pin 4 which secures the head 2 thereon. 5 is the bobbin having its socket, which receives the spindle, tapered at one end as indicated at 6, the tapered bushing 3 wedging snugly in such tapered end of the bore. The spindle 1 is hollow, and contains a spring latch bar 7, provided at one end with lug 8 fitting into a small aperture in the spindle to hold the latch bar 7, secure in place. This latch bar has in advance of the lug 8 protuberance 9, which bears against the wall of the spindle and serves as a fulcrum point when the latch bar is flexed, or held under tension at its opposite end 10. This latch bar 7 is provided with a broad shoulder 11 and a bulged head 12 beyond said shoulder, end 10 normally springing outwardly, when permitted to do so, through the longitudinal slot 13 in the spindle.

When the bobbin is slipped over the spindle, with the tapered bushing 3 fitting snugly in the tapered end of the bore of the bobbin, the shoulder 11 engages with the opposite end of the bore in the bobbin, while the bulged head 12 protrudes from that end of the bobbin and bears against the said end so as to hold the bobbin snugly on the spindle, the spring latch bar 7 being held under tension and the head 12 effectually preventing the bobbin from working longitudinally off the spindle. The shoulder 11 bears outwardly against the bobbin at one end of the bore, and the tapered bushing wedges into the tapered portion of the bore; hence, any rotary movement of the bobbin, independently of the spindle, is positively prevented.

THE "MASON" COILER DRAWING FRAME.

(*Continued from page 277.*)

The full can stop motion works by the pressure of the cotton in the can lifting the coiler-tube gear just enough to bring it into contact with a flat spring, set one-sixteenth of an inch above the normal position of the coiler-tube gear; connection is thus made, and the frame stops as before. The magnets for attracting the armature are enclosed in a strong iron box, and entirely out of the way. The current can either be generated by ordinary batteries, or by a magneto-electric machine, driven by a small pulley, and which requires no attention other than an occasional oiling.

What is termed the combined electrical and mechanical stop motion of the Mason frame, is so arranged that the back stop motion is operated similarly to the electrical stop motion, previously described. The contact rolls at the back also act as lifting rolls to help the sliver out of the cans at the back. This is an essential feature in mills using combed work. The front stop motion, full can stop motion, and roll-lapping stop motion are operated in the same manner as on their mechanical stop motion frame.

A novel feature of the lifting rolls, which may be applied also to frames having the mechanical stop motions, is the ability to piece up an end at the back of the frame, without having to lift out or raise the top lifting roll, in order to get the sliver under the lifting roll, and in its proper place in the sliver guides at the back of the frame. The lifting rolls will thread themselves, and the end immediately goes to its particular place, without further attention from the operative. In mills where small help is used, this feature will be found to be of great practical value, as the operative need not go up close to the frame, in order to put the end under the lifting roll.

The principal calculations in connection with this drawing frame, as will be readily understood, are the drafts between the rolls of the drawing head. Four sets of rolls, as already previously referred to, are used and the rule for calculating the draft from the weights of the sliver is thus: Multiply the weight per yard of the sliver fed to the drawing rolls by the number of slivers fed to each delivery and divide the product by the weight per yard of the delivered sliver.

Example: What is the draft on a drawing frame where the sliver fed to the machine weighs 60 grains per yard, we double six, and the delivered sliver weighs 58 grains per yard?

60 grains $\times$ 6 = 360 grains.
360 grains $\div$ 58 = 6.21 draft.

The calculation of the draft from the machine is made by getting the ratio of the surface speeds between the first pair of rolls that grips the cotton and the pair of delivery rolls.

Some superintendents figure draft of a drawing frame simply between back and front rolls, ignoring the draft between front roll and calender roll, and between the preventer and back rolls. Although these drafts are quite small, by omitting them in the calculation, an error in the result will occur and this error when repeated in each of the three processes, will multiply and lead to trouble in calculating weights.

Draft constants for the total draft of the machine should always be figured out and kept on hand, thus saving labor when it becomes necessary to change the draft of the machine and a new draft gear has to be figured, as otherwise the gears would have to be counted on the machine, in order to get at the constant as required to be known for any change in draft. This constant is figured exactly as the draft, except that the draft gear is omitted in the calculation. Proportion is sometimes used to obtain a new draft gear, but it is not as accurate as using the constant of the machine, from the fact that the draft on the machine is rarely ever exactly what is calculated, because certain drafts call for fractions of teeth in the draft change gear which is impossible to have.

The draft of the Mason drawing frame, when using metallic drawing rolls is different from that when using leather top rolls, as the flutes of the rolls mesh into each other and the slivers, in passing between them, sink down into the grooves between the flutes and thus receive an extra draft, or we may consider that larger fluted rolls in connection with leather top rolls are used, the equivalents being:

$1\frac{1}{8}$ in. dia. roll, 32 pitch, to be figured as $\frac{9}{8}$ in. dia. roll.
$1\frac{1}{4}$ " " " 32 " " " " " $\frac{10}{8}$ " " "
$1\frac{3}{8}$ " " " 32 " " " " " $\frac{11}{8}$ " " "

24 pitch is figured same as 32 pitch.

$1\frac{1}{8}$ in. dia. roll, 16 pitch, to be figured as $1\frac{10}{16}$ in. dia. roll.
$1\frac{1}{4}$ " " " 16 " " " " " " $1\frac{11}{16}$ " " "
$1\frac{3}{8}$ " " " 16 " " " " " " $1\frac{12}{16}$ " " "

The total draft of a drawing frame is generally nearly equal to the number of doublings at the back of each delivery, so that the weight per yard of the finished sliver is equal to the weight per yard of the sliver fed to the machine.

(To be continued.)

COTTON SPINNING.

RING SPINNING:—A General Description of the Modern Ring Frame—The Creel—Roll Stands—Weighting Rolls—Top Rolls—Bottom Rolls—Clearers—Care of Rolls and Roll Stands—Faulty Work of Rolls—Thread Boards—Rings—Ring Holders—Size of Ring to Use—Traveler Clearers—Setting Rings—Care of Rings—Finishing of Rings—Ring Travelers—The Action of the Traveler—How Travelers are Made—Weight of Travelers—Spindle Rails—Spindles—Setting Spindles—Lubrication of Spindles—Bobbins—Bobbin Clutches—Banding—Banding Machine—Band Tension Scale—Tin Cylinders—Ballooning and Separators—Winding—Builder Motions—The Warp Builder—How to Set the Builder Motion—The Filling Builder—Spinning Filling on Paper Tubes—The Combination Builder—The Care of Ring Rails and Lifter Rods—Some Causes for Badly Shaped Bobbins—Doffing.

NOTES:—Management of the Spinning Room—Data on Ring Frames—A new Spindle Drive Device—Care of Machines—Oiling—Leveling Frames—Power Tests—Power Consumption—Arrangement of Machinery.

FAULTY YARNS:—Knots and Bunches—Variations in Counts—Uneven Yarn—Thick and Thin Places—Weak Yarn—Kinky Yarn—Dirty Yarn—Kockled, Curled or Knotty Yarn—Slack Twisted Yarn—Hard Twisted Roving—Cut Yarn—Harsh or Wiry Yarn—Badly Wound Yarn—Bobbins Wound too Low—Soft Wound Bobbins—How to Prevent "Double"—Colored Work—Waste—Breaking Strength of Yarn.

CALCULATIONS:—A general Description on the Subject of Draft, Twist, Production and Gearing—Calculating the Draft from the Gearing—To find the Draft—To find a Constant—To Ascertain Draft Change Gear—To Ascertain Hank Roving—To Ascertain Draft—Twist—Standard Twists—Contraction Due to Twist—Notes on Twist—Calculating Twist—To Ascertain Speed of Spindles—Calculating Twist from Gearing—Traverse Gear—Taper—Sizing the Counts—The Grading of Cotton Yarns, Single, Two or More Ply—Production—Programs for Spinning Yarns of Various Counts, from Bale to Spun Thread—Illustrations with Descriptive Matter of the Different Makes of Ring Frames.

The Ring Frame.

(Continued from page 234.)

In order to avoid the necessity of frequent lubrication of bearings, with its consequent liability of the oil coming in contact with the rolls, roving or yarn, ball-bearing top rolls have been manufactured. The ball-bearing top roll made by the Woonsocket Machine & Press Co., has been shown and described on page 180 of Part 2 of this work. Another type is shown in Figs. 242 and 243. A point in favor of this ball-bearing top roll is, that besides running with perfect freedom minus the use of a lubricating oil, the rolls adjust themselves automatically to their mate bottom rolls, thus compensating for any irregularities present in the covering in any one of the top rolls in the machine, every one of them in turn gripping its mate bottom roll throughout the entire length of the top roll covering, a feature readily explained in connection with the accompanying two illustrations. Fig. 242 is a longitudinal section through a pair of these ball-bearing top rolls, Fig. 243 being given to illustrate (somewhat exaggerated for sake of clearness) how such a top roll having a covering of uneven thickness will adjust itself relatively to its mate bottom roll, in order that, as stated before, the covering of the top roll will grip its fluted roll uniformly from end to end.

Examining our illustrations more particular, we see that the arbor 1 is formed with a tapered shoulder 2, to which is connected at each end a screw-threaded spindle 3. The central portion of arbor 1 is formed of a reduced diameter to provide a proper support for the stirrup of the saddle.

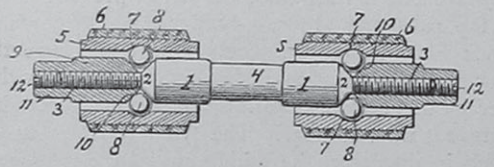


FIG. 242

The shells 5 of the roll are provided with fine threads so as to permit the leather covering 6 to be screwed on, so as to fit closely and tightly, without any liability of slipping endwise or turning on its shell, each of which is formed on its inner side, midway between its ends, with an annular groove 7 to receive balls 8, which in turn bear on the tapered shoulders 2 of the arbor and are held in contact there-

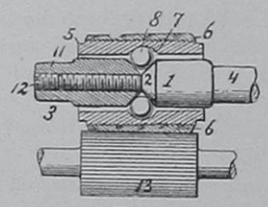


FIG 243

with by sleeve nuts 9, the inner ends 10 of which are also tapered. These nuts 9 screw onto the spindles 3, and the balls 8 are contained in the channels formed by the grooves 7 and the spaces between the tapered ends 10 of the nut 9 and the shoulders 2 of the arbor. The nuts are somewhat longer than their spindles, and in turn provide journals 11 for holding the rolls in the roller-stand (not shown) of the frame. The nuts 9 when screwed home (*i. e.*, adjusted to prevent the balls 8 from being dislodged, while permitting them to have perfect freedom of movement) leave spaces to receive tightening screws 12, which bear firmly against the ends of the spindles and lock the nuts and spindles securely together.

The construction of the top roll thus explained, also provides for a slight rocking movement which compensates for any irregularity present in the thickness of the covering 6 and when then minus this rocking movement, as is the case in connection with common top rolls, the latter will not always bear evenly all over their working surface on the bottom rolls, whereas in connection with the new top rolls, where such an irregularity occurs in the thickness of the covering 6, as will be seen from consulting Fig. 243, the roll will rock sufficiently to allow its covering to bear against its bottom roll 13 all over its entire width. Spaces between the nuts, arbor and shells are shown in the illustration somewhat exaggerated in order to more clearly illustrate the construction; the bore of

the shells actually being such as to provide only very little space between the inner walls of the shells and the arbor and nuts, however, sufficient to permit a very slight rocking movement to take place, in order to compensate for any possible irregularities in the covering 7, as previously referred to.

Bottom Rolls.—The bottom rolls are made of steel throughout, and rest in bearings in the roll stand. They are fluted irregularly so as to prevent cutting the top rolls and are case-hardened in the essential parts. They should be ground so as to insure their being perfectly round and of uniform diameter and the flutes be of uniform hardness and temper throughout to prevent uneven wear. The front rolls are usually 1 inch in diameter, the middle and back rolls are $\frac{7}{8}$ inch diameter. The front roll is made larger, partly to support the heavier weight, and partly so that it does not have to turn so fast to make the required surface speed. For some purposes the front roll is made $1\frac{1}{16}$ inch in diameter, whereas for extremely short staple a $\frac{7}{8}$ inch front roll may be used to advantage, as they can be set closer to the middle rolls. That part of the bottom roll which is fluted should be about one-eighth of an inch longer than the leather covered boss of the top roll, in order to prevent the top rolls from running off the fluting. The fluted part of the steel roll must not be so wide so as to come into contact with the bearing of the roll stands, as this would render it liable to conduct oil therefrom to the leather covering of the top roll.

The bottom rolls should be sharp and smooth when they are received; if not, they should be carefully gone over and made fit for use before being put into the roll stand. If there are any rough places on the fluting, that would catch the fibres, these should be rubbed down with a fine fluting file and then smoothed off with fine emery cloth. If only slight defects exist, or after the previous process, the following is recommended as a good method of cleaning and polishing bottom rolls: Make a paste of whiting and animal oil of about the consistency of ordinary corn mush, then procure some pieces of card clothing about six inches square, remove the roll from the roll stand and put it on stands made for this purpose and fill the flutes by hand with this mixture and also fill the carding clothing full of it. Then scour the roll with this mixture thoroughly, rubbing the roll lengthwise with the fluting, going over each inch at least five hundred times. Then go over the roll again, using fine sawdust, wipe off the residue and polish the roll with clean waste. Care should be taken in cleaning steel rolls not to heat them up so as to destroy the temper of the fluting.

Clearers.—There are two kinds of clearers used on the ring frame, the top clearer and the under clearer. Top clearers, as the name indicates, are used for cleaning the top rolls from the accumulation of short fibre and dust, which would otherwise collect on them. Underclearers are used for the same purpose, as well as to lap up broken ends.

Although the roving, when leaving the last set of fly frames is pretty well cleared of all impurities, as well as short and broken fibres, still some of the latter will be present and which have a tendency to fly out and in turn lick around the rolls, more especially so when there is much electricity in the air, which occurs when the air of the room in which the frames are running is dry. The most frequent occurrence is for them to curl around the top rolls, producing what is known as *licking* which if not prevented will draw other fibres of the sliver around with them until at last, if not noticed by the operator of the frame, all of the sliver would be delivered around the front roll, in turn causing consequent trouble and waste of material.

To prevent any licking of such fibres around either the top or bottom rolls, is the object of top and under clearers, which are devices placed in contact with either series of rolls for the purpose of taking up any fibres which cling to them. Both clearers, the one for the top rolls as well as the one for the bottom rolls are important devices to the drafting rolls of a ring frame, but as the tendency of the fibres is to fly upward and stick to the top rolls, the top clearer is for this reason the one of the greater importance; the under clearer principally lapping up broken ends. Both top and under clearers must be kept clean and well covered, or waste will be picked up by the roving from both rolls and clearers, and spun into the yarn.

The Under Clearer usually consists of a round wooden roll, about $\frac{3}{4}$" in diameter, and which roll can be covered or left bare; the principal covering, if such is used, being denim or canton flannel, the latter answering the purpose best on account of its softness and smoothness, which greatly assists in removing the lap from it after a roving strand has broken. The best adjustment for these under clearers is by means of weighting them by a lever arrangement working against the pivots of the clearers, pressing the latter in turn against the under side of the fluted bottom rolls, and which kind of weighting is considered superior to that form of arrangement requiring a spring to press against the bearing in which the pivot of the clearer revolves. The objection to spring weighting is that the spring is liable to break or to lose its elasticity after being used for some time. These under clearers, also sometimes called scavengers or waste rolls, are made in short sections so as to fit between roll stands. This under clearer is shown in Fig. 230 at *D*, being held in place and pressed up against the front bottom roll *E'* by means of the weighted lever *J*, pivoted to the roll stand at *K*; the front end of the lever being formed to receive the bearing of the clearer roll, the other end being enlarged to form a weight.

In addition to the usual front under clearer thus explained, a second roll is sometimes used which bears against the under side of the middle and back bottom rolls. This extra roll is one inch in diameter and is covered with denim, being supported in its position by springs held in sockets. The arrangement is such that the rolls can be easily detached for cleaning or repair.

(*To be continued.*)

WORKERS, STRIPPERS, FANCY AND SWIFT.

By J. H. Dunn.

(*Continued from page 244.*)

SETTING. It may be well here to notice another point in connection with workers, strippers, fancy and the swift, and that is that some carders set the stripper so as to act as a sharpening roller to the clothing of its worker, *i. e.*, that the action of stripping the wool from the worker at the same time sharpens the points of the clothing of the latter during the process. In the same way he then may set the fancy so that it will sharpen, *i. e.*, keep sharp the teeth of the main cylinder during the brushing action of the fancy. This method of carding is known as self-grinding, which however, is not practiced by all carders, a great many of them setting rollers and cylinders so as to do only the work required of them by the stock; sharpening the clothing specially by means of special grinding, a process which however, is more or less condemned by carders adhering to the self-grinding principle, claiming that it means nothing but extra wear on the clothing, time lost, besides varying the sharpness of the points of the clothing during the length of time between which these special grindings are done. A further claim of theirs is that the needle point, obtained by means of self grinding, is superior to the ground point obtained by means of special grinding.

A GOOD LESSON. Provided you are deeply interested to study the principle of carding, *i. e.*, the working down of the stock by the action of workers and strippers, watch carefully a mix of two colors, differing considerably, and more so in their percentage. The more pronounced the latter and the more difficult the smaller portion of the percentage is to card, the more valuable the lesson. Looking on the first worker of the first breaker card, you then will notice the distinct color of the smaller percentage of the stock used in the mix appearing in bunches. Watching one of these bunches more particularly, you will see how the same is caught up several times in succession by the different workers, growing every time smaller, until finally it disappears to your eyes, whereas in some instances you may notice this bunch right along—it will go into the sliver, you will see it on the second breaker, the finisher, and although considerably reduced in its original size, you may finally notice it in the roving and consequently also in the yarn and the cloth the latter was used for.

The experienced carder will know at a glance on the first breaker, in fact we might say at once after the first worker came in contact with such bunches or lumpy stock, whether said bunches will open or card out easily or whether not. He will notice that if in a condition to card out, said bunches will not only be well opened out after leaving the first pair of workers and strippers, but that a portion of said bunches have already passed on to successive workers, in fact before bunches in question are properly carded out, they are possibly distributed in the web throughout the entire card, some possibly already incorporated in the web on the doffer, although before reaching that point, they are bunches no longer having lost their identity in the mass of the mixture.

Now it will be readily understood that not every mixture will work that way and when trouble for the carder is in store for him, except he is blessed with a superintendent who knows his business and who will put the blame where it belongs. The bunch will not yield, will not card out; although losing some of its dimensions, it remains present, seen as far as the roving. The trouble may rest in the nature of the stock used, or good stock may have got spoiled in one of the preparatory processes, for instance, the scouring, the dyeing, etc. Such bunches, delivered to the swift, are liable to come up in any of the workers and thus become partly carded, again some are released from the swift not until at the doffer, after having been brushed up by the fancy, and when such are carried on to the second breaker card unworked (uncarded) and when the same affair may be repeated there. Examining such work before us, we will notice that only the largest of these bunches or knots, are caught up by the first worker, yet not all of these are taken hold of, it all depending upon which part of the carding engine has the best hold on said bunch, *i. e.*, whether it is the swift, a worker, or the doffer which retains what it has caught. When such a bunch or knot is once held by a worker, it will to some extent be taken care of. You will see it going round and round said worker many times more than bunches which are more easily opened, it will gradually be reduced in size by the tearing out of some fibres and the wearing away of others, and although it will not lose its character of a bunch or knot, it will finally become so much reduced in size so that it will slip with the other stock through all the cards and show in every subsequent process and even in the finished goods themselves. When seen there, the fault may be laid point blank on the carder, yet if the superintendent would have seen the work, when on the card, his decision might have been different—watch your workers on the first breaker carefully when dealing with such mixes.

The fancy throughout the entire life of its clothing is one of the most simple parts of the card, and this with little chance for injury to it by means of handling. It shows the effects of use so slowly, in fact not until on account of the shortness of the teeth from wear and their consequent loss of elasticity and surface speed it is no longer fit to perform the duties required of it. The nice appearance of a worn-out fancy often may make it hard for a carder to convince his superintendent that a new clothing is absolutely necessary.

Although simple in construction and operation, the fancy at the same time is a very important factor in carding, and should work properly or you will not get good results from it; the stock will roll through, or your cylinder will wind and fill up, or all the stock will be thrown out in flyings. A fancy with too straight a pitch will cause flyings, and will cause a cylinder to wind; first, because it is on the cylinder too hard; second, because it is not on hard enough. So, you see it is necessary to have the right pitch. A fancy running too fast will also cause flyings; too slow will cause the cylinder to wind. A fancy pitched too much will cause the cylinder to wind, and if too hard will cause it to

wind; and if wire on fancy is uneven, will cause the cylinder to weave uneven. Always keep a good, sharp clean point on all your wire.

The first to be obtained in the making of the clothing for the fancy is its adaptation to the purpose required. Its function is that of a brush, and nothing more. It simply brushes up the already carded stock, so that it may be taken from the cylinder by the doffer. This difference in what is required for the clothing of the fancy, as compared with that of other parts of the card is the reason why the teeth for the fancy are made more than twice the length of the teeth of the other clothing; again said teeth should be set in lighter foundation, and not so closely nor so tightly as is required in connection with other card clothing. The kind of wire used on the swift as well as kind of stock (as a rule) to be carded will guide the overseer as to the kind of wire (clothing) to order.

Since style of goods made by a mill in most instances change continually, except advised differently by the management of the mill, it will be advisable for the carder to always order the wire for his fancies one number finer than that on the cylinder against which it is to run, and rely on his practical experience to overcome sudden changes in texture of goods made by the mill. When dealing then with stock requiring coarser wire for the fancy, increase its speed and as a rule you will accomplish the result you are after, except the teeth have not previously been set too far forward in grinding. When such is the case, set them back with a springy steel strickle, or scraper, or better, if it is carefully done with a very light facing on the grinder for a minute or two. In either case, do not re-grind, but put the fancy in the card and set it snugly to the cylinder, but not hard enough to bend the teeth forward again and let the card run for ten or fifteen minutes minus stock, which will smooth up the points of the clothing of the fancy, after which set it at a proper distance and start card for work.

SETTING THE FANCY. This has been stated by one of our best woolen carders thus: "The best way I know is to set your fancy up with a fine gauge, to feel lightly at both ends, then start up the card and use your ear. When you think you are right put the stock on and let run a while. Then knock out your feed, and if your fancy is working right, the stock will run out of your card quickly and leave your cylinders and workers clean. If on too hard, it will drive the stock in the cylinder, and the worst kind of work will be the result. Any carder can tell better by looking at his cylinder how his fancy is working, than by ear or gauge after the card has run awhile. When right let it alone. Some men go marching up the room every day and put their ear to the fancy, and jab this end in and the other out. How can they tell always by the sound? Do they think all fancies sound alike? What do they do it for? Simply for effect. Do not think that I do not believe in going around and listening to my fancy. I do; but I do not believe in jabbing them in and out every day, especially if the super or owner happens to be present. When a fancy throws, the card is either dirty or the fancy is too close to the cylinder, or the same speeded too high, or clothing bruised or hooked, therefore lumpy and uneven yarn is the result. If a fancy winds, it will not raise the stock properly from the cylinder, which is also the cause of uneven yarn."

Producing High Counts in the Spinning of Woolen Yarns.

The new process is based upon the fact that it is impossible to produce as fine a woolen thread as a worsted from the same grade of wool, and that in the production of woolen yarn, a low grade short fibre stock can be employed. The fineness of spinning woolen yarn is limited, and since this fineness of count is an important item, worsted yarns, notwithstanding their greater cost, are necessarily extensively employed in the better grades of cloth. The distinction between these two classes of yarn will be apparent when it is considered that a $\frac{1}{4}$ grade of wool can be combed into a 30's worsted yarn, while the same wool, if made into a carded yarn, cannot be reduced more than a 25 cut yarn, the same approximate difference between the combing and carding systems of making wool into yarn holding good all through the different commercial grades of wool met with.

The primary object of the new process is to produce higher counts of wool spun yarn than is usually possible to spin from a certain grade of wool. The resulting yarn, it is claimed by the inventor of the new process, Mr. J. S. Butterworth, is even and smooth in texture and at a first glance may be mistaken for worsted yarn. The new process omits the waste question (noils) characteristic to worsted spinning, no change in the carding and spinning of woolen yarn ordinarily employed having been made.

According to the new process, a lot is first formed composed of a mixture of vegetable and animal fibres, as for instance, wool and cotton. This composite stock is then carded in the ordinary manner and spun into a single yarn. Two or more of these ends are then twisted in the opposite direction from that of the single yarn, into a ply yarn, which in turn is reeled into a skein. These skeins of yarn are then subjected to an acid treatment whereby the vegetable fibre is carbonized, leaving the yarn composed only of its animal fibre.

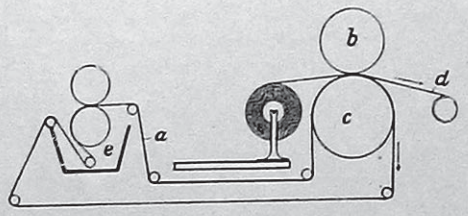
Any of the well known acids for destroying or carbonizing the vegetable fibres may be employed, as for instance, sulphuric, muriatic, or hydrochloric, nitric, or aluminum chlorid. This acid treatment may be either by dipping the yarn into the acid bath or by exposing such yarn to the gases thereof. In either case, the saturated, impregnated, or treated skeins are hung in a heated chamber, or otherwise exposed to the action of the heat. The vegetable fibre is thus destroyed and can be shaken and beaten out as dust, leaving intact a strong worsted-like ply yarn composed of the remaining animal fibre only.

To Impart a Permanent Finish.

The object is to apply heat and steam to the cloth to be treated in such a way that on the cloth being passed between the usual calendering rollers, steam is generated at the actual point where the cloth is

submitted to pressure between the two rollers, and the steam caused to strike right through the cloth and give it a permanent finish.

The accompanying illustration is a diagramatical view of the machine used, illustrating at the same time the method of the procedure.



Examining this illustration we find that a dampened cloth *a* is caused to pass over the roller *c*, together with the cloth *d* to be treated. This damp cloth *a* carries the moisture to the point where the pressure is applied, and the heat in the upper roller *b* causes steam to be generated at this point, which steam strikes through the cloth *d* and so imparts to the latter the improved finish.

DIFFERENT KINDS OF FINISHES can be arranged for, according to the different surfaces on the upper heated roller, or by altering the texture of the dampening cloth. For instance, in order to give a plain finish, a fine faced sateen cloth is used for the damper, whereas in order to give a twill finish, a pronounced twilled dampening cloth is used. Thus designs of various kinds can be applied to the cloths to be finished, according to the different surfaces either of the calendering roll or of the dampening cloth.

The actual apparatus can be varied considerably; for example, the dampening cloth *a* can be arranged in a single length to pass from one roll on to another, passing over rollers in troughs *e* so as to pick up liquid before passing between the pair of squeeze rollers, or arranged so as to be continuous as shown in diagram, so as to obviate the necessity of winding back. So far water only has been used for dampening the cloth *a;* however, water mixed with fillings or other liquids could also be used for dampening this cloth for imparting different effects to the fabric treated; or softening substances such as soluble oil, it is claimed, can be used in a similar manner.

The Importance of Proper Boiling of the Various Starches for Sizing Yarns.

(*Continued from page 229.*)

A NEW SOW-BOX FOR SIZING OR SLASHING MACHINE.

As previously explained, it is of considerable importance that the size in the sow-box of a sizing or slashing machine should be properly boiled or cooked, and that there should be uniformity in its application to the yarn. At present, the sow-box is usually divided into two compartments, one larger than the other, by means of a partition, which crosses the box. A small passage is left near the bottom of the box, so that the size, as it is fed into the box, passes through the first compartment, in which there is a perforated steam pipe for boiling the size, then through the small passage at the bottom of the partition into the larger compartment containing the immersion, sizing and pressure rollers, and in which there is also a perforated steam pipe for boiling purposes. The object of this indirect feeding of the size into the trough is to enable the size to be properly boiled, and in fit condition for sizing the yarn. This object is, however, only inefficiently attained, for the raw size entering the box, by reason of its greater specific gravity, falls to the bottom, and immediately makes its way through the said passage into the larger compartment. The size is thus, not strictly speaking, throughout its entire bulk, of the same specific density or consistency, the result being that the warp especially in the case of heavy sizing, receives more of its share in some parts and less in others.

To overcome this trouble, *i. e.*, to insure equal distribution of the size over the surface of the warp, a new construction of a sow-box has been lately invented. The same is of English origin, and is shown in Fig. 5 in its longitudinal section, Fig. 6 being a perspective view of it. This new sow-box, we find divided into two compartments *B* and *C* by the partition *D*, but in the lieu of the size being allowed to pass direct into one compartment from the other, through a small opening

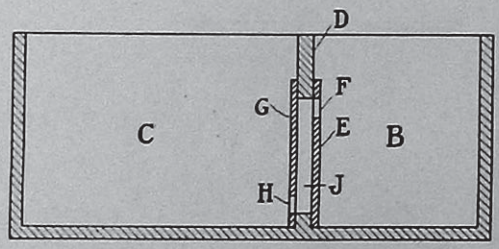


Fig. 6

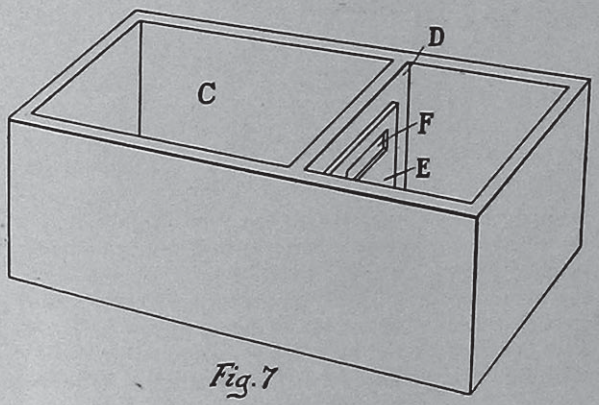


Fig. 7

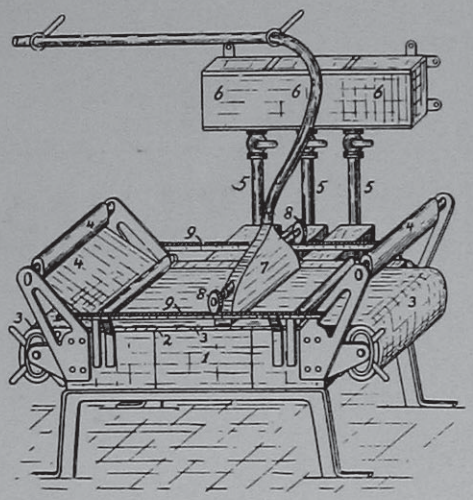
at the bottom of the trough, as is the case in the old style of sow-boxes, previously referred to, we find the division wall of the trough of the new sow-box to consist in a vertical passage and an upper and lower slot on each side thereof, in turn causing the size to ascend to any required height and then descend through the said internal passage in the division wall, ere it will be permitted to pass into the adjacent compartment. For this purpose, a large rectangular hole

is cut in the partition *D*. On each side of such hole, two copper plates *E*, *G*, are fixed. The plate *E*, which is fixed at the side of the partition or division wall in the smaller compartment, has a horizontal slot *F* cut in it near its top edge, and the plate *G* which is fixed to the face of the division wall in the larger compartment, has a similar slot *H* formed in it, but in this case, the slot is at or near the bottom of the trough.

The size, which enters from the back, thus arises to the height of the slot *F* in the small compartment *B*, and passes down passage *J* between the adjacent plates, before it can emerge through the opening *H* at the bottom of the large compartment *C* and enter the latter. This insures the size being properly boiled and in excellent condition for imparting to the yarn, as it is passing around the usual immersion and sizing rollers in box *C*.

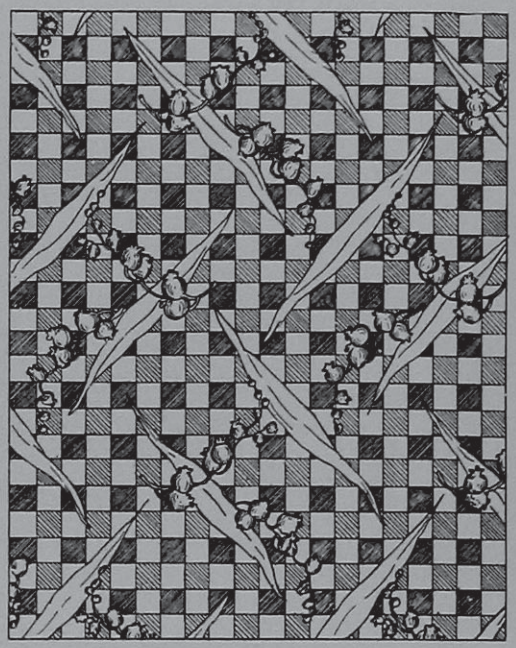
An Apparatus for Dyeing or Printing Yarns and Fabrics.

The machine consists of a dye-beck 1, which may be divided into a suitable number of compartments. At the top of the beck is a metal sieve 2, on which lies a felt blanket. Above this blanket are disposed the stencil patterns, corresponding to the designs to be

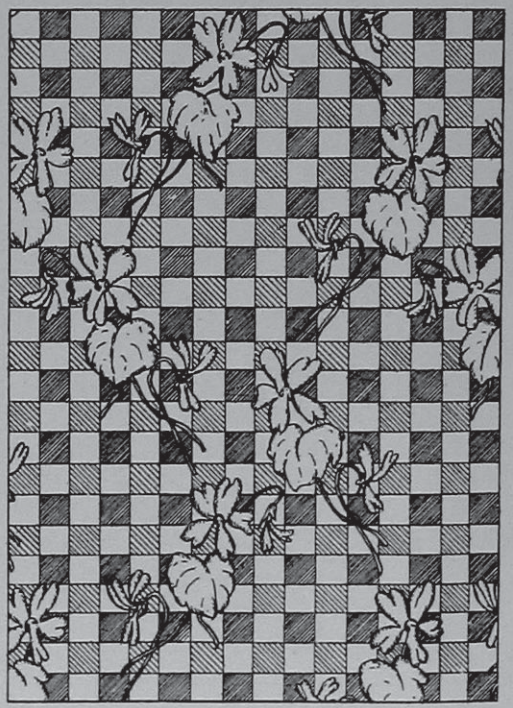


printed upon or imparted to the yarn or fabric. On these stencil patterns there is laid the previously beamed material 3 to be dyed or printed; and above this material there travels an apron 4 which is wound upon a roller. The supply of liquor in the beck 1 is kept constant by the beck being connected by pipes 5 with tanks 6, the inlet to which is controlled by a float valve. 7 is a vacuum apparatus of any suitable description, whose suction-mouth is guided over the apron 4. The suction-head of the vacuum apparatus is adapted to be actuated mechanically by means of pinions 8, meshing with two lateral racks 9 extending lengthwise of the machine. The beck is divided into a plurality of compartments by means of partitions extending up to the blanket, so that several dyes may be employed, each having its separate supply of dye; however, all compartments may be thrown into one.

New Designs for Textile Fabrics.



These two designs for textile fabrics have been lately patented by H. Jacobson, and refer to Novelties



in floral designs for Damasks, with checkerboard effects, in two colors, for a background.

SOME SPECIAL COTTON FINISHES.

(Continued from April issue.)

HARVARD SHIRTINGS. These goods are frequently stiffened with Epsom salts at 50 deg. Tw. with the addition of 10 per cent. of glycerine substitute, or 120 lb. common salt per 1,000 gallons of liquor. If

BUYERS' INDEX—Continued

Logwood Crystals.
West Indies Chemical Works, Ltd.

Logwood Extracts.
West Indies Chemical Works, Ltd.

Looms.
Crompton & Knowles Loom Works.
Draper Co.
Kilburn, Lincoln & Co.
Mason Machine Works.
Whitin Machine Works.

Measuring Devices.
Draper Co.
Sipp Electric & Machine Co.

Mercerizing Machinery.
Schuchardt and Schütte.

Metallic Rolls.
Metallic Drawing Roll Co., The.

Mohair.
Littauer, Ludwig.
Queensbury Mills.

Mules.
Mason Machine Works.

Peroxide of Sodium.
Roessler & Hasslacher Chemical Co.

Pneumatic Conveyors.
Philadelphia Drying Machinery Co.

Power Transmitting Machinery.
Philadelphia Drying Machinery Co.

Presses.
Philadelphia Drying Machinery Co.

Printing Drums.
Crompton & Knowles Loom Works.

Pumps.
Philadelphia Drying Machinery Co.

Quillers.
Sipp Electric & Machine Co.
Whitin Machine Works.

Railway Heads.
Mason Machine Works.
Whitin Machine Works.

Reeds.
Whitaker Reed Co.

Reels.
Draper Co.
Sipp Electric & Machine Co.
Whitin Machine Works.

Revolving Flat Cards.
Mason Machine Works.
Whitin Machine Works.

Ribbons and Piece Silks for Trimming Knit Goods.
Cheney Bros.

Shuttles.
American Textile Specialty M'ch'y Co.

Silk Machinery.
Altemus, Jacob K.
Crompton & Knowles Loom Works.
Halton's, Thomas, Sons.
Mason Machine Works.
Sipp Electric & Machine Co.

Silk Yarns.
Cheney Bros.
Littauer, Ludwig.
Ryle, William, & Co.

Sizing Compounds.
Cummings, J. W.

Spindles.
Draper Co.

Spinning Frames.
Mason Machine Works.
Whitin Machine Works.

Spinning Rings.
Draper Co.
Whitaker Reed Co.

Spoolers.
Draper Co.
Whitin Machine Works.

Tanks and Tubs.
Philadelphia Drying Machinery Co.

Tapes, Braids and Edgings.
Chapin, George W.
Weimar Brothers.

Temples.
Crompton & Knowles Loom Works.
Draper Co.

Threads.
Chapin, George W.
Littauer, Ludwig.

Tinsel.
Littauer, Ludwig.

Twisters.
Draper Co.
Mason Machine Works.
Whitin Machine Works.

Warp Stop Motions.
Crompton & Knowles Loom Works.
Draper Co.
Kip-Armstrong Co.

Winding, Beaming and Warping Machinery.
Altemus, Jacob K.
Draper Co.
Whitin Machine Works.

Wool Combers.
Crompton & Knowles Loom Works.

Woolen Machinery.
Altemus, Jacob K.
Crompton & Knowles Loom Works.
Hunter, James, Machine Co.
Philadelphia Drying Machinery Co.

Woolen Yarns.
Littauer, Ludwig.
Queensbury Mills.

Wool Washing Machinery.
Hunter, James, Machine Co.
Philadelphia Drying Machinery Co.

Worsted Yarns.
Campion, Richard.
Griswold Worsted Co.
Littauer, Ludwig.
Queensbury Mills.

Yarn Testing Machinery.
Sipp Electric & Machine Co.

Irish moss mucilage is used, an antiseptic must be added to prevent mildew.

DRILLS. These are heavy white cloths and when manufactured and finished for the China and Eastern market must have a full, firm feel, be rather lustrous, and be heavily filled. Such drills are generally finished as follows:—Mangle on five-bowl sycamore and brass bowls, water mangle in cold water, stiffen on a mangle with two sycamore bowls, dried upon tins, conditioned on damping machine, then cold calendered without friction on a five-bowl calender, the pressure being regulated according to the degree of lustre required. The goods are then made up. Drills for the home markets are finished softer than those for the China and Eastern markets. This is attained by using a little less starch in the mixing, and not so much weight on the calenders. Rice starch suits better for drills than other starches, not giving so bright a lustre, as these cloths are generally finished dull. The same mixing as for China finishes can be used.

BUCKRAM. Buckram when finished is as stiff, or even slightly stiffer, than a piece of cardboard of an equal thickness. Stiffen twice on Scotch friction mangle, the bowls speeded at about five to one, run twice through, the first time face up, the second time back up, dry over tins and calender slightly. The mixing for 16 by 16 to 17 by 17 cloth, is 6 cans flour paste 30 deg. Tw., 1 small can starch 8 deg. Tw., 6 cans China clay paste, sometimes a little glue is added.

LABEL CLOTHS. The production of cloth labels for parcels and packages has now become a large trade and is an important part of the finisher's business. Rather low qualities of cloths are used for labels and practically are only used as a means of fashioning or holding the filling, which is the most important part of the label, in a convenient form. Generally a 12 by 12 cloth is used, but other equally low makes are used. Stiffen the cloths face up on a Scotch mangle with wood and brass bowls, giving as much friction as possible so as to get the mixing well into the cloth, dry on the tins, damp, again stiffen as before but now back up, dry on tins, damp, calender slightly with warm but not hot bowl with no pressure. To obtain firm labels, on which the ink will not run, the cloths can be stiffened a third time.

The mixing is 4 cans flour paste, 20 lb. farina, 5 cans mineral, 5 cans China clay, 35 lb. fish glue, 5 lb alum, 7 lb. wax, blue to shade, mix the flour paste and the farina with water and just boil, then cool and stir in the mineral, China clay and wax. Dissolve the fish glue and alum separately in water and add to the rest, boil the whole to 150 deg. F., adding sufficient water to make about 100 gallons of mixing.

JACONETS. These cloths are finished to have a full feel. There are two kinds of Jaconet Finish, hard and soft. The hard finish is obtained as follows:—Mangle straight through with full weight on a six bowl mangle through hot water, stiffen on stiffening mangle using corn starch at about 12 deg. Tw., and dry on the tins, damp, stretch as nearly as possible to full width, calender four nips, straight through with full weight on. The calendering is done twice and they are then made up. Soft Jaconets are finished similarly, only the starch mixing is used at about 8 deg. Tw., and they are only once calendered. The mixing when weighting is required is 3 cans dry starch, 1½ cans dry mineral, 2 cans wet China clay, 1 lb. wax, boil well, make up to 20 canfuls.

BACK FILLED HANDKERCHIEF FINISH. This is done on light 15 by 15 cloths for making into handkerchiefs as follows:—Stiffen on back filling mangle, dry on tins, damp slightly, beetle 30 minutes one end, 40 minutes the other, and make up.

The mixing is 1½ cans starch and 1½ cans water mixed, 3 cans China clay paste, 1½ cans water, 1½ lb. white wax, ½ gill soluble oil, blue to shade, boil up well.

COTTON FROM FIELD TO FACTORY.

(*Continued from page 239.*)

The Saw Gin. The same is the invention of Eli Whitney and in its principle of operation has withstood the criticisms of practical manufacturers and theorists for more than a century, and to-day it practically prepares the bulk of the cotton crop for market.

Eli Whitney was born in Westboro, Mass., December 8th, 1765, and from boyhood up was an inventive genius all around. When 19 years of age, he decided to prepare for college, earning his living besides carrying on his studies, being able in this way to enter Yale in 1789. When graduating in the autumn of 1792 he went to Georgia with the view of entering into the legal profession. By invitation he made his home with the widow of General Green, the Revolutionary hero, and there had his attention directed to the need of a machine for preparing seed cotton for the market. This cotton adhered so obstinately to the seed that the task of cleaning it had to be done by hand, consequently it was laborious work. Separating one pound of the clean staple in this manner from the seed was a day's work for a woman; but the time usually devoted to picking cotton was the evening, after the labor of the field was over and when the slaves, men, women and children were collected in circles, while an overseer stood by to rouse the dozing and urge the indolent. Consequently this kind of cotton—now the bulk of the cotton crop of the world—was of little value to the planter. Whitney, foreseeing that important results would follow a speedier process, at once started to construct a machine for doing this work, thus producing his famous gin, for which he received a patent in 1793.

That Whitney's cotton gin has conferred vast benefits in developing the power and progress of the United States is a matter of well authenticated history. The inventor made the prosperity of the Southern states agriculturally, financially and commercially; made England rich, and changed the commerce of the world. The debt which the nation and the world owe to Eli Whitney is proclaimed by the eloquence of statistics, and which indicate that Lord Macaulay was

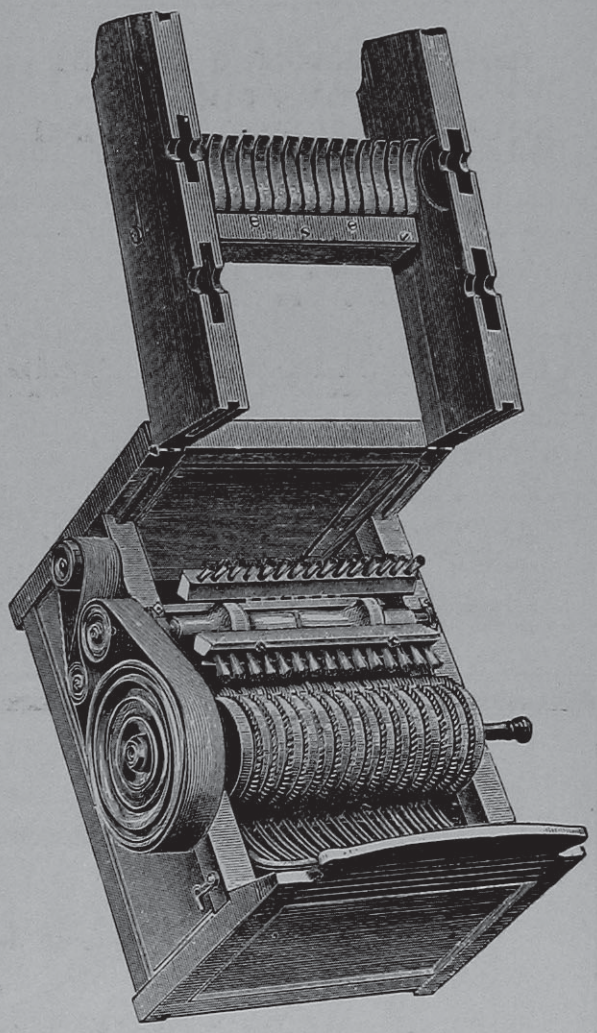


FIG. 8

not too extravagant in saying, "What Peter the Great did to make Russia dominant, Eli Whitney's invention of the cotton gin has more than equaled in its relation to the power and progress of the United States." Whitney died January 8, 1825.

The accompanying illustration Fig. 8 is taken from a small model of a gin, made under Whitney's own direction in 1800 and now at the Smithsonian Institute.

Coming next to consider the action of the saw gin upon the cotton fibre, we certainly find a weak spot in that this gin considerably damages the staple by more or less breaking individual fibres; however a great advantage remains for it in the fact that it cleans the cotton from its seed thoroughly and rapidly. In times before the Civil War, cotton growing was carried on on large plantations which owned their own ginneries.

Announcement:

We beg to announce that in the interest of *our Advertisers* we have facilities for Exhibiting smaller classes of Machinery, Working Models, Supplies and Devices Relating to the Textile Industry; to look after their interest and demonstrate advantages.

For the convenience of the practical men and the busy manufacturers, the Exhibit will be open from 8.30 A. M. to 5.30 P. M. daily and every Tuesday from 7 to 10 P. M.

Full particulars on request.

POSSELT'S TEXTILE JOURNAL, Philadelphia.

They ginned slower and as a result the fibre was little cut or broken, nor crimped nor knotted, a feature explained by the fact that a slow speed gives a loose roll of cotton for the saws to operate upon whereas a high speed of the machine results in a closer and more compact roll of cotton for the saws to operate upon. Certainly the high speed gives the largest amount of work and at the same time cleans the cotton more thoroughly; however strains and breaks more the fibres, adding numbers of short fibres, often nipping off fragments of seed and passing immature seed with lint attached through the breast of the gin along with the good fibre.

As mentioned before, no radical change in the saw gin has taken place since the days of its inventor, the principle of its action has remained the same. The seed cotton is held in a box, one side of which is a grate of steel bars or ribs. Through the intervals of the grate a number of thin steel disks notched on the edge (saws) rotate rapidly. The teeth of these saws engage the fibre and pull it from the seed, which as they are cleaned fall out of the machine through a slit below the ribs. Behind the cylinder holding the saws is a larger cylinder (the brush) filled with bristles acting in contact with the saws. Both cylinders rotate in the same direction, the brush cylinder sweeping from the saws the fibres they have detached, which by the draft created by the rapid revolution of the two cylinders are blown out from the gin. The most notable improvements made to the gin consist in placing rotatable plates at the ends of the cotton roll, as forming in the gin breast, thus reducing friction and assisting the revolving of the roll of seed cotton. Again the mote board, invented in 1845, permits regulation of the air current produced by the wings on the brush so nicely that the current is just strong enough to carry off the cleaned cotton, but not enough to carry off the motes, or immature seeds which thus become separated. In 1878 a condenser was added, and made a part of the gin. This condenser is a revolving screen, and as the cotton is blown against it, the air passes through, leaving the lint on the screen in the form of a bat, the air passing out through the bottom and ends of the condenser, and carrying the dust and dirt with it, the screen as it revolves, constantly presenting new surfaces to the oncoming cotton. A bat roll is placed over the top of the revolving screen, and lifts the cotton from it, delivering it into a chute. The addition of this air current, and the passing of the cotton through flues to a lint room, or a condenser, also materially assists in opening up neps occasionally caused by the films of cotton doubling around the teeth of the saws and becoming snarled. The original hand feeding of the seed cotton to the gin has also now days been greatly simplified and improved, in that a fan blower draws a current of air through a wood or metal flue, sucks the cotton up from the wagon or bin in which it has been stored, and delivers it to the gin.

(To be continued.)

TEXTILE WORKER'S BUREAU

Situation Wanted by a Foreman on Twisting and Entering, hand and machine twisting; or Warping and Winding in a Broad Silk Mill. First class references. Address: "Hustler," care of POSSELT'S TEXTILE JOURNAL.

Designer Wanted. "We want new color combinations and new designs for Jacquard Hammocks, both to be along the lines which make Hammocks salable. Will pay well for our wants if anyone is equal to supplying the same. Do not write unless you have ideas entirely out of the ordinary in color harmony and design. Address Hough Shade Corporation, Janesville, Wis."

Account Wanted, of a firm who makes or handles Bed Spreads and Coverlets. We have several men on the road from May 1st to January 1st and would like to add this line to our goods. Address: Cedar Bluff Woolen Co., Cedar Bluff, Va.

Superintendent for Knitting Mill in Georgia. To take charge of 100 Latch needle machines on Women's and Children's Ribbed Underwear (Cotton). We require a man who can manage machines, material and help to best advantage. Address only with full particulars: C. K. Co. 12, POSSELT'S TEXTILE JOURNAL.

Overseer of Carding or Spinning, including Ring Spinning, Spooling and Warping, or both; or Asst. Supt. Thorough Mechanic, holding a Massachusetts Engineer's License; also understand finishing and warp preparation as well as the construction of plain and dobby looms, having repaired and set them up. Learned all to take Superintendent position. Am at present employed as Spinner in charge of 11,000 spindles; was second hand in Card room previous to spinning. Well up on Waste-question. Have always raised the production where employed. Strictly temperate, American, married and best of references. Go anywhere. W. R. H. 16, POSSELT'S TEXTILE JOURNAL.

Boss Dyer. Seven years' experience in Hardening, Fulling, Washing and Dyeing Woolen Felts. Temperate and steady. Go anywhere, prefer the South. G. H. 13, POSSELT'S TEXTILE JOURNAL.

Asst. Designer or Boss Weaver. Extensive experience on Fancy Worsteds and Woolens, also on Cotton Worsteds. 32 years of age, single. T. F. L. 15, POSSELT'S TEXTILE JOURNAL.

Winding Filling Yarn from Cops to Shuttle Bobbins. To obtain loom production by rewinding, cops must be controlled by the facts that cost must be minimized to equalize the result of the process. Our skein winding machine has been tried out and proven long ago that it is *the only successful machine to-day on the market,* and we now offer the machine in a new type, specially adapted for this particular work and use, only with features that deserve special attention. The above I guarantee to give, high speed without injury to the yarn, also hard wound bobbins in every part, the wound bobbin containing the amount of yarn that will astonish the most skeptical textile manufacturer. I stand by all I claim with reference to production at the lowest cost. The machine is not an expensive one and the floor space economical. Will place a machine in, on approval, or will wind samples of yarn from cop to bobbin, or from bobbins to bobbins, to prove what I can accomplish. A trial will convince you. All inquiries will have my personal prompt attention.

Jacob K. Altemus,
2814 N. 4th St., Philadelphia.

The Dyeing and Finishing of Knit Goods, in the Roll, Wavy Zibelines produced on Knitting Machines, Jersey Cloth, etc., are one of the specialties of the well known firm of the Firth & Foster Co., Public Dyers and Finishers, Philadelphia.

The Altemus New Hosiery Winder is attracting considerable attention among Knit Goods Manufacturers. The design of the machine is by Mr. J. K. Altemus, who has made the subject of perfect and at the same time economical winding a life study. The machine is what is known technically as a Skein Winder, and constructed for handling Hosiery Yarns up to 80's; and will satisfactorily wind the finest kinds of yarns. For further particulars, address Mr. Altemus, who will give the inquiry his personal attention.

MILL NEWS

Philadelphia. The Wingohocking Hosiery Mill, of Germantown, is running 60 hours a week, with orders ahead.

Philadelphia. The Sherwood Hosiery Mill, at Germantown, is reported running overtime, owing to being behind on orders.

Philadelphia. The Brown-Moore Hosiery Co. is building a new factory, cor. Hancock and Westmoreland streets.

Philadelphia. A contract has been awarded the Standard Hosiery Company for a spinning mill to be erected, which will about duplicate its present plant. The machinery to be installed will increase the output of the plant about 1,000 dozen daily or to about 3,600 pairs children's and misses' ribbed hosiery.

Philadelphia. The Bell Hosiery Company has leased temporary quarters at Mascher and York streets.

Reading, Pa. The East Penn Hosiery Company is installing new machinery to increase its output, they being behind with their orders.

Reading, Pa. The Terry Hosiery Company has incorporated with a capital of $25,000.

Plymouth, Pa. The Wyoming Valley Knitting Mill has resumed operations.

Hawley, Pa. The machinery of the United States Knitting Mills here, has been purchased by J. W. Sandercock and associates, of Lake Ariel and Scranton. They have formed the Lake Ariel Knitting Company. The machinery has been shipped from here to that place.

Riverside, Pa. The Reading Dye Works will erect a new building, which will be occupied by new machinery, imported from Germany. This is the second addition to the plant within a year.

Brooklyn, N. Y. The Eclipse Knitting Mills have been chartered with a capital of $10,000.

Cohoes, N. Y. The old Eagle Hotel is torn down to make place for the new Fuld & Hatch knitting mill.

Jersey City, N. J. The Garretson Silk Company (capitalized at $25,000) have filed articles of incorporation.

Wilmington, Del. The Glen Hosiery Company is completing a new two-story mill, and after this will have a capacity of 600 dozen pair of hose a day.

Wilmington, Del. The Wilmington Silk Company have incorporated with a capital stock of $25,000.

Great Barrington, Mass. The machinery of the Reliable Knitting Company has been removed from its plant in Canaan, Conn., to here.

Rochdale, Mass. The mill of Comins & Co., which has been running on a schedule of four days a week for two months, has gone back to full time.

Webster, Mass. A part of the plant of the Perryville Woolen Company has been started on a full-time schedule of sixty hours a week. The entire mill will be working this way within a few weeks.

Lowell, Mass. The Tremont and Suffolk Mills will enter upon a new departure by the installation of a small

knitting plant within its yard, for the purpose of testing the yarn produced by their spinning departments.

Holyoke, Mass. The Farr Alpaca Company will spend for improvements this summer the largest amount in any one year in the history of the company. This company has been running right along to its full capacity.

Lawrence, Mass. The plants of the M. T. Stevens & Sons Company are running full blast with plenty of orders ahead. Twenty new Knowles & Crompton looms were installed at their Haverhill plant. Their mills in Andover and North Andover are also running full time, with the usual payroll.

Albion, R. I. Work has started on a large brick addition to the cotton plant of the Valley Falls Company. It will provide room for 250 looms and 15,000 spindles.

Dexter, Me. The Dunbarton Woolen Mills, which have been running on short time, are now on full time.

Dover, N. H. The mills of the Cocheco Manufacturing Company, which have been on short time, are now operating on full time.

Madisonville, Tenn. It is reported that the Madisonville Knitting Mills will increase their present equipment.

Fredericksburg, W. Va. The Washington Woolen Mills, it is rumored, will erect an additional building and install machinery to double present capacity.

Sylacauga, Ala. It is rumored that J. P. Batson intends to establish here a mill for knitting cotton hosiery.

Paducah, Ky. The plant of the Wisdom Hosiery Mills has received a complete overhauling and the installation of new machinery. The dye plant has been changed to permit of the sulphur black process being used.

Caroleen, N. C. The large mills of the Henrietta system, with the Cliffside Mill, are all running on full time.

Simpsonville, S. C. The cotton mill here has begun operations on the constructon of their plant, which when finished will comprise 8,000 spindles and 200 forty-inch looms.

Blacksburg, S. C. The Blacksburg Mills is preparing to begin the construction of its plant. It is to have 5,000 spindles and 128 forty-inch looms for the production of 64 x 68 forty-inch 3.15 cotton cloth.

Newberry, S. C. The Newberry Cotton Mills have decided to install an additional 10,000 spindles and 30 looms.

Augusta, Ga. It is rumored that a knitting mill is to be started in North Augusta, Ga., for the manufacture of stockings, by Thomas L. Foreman.

Atlanta, Ga. The Atlanta Hosiery Mills will rebuild its plant, which was destroyed by fire several weeks ago. Its probable equipment will be about 100 knitting machines and accompanying sewing machines, etc.

Athens, Ga. The Southern Manufacturing Company has completed its addition. This increase gives the company a total of 19,602 spindles and 400 looms.

Minneapolis, Minn. The Northland Knitting Company has erected a mill for the manufacture of knit goods. Sweaters, knit coats, scarfs, tams, toques and baby knit wear will be made. The capital stock of the concern is $150,000.

Marinette, Wis. The first large power knitting machines have been installed at the plant of the Marinette Knitting Works. About 100 hands will be employed this summer.

Kansas City, Mo. It is rumored that the Manufacturers and Merchants Association, of this place, is greatly interested in the establishment of a knitting mill.

Chicago, Ill. The Central Knitting Mills has been incorporated with a capital stock of $5,000. They will manufacture underwear, hosiery, etc.

EXPLANATIONS FOR THE CHART OF WEAVES ON

"Textile Designing Simplified."

The object of this chart is to show how easy weaves for all classes of Textile Fabrics can be constructed; it will be a search light in the misty matters in the field of designing Textile Fabrics. Keep this chart of weaves for reference. Millions of new weaves can be obtained by it.

All weaves for Textile Fabrics have their foundation in Plain Twills and Satins.

PLAIN.—This weave and its sub divisions are explained on the chart in the top row by 16 weaves, the sub-divisions covering common, fancy and figured Rib and Basket weaves.

TWILLS —The foundation of constructing regular (45°) twills is shown by rows 2 and 3 with twenty six weaves, covering twill weaves all the way from 3 harness up to 13 harness. The sub divisions of twills are quoted next on the chart, being Broken twills, Skip twills, Corkscrews, Double twills, Drafting twills, Curved twills, Combination twills warp drafting Combination twills filling drafting, 63° twills, 70° twills, Wide wale twills, Entwining twills, Checker-board twills, Pointed twills, Fancy twills, thus covering every sub division of twill weaves possible to be made.

SATINS are next shown, giving also their sub divisions, viz: Double satins and Granites.

HOW TO PUT A BACK FILLING ON single cloth is shown below the satins by two examples, and at its right hand is quoted the principle of

HOW TO PUT A BACK WARP ON single cloth.

On the bottom line are given the four steps for :—

THE CONSTRUCTION OF DOUBLE CLOTH, 2 @ 1; and above the same one example, with the arrangement 1 @ 1.

THREE PLY CLOTH is shown by one example.

HOW TO BACK SINGLE CLOTH WITH ITS OWN WARP is shown by two examples.

WEAVES FOR SPECIAL FABRICS are quoted: Tricots (warp, filling and Jersey effects), Rib fabrics, Honeycombs, Imitation Gauze, Velveteen, Corduroy, Chinchillas, Quilts, Plush, Double-plush, Tapestry, Crape, Terry, Worsted coating stitching, Hucks, and Bedford cords

HOW TO WORK THIS CHART OF WEAVES.

CAPITAL LETTERS of references refer to the plain weave and its sub-divisions.

SMALL LETTERS of references refer to twills and their sub-divisions.

NUMERALS of references refer to satins and their sub-divisions.

Example.—How to ascertain the construction of the weave at the right hand top corner of the chart; being the figured rib weave marked C C′? These two letters of reference mean that said figured rib weave is nothing else but the combination of the 2-harness 6 picks common rib weave warp effect C, and the 6 harness 2 picks common rib weave filling effect C′.

Example —The letter of reference *c*, underneath the first broken twill indicates that the same is obtained from the $\frac{1}{3}$ 4 harness twill *c*, (third weave on the second row ; in other words, letter of references below each weave of any of the various sub divisions refer always to the corresponding foundation weave.

Example.—Twills *q* and *o*, are the foundation for the eight combination twills filling drafting, said common twills are drafted 1 @ 1, the different designs being obtained by means of different starting.

Example —The wide wale twill *t′ w′*, has for its foundation the 63° twills, marked also respectively *t′* and *w′*, the latter two weaves have again for their foundation respectively the common twills marked *t* and *w*.

Example.—Granites marked 8 have for their foundation the 8-leaf satin, such as marked 12 the 12-leaf satin.

Example.—Backed by filling *e* 8, means the common $\frac{2}{2}$ 4-harness twill *e*, (fifth weave on second row) and the 8-leaf satin is used in the construction of this weave.

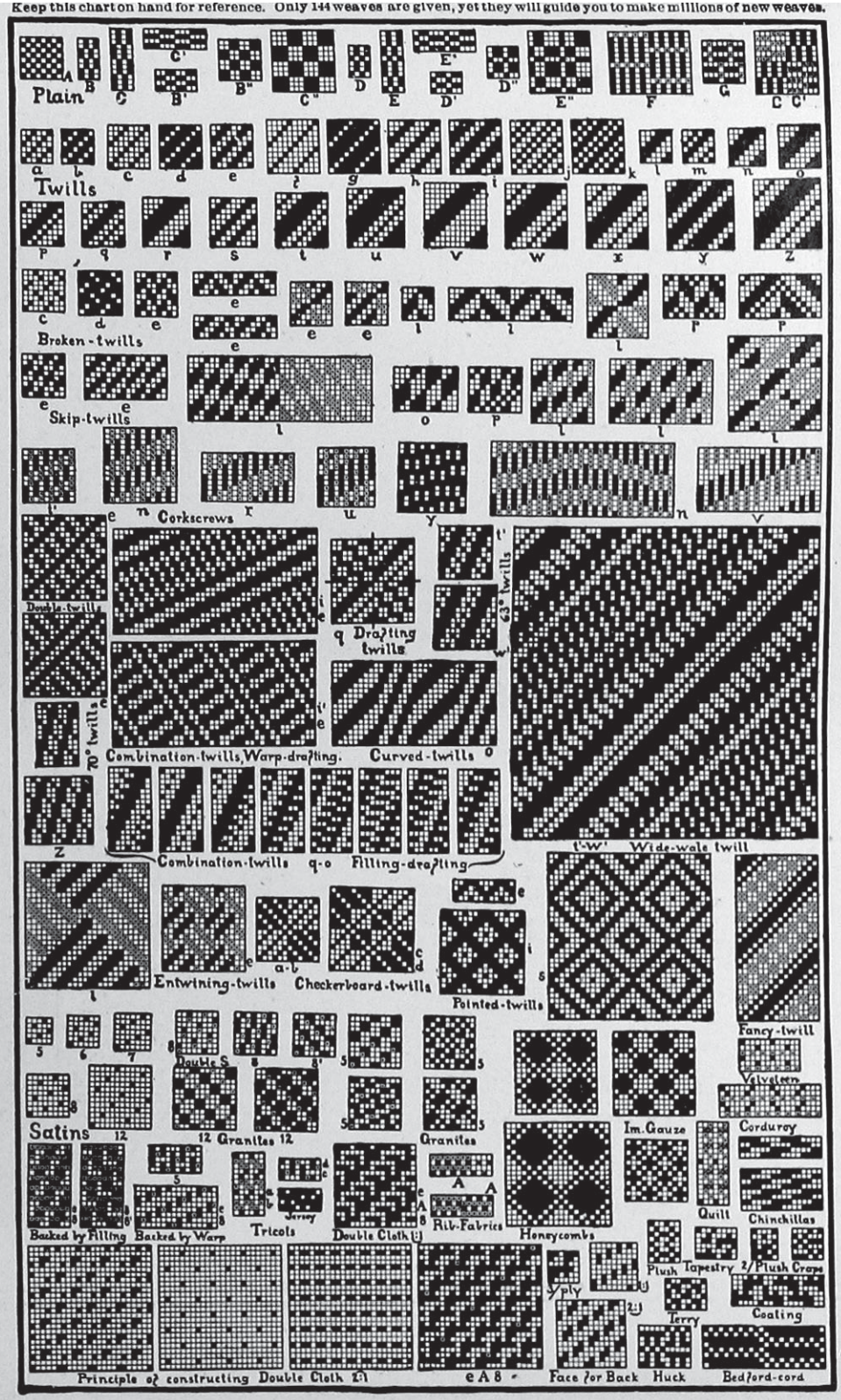
Example —The complete design of double cloth, marked *e* 8 A, means that the common $\frac{2}{2}$ 4-harness twill (*e*), the common plain (A) and the 8-leaf satin (8) are used in the construction.

Example.—Rib fabric A, indicates that the plain weave forms the foundation.

It will be easy to substitute different foundations in constructing weaves for heavy weights.

In reference to single cloth weaves we only want to indicate that by following rules shown in the chart, millions of new weaves can be made up from it.

Keep this chart on hand for reference. Only 144 weaves are given, yet they will guide you to make millions of new weaves.



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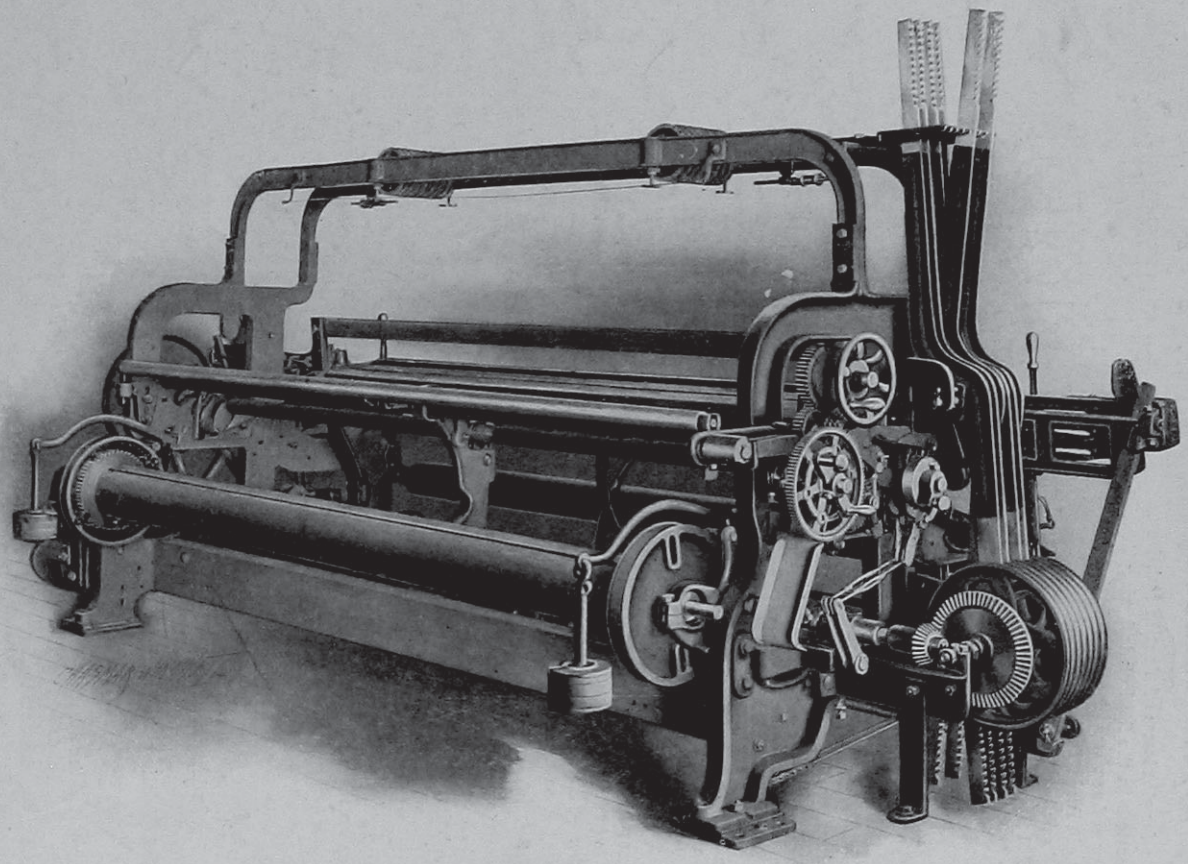

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