power strap *N* holds lug strap *L* in the required position on the picker stick, being secured to the latter by screw *O*. Raising or lowering the position of the power strap on the picker stick, will in turn either lower or raise the power for the throw of the shuttle.

The lower end of the picker stick *M* is adjusted to what is called the parallel motion, the same consisting of the rocker *P* and shoe *Q*; a strap *R* is secured at one of its ends to the picker stick *M* by means of plate *S* working in unison with bolt *T*, the other end of the strap *R* being connected to spring *U* by means of hook *V*. The object of this contrivance is to insure, by means of spring *U*, the return of the picker stick, after picking, to its initial position.

The operation of the picking motion is thus: Full lines in Fig. 1 show the motion, as well as the picker stick, at rest. In connection with Fig. 2, the action of the picking cam is shown by means of its shaded portion, *i. e.*, the extension of the cam from its circle.

The picking cam revolves in the direction of arrow *C*. When point *a* of said cam reaches the pick ball *D*, the latter is gradually forced up, by the rotation of the cam, until point *b*, or the nose of the cam, is brought into contact with the pick ball *D*, after which a quick return of pick ball *D* to its initial position takes place, as indicated by cam line *b* to *c*. We have shown the

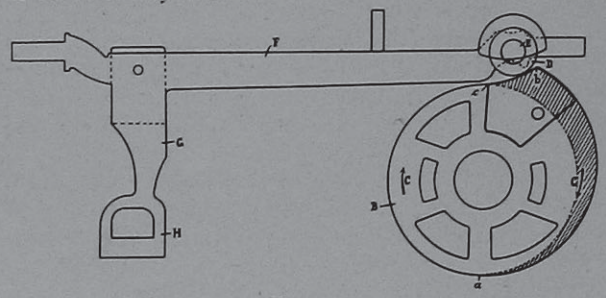


FIG. 2.

raising portion of the pick cam, *the pick*, shaded, to simplify it to the reader. The gradual extension from the circle line of the cam, imparts a gradually accelerated motion to the picker stick until arriving at the nose *b*, and where an abrupt return of the picker stick

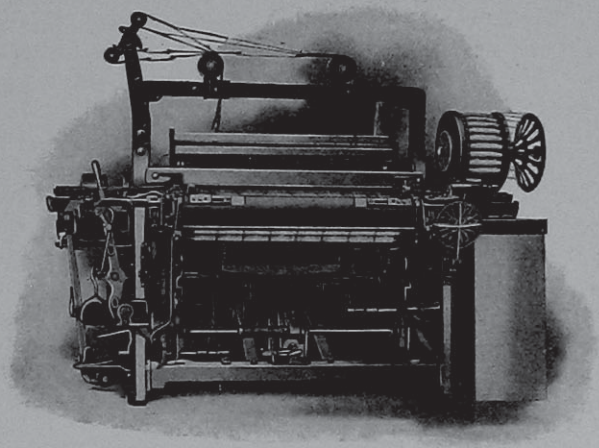
to the initial position occurs; or in other words, the picking of the shuttle requires the distance of cam *a* to *b*, the return of the picker being accomplished in the short distance *b* to *c*.

This motion of the cam and pick ball gives the picking arm *G* an inward motion (see dotted line position *G'*), thus forcing the picker stick forward into dotted line position *M'*, in turn imparting, by means of picker *W*, a blow to the shuttle sufficient to drive the latter through the shed and into its box on the opposite side of the loom. This motion is called a pick.

Since the picking motion is a most important part of the loom, you will find that by giving careful attention to it, you will greatly improve the running of all other parts of the loom.

Remember that you are to use as little power as possible, consistent with the proper running of the loom.

There are many ways of lessening or increasing the power for the picking motion. It is always better to have the lug arm *K* as short as possible (this tends to lessen the jar on the loom) by properly adjusting your outside lug strap *L*. This lug strap *L* should be about one inch higher on picker stick *M*, than lug strap *I* is on the picking arm *G*, in order to obtain good results. This gives the picker stick, and in turn the picker, a downward motion, with the result that the shuttle will hug the race plate of the lay.



The Northrop "Model E" Loom

To increase power, lower the outside lug strap *L* on picker stick *M*, by means of lowering power strap *N* on the stick, in turn imparting to the latter, a shorter and quicker sweep, hence more power. In turn raise lug strap *L* by means of power strap *N*, to lessen the power on picker stick.

Spring *U* of the parallel motion should not be tightened too much; just sufficient to insure the return of the picker stick. If too tight, you are wasting power by acting against the spring.

The picking shoe *Q* sets on the rocker *P*, so that the picker stick *M* while resting in the middle of the recess in the shuttle box, is parallel with the lay, so that in giving the shuttle the least bit of a raise, when in the box, it will also have the same amount of raise on the delivery of the shuttle.

Adjust the lug straps *I* and *L* so that they will measure 12 inches from their inside surfaces.

The sweep of the picker stick is from 6½ to 7 inches, the recess in the lay is 10 inches; this leaves about 3 inches between picker stick and bumper.

The picking shaft *F* must be adjusted so that it will work freely in its bearings, and high enough to relieve the jar on the loom; at the same time, as mentioned before, the outside lug strap *L* must be about one inch higher on the picker stick than the inside lug strap *I* on the picking arm. It must be remembered however, that the higher the pick arm is raised, the more it tends to lessen the jar on the loom.

The pick cams *B* must be set so that the loom will start to pick exactly on top center, by turning the lay from front center to top center, and placing the hand on the lay end, holding the picker with the thumb. As the picker ball is rising on the incline on the cam (see shaded portion), it is taking up the slack in the lug straps, so that the picker stick starts to move exactly on top center, regardless of the play in the lug straps.

Care must always be taken to tighten the spring *U* that connects the heel strap *R* to the picker stick *M*, tight enough to insure the proper return of the picker stick, yet not so tight as to waste power and cause the picker ball *D* to rebound on the cam *B*, and in turn wear the cam in places.

Too much cannot be said about the waste of power. As every good loom fixer has found out by long experience, the trouble caused by broken picker sticks, worn out straps and battered pickers, could almost be entirely overcome by using as little power as possible, and the proper use of check strap.

Protector Rod.

The protection rod is made in two parts, joined in the middle with a coupling and four set screws, two for each rod. If one dagger is higher than the other, it is only necessary to loosen two of the set screws, place the dagger in the proper position and tighten again.

To set the dagger, remove the pin in the shipper, place the handle in running position, and by turning the lay to bottom center with the shuttle in the shed, set frog so as to release the handle without shuttle breaking the yarn.

The spring on the protection rod should be set so that the dagger will act quickly, but care should be taken not to have the spring too tight, as it is a great waste of power, in driving the shuttle in the box.

(To be continued.)

State Entomologist, E. L. Worsham has about perfected plans for the growing of between 2,500 and 3,000 bushels of the resistent variety of cotton seed, which tests have proven is not subject to the ravages of the dread black root, which costs the cotton growers of Georgia thousands of dollars each year. These will be located in the counties of Dooly, Schley and Sumter. Experiments made in growing this resistent variety in those countries, last year, have proven great successes.

Diagonal worsteds are finding much favor for women's suits this season, it being a most satisfactory cloth from all standpoints.

GRANITE WEAVES OBTAINED BY MEANS OF FOUR CHANGES.

Granite weaves are used in the manufacture of cotton, wool, worsted, silk and linen fabrics, being weaves employed where a small, well broken up effect of the interlacing of the warp with the filling is required in the fabric.

In former issues of the Journal (November and December 1908), we explained the construction of Granite Weaves by means of taking our regular satin weaves for the foundation. We now will explain the construction of these granite weaves by means of another procedure, i. e., *by means of four changes,* which is a great deal easier for the designer compared to the procedure explained in the November and December 1908 issues; besides, the new procedure permits the construction of a greater variety of granite weaves, since the number of new granite weaves having satins for foundation, is always more or less limited (again, they require more work, on the part of the designer, to obtain them), whereas, by means of *four changes,* the number of new granites obtained is unlimited. By this, however, we want to say, that not every new weave thus constructed is perfect, but the greater part of the weaves thus obtained are; and, again, a great many of these weaves, even if of no practical use in their original construction (as obtained by rules given later on), can be readily modified (by adding either risers or sinkers, or both, in places where required) so as to make perfect granite weaves. Again, some of these results, even if of no use for weaves, can be used as motives, etc., in connection with figured work, both for harness and Jacquard. Certainly a small percentage of the results will be of no value; however, this percentage is so small as not to contract the least from the value of this method of constructing granite weaves by four changes, to the designer.

The rule for designing these granite weaves by means of four changes is thus: Place one or two weaves four times into each other; every time (before starting any of the four changes) turn your point paper 45 degrees. In laying out the plan, i. e., the repeat for the new granite, remember that the latter is four times the size of the foundation weave or weaves used, since you need twice as many warp threads and twice as many picks for the new weave as compared to its foundation. For this reason a 3 by 3 foundation weave, or weaves, will produce a 6 by 6 granite weave, a 4 by 4 foundation weave or weaves will produce an 8 by 8 granite weave, a 5 by 5 foundation weave or weaves will produce a 10 by 10 granite weave, etc., etc.

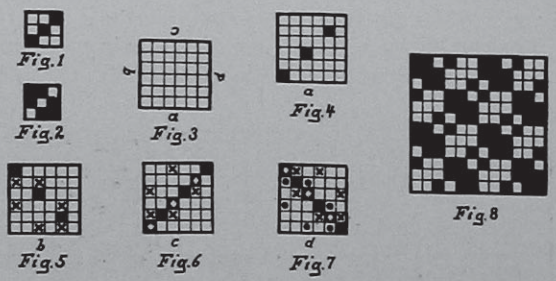
This will explain that these granite weaves can only be designed for an even number of harness and picks for their repeat.

The method of designing these granite weaves will now be best explained by means of a few practical examples, after which we will give the reader a collection of some excellent weaves of this kind, for reference, all of which will produce excellent results in practical work.

Let us begin with simple weaves for foundation.

For example, the $\frac{1}{2}$ 3-harness twill (see Fig. 1), to be combined with the $\frac{2}{1}$ 3-harness twill (see Fig. 2). Foundations to be used alternately.

Fig. 3 shows us the empty point paper required for the new granite. The same calls for six squares each way on account of the foundation weaves being a repeat of 3 by 3 ends. We have marked Fig. 3 with letters of reference *a, b, c* and *d*. Now let the reader



understand that Fig. 3 will be used respectively in four positions when planning for the construction of the new granite, i. e., letter of reference *a* will be at the bottom of the weave plan, when inserting the first foundation weave. Letter of reference *b* will be at the bottom when inserting the second foundation weave, letter of reference *c* when the next weave is inserted, and finally letter of reference *d* will be at the bottom of the weave plan when inserting the fourth, i. e., the last weave. This feature has been explained in connection with weaves Figs. 4, 5, 6 and 7, where the reader in turn will find the letters of reference *a, b, c* and *d* respectively at the bottom of the weave plan. This turning of the weave plan will be the hardest point to grasp by the reader. Be sure that you have your foundation weaves before you, on a separate sheet of paper, in order that you do not turn these foundation weaves simultaneously with the weave plan, and, as a result, mix up the whole affair.

First Change. Fig. 4 explains this subject. Letter of reference *a* is at the bottom of the plan. Consider every other warp thread and every other pick on your weave plan only, and in turn, insert weave Fig. 1 in the weave plan, as shown in Fig. 4, by means of *full* type.

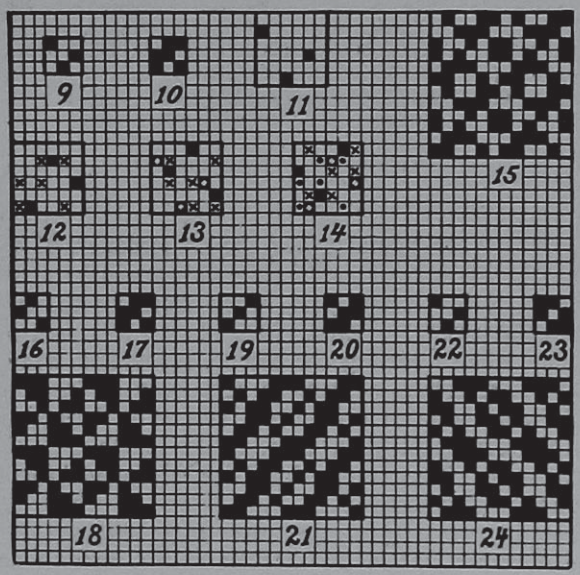
By quoting "use every other warp thread and every other pick, both warp and filling ways in the plan," let it be understood that, in that instance, we refer to warp threads and picks 1, 3 and 5 only, i. e., all the uneven numbered warp threads and picks, the even numbered ones being left out of consideration—the same as if they would not exist. Be sure that you understand this point thoroughly before going any further, since the identical procedure is repeated in connection with the next three changes (Figs. 5, 6 and 7), and will not be mentioned again by us; we to take for granted that the reader understands the subject of considering every other warp thread and pick only in the various changes, when considering these weaves.

Second Change. Fig. 5 explains this subject, using in this instance, foundation weave Fig. 2 for inserting

in the weave plan, considering every other warp thread and pick only. This foundation weave has been indicated by means of *cross* type, showing in the plan, also the first change (Fig. 4) as was left in the weave plan, the latter being simply turned 45 degrees to the left, i. e., letter of reference *b* of diagram Fig. 3 is at the bottom of the weave plan.

THIRD CHANGE. Take plan Fig. 5 and turn it again 45 degrees to the left and insert foundation weave Fig. 1 again, the same as you did in connection with Fig. 4. *White dot* type shows the procedure.

FOURTH CHANGE. Turn plan Fig. 6 again 45 degrees to the left and insert foundation weave Fig. 2, in the



same way as you have done in connection with Fig. 5, the only difference being that, in the present change we use *black dot* type in place of cross type used before. Diagram Fig. 7 explains the subject.

The latter is now the complete weave, being shown in four styles of type, representing the four changes that the plan Fig. 3 has gone through in order to produce the granite.

Fig. 8 shows us weave Fig. 7, for the sake of simplicity to the reader, executed in one kind of type, the weave repeating on 6 warp threads and 6 picks.

The reader, in turn, might now ask the question: Why have we used the combination of the two mate 3-harness twills; i. e., the $\frac{1}{2}$ 3-harness filling effect twill in connection with the $\frac{2}{1}$ 3-harness (its mate) warp effect twill? In this instance, we produced a granite weave well balanced, *i. e.*, the amount of risers and sinkers for warp and filling in one repeat of the weave are equal (three risers and three sinkers every time), being a feature of the greatest advantage for a perfect granite weave. However, this is not a fast rule, although in small repeats, we will always adhere, more or less, to balancing this amount of risers and sinkers, yet in weaves calling for a large number of harnesses for their repeat, this item is not always adhered to. We will find that a slight variation may produce perfect granites, in fact, be just the proper combination to obtain a certain effect.

The question will now come up, how many new granite weaves can be obtained from one foundation?

By changing the starting of the foundation weaves, either warp or filling ways, different granite weaves are obtained, although in some instances duplicates may come up, for instance the same weave in a different position starting differently, twill effect running in a different direction, etc.

To clearly explain the subject of how many weaves to obtain from one or two foundation weaves (in the present instance the two 3-harness twills), Figs. 9 to and including 24 have been given, showing that these two 3-harness twill effects, used for foundation, will result in four additional granite weaves, every one of which is different from the other, all being of practical value to the textile designer. Changing the position of the foundations shown, will result in duplicates.

Figs. 9 and 10 show our 3-harness foundation twills in a different position from that placed in the previous example. Proceeding with the construction of the respective granite weave the same as before:

Fig. 11 illustrates the first change, shown by means of *full* type.

Fig. 12 illustrates the second change in *cross* type, showing also the first change in full type in its turned position.

Fig. 13 shows the third change in *white dot* type, showing also changes one and two, in their respective types.

Fig. 14 shows us the fourth change in *black dot* type, showing also first, second and third changes, in their respective types.

Fig. 15 shows us the complete weave as obtained in diagram 14, executed, for sake of clearness to the reader, in one color, two repeats being given in order to better illustrate the weave, which repeats on 6 warp threads and 6 picks.

Figs. 16 and 17 show again the two effects of the 3-harness twill, placed in a different position than before, with the result of obtaining, by means of four changes, weave Fig. 18, repeating on 6 warp threads and 6 picks, two repeats of the weave being given.

Figs. 19 and 20 show again two different positions for starting the two effects of our 3-harness twill, the result of the four changes being shown by means of weave Fig. 21, repeating again on 6 warp threads and 6 picks, two repeats of the weave being shown.

Figs. 22 and 23—the same two effects of the 3-harness twill, but in a different position for starting—if treated by four changes, result in weave Fig. 24, repeating on 6 warp threads and 6 picks, showing again two repeats of the weave each way.

(To be continued.)

The United States Board of General Appraisers has decided that Egyptian veils or scarfs, made by passing metal thread through the fabric and producing the same ornamentation on both sides of the fabric, are "appliqueed" within the meaning of the word as used in the tariff act. The fabric is made of cotton netting and has designs of metal threads that are applied to the netting after it has been woven.

DYEING COTTON CHAINS.

(Continued from page 60.)

Slashing.

Fig. 16 shows us the Cylinder Slasher as built by the Textile Finishing Machinery Co., in its side elevation. This slasher consists of four sections, marked respectively in the illustration, as *A, B, C* and *D*. The framing of this machine is preferably made in sections, as shown in the illustration, to make it easier to align the slasher in the mill, but if so desired, the machine can be constructed in one frame. Section *A* of the machine carries the two drying cylinders *a* and *b*. *B* is the section holding the size boxes. *C* is the creel section, providing bearing in its side frames for holding eight back beams. (Fig. 17 is a detail illustration of this creel section). *D* in Fig. 16 is the head stock, holding the rods *c* and the reed *d* (expanding comb) both being necessary for separating the sized threads; the head stock also holds 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 run of the yarn, from the eight back beams in the creel section *C*, to the loom beam *f*, as is situated at the end of headstock *D*, is shown by means of broken line *E*.

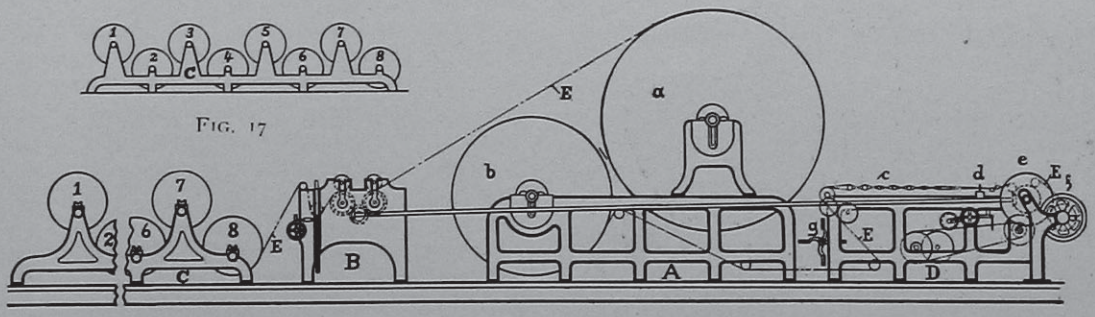


Fig. 16.

Fig. 17

Fig. 18 shows us the single cylinder slasher, as built by the Textile Finishing Mch'y Co., in its elevation. This slasher is also known as a *tape dresser*, and is a style of slasher in favor with mills dealing with pattern work, where it is desirable to use lease rods at the size boxes. Letters of reference for the four sections of this slasher are used correspondingly to the ones previously given, viz: *A* the drying section (showing one cylinder); *B* the size box (2 compartments in this case); *C* the creel (arranged for six back beams), and *D* a portion of the head stock. *E* indicates the run of the yarn through the machine.

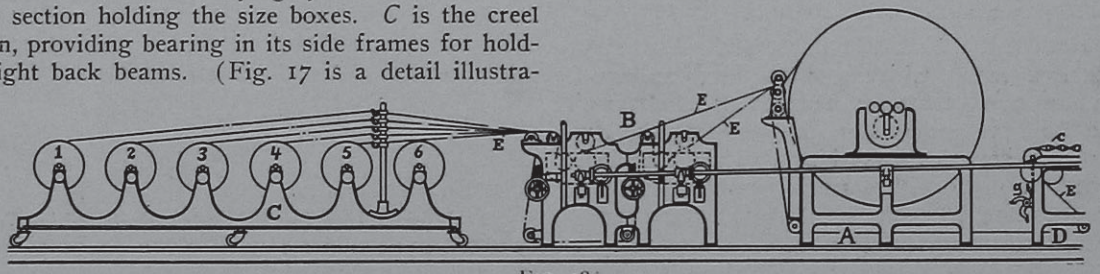


Fig. 18.

Long Chains for Quilling.

Chains destined for filling purposes, after having the cord which was wound around them previous to boiling-out removed in the beaming room, on the machine previously explained in connection with Fig. 14 (see page 60 of the February issue) are then sized. A machine built for this purpose by the Textile Finishing Machinery Co., is shown in its elevation in

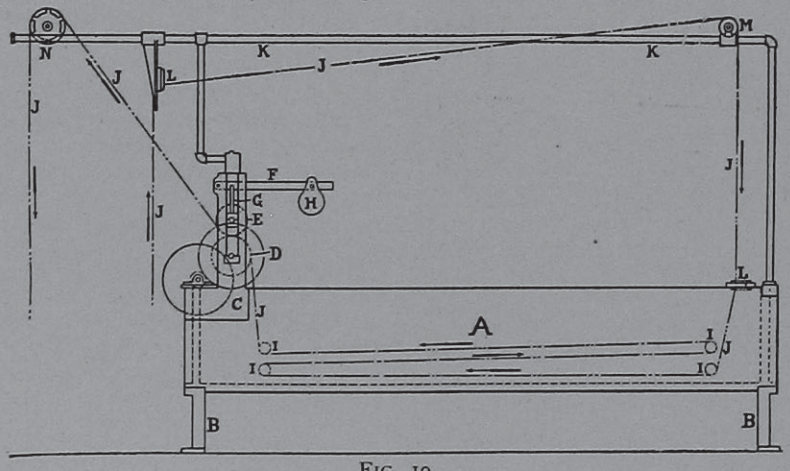


Fig. 19.

Fig. 19, and consists of a wooden tub *A*, supported on iron legs *B*, fitted with iron nip stands or housings *C*, supporting squeeze rollers *D* and *E*, supplied with levers *F*, *G* and weight *H*, so that the chains will be thoroughly squeezed after being sized in the tub *A*, which for this purpose contains a brass immersion

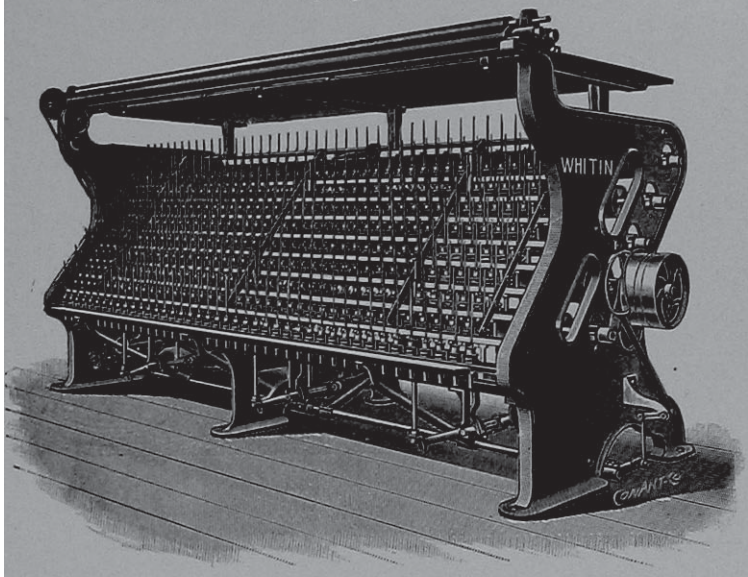


FIG. 20.

frame (not shown) which supports brass rollers *I* and the necessary brass guides for leading the chains *J* through the size (see arrows for indicating the run of the chains through the machine). These machines are sometimes made with a single compartment, but usually two compartments, side by side, are those

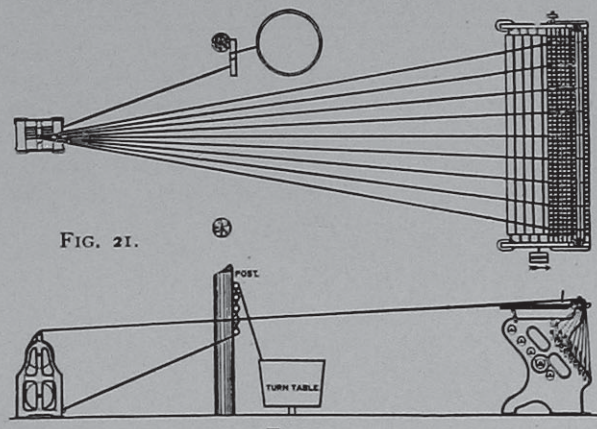


FIG. 21.

FIG. 22.

mostly in demand, and when one compartment is used to size yarn dyed in dark shades, and the other for the sizing of light shades. These machines are fitted with light, but strong pipe overhead rigging *K*, carrying pot eyes *L*, guide rollers *M*, and reels *N*, to receive size and deliver one chain in each compartment. After being sized, the chains are dried on a chain drying machine, as explained in connection with Fig. 12 on page 59, when dealing with chains destined for warp purposes. The chains are then taken to the Quiller, to transfer the yarn, colored in the chain, onto bobbins or quills for use in the shuttle. This process of preparing filling yarn for the loom is more economical than the skein system, the short chain system being entirely out of question, requiring too frequent threading up. The chain of the yarn that comes to the machine from the drying machine or the dry room, is then placed on a *turn table* and guided to, and over friction drums, placed some distance in front of the quiller, and from there through a swinging reed or comb (to separate the individual threads comprising the chain) and over guide rods to the bobbins, as placed on the 9 or 10 rows, upright spindles, of the quiller, the whole operation in itself being similar to beaming. Each row of spindles has its guide or builder rail, the spindles being driven similar to those of spooler spindles; the builder rail is controlled by a heart-shaped cam.

Fig. 20 shows the Long Chain Quilling Machine, as built by the Whitin Machine Works, in its perspective view. Fig. 21 shows a plan view of this Long Chain Quiller and its connections, Fig. 22 being an elevation of the plan view shown.

(To be continued.)

The Lace Finishing Controversy

between Nottingham and American firms having branches in that English city for buying laces in the brown and finishing them, has resulted in that the finishers' association refused to sell finished goods to the American firms, goods which the latter were unable themselves to finish, but needed for their trade, unless they closed their finishing plants.

At the outset the association sought to effect its object by advising its members to refuse to buy from manufacturers who sold laces in the brown to American finishing houses, but this advice seemed ineffective, as the American firms went along as usual buying brown laces and finishing them.

On December 7 last a fresh development appeared in the formation of an association of lace manufacturers—firms who supply the American finishers with brown goods. The object was not specifically announced—only that it was to deal with any malpractices which might occur. Gradually, however, it has come to be generally understood that this organization is opposed to the Lace Finishers' Association in its attempt to prevent American firms from finishing laces; and it is now alleged that these manufacturers have definitely refused the finishers' request to cease supplying American firms with brown goods, and have expressed their intention to sell where and to whom they like.

An important result of the finishers' association's attitude toward American firms may be to establish lace-finishing plants in the United States. The import duty on invoices of brown laces would amount to less than on the finished goods, and if this difference exceeded or equaled the cost of finishing in the United States, some of the finishing now done abroad would probably be transferred to here.

The Proximity Manufacturing Co., of Greensboro, N. C., has hit upon interesting means of portraying, by means of stereographic views, actual conditions in representative southern cotton mills and cotton mill settlements, including manufacturing processes, school, kindergarten and welfare work; thereby correcting some wrong impressions spread abroad by agitators.

NOVELTIES FROM ABROAD.

Light Weight Cloaking. (*Herringbone Effect.*)

Warp: 7128 ends; 2/48's worsted; light gray and dark gray twist.

Weave: See Diagram **Fig. 1**; repeat 60 warp threads and 48 picks; 12-harness fancy draw.

Reed: 18 @ 6 ends per dent; 108 ends per inch; 66 inches wide in reed.

Filling: 48 picks per inch, 2/40's worsted black.

Finish: Worsted finish, 56 inches wide.

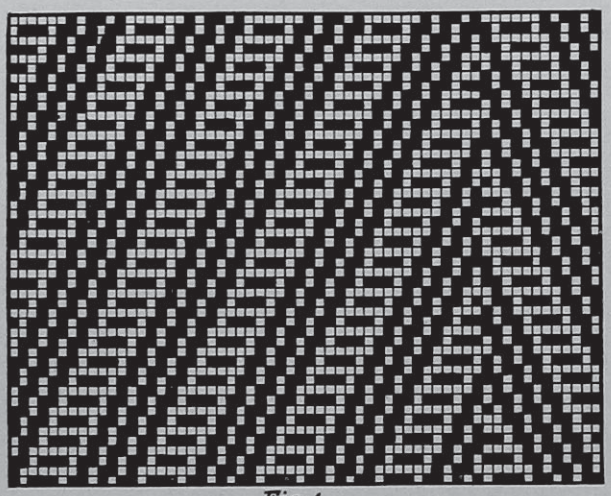


Fig. 1

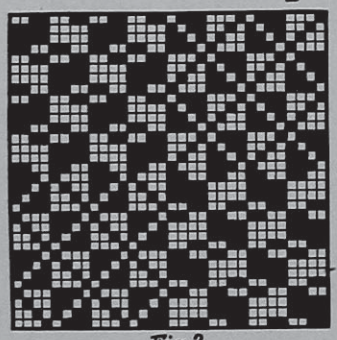


Fig. 2

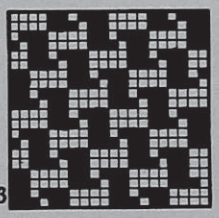


Fig. 3

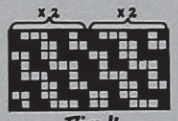


Fig. 4

Fancy Worsted Dressgood.

Warp: 2079 ends; 2/24's worsted cheviot, light gray mix.

Weave: See Diagram **Fig. 2**; repeat 32 warp threads and 32 picks; 16-harness fancy draw.

Reed: 10½ @ 3 ends per dent; 31½ ends per inch; 66 inches wide in reed.

Filling: 30 picks per inch, 2/24's worsted cheviot, green red mix.

Finish: Worsted cheviot finish, 52 inches wide.

Piece Dye Dressgood. (*Granite Effect.*)

Warp: 5000 ends; 2/80's worsted in the grey.

Weave: See Diagram **Fig. 3**; repeat 10 warp threads and 10 picks; 10-harness straight draw.

Reed: 20 @ 5 ends per dent; 100 ends per inch; 50 inches wide in reed.

Filling: 76 picks per inch, 1/48's worsted, in the grey.

Finish: Scour well, dye in piece light blue or any other fashionable color, 44 inches wide.

Worsted Dressgood. (*Yachting Stripes.*)

Warp: 5300 ends; all 2/64's worsted.

Weave: See Diagram **Fig. 4**; repeat 32 warp threads and 4 picks; 16-harness fancy draw.

Reed: 12½ @ 8 ends per dent; 100 ends per inch; 53 inches wide in reed.

Dress: 1 end 2/64's worsted, black.
1 " " " , white.
—
2 ends in repeat of pattern.

Filling: 75 picks per inch, arranged thus:
1 pick 1/40's worsted, black.
1 " " " , white.
—
2 picks in repeat of pattern.

Finish: Scour well, clip on shear, press; 48 inches finished width.

THE MANUFACTURE OF OVERCOATINGS AND CLOAKINGS.

F. Whitneys, or Flaky Cloth.

(Continued from page 71.)

(*b*) Heavy Weights Produced by Back Picks.

To produce a heavier fabric structure, we must add back picks to the single cloth structures, as until now dealt with. The principle observed in adding these back picks is identical with that of adding back filling to any single cloth structure, hence of no difficulty to the designer; in fact he will find his work of constructing these weaves made considerably easier, on account of the great many places for stitching at his disposal, as well as for the eye not to see in the finished fabric, the place where the back filling is hitched to the ground structure.

The rule for adding a back filling to a single cloth structure is to have a sinker in the two joining pile picks, where there is a sinker met with in the back pick, *i. e.*, arrange the stitching of the back filling between two sinkers of the body structure. This rule is also observed in connection with the present system of weaves.

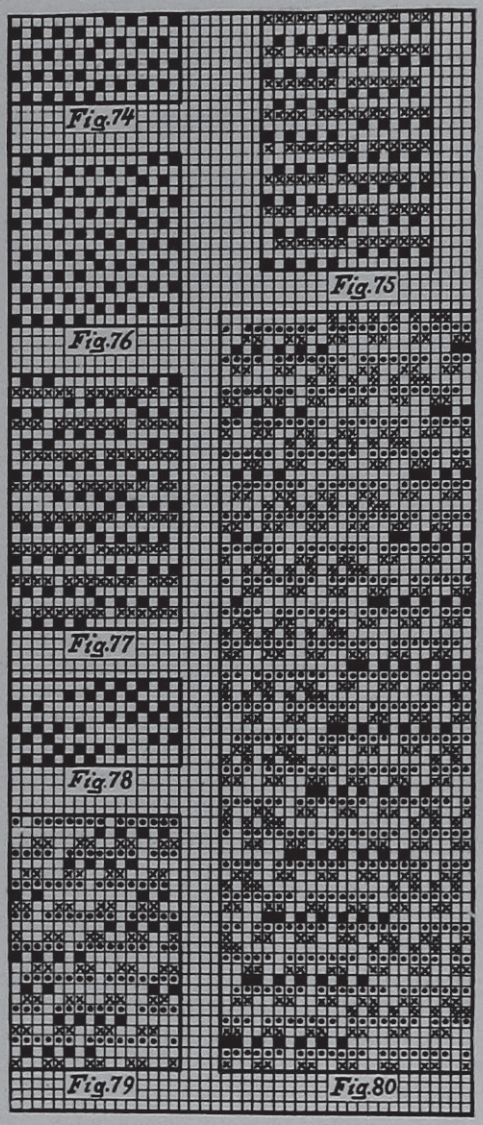
The most generally used arrangement of face and back filling is one pick back to alternate with one pick face.

Weaves Figs. 74, 75, 76 and 77 are examples of this kind of Whitney weaves. The body structures, *i. e.*, the single cloth structures are shown in weaves Figs. 74 and 76, being weaves in which the filling alternately acts as a ground and pile pick. Adding a backing to these weaves will result in a perfect fabric, since the backing will impart the necessary strength to the fabric structure. Weave Fig. 75 is the working weave with reference to single cloth weave Fig. 74, and weave Fig. 77 the working weave with reference to single cloth weave Fig. 76. The face of weaves 75 and 77 is shown in *full* type corresponding respectively to type used in connection with weaves Fig. 74 and 76; the back picks in weaves Figs. 75 and 77 are shown by means of *cross* type.

In connection with weaves Figs. 78, 79 and 80, two examples of Whitney weaves are given in which a special pile pick is used and when we then have to

use three different systems of filling, viz:

(1) Back picks—see *dot* type.
(2) Ground or body picks—see *cross* type.
(3) Pile picks—see *full* type.



Weave Fig. 78 is the face or pile pick weave for complete weave Fig. 79 arranged 1 : 1 : 1. Weave Fig. 80 shows a specimen of a Whitney weave, constructed with the purpose in view to produce long flakes in the fabric.

(To be continued.)

Stiff Polished Yarns.

Some of the artificial silk products are manufactured in such a way as to supply a very useful substitute for horse hair in many applications. A recent German patent describes a method of producing a somewhat similar effect on hard-twisted cotton yarns, ordinarily used for so-called polished yarns by varying the customary process. It consists in mercerising the yarn previous to sizing and lustring. This mode is claimed to effect such an alteration of the fibre by the mercerisation that it is capable of absorbing eventually much more size than otherwise, and that the product, after sizing and lustring, answers well as a substitute for horse hair.

THE IMPORTANCE OF THE PROPER MIXING OF COTTON.

(Continued from page 69.)

Warp or Filling. Long and strong stapled cottons are generally better suited for warp, and short, soft stapled fibres for filling; indicating that a lot of cotton may be either better suited for warp or for filling. To mills who besides spinning do their own weaving it will make no difference to purchase large consignments of cotton that partake of either warp or filling qualities, so long as the length of staple and price is satisfactory, since they can sort out those bales that take more for either warp or filling, and make their mixings accordingly, the yarns from either mixing being woven into cloth in their mill and thus not liable to the same amount of criticism as yarns spun for the trade. In mixing cottons for warp yarns, besides the length and strength of staple sometimes color is also a factor; but for filling, color is very important, whilst strength of staple may or may not be essential. With reference to color, a mixing which is to be spun into warp will be several shades darker than if it is spun into filling, a feature explained by the fact that as a rule warp yarn is spun with more turns per inch than filling, *i. e.*, harder twisted; and it is owing to this increase in twist that the color of warp yarn is deeper. The reason for this is found in the varying reflection of the light from the surface of the yarn, owing to the different disposition of the fibres, since the difference in color depends on the number of rays reflected.

Testing the Loss in a Fresh Supply of Cotton. Every new lot of cotton should be tried to discover the percentage of loss both as to moisture and dirt. For this purpose a certain quantity of cotton is taken from the middle of several bales until say about 100 lbs. is got together; it is then exposed to a warm atmosphere for a considerable number of hours, so as to allow of the evaporation of any water which may have been absorbed, or, as is not infrequently the case, has been fraudulently put there for the purpose of increasing the weight of the bale; after this process it is reweighed, thus readily giving us the loss by moisture. Then this sample of cotton is passed through a picker and scutcher, the insides of which have been thoroughly well swept out, after which the laps made are weighed, and the machines once more swept out, and all the droppings, dust, sand, seeds, etc., that have come out of it are collected and weighed, keeping each kind of impurity as much as possible by themselves. All these different weights thus obtained are entered in the book kept for this purpose, opposite the mark of the cotton, in this manner clearly showing the first loss in any lot of cotton as handled by the mill. To test the working qualities of a mixture, a small sample lot of a few pounds should be made first, and in turn passed through the machinery and spun into yarn, in this way ascertaining whether any change is required before proceeding with the large lot or lots.

Yet, in spite of all these dangers connected with careless mixings, it is a fact that its importance is

not sufficiently appreciated by many superintendents of mills, being left to the care of subordinates, many of whom are not fully alive to the importance of their work.

PROPER MIXING. Since there is always more or less difference in the contents of bales, it is very desirable that a mixing should be made large enough to last for some time (as large as possible), as in this way more regular spinning and a nicer, uniform yarn is obtained. In addition to this the cotton is all the better for standing in the stack a short time, as by this means the air can circulate through it and render it far softer and more supple than it would otherwise be. The mixings must be made according to the counts and quality of the yarn required, the price at which it is to be sold, or used in the mill, and according to the machinery with which it has to be made. The first thing to be done with the cotton is to sort and examine every bale previous to mixing, and put aside any bales that are not up to standard, for further examination and consideration as to what should be done with them. Falsely packed bales, or water packed bales, or such as full of sand, etc., should be rejected or proper claims made.

If the cotton is mixed by hand, the method usually adopted is to have the bales ranged conveniently. The contents of the first bale are pulled into small pieces and spread out in a thin layer, aided by a rake, over the whole surface of the mixing bin or section of the room allotted for it. Then in turn the second bale is spread on top of the first, the third in like manner, and so on, until a great pile is formed, these layers being trampled down exactly in the same manner as building a hay stack. When the cotton is required for use, it should be pulled from one end of the mixing, in a regular cut as it were, from top to bottom, taking care to handle the layers cautiously and disturb them as little as possible in order to present the mass to the action of the first machine with the greatest amount of uniformity. In some mills only the half of the hoops of a number of bales are opened at first, in order to see what difference there is in the staples; but another advantage for this procedure is, that it allows a comparison to be made as to the amount of expansion each half bale will show when released, from which feature alone a judgment may sometimes be drawn as to the normal or excessive amount of moisture which individual bales contain. If the half of the released portion of the bale rises up considerably above that of another, it may be taken as a sign that the cotton was packed under fairly good conditions; but if another half bale shows a much less amount of elasticity, when unpacked, in comparison to others, it may be due to an absorption of moisture by the fibres that has probably occurred during packing, and its evaporation will cause a certain amount of invisible loss during its usage.

It is obvious that by the use of machinery a much more intimate mixture can be made of the various grades than is possible by hand mixing, and it must be remembered, that if any advantage is to be gained from mixing, the earlier the fibres are thoroughly diffused among the mass the better, and much of the work of the earlier machines (picking, scutching, carding) is removed if this object is attained at this stage.

In mixing by the aid of a bale breaker or a hopper feed used in connection with a picker, or single, the bales, say ten or about, containing the various qualities of cotton to be mixed are opened and placed near the machine. A layer from each bale is taken in succession and placed upon the lattice feed

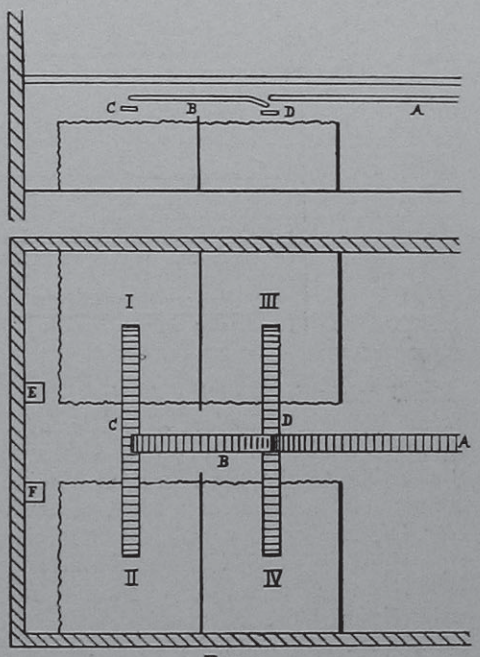


FIG. 1

apron or in the hopper, as the case may be, of the machine, and is thus opened out. The machine in turn delivers the opened cotton onto a lattice, from which it is carried automatically to the mixing bin or bins, which can be located on the same floor or below the opening room as the case may be. If the bale breaker or hopper feed is over the mixing room, the cotton is dropped through the floor upon a lattice placed underneath and by means of the latter delivered to its bin. If the mixing bin is situated at a considerable distance from the bale room in which the breaker or hopper is working, the cotton is drawn from the machine to the bin, through a long tube by means of an exhauster. If the bale breaker or hopper feed is on the same level as the mixing room, the cotton is deposited by the machine upon a horizontal apron which delivers it to elevating lattices, from whence it is deposited upon any desired mixing.

To give a clear understanding of the subject, the accompanying diagram, Fig. 1 is given, showing in section and plan view an approved method for conveying opened cotton to mixings and delivery of the latter to the picker room. The cotton, as it comes from the machine (as previously referred to) is in one way or the other delivered onto a traveling lattice *A*, as situated near to the ceiling of the

mixing room. This lattice is one of a series *A, B, C, D,* which are so arranged that the cotton can be taken as required to any one of the four mixing stacks or bins shown in the illustration. The method of delivery of cotton is thus: The cotton is taken along by the lattices *A* and *B,* both running in the same direction. From *B* the cotton falls on a cross lattice *C,* which can be run in either direction, as the case requires, to in turn deliver the cotton either to mixing bin I or II, and where it is spread out over the whole surface. For delivering the cotton either to mixing bin III or IV, the run of the lattice *B* is reversed and when lattice *A* will thus deliver the cotton at the junction of lattices *A* and *B* onto lattice *D* which works similar to lattice *C* and thus delivers the cotton either to the third or fourth mixing as the case may be. In the same manner as feeding to bin III or IV, two or more additional mixing bins may be provided, in which instance the arrangement of lattices *B* and *C* is simply duplicated for each additional series of bins.

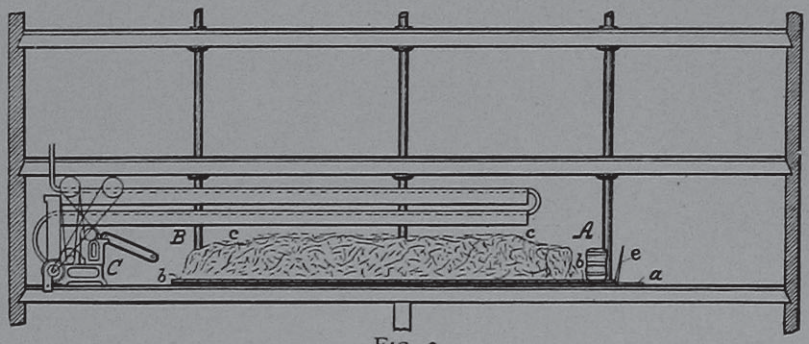


FIG. 2

For fine work it is a good plan to let the cotton stand in the mixing at least a week—longer, if possible, in order to give the fibre an opportunity to *age, i. e.,* absorb air and expand. Should the cotton be of a leafy nature, the room should be heated artificially, so that each fibre becomes of the same temperature. Another reason is, that when cotton containing leaf is subjected to a little heat the leaf rolls up and becomes crisp, and can be got out by the beater without being broken up. If the cotton contains seeds, heat causes trouble, as the cotton clings to the seeds. By allowing the cotton to lie in an open state in the mixing a few days, the dirt being more exposed and the fibres of an even temperature, we can treat the cotton less harshly in the picking and scutching by running the beaters slower, and thus do not knock the nature out of the staple, in turn making stronger yarn. When feeding one or the other mixing to the picker, break in the mixing in as regular a cut down in the stack as possible, thus giving a greater chance of regularity of the mixing, since it enables a little of every layer in the stack to be passed through the picker in a short time. *E* and *F* show the mouth of trunks, to which the mixings are readily fed, carrying the material direct to the hopper feeder of the picker or placing it within easy reach of the person feeding the picker or pickers, provided no hopper feed is used. In many mills no special mixing is done, the cotton being simply taken from several bales as placed near the hopper feed, or in some mills (where no hopper feed is used) placed near the picker; the taking of layers now and then from one or the other bale being in this case the only mixing done.

The *ageing* of cotton, *i. e.,* giving the fibre an opportunity to absorb air and expand, is by some cotton manufacturers, who although doing no special mixing, considered of such importance that they use it in connection with direct bale mixing to the hopper feeds or pickers where the former are not used.

In the picker rooms it is always difficult to keep the cotton in unbaled condition for the proper length of time, as it is often more convenient to the help to supply a recently unbaled lot of cotton to the hopper feeds or pickers than to attain access to that which has been standing unbaled for a considerable length of time. To overcome this trouble, *i. e.,* to insure

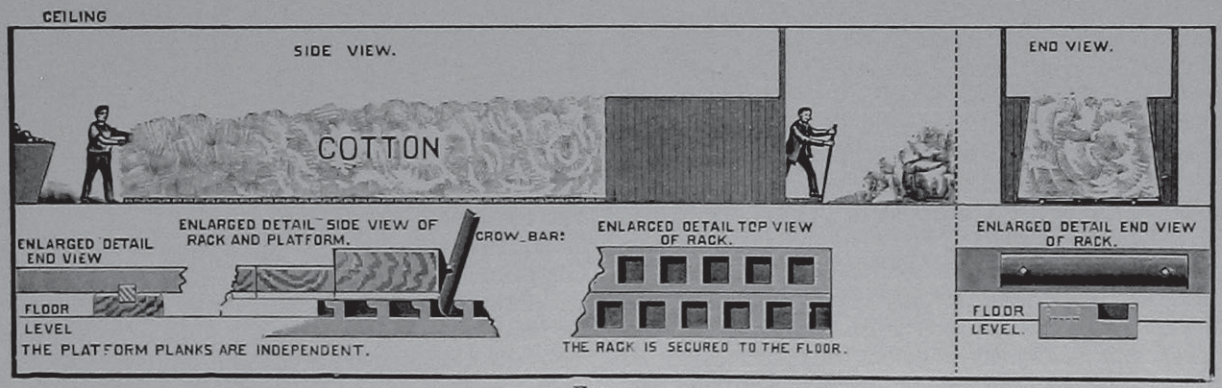


FIG. 3

that the oldest cotton, or that which has been unbaled for the longest time, shall always be supplied first, the appliance shown in Fig. 2 will be found of the greatest of advantage, the illustration being a longitudinal section of a portion of a picker house showing an ideal method of opening bales and feeding the cotton to the hopper feeds or pickers in order to obtain *ageing* of the cotton. To accomplish this result, the portion of the picker house that is to be provided with this appliance, has its floor provided with guideways or rails *a*, extending from a point *A* near where the baled cotton is stored, to a point *B* near the hopper feeds or pickers *C*. Upon said rails *a*, are supported a number of planks *b* and which together constitute a platform upon which the pile *c* of loose cotton is supported, the bales of cotton being opened at or near the rear end *A* of said platform, as shown, and the loose cotton from the bales piled up on the platform against that in advance of it. The platform should be of sufficient length to support a pile of loose cotton that will supply the corresponding machines or pickers *C* for a number of days, or for the length of time which is found in practice to be sufficient to thoroughly *age* the cotton in its loose condition; and as the cotton is always removed from the forward end of the pile at *B* to be supplied to the machines, it will be seen that the cotton which is added to the pile at *A* will not be supplied to the machines until the entire pile in advance of it has been used up. As the cotton is being constantly withdrawn from one end of the pile and added at the other end, it is necessary that the entire platform *b*, with the pile of cotton upon it, is moved forward from time to time, in proportion as the cotton is taken away at the end *B*, by levers *e* (one near each side) suitable fulcrum supports being provided in the rails *a* for the lower ends of levers *e*. With the appliance thus described, two men operating two of the levers *e* can easily advance the platform and the pile of cotton upon it. When the cotton has been removed from the forward end at *B* sufficiently to uncover one or more of the platform sections *b*, the latter are taken up from the rails and carried around and applied to the rails at the rear end *A*, so that the platform, although constantly advancing, remains as a whole in about the same position at all times and remains of about the same length.

Fig. 3 clearly illustrates the procedure, giving side view and end view of the loaded platform, also detail views of the mechanism for operating the platform. The device is known as the "Bourne Traveling Platform for Picker Rooms," the construction of which is controlled by the Draper Company, of Hopedale, Mass., who in turn sell the right to use it to mills, furnishing castings for the rack when so desired. The idea is so simple that the contrivance is easily installed by mill carpenters.

Spinning "Washed Flax Waste."

Washed flax waste constitutes the waste produced at the spinning of flax, and which waste until now was used only in the manufacture of cigarette paper, but which, by a new foreign process, just patented, can be spun into yarn by a process resembling the woolen spinning principle.

In connection with this process, the washed flax waste is first dried, either in the open air or by steam. When it is quite dry, it is passed through the picker to separate the fibres which adhere one to the other by reason of the washing operation, and to render them shorter; from there the waste is conveyed to the opener which is intended to arrange the fibres in such a manner that they are more easily treated by the raveling machine, the object of which is to give to all fibres the same length, after which the material is then properly oiled, to permit spinning. After the oiling operation, the material is conveyed to a beater and then to the carding machines up to the continuous condenser, and finally to the self acting frame or to the fixed continuous frame according to whether warp or filling is wanted.

In connection with the condensers, the large and small rubbing sleeves may be provided with special contacting cleaning rollers which are furnished either with *shag* or with *cord* garniture. The addition of these rollers prevents the rubbing sleeve from being soiled, and allows a superior yarn to be obtained even when materials are treated which are very difficult to be spun.

The material thus prepared, is spun either in a pure state or mixed with a certain amount of cotton, wool or other fibres having an animal, vegetable or mineral origin according to the final products which are intended to be obtained. The oiling also varies according to the final result.

This new process allows the spinning of the finer numbers, such as 18, 20, 22 and 25 line, which alone have a commercial value, the coarser sizes having no value whatever because they are too heavy and cannot in these coarse sizes compete with the cheaper jute yarns, hemp and tow yarns, even against cotton, cotton being light weight, give by equal weight far more length. The yarn made by the new process, it is claimed, is smooth and without the lumps and impurities of other flax and tow yarns, giving thus a nicer cloth.

Mr. A. W. Buhlmann, the prominent Textile Engineer of 487 Broadway, New York, has some of the most attractive fabric sample produced with Waste Flax Yarns, and will be pleased to get into communication with manufacturers of linen goods who are interested in producing a superior fabric at a lower cost than heretofore possible.

Russia will this year grow the best cotton crop in the history of the staple in that country. The yield is likely to be not less than 1,000,000 bales of 500 pounds each, it is estimated. Russia's yield will most likely supply the entire domestic consuming demand. Domestic improvement in agriculture has vastly increased the purchasing power of the rural population, by which Russian cotton mills have greatly benefitted.