metal was really the cause of friction? Again. How does W. P. explain the fact that with the flat heddle we can do silk weaving as close as 60 per inch and shaft or 480 ends per inch, a thing that cannot be done now with any twine harness not to mention an ordinary wire heddle?

W. P. states that the heddle eyes have a sharp edge which can be found by looping a thread around the edge and that this thread will be quickly cut on the flat heddle and not so on the German? In reply to this let me say that in the first place no thread is ever subjected to any such test when actually in the loom. If W. P. will take a thread, however, and rub the same up and down on the outside of the eye of the German heddle, especially where the twisted portion is, he will find it will cut the thread also or fray it open. Now take a four shaft harness and the condition is this:

In the flat heddle one thread, the one which is actually in the eye, is exposed to the so-called sharp edge of which W. P. complains. The other three threads from the three other shafts are brought in contact with a perfectly smooth steel surface.

With a German heddle conditions are exactly reversed, the one thread in the heddle is protected by the smooth edge of the German heddle eye, but the other three threads come in contact when shed is formed with the soldered and twisted portion of the wire heddle and every one knows how smooth they are. There is no need of going into the other disadvantage which the German heddle eye possesses, namely, that oftentimes the thread gets caught at the bottom of the eye where the wire joins.

Your other correspondent, Mr. S. G., is evidently misinformed when he states that we advise the use of a different width of heddle eye to the count of yarn used. We do advise a different heddle for weaving organzine silks and possibly finer grades of raw silk, but our regular heddle for weaving worsted and cottons, etc., has fully as wide a range as any German heddle made. Naturally different sizes of eyes are made to suit different requirements. Every man has his own ideas as to what size eye he prefers. We certainly are not aware that the thread pulls through the flat heddle eye at an angle. If it did it probably would not weave at all. 8-15-08. William Fehr.

---

## RIBBONS, TRIMMINGS, EDGINGS, ETC.

### A Treatise on Narrow Ware Manufacture.

By O. Both.

(*Continued from page 47.*)

### Rib-Fabrics, Formed With Two Systems of Filling.

This system of weaves is extensively used for the body portion of narrow ware fabrics, and closely resembles in their construction the *half hollow selvages* previously explained.

Two picks of any one of this system of weaves always act as companion picks, *i. e.,* when one of them, for a certain number of warp threads, interlaces as face pick, the other floats on the back of the structure, and vice-versa.

This exchanging of the picks results, at the places where the same takes place, in indentations in the fabric structure, which, if so desired, may be made more pronounced by having two or three warp threads interlace as single cloth.

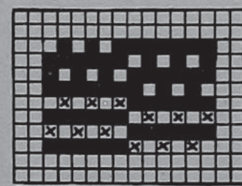


Fig. 64

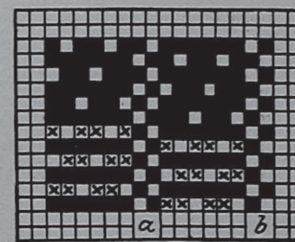


Fig. 66

Fig. 65

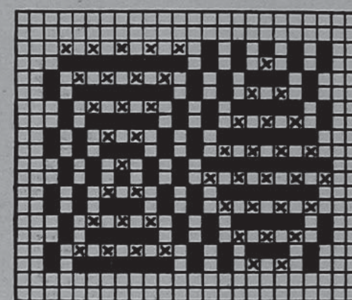


Fig. 67

The accompanying plate of four weaves will explain the subject. In the same *cross* type, as used in one repeat of the weave, indicates the interlacing of the filling with the warp, as a face pick.

*Cross* type and *full* type indicate warp up, *i. e.,* the floating pick rests on the back of the fabric structure.

Weave Fig. 64 shows the plain weave (see *cross* type) used for the interlacing of the face of the fabric structure. The cut lines in the fabric run with the direction of the warp.

Weave Fig. 65 shows again the plain weave (see *cross* type) used for the interlacing of the face of the fabric structure, the cut lines in the fabric in this instance, being arranged to run in an oblique direction.

Weave Fig. 66 shows the 3-harness twill, warp effect, used for the interlacing of the face of the fabric structure. In order to increase the *cut* effect in the fabric, we used in this instance two series of warp threads (see *a, b*) in the repeat of the weave to interlace in single cloth, *i. e.,* the plain weave in this instance.

Weave Fig. 67 shows a figured effect, showing again the plain weave used for interlacing the rib-fabric structure as figured (diamond pattern) upon a single cloth warp rib effect ground.

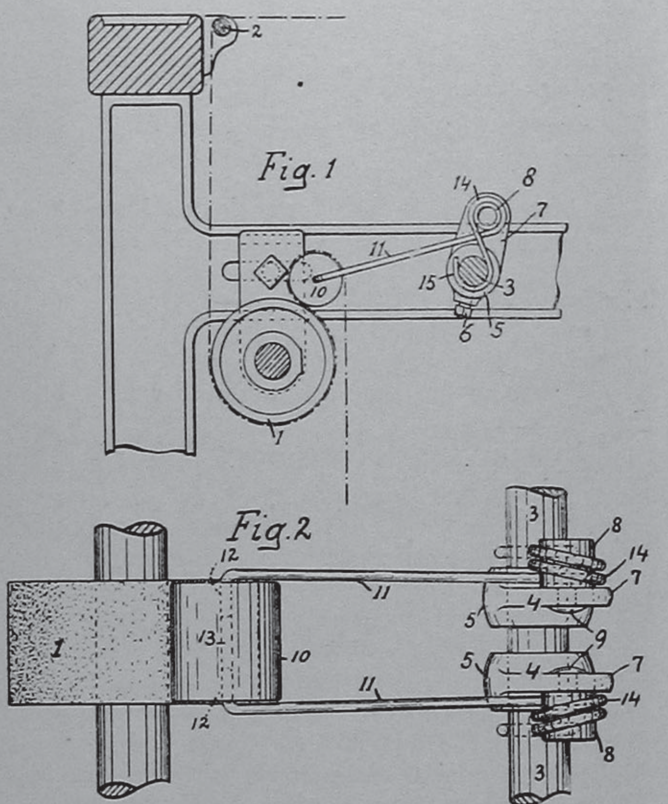
(*To be continued.*)

---

### Widmer's Improved Take-up for Narrow Ware Looms.

The object aimed at in this new device is, to provide in combination with the sand roller of the take-up mechanism improved means for maintaining the proper contact of the sand roller on the fabric. The new device is inexpensive in construction and readily attachable to any make of loom.

Of the accompanying illustrations, Figure 1 is a vertical sectional view of the new device, showing also those portions of a loom to which the same more particularly refers. Fig. 2 is a plan view of the sand roller and the new attachment, shown somewhat enlarged as compared to Fig. 1.




A description of the construction and operation of the new device is best given by quoting numerals of references accompanying the illustrations, and of which, 1 refers to the sand roller, around which the fabric passes on its way downwardly from the bar 2, to the take-up roller (not shown). 3 is a fixed shaft mounted in the loom side and on which is secured a pair of brackets 4 for each sand roller, each bracket comprising a sleeve portion 5 which is slipped onto the shaft and secured against turning thereon by means of set screw 6. An arm 7 projects upwardly from the sleeve 5 and carries a hollow stud 8, formed with a rivet 9 extending through the arm and securing the stud thereto.

10 is a pressure roller, provided to press the woven fabric (see dot and dash line) against the sand roller 1. Roller 10 is carried by a spring-support comprising two elastic wires 11, each wire consisting of a substantially straight portion having one end turned off at right angles, as at 12 and introduced into the bore 13 of the roller 10. The other end of each wire is bent first upwardly to form the loop 14, and then downwardly into the form of the hook 15. The studs of the pair of brackets 4 project outwardly and receive on them the loops of the wires, the hooks of the latter being engaged around the shaft 3.

HOW TO ADJUST THE CONTACT OF THE CLOTH ONTO THE SAND ROLL.

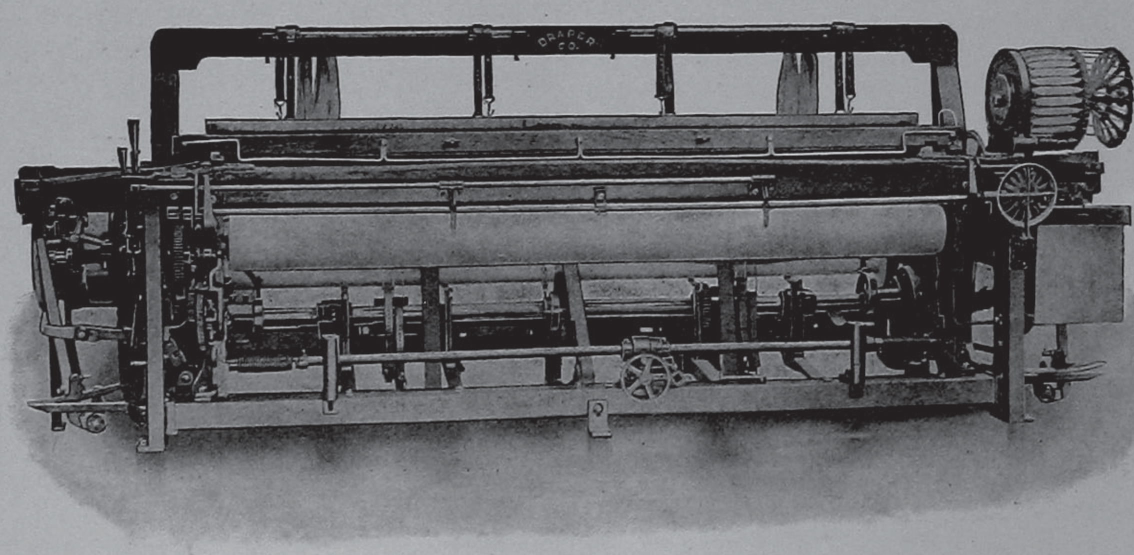
From explanations thus far given, it will be readily seen that by changing the position of the pair of brackets 4 on its shaft 3, (after again tightening set screw 6) either more or less pressure will be exerted on the roller 10, as operating against sand roller 1, *i. e.*, onto the cloth in its travel between both rollers. As will be readily understood there are a varying number of these devices used in a narrow ware loom, each of which is set independent of the other. Their general position in the loom on the shaft 3 can also be readily changed to suit (as the case may require) more or less gangs, or series of fabrics woven.

---

### The "L" Model Northrop Broad Sheeting Loom.

On a visit, a few days ago, to the exhibition department of the Draper Co., this loom attracted our special attention, on account of its rigidity of construction, as well as the easy running and handling of this large loom by the operator.

This loom was specially designed by the experts of




the Draper Company, for this class of work, the various parts of the loom being built with plenty of stock, to avoid breakage. Any one of their regular patterns of automatic, filling batteries can be applied. The drive

# Posselt's Textile Journal

*A Monthly Journal of the Textile Industries*

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

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

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


of the loom is by a friction pulley with auxiliary gearing. Other improvements are, a high roll take up; compound let off with double beams, and twine harness mechanical stop motion. The shipping mechanism acts very easy and for a fact can be operated by one finger, there being also an attachment provided, reaching across front of breast beam, so that the weaver can conveniently start or stop the loom without having to walk over to the shipper handle.

This model of a loom, we were informed, starts in the mill with as little trouble as an ordinary narrow loom, whereas with common broad looms, it has always been found to take some time for the looms to settle down to a good running condition.

1850 of these looms are now successfully running in mills, several of them having lately ordered over 500 more of these looms, a feature which certainly speaks well for this loom.

---

From the Superintendent of a New York Silk Mill: I always enjoy reading the articles on designing in the Journal. 7-19-08. G. Y.

## The National Association of Cotton Manufacturers.

Officers of the Association (*September, 1908*).

*President.*

Charles T. Plunkett, Sec. Berkshire Cotton Mfg. Co., Adams, Mass.

*Vice-Presidents.*

George Otis Draper, Sec. Northrop Loom Co., Hopedale, Mass.

Franklin W. Hobbs, Treas. Arlington Mills, Boston.

*Directors.*

Robert Beatty, Robert Beatty & Co., Philadelphia.

Frederick A. Flather, Treas. Boott Mills, Boston.

George P. Grant, Jr., Treas. Grant Yarn Co., Fitchburg, Mass.

Edwin Farnham Greene, Treas. Pacific Mills, Boston.

David S. Johnston, Gen. Supt. Harmony Mills, Cohoes, N. Y.

John W. Knowles, Treas. Page Mfg. Co., New Bedford, Mass.

William H. Loftus, Supt. Clark Thread Co., Newark, N. J.

Henry F. Mansfield, Supt. Steam Cotton Mills, Utica, N. Y.

Joseph Merriam, Pres. Springfield Webbing Co., Middletown, Ct.

*Secretary and Treasurer.*

C. J. H. Woodbury, Boston.

The next semi-annual meeting of this Association will be held at Saratoga Springs, N. Y., Tuesday and Wednesday, September 29-30, 1908.

The sessions will be held in the ball room of the United States Hotel, at 10 a. m., 2.30 p. m., and 8.15 p. m., on Tuesday, and at 8.15 p. m., Wednesday.

Wednesday will be devoted to an excursion to the works of The General Electric Company, and Thursday to an excursion through Lake George.

Papers are expected to be read on the following subjects:

Commutator Grinding.

Cotton Fibre Substance and its Properties.

Importance of Forest Preservation for Manufacturers.

Low Pressure Steam Turbines.

Measurements of Power and its Transmission.

Meeting of the International Federation of Master Cotton Spinner's and Manufacturer's Associations at Paris, June 1-4, 1908.

Modern Methods of Dyeing in Cotton Mills.

Positive and Accurate Humidity Controlling Devices.

Relationship between Cones and Flyers upon Cotton Roving Frames.

Standard Specifications for Staple Gray Goods.

Textile Fabrics and their Consumers.

Textile Mill Power Plant.

Textile Tests in Europe.

Two Hundred Varieties of Cotton Fabrics.

What is a Plain Cloth, What is a Plain Weave?

TRANSPORTATION: A special train of parlor cars will leave the Southern Terminal, Boston, via the Boston and Albany Railroad, at 10.00 a. m., on Monday, September 28, stopping at Worcester at 11.11 a. m., Springfield from 12.34 to 1.06 p. m., Pittsfield at 3.10 p. m., Albany at 4.25 p. m., and arriving at Saratoga Springs at 5.55 p. m.

The price of tickets, covering transportation for the round trip, parlor car seats, Boston to Saratoga, meals en route, board at United States Hotel, will be $25.50 for the trip returning Thursday morning; including the Lake George trip and returning Friday morning, will be $32.25.

Trains will leave the Reading Terminal, Philadelphia, at 12.00 noon and Grand Central Station, New York, at 3.10 p. m., Schenectady at 12.45 p. m., Utica at 12.20 p. m., to arrive at Saratoga Springs on Monday afternoon in time for dinner. The service from New York will be in special parlor cars attached to the regular train.

Information upon times of departure and rates from other points and tickets may be secured from the Raymond and Whitcomb Company, 306 Washington street, Boston, Mass.; 225 Fifth avenue, New York City; 1005 Chestnut street, Philadelphia, Penna.; O. E. Jenkins, University Building, Syracuse, N. Y.; or M. M. Hennessy, New York Central Railroad Station, Utica, N. Y. These tickets for special trains or special cars are not on sale at railroad ticket offices, but only at the above, who will also give information upon obtaining tickets from their home stations on trains tributary to the special.

These arrangements do not prevent any one from traveling independently if they prefer to do so.

---

### The New Brake Mechanism for Draper Looms.

The advantages obtained by the new mechanism are the removal of chances for breakages, providing at the same time a smoother running of the loom. This result, the Draper Company obtains by providing a slight cushioning action between the link and the brake shoe, and when live and dead frogs are used that the movement thereof is equalized by this cushioning action.

To be able to more readily explain the new device the accompanying two illustrations are given, of which Fig. 1 shows the new device in its side elevation, showing also those parts of a loom to which the latter more particularly refers to. Fig. 2 shows the cushioning connection between brake shoe and transmitting link.

When the protector mechanism operates, the movement of the frog 1 in turn actuates the link 2 to operate the brake mechanism, and when through the weighted arm 3, pivoted at 4 and actuated through release of the shipper, the link 2 operates the brake mechanism, the arm 3 having a toe 5 to co-operate with the lug 6 on the link 2.

The rear end of the said link 2 is screwed into the shank 7 of a housing 8 (see Fig. 2), having an opening in its side to receive a lug 9 extended laterally from the brake shoe 10; the housing 8 receiving a cushioning rubber block 11, interposed between the rear end 12 of the housing 8 and the lug 9.

When the link 2 is moved in the direction of the arrow, this motion is then transmitted to the lug 9

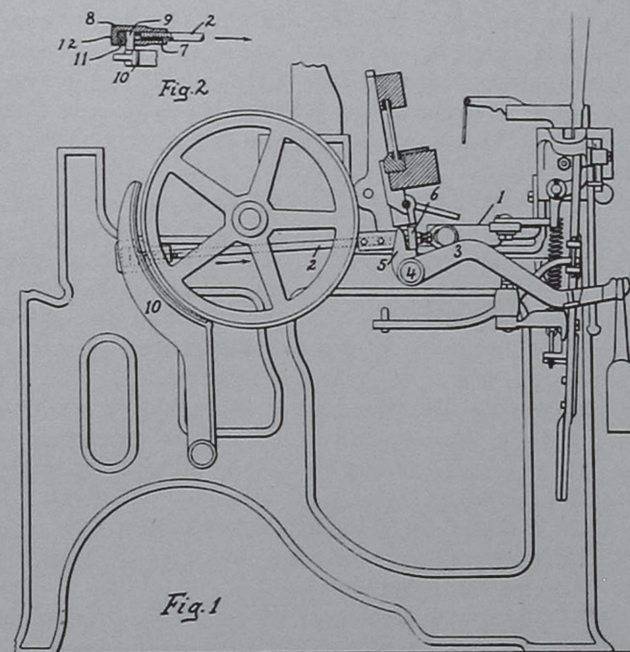



Fig. 2

Fig. 1

through the cushioning member 11, thus absorbing any undue shock and strain upon the lug 9, or the brake shoe 10. By this cushioning connection, between link and brake shoe, breakage of the shoe or its lug is eliminated, rendering in turn the operation of the brake mechanism smoother and less violent.

When a loom fitted with live and dead frogs bangs off, the cushioned dead frog permits a slight forward movement of the lay at that side of the loom, the momentum of the lay at the same time acting through the live frog 1 and the connecting link 2 at the opposite side to compress the cushion 11, so that the two ends of the lay will have a slight forward movement in unison, before stopping at front centre. This feature obviates any twisting tendency of the lay, which would occur if the lay were positively held by the link 2 at the live frog end and permitted to move forward slightly at the opposite end, where the dead frog is located.

---

### A PRACTICAL TREATISE ON THE KNOWLES FANCY WORSTED LOOM.

**By E. P. Woodward,**

Master Weaver.

*(Continued from page 44.)*

#### Timing the Head.

*(Continued.)*

With the parts of the head which are involved, timed to the forward movement of the chains, they can now be timed to the chain's reverse or backward movement.

This calls for the same principle of timing as is used when timing for the forward chain movement, and involves the use of the reverse pinion gear #11 and the double reverse gear and its stud #12.

To time the head to the reverse movement of the chains: First, turn all cylinders forward by means of their hand wheel and be sure that all parts are in time to the chains forward movement. Second, without removing any parts, turn all cylinders backward by means of the hand wheel until the vibrator points, which are changing positions, show they have made half of their movement. This will show all such points located in a straight line midway of their extreme positions. With all cylinders held fixedly in this half change position, place the reverse pinion gear on its shaft in perfect line with the keyway of the shaft and the keyway of the forward pinion gear. Next, without disturbing any of these parts, place the double reverse gear in mesh with the reverse pinion gear and the chain cylinder gear,—being careful at the same time to see that the hole in the double reverse gear and the hole for its stud in the head frame stand in line.

The stud can now be placed in position and fastened, and the head is timed to the reverse movement of the chains. The timing will be found identical with the forward timing.

With the retaining pin, spring, and collar adjusted to hold the reverse and forward pinion gears on their shaft, the timing is complete.

This timing will also show the lock knife cam with the high part in contact with the lock knife finger and the finger midway between the two extremes of the high part of the cam.

The chain shaft will also be found to rest easily and show no inclination to creep away from its half change position. This is caused by the two bars of the chains which are in contact with the lifting part of the chain runs, exerting pressure as nearly equal as the construction of the chains will admit. The raiser of the bar which is passing out of action and the raisers of the bar which is coming into action are located in the same relation to the lifting part of the chain run, hence, the pressure on each side of the chain run being equal, causes the chain shaft to maintain a fixed position on the half change position of the vibrator levers.

To review the matter: The problem before the learner has been—to find the most direct method to determine how far ahead of the box section cylinder the harness section cylinder can be set and at the same time have all parts of the head work in harmony with the builder's plans which are:

(1) Full gearing contact from the time the first tooth on the harness section strikes until the time the last tooth of the box section finishes.

(2) A lock-knife to hold all required gears in suitable gearing contact in the lower cylinder during this time.

(3) A chain properly timed to hold all required gears in suitable meshing contact in the upper cylinder during this time.

(4) Also required means for properly actuating the lock knife.

As it is preferable in this case to start with a part of the head which cannot be moved (*i. e.*, the top cylinder gear on the box section), the cylinder gears are all turned forward until the upper box cylinder has finished meshing with its gear.

At this point the chains give the required change to the vibrator levers and as soon as this is accomplished, the harness cylinders can engage their gears.

This is the limit of time of setting the harness cylinder ahead of the box cylinder, regardless of any specified number of teeth. The lock knife should always be home by the time the harness cylinders strike.

This time accomplished to the forward movement of the chains, can also be accomplished to the reverse movement of the chains, as described.

Keep the following facts in mind in timing the head: The chains act first and the lock knife and cylinders follow the chain time, the lock knife never being timed later than the cylinders.

Probably the question will be asked why one method of timing is given for the forward movement of the chains and an entirely different method of timing is used for their reverse movement. The reason is this. When starting to time the head to the forward movement of the chains, there were no points located. Theoretically, it was known where to start from *i. e.*, the last tooth of the box cylinder and its gear. In theory it was also known where to place the first tooth of the harness cylinder *i. e.*, where it would engage the first tooth of the harness vibrator gear as soon as the chains had moved the vibrator levers to their extreme positions. *Theory* and *principle located* these two points where they could be *seen*.

With something tangible to work and calculate from, it was then easy and possible to lay out the cam which would govern the lock knife and also locate the lock knife finger and lock knife cam to their correct positions.

These two chain positions—*i. e.*, the latest chain movement at which the vibrator gears could finish moving and the earliest chain movement at which the vibrator gears could start moving, are the two extremes of the gearing time of the vibrator gears.

Half way between these two extremes is the half change position of the vibrator levers and with the chain cylinder in this position the keyways of the chain cylinder, the forward pinion gear, and the reverse pinion gear all come in line.

Thus it should be readily seen that in order to have the reverse key change from one of its gears to the other, this is the time and the place to change it, for the obvious reason that the chain cylinder will have no tendency to move from the position given it when the key is sliding from one gear to the other and the setting of the head is also helping to keep the chain cylinder in line, thus helping the weaver to readily change the key to the gear required.

A few minutes careful study of this article will show the learner that with the two extreme positions of gearing contact located, he can time the head in the simplest known manner by using the method of timing which for want of a better name is commonly called *timing on centres* and this method will apply especially to heads which have been timed and set up by the methods described in this series of articles.

TO TIME THE HEAD ON CENTRES, first, turn the chain cylinder gear forward until the vibrator levers show half change. (They will drop to this position themselves with a slight turn of the chain shaft gear); second, by means of the hand wheel, turn the cylinder gears forward until the lock knife finger stands midway of the high part of the lock knife cam.

Without disturbing any of these positions, place on their shaft (with all keyways in perfect alignment) the forward and reverse pinion gears. Next, place, as previously described, the double reverse gear and its stud. Tighten it to its position and place retaining pin, spring and collar on its shaft and the head is truly timed to both the forward and reverse movement of the chains.

When fitting the reverse pin, see that it is nicely matched to its keyway and have the knob of the reverse pin run concentric to its shaft instead of turning with an unsightly wobble. Have the end, which slides through the retaining collar, *fill the collar*. This fitting will give the retaining pin a chance to do what it is intended to do. The nicely fitted key will then stay easily where it belongs and will need no clumsy locking latch to keep the reverse key in place. With a suitable drill, counter bore slightly on the key where the retaining pin will bed, when the key is in the forward pinion gear as it should be.

Do not run the retaining spring too stiff. It does not need it. When filing the keyways in the gears do not file either keyway deeper than the recessed part of its gear.

Be careful also to file the reverse pinion gear no deeper than the forward pinion gear, since to do so, would take away the backing for the reverse key (when drawn out) and leave it standing in a drooping position.

File the corners of the key a trifle where they are apt to come in contact with their gears. The part of the key which fits the reverse gears should not exceed in length the combined length of the recesses in the gears. This recess is there for a two fold purpose—to avoid breaking the gears if at any time the loom should start with the key partly out and also, to allow the turning of the chain shaft without moving the cylinder gears.

Also chisel the edges of the gears keyway to a suitable angle (45 degrees $\frac{1}{8}''$ back) to enable the key more readily to enter the keyways in the gears. These little things in fitting will be found a preventative of the key getting burred and hard to work, and will also help the weaver who handles the loom.

Do not file the vibrator ends to a point, nor on the part where they rest on the leveling bar. To do so, will in the first instance cause the lock knife to throw out on heavy work. When filed where they rest on the leveling bar, they can never be fitted correctly to the gauge until the part filed away has been replaced either by *peening* or throwing the end of the lever down between the distance from beyond the vibrator gear bearing, to the point of the lever.

The vibrator lever should never be filed where it fits the heel pin and heel cap, until one is sure it cannot work freely without, since to do so will cause the lever to lose motion and the gear will not bed in the top cylinder as it otherwise would.

The above parts are all machined to gauge and when one has trouble with the head, a careful examination will show the trouble to be elsewhere, rather than in these parts.

The advantages of this method of timing over others are:

(1) Being able to work from a given point and from this point at once, determine for a certainty the limit of gearing contact to which the cylinder gears should be set.

(2) Knowing that with the cylinder gears set to the limit of time allotted them, the lock knife, lock knife cam, and finger can at once be timed to their positions.

(3) Also that the lock knife time, once set for the extremes is set for all cylinder gear time between the extremes, and needs no further attention from the fixer at any time he may need to set the cylinder gears later.

(4) Being able at any time to take down, if necessary, all the gears of the chain drive and replace them in a minute by timing all *on centres* and knowing from start to finish his work, will end in a well timed head.

*(To be continued.)*

## JACQUARD DESIGNING.

*(Continued from page 40.)*

### STRIPES PRODUCED IN SINGLE CLOTH

by means of alternately exchanging warp and filling effects in connection with an all over design.

This system of designing finds use in connection with cotton as well as silk dress-goods, draperies, etc. With dress-goods, it finds its most extensive use with uni-colored fabrics, although in some instances striped warps may be used in order to make the stripe effect more prominent. In connection with uni-colored structures, the difference in the general character of the yarn used (warp vice versa filling) will be sufficient to produce the required stripe effect in the fabric and is in most cases all the prominence of a stripe effect desired, since it must not be lost sight of that the general all-over figure plays a most important item with reference to design in fabric desired, and which feature is more preserved in connection with uni-colored fabric structures.

To explain the subject to the reader, the accompanying fabric sketch Fig. 44 is given, showing a repeat and a half of the design, both warp and filling ways.

Examining this fabric sketch shows us an all-over, floral figure, thrown all over the repeat of the design. Where this figure comes on the warp effect stripe, it is produced by the filling, the warp forming the ground; again where the said figure comes on the filling stripe, it is produced by the warp, the filling then forming the ground.

In order to more clearly explain the subject to the reader, we will now show the planning of the sketch given, onto its point paper, *i. e.*, the design required for use in practical work.

Let us suppose that, sketch given refers to an actual size fabric sketch.

FIG. 44.

The repeat of the design is then 3″ by 3″.

POINT PAPER: Suppose texture of fabric to be

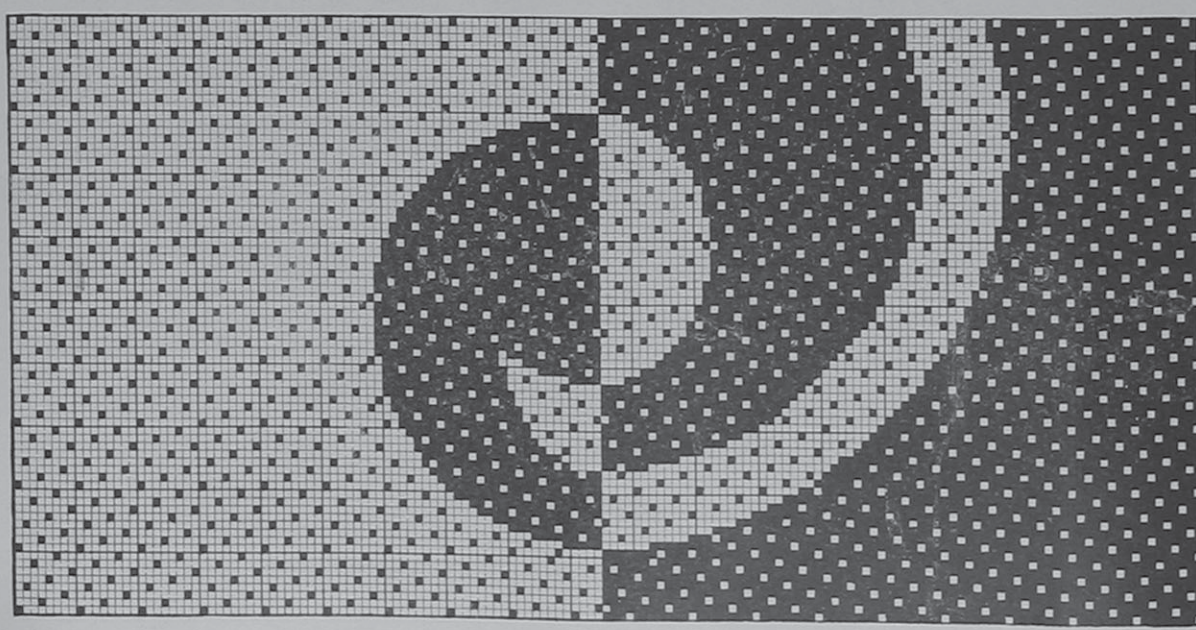


FIG. 45.

200 by 200, and when consequently the point paper to be used is either 8 x 8, 10 x 10 or 12 x 12. We selected for our point paper design 8 x 8 paper.

CALCULATING AS TO SIZE OF JACQUARD MACHINE to use, we find: 3 inches width of one repeat of design × 200 warp threads per inch = 600 size of Jacquard machine required.

FOR WEAVE, we selected the exchange of 8-harness satin, warp and filling effects.

There are two warp and two filling stripes in one repeat of design, and 600 ÷ 4 (stripes in one repeat) = 150 warp threads, for each stripe.

With reference to repeat of design filling ways, since dealing with a balanced texture (200 by 200) and repeat of design in sketch (3″ by 3″), the same number of picks in one repeat (600) as used for warp, are required.

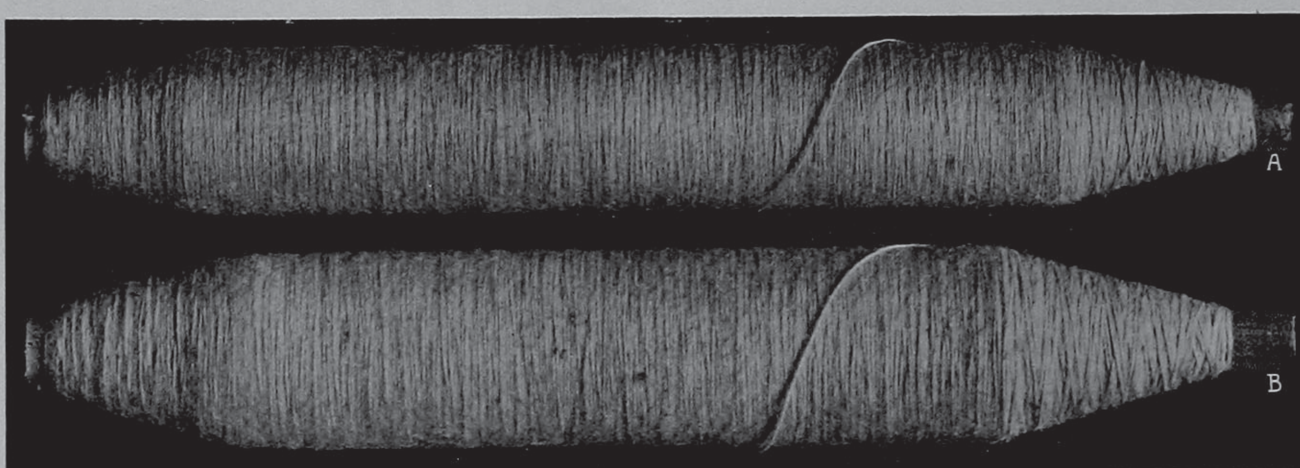
Fig. 45 shows an actual reproduction of a small portion of the complete design, on point paper, calling for 152 warp threads and 76 picks. The left hand upper corner, in our sketch, is the one shown executed on point paper, the same being one half of a warp stripe and one half of a filling stripe, with the figure running from one effect into the other, and clearly shows the principle of how to proceed with the execution of the complete design on point paper.

Note the distinct cutting off of warp and filling effects, (raisers opposite sinkers) at any point where stripes join. This feature must be strictly observed throughout the entire repeat of the design; *i. e.,* this clear cut off is an absolute necessity for a perfect, salable, fabric structure.

Full squares in point paper design refer to warp up, empty squares indicating filling on face.

## The Oswald Lever High Speed Cross Wind Quiller.

One of the most recent improvements in winding machinery, and one that is meeting with universal favor is the *Oswald Lever High Speed Quiller,* for winding fine cotton counts and medium and heavy silk yarns, either on the bare spindle, short butts, quills or paper tubes, from skeins or bobbins, from cones or rewinding.




It is a machine that is extensively used in winding cotton yarns for cotton back silks, regular and coarse silks or dupion, as used in tapestry mills, and attains a speed of 2000 to 2200 r. p. m. The machine is on the same general build as the others turned out by these progressive machine builders.

THE VIBRATING MOTION which is imparted to the builder motion is obtained from the main driving shaft, as running throughout the length, in the middle of the machine. The driving pulley is on the far end of the shaft, while at the head end of the machine, the shaft is provided with a small bevel gear. This bevel gear meshes with a larger gear of the same type, which in turn drives a short auxiliary shaft, seated in bearings, carried by two upright arms, secured to the frame-head of the machine.

The grooved (steel) cam, by which the vibrating motion is obtained, is secured to this auxiliary shaft and operates between the upright arms. The groove in this cam runs in a regular way from side to side and within this groove a steel stud travels. This stud is in turn attached to a union, which is secured on a square equalizing bar, which operates in bearings secured on the same supports, above the auxiliary shaft, previously referred to. From the top of this union a connecting vibrating arm conveys the motion to a vibrating hanger, which in turn imparts the motion to the vibrating shaft, carrying the yarn guides.

This vibrating motion is secured by having the groove, in the cam, run from side to side, or in other words, it runs from a low point to a high point, twice in every revolution.

THE BUILDER MOTION is built upon the principle of the *original Lever and Grundy motion,* with the exception, that it has been improved and works on the cone principle, the object being to build the cop between the convex, flat surface of three revolving cones. *The advantage* of this system of building the cop, being that the yarn is subjected to no friction and consequently does away with all chaffing of yarn during the winding process.

One of the most ingeniously constructed parts of the machine in connection with the builder motion, is the vibrating guide. Inasmuch as the tension of the yarn produces the most satisfactory cop, the new porcelain guide is secured to the vibrating arm in such a way that it will have plenty of play, back and forth, and that the yarn, as it is wound on the bobbin, keeps the guide, automatically, close against the cop.

In order that the nose of the cop may be kept up tight against the surface of the three revolving cones, tension on the spindle is produced by movable weights. As the bobbin builds itself up, the spindle is in turn forced down, the tension on the nose of the cop, by means of the weighting arrangement previously referred to, remaining uniform throughout the process. This tension may be changed by adding additional weight, according to the count and character of yarn in process and the hardness of the wind desired.

WHEN WINDING FROM THE SKEIN DIRECT, the yarn is conveyed from above, it being on reels secured on the top beam. The tension on the skein as is on the reel, is produced by having the beam of the bearing in which the reel rests, weighted, automatically, throughout the process, equivalent to the weight of the yarn as is any moment throughout the process on the reel.

In leaving the reel, the thread is carried through a porcelain guide. This guide is secured on a flexible wire support, which equalizes the slack, which the builder motion exerts on the yarn between the high end of the nose and the long end. This take up wire has to be changed according to the count of yarn in process. Again, on account of the different speed, with reference to high and low diameter of the nose of the cop, without this flexible wire guide the vibrating guide would exert a jerking action on the skein and result in the ends breaking. This guide permits the running of the reel and spindle at uniform speed, the guide being the medium to take-up and let-off the constantly varying difference in feed.

When winding from cones or rewinding, the latter are placed on spindles, carried on a wooden creel board, secured between the sides of the frame in front of the machine. The same spindle will do for holding either cone, bobbin, or cop.

The nose. The length of the throw of the yarn guide, *i. e.*, the length of the nose of the cop, that can be built, varies from $\frac{3}{4}$ to $1\frac{1}{4}''$, and to secure a nose between these points is accomplished by adjusting the stud in the vibrating lever to a different position in the groove, either higher or lower, according to the desired cop required. In order to facilitate matters in this direction, the groove of the vibrating lever and the end of the vibrating shaft are indexed alike, in order that all adjustments will harmonize, as this is essential in building a perfect nose.

For removing the three cones from the spindle, whether for tying a broken end or for doffing, the cone stand is provided with a catch, which when loosened allows the cones to be drawn back, free of the cop.

Another feature of this machine that is worthy of mention is:

The stop motion. It is operated by means of a small eccentric on the main shaft. This eccentric operates a vibrating knife, which extends throughout the entire length of the machine. On the front rail and connected with the spindle, directly above the friction weight, is an oscillating blade. This is connected with a spring trigger, which is in turn connected with a rod running down to a point below the friction weight. To this rod is attached an open ring which fits directly below the base of the weight. When the spindle is in motion this is free of the latter.

In order to more clearly show the working principle of the stop motion we will follow the travel of an end. The yarn is passed through the guide on the rail, this is connected by a wire to the blade, which is weighted at one end. When the yarn breaks, the guide falls, the blade drops to a level with the vibrating knife, catches and is pulled forward, thus releasing the spring trigger, releasing in turn the spring rod which brings the ring up and in contact with the surface of the friction weight, thus arresting the motion of the spindle.

For winding 2-ply yarn, two individual stop motions are provided, one for each single end, in order to arrest the motion of the spindle any time either one of the two ends breaks.

From the foregoing, the mechanical construction of the winder can easily be conceived, and the taking into consideration that more yarn can be put into a shuttle by winding on this principle, using a paper tube instead of wooden or steel bobbins, the flange as found on the bottom of bobbins being utilized, will give more winding surface in a given size cop. Furthermore, the paper tubes are smaller in diameter, bobbins being almost twice as thick.

In conclusion, it is interesting to know that the builders of this new winder, The Oswald Lever Co., Inc., of Phila., claim that they can put more yarn in a given size shuttle, than any other cross wind, and stand ready to prove this statement to any concern interested.

To substantiate these facts, 2 different counts of yarn wound on their machine were submitted for tests:

(A) Single 25's, soft spun cotton yarn, wound on paper tube.

Length of tube: $6\frac{1}{2}''$
Length of yarn on tube: $6\frac{3}{16}''$
Diameter of cop: $\frac{27}{32}''$
Weight of cop:.......... 487.65 grains
Less weight of empty tube: 31.88 "

Amount of yarn on tube:... 455.77 grains
Single 25's cotton = 21,000 yds. per lb. or 7000 grains.

$21000 : 7000 :: x : 455.77$

$$\frac{21000 \times 455.77}{7000} = 1367.31$$ or practically $1367\frac{1}{3}$ yds. length of thread of yarn bobbin contains.

(B) Single 12's, soft spun cotton yarn, wound on paper tube.

Length of tube: $6\frac{1}{2}''$
Length of yarn on tube: $6''$
Diameter of cop: $1''$
Weight of cop:.......... 490.00 grains
Less weight of empty tube: 31.88 "

Amount of yarn on tube:... 458.12 grains
Single 12's cotton = 10,080 yds. per lb. or 7000 grains.

$10080 : 7000 :: x : 458.12$

$$\frac{10080 \times 458.12}{7000} = 659.69$$ or practically $659\frac{1}{2}$ yds. length of thread of yarn bobbin contains.

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From the Superintendent of a Philadelphia Woolen and Worsted Mill: The July issue certainly was a fine Journal; Best ever issued here. 7-25-08. G. S.

### The Mason "Improved Model" Ring Frame.

Among the many types of textile machinery that have been the pioneers in their respective branches, is the *Mason Ring Frame*.

The first successful application of ring spinning is credited to the late Mr. William Mason of Taunton, Mass., who built the first ring frame at Killingly, Conn., in 1833. In 1836, Mr. Mason removed his plant to Taunton, taking all his patterns with him, and there established the well known Mason Machine Works, building then for a number of years, the entire demand for ring frames.

From that day until this, the immense plant of the Mason Machine Works, have produced ring frames that are a credit to mechanical skill, holding a most prominent position in this line of cotton spinning machinery.

At the Corr Mfg. Co.'s plant at Taunton, may be seen an *Improved Model Mason Ring Frame,* lately designed, it being a rule of the Mason Machine Works, that previous to putting a new construction of their various machinery in the market, to subject the first specimen for a reasonable time to actual working test in a mill handy of access and where it is carefully watched by their experts, to be a sure success when put in the open market.

While on a visit to this plant, we had the opportunity of seeing this frame in operation.

Among the many improvements that have been made, is the door to the headstock. This cannot be opened while the machine is in operation, this obviating the possibility of inquisitive persons getting fingers or hands caught in the driving gears and unnecessary expense from law-suits. This alone should be of interest to every manufacturer, treasurer and superintendent of any cotton spinning plant. At the same time the gearing for the builder motion is all contained in the headstock.

THE GENERAL DESIGN for the frame is for more stability and in this direction, the headstock, girth, sampson, etc., have all been built much heavier. The tin-cylinder is operated in heavier ring-self-oiling bearings, and the shaft is provided with a sleeve or bushing, thus reducing the wear on the same to a minimum.

THE SPINDLE RAILS are built on the girder or box rail pattern and naturally tend to increase the stability of the frame.

THE IMPROVED BUILDER-MOTION is constructed on much more simple lines, greater rigidity in construction, being able to turn out or build a more perfectly shaped bobbin.

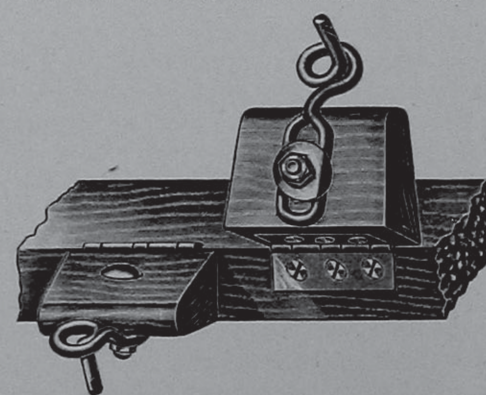
THE CREEL is built on much stronger lines; instead of having a single support as before, it is now built with a double support, thus giving the creel more stability.

In order that the bearings may be kept as free as possible from dust and dirt and to facilitate in cleaning and repairing, or the removal of parts, all the pipe bearings have been discarded and the cap type used in their place.

Another feature which commands attention, is the fact, that on the new type of ring frame it is possible to adjust to a level without the cumbersome method of blocking the feet as before, each foot of the machine being provided with a set screw, intended for this purpose.

### The Palmer Adjustable Thread Guide.

With the march of progress, during the last decade, the different parts of the ring frame were improved from time to time, but little or no attention was paid to the thread guide. As every spinner knows, this is one of the most important points in the production of perfect bobbins, and that with the old style thread guides, the spinner has ends breaking, more or less, and poor bobbins as a result, with consequent loss in production and waste in material to the mill.



One of the most necessary adjuncts to successful spinning, from the time the roving leaves the bite of the rolls until the yarn is on the bobbin, is the accurate guiding of the roving over the centre of the spindle. With the old style screw eye guides it was next to impossible to accomplish this. A spinner would spend time and energy in trying to true the eye, by pushing or bending it this way or that, and taking a turn or two in or out, and by the time he was through it was invariably as bad as before if not worse, the roving ballooning out of centre as much as ever, ends breaking and bobbins building poorly, $\frac{1}{32}$ to $\frac{1}{8}$ of an inch out of centre of the travel of the roving being at the bottom of the trouble.

This state of affairs continued until a short time ago, when Mr. I. E. Palmer, President of the I. E. Palmer Co., of Middletown, Conn., observing those difficulties in the company's spinning department, put on the market an adjustable thread guide, which could be attached to any old style wooden finger board with little or no trouble, and which overcomes all faulty points previously referred to.

This adjustable thread guide has met with universal favor, both here and abroad, and is used already in some of the largest and most prominent mills, which fact alone speaks for its attainments. The adjustable thread guide consists of an ordinary round eye guide, with a hooked shank, which is secured to the finger board, by a bolt and a flanged washer. The top surfaces of the hooked shank are grooved to insure positive adhesion to the wood.

An idea of the guide may be obtained from the accompanying illustration, showing a portion of the thread board, with two thread guides adjusted. On the right hand side may be seen the wooden finger board, as attached to the back rail by the usual hinges, in a raised position ready for doffing. The connection of the guide to the finger board is obvious. To the left, a finger board is seen in position with the guide over the spindle, showing also the top of the bolt used in retaining the guide.

An advantage that this guide has over the old style of thread guides is its simplicity, both in adjusting and setting on the finger board. It does not require a skilled mechanic; any ordinary help can do it, also the frame need not be stopped, it being only necessary to break back an end or two on either side of the finger board to be fitted. In order that the bolt may be set true and the application easily accomplished, a drilling template, forcing tongs and socket wrench are furnished by the manufacturers.

Now a word as to how the thread guide is set, assuming that one is using the above mentioned tools. Adjust the template, bore the hole, and force the bolt. Then lay the hooked shank over the free end of the bolt, place the flanged washer in position and tighten the nut.

After the guide has been secured, it cannot be moved by the operator, but may be adjusted by the proper person when the case may require, either one way or the other, backward or forward, to centre the eye of the guide over the spindle.

These distinctive advantages of the Palmer thread guide should attract the attention of every progressive cotton manufacturer, superintendent, and spinner who are still using the old style guide.

Furthermore, Mr. Palmer has invented a revolving guide which is peculiarly adapted to wet or dry twisting. This revolving guide is attached in the same manner as the one explained, but is entirely different in construction, consisting of a grooved pulley or guide of brass, which revolves in the forks of a holder of non-rusting material. It is claimed by Mr. Palmer, that yarn spun with this guide has the fibre laid closer and is far smoother than yarn produced in any other way, and that the guides more than pay for themselves in the motive power that they save.

**The Sipp Ball Bearing Measuring Reel.**

One of the many improvements that are commanding the attention of progressive manufacturers is the Sipp Ball Bearing Measuring Reel, built by the Sipp Electric & Machine Co., of Paterson, N. J.

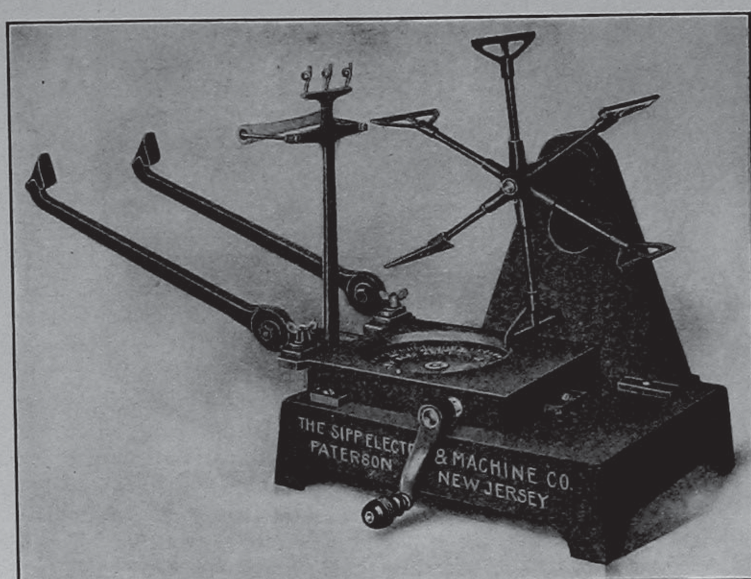
As can be readily seen from the accompanying illustration of this Measuring Reel, the general construction of the machine is superior to any other similar machine on the market at the present time.

The features of the machine which are most prominent, are its compactness, which naturally results in far more accurate results than the old style measuring reel, its easy running, traverse adjustments, and recording dials.

In order to give it a high speed and a light running, the shaft of the driven reel revolves on double ball bearings.

The principle used in driving the reel as well as the traverse guide and the recording dials is the sprocket and chain. It is geared to a speed of 5 turns of the reel to one of the crank at the front of the machine.

Another feature which is characteristic of the machine is the eliminating of the gear wheels, which in machines now on the market are left unguarded and when the operator invariably has trouble either by catching his fingers, clothing, or the yarn he is testing, in the meshes of the gearing. This feature alone makes the new measuring reel far superior to the old style machines.




Then again, the traverse motion. This can be adjusted to two extremes, one *wide gauge* for sampling one end as to condition and count of yarn, and another one, *a narrow gauge,* for use when sampling, three ends at one time, for count of yarn only.

The reel can also be adjusted between these two points, by moving the slide on the guide arm in a groove in the face plate, which is driven direct.

For recording the count of the yarn tested, the machine is provided with two dials. The main dial is used for readings up to 500 yards, and the second dial for readings up to 5,000 yards, the capacitly of the reel being 20,000 yards or more. This fact makes the reel of immense benefit to any concern where large amount of yarns have to be tested.

For removing the skein from the reel, one or two arms, located opposite each other, can be lowered by withdrawing a pin in the rod.

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### The Altemus High Speed Winder.

A question of great discussion at the present time, and one that is commanding considerable attention, is that of rewinding filling yarns from cops or bobbins to shuttle bobbins, in order to increase loom production.

At the same time, in connection with woolen yarns, they can be spun on extra large bobbins (as now done with warp yarn) and then rewound on bobbins, which can be used in the loom, in this way increasing production in the spinning room as well as the weave room, a very important item for any mill.

Mr. Jacob K. Altemus, the well known builder of winding machinery, having made a life long study of the subject, has solved the problem, and is offering to the progressive textile manufacturer, *a high speed, variable traverse winding frame,* for this class of work. The cost of installation is infinite and high production is accomplished at a minimum cost.

The primary feature of this process is that the winder be capable of winding more yarn, of an equal count, whether cotton, woolen or worsted, on a given size bobbin, than otherwise. Mr. Altemus has accomplished this and claims that he has frequently wound the same amount of yarn that was on two and three bobbins, onto one bobbin.

However, there are instances where rewinding will not pay, since the increase varies from 20 to 300 per cent, and naturally in connection with anything below 50% it will be advisable to first correspond with Mr. Altemus on the subject.

REWINDING, and the consequent increase in loom production, is a question of vital importance to every textile manufacturer or manager of a mill and that the claim of Mr. Altemus cannot be disputed and to verify his statements, he extends *to you* the opportunity of sending natural bobbins, as they come from the spinning room, to him, at 2824 N. 4th St., Philadelphia, and having it rewound by his system onto shuttle bobbins, demonstrating to you that it is the best winder ever produced by the well known shop and that it is capable of producing the best results with the least labor.

At the same time, Mr. Altemus is building a complete line of upright spoolers especially for fine silk, cotton and worsted yarns; warpers for wet or dry work, with pinless attachment for obviating pin and section stripes; drum spoolers; winders of all descriptions for winding all kinds of yarns and a general line of machinery to handle tape in the warp or finished condition.

### The Manufacture of Wool Yarns.

With regard to the sorting of wools, no definite rule can be applied until the aim and object for which the wool is intended to be used has been determined. For instance, a manufacturer may have in stock a large number of fleeces which are quite suitable for the production of the finest worsted yarns, and yet he may require the same for the manufacture of yarns which have to be made into fine woolen cloths. In this case sorting will not be the same for the woolen as it would be for the worsted yarn. The difference in the two threads is, that while we require uniformity of surface in the worsted, it is necessary to have a rather rough appearance in the surface of the woolen thread. This difference arises from the fact that woolen yarns, especially those used for such woolen fabrics as meltons and billiard cloths, must be so formed as to allow each thread to embrace or interlock with a neighboring thread during the process of fulling, this effect being accentuated by the serrations of the fibres projecting from one thread interlocking with those of another. An ideal woolen thread used for fulled fabrics is one that possesses the fibres laid almost straight in the core or centre of the thread surrounded by fibres which project in the manner already described; whereas a worsted thread, being required for cloths which invariably have a clean-cut surface and show the weave effect when the fabric has been finished, must be so formed that all the fibres are laid straight and parallel.

From this description it must not be understood that all woolen threads are so made as to produce fabrics which possess a finely fulled or compact finish, neither are all worsted threads made to produce fabrics with a well-defined surface, because in some cases it is essential to have woolen fabrics with weave development plainly visible, and worsted fabrics with a slightly fulled finish.

The machinery and the methods of their actuation play the most important part in the determination of both variety and general effect of all wool yarns. The marvelous development in textile machinery for the manufacture of woolens has been so great that it is now possible to make comparatively good yarns from materials which formerly were considered valueless for manufacturing purposes, and one great advantage in the textile trade is the fact that all waste, so considered by the manufacturers of worsteds, is a valuable commodity to the manufacturers of the woolen thread.

A brief survey of the machinery used in the manufacture of wool yarns will be given. In the first place, therefore, let us contrast the two processes of manufacture—viz., worsted and woolen.

WORSTED YARN. After the wool has been thoroughly sorted, it must be scoured and dried preparatory to being passed through the machines which comprise the actual plant for the manufacture of worsted yarns. It must, however, be mentioned at this stage that as we have to deal with two distinct lengths of fibre, which for simplicity we will term short and long, it is necessary to have two methods of preparing—

that is, preparing the scoured wool ready for the machines which are only able to deal with the wool fibre when it is presented in sliver or continuous length. For this reason there are the short-wool process and the long-wool process. In the former the wool is taken from the drying machine direct to the worsted carding machine—that is, if the wool has not become matted in scouring and does not require passing through an opening machine. The functions performed by the worsted carding machine are such as to combine the separate fibres into a rope-like sliver which is wound in the form of a ball at the delivery end of the machine. The slivers from this machine are then taken (the number being determined by the thickness required) and passed through a combing machine suitable for the length of fibre of which the sliver is composed. If the wool had been long-fibred wool, the process for the preparation up to the stage we have now reached would have been quite different, inasmuch that while we have to prepare the sliver or continuous length of wool for the combing machinery by carding the shortest wool fibres, it is necessary to form a sliver by means of preparing gill boxes, five or six in number, when dealing with long-stapled wools. The combing machinery which treats the wool in the sliver form may be divided into two classes—viz., short wool combs and those used exclusively for the longest fibres. The sliver at this stage, whether long or short wool is being combed, is not composed entirely of fibres equal in length, but it is one of the objects of combing to form a sliver which possesses as far as possible an equality in the length of its composite fibres; if this is not carried out, the short fibres, termed in the trade "noils," will cause uneven and lumpy yarns.

Another process, known as back-washing, is performed either after or before combing, commission wool-combers preferring this operation before rather than after combing has been done, for the reason that a much better price can be obtained for the noils, which appear much whiter than would be the case were they to back-wash after combing. In back-washing it is possible to give a much whiter appearance to the sliver by adding common blue or methyl violet to the liquor through which the sliver is passed.

The next operation after combing is to make a ball of sliver known as a "top" from the several slivers which are put up at the back of a balling gill-box. The tops or balls of sliver made at this machine are regulated in thickness by drafting and doubling—*i. e.,* drawing a sliver or number of slivers out in length in such a manner as to attenuate the length put in at the back of the machine. The tops or balls of sliver are then taken and passed through a set of drawing boxes. This set generally comprises six, eight, or ten machines, according to the nature and quality of the material under treatment.

The term drawing or drafting given to this set of machines is not in any way misapplied, as it is during these operations that the sliver is reduced in thickness to such a degree as to form a roving yarn suitable to be spun in some cases to very fine counts.

Worsted spinning machines may be recognized under three heads—viz., fly, cap, and ring spinning frames,—and manufacturers adopt the type most suitable for the particular trade in which they are interested, as there is a marked difference in the results obtained in each respective type. Some are only suitable for spinning yarns for hosiery, whilst others are built for the manufacture of coating-yarns and threads similar in construction; but when a knowledge of the respective machines has been acquired, along with a study of color mixing and matching, the construction of the various yarns now upon the market will be more readily understood.

It will have been noticed from this brief account of the various operations that the tendency has been to keep the fibres in as parallel a direction as possible by means of the large number of drawings or draftings to which the wool has been subjected.

WOOLEN YARNS. The manufacture of woolen yarns is altogether different from the manufacture of worsteds, the preparation of the wool for the spinning in the former being a much greater responsibility than is the case with the preparation for the latter. This will be understood from the fact that while it is possible to remedy to a large degree almost any defect which may arise in the first machines in worsteds, defects are difficult to remove which arise in the preparation of woolens. In the first place, it may be mentioned that all wools and materials used in the manufacture of woolen yarns are not scoured in the raw state, neither is it essential in some cases to remove all the short fibres; hence sorting and classification of fleeces are not as important to manufacturers of woolens as they are to the manufacturers of worsteds. Whether the wool has been scoured or not, it is imperative, if the best results are desired, to open all wools in machines used exclusively for opening purposes. This process reduces the wool from a comparatively matted state to a very open, free, and much more workable condition than it otherwise would be.

The carding machinery which prepares the roving for the mule requires the most skillful attention, because if a good carded thread is not obtained there is no intermediate process by which it is possible to remedy the defective roving yarn. The carding machine consists of two or three parts. If two, the first part is known as the breaker, and the second as the finisher; if it is composed of three parts, there is an intermediate, known as second breaker, between the first and second parts. The wool is fed into the machine, says J. W. Radcliffe in "The Textile Manufacturer," either by hand or by an automatic arrangement, the latter being much more reliable, as it evenly distributes the material over the lattice or creeper which carries the wool forward to the feed rollers of the first breaker, thus ensuring much better results with regard to even and level yarns.

The machine is composed of a series of cylinders and rollers, all of which perform some function in the carding operation by having their respective surfaces covered with various kinds of card-wire. The speeds of the various rollers are properly timed and regulated, along with proper setting one with another, and when good threads can be obtained, even from materials which were once despised by those associated with textile industries. The latter portion of the finisher card is fitted with a condenser, and is one of the most important parts of the machine. There are many methods of condensing—*i. e.*, reducing the wool from a thin fleece-like state into threads or rovings suitable for the woolen spinner; but the whole of them may be considered under two heads—viz., the double doffer condenser and the single doffer condenser. The rovings or condensed threads formed at this machine are generally from 60 to 240 threads in number, varying with the make of the machine, which is selected according to the materials which are to be carded. The mule which follows this machine is a wonderful piece of mechanical ingenuity. The most important part of the mule is the headstock, and this is situated in the centre of the mule frame. It is from this source that all other parts of the machine receive their actuation and it is regarded as one of the most complicated machines in the textile trade.

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### An Improved Woolen Card.

The object is to increase the capacity and efficiency of a carding engine, without increasing the number of workers in contact with the swift, in fact obtain an increased carding surface with a less number of these workers than are commonly met with, thus permitting the use of a smaller swift, for which reason the height of the carding engine can be reduced.

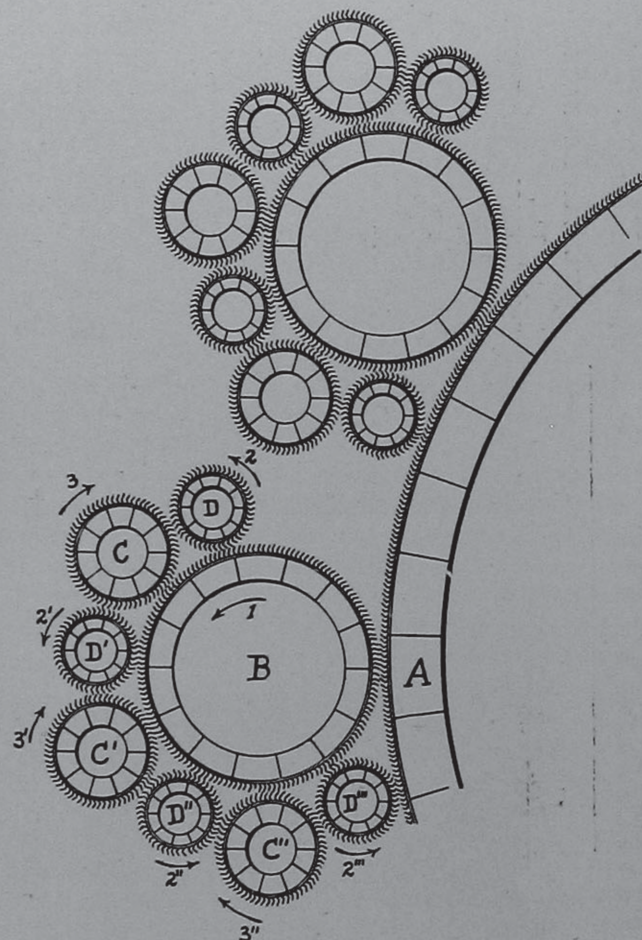
In order to obtain this increased carding surface, we find used in connection with each worker as acting in contact with the swift, three sub-workers, acting in connection with the main-worker. Four stripper rollers form the connecting link.

The construction of the machine, as well as the process of carding, is best explained in connection with the accompanying diagram, of which,

*A* indicates the swift,
*B*, a main-worker,
*C*, *C'* and *C''*, three sub-workers, and
*D*, *D'*, *D''* and *D'''*, four strippers.

Two main-workers, with its companion set of sub-workers and strippers are shown.

The Carding Process. The stock to be carded, is fed to the swift *A* by the customary means (feed rolls, lickers in, not shown) and is transferred from it to the main-worker *B*, because of its slower surface speed. The stock on the main-worker is then carried in the direction of the arrow 1 and is stripped from it by the stripper *D* which has a greater surface speed than the main-worker. This stripper *D*, carries the stock in the direction of arrow 2, and it is taken from the stripper by the sub-worker *C*, which has a greater surface speed than the stripper *D*. This sub-worker *C*, then carries the stock in the direction of the arrow 3, and it is taken from it by the main-worker *B*, in the same manner as the latter takes the stock from the swift *A*, since the surface speed of the sub-worker *C* is substantially the same as that of the swift. The stock is now again upon the main-worker *B* and is carried in the direction of arrow 1, until it is stripped by the stripper *D'* acting in the same manner as stripper *D*. From the stripper *D'*, the stock is taken by the sub-worker *C'* acting in the same manner as sub-worker *C* and again delivered upon the main-worker *B*. This operation is repeated by the stripper *D''* and sub-worker *C''* and when the stock is finally taken from the main-worker by the stripper *D'''*, from which it is taken by the swift, having a greater surface speed than the stripper *D'''*.




Summary of the Speed of Rollers: The surface speed of the main-worker is much slower than that of the swift; the surface speed of the strippers is faster than that of the main-worker, but slower than that of the swift, and the surface speed of the sub-workers is substantially the same as that of the swift and therefore greater than the surface speed of the strippers.

Carding Points: The stock is carded between the swift and the main-worker and is still further carded between each sub-worker and the main-worker. In this way the number of carding contacts through which the stock passes in each machine is increased, providing carding contacts, not only between the main-workers and the swift, but also between each main-worker and the sub-workers arranged around it.

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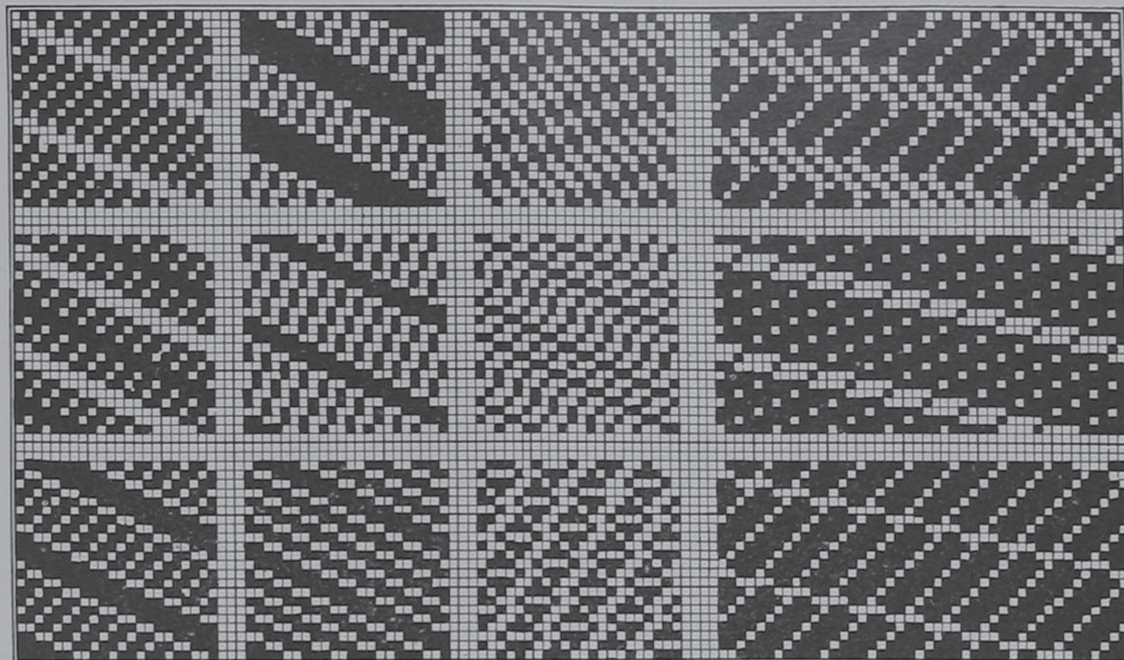
From the Manager of a Philadelphia Silk Mill: I am well satisfied with your paper and wish you success with it. 7-25-08. W. R.

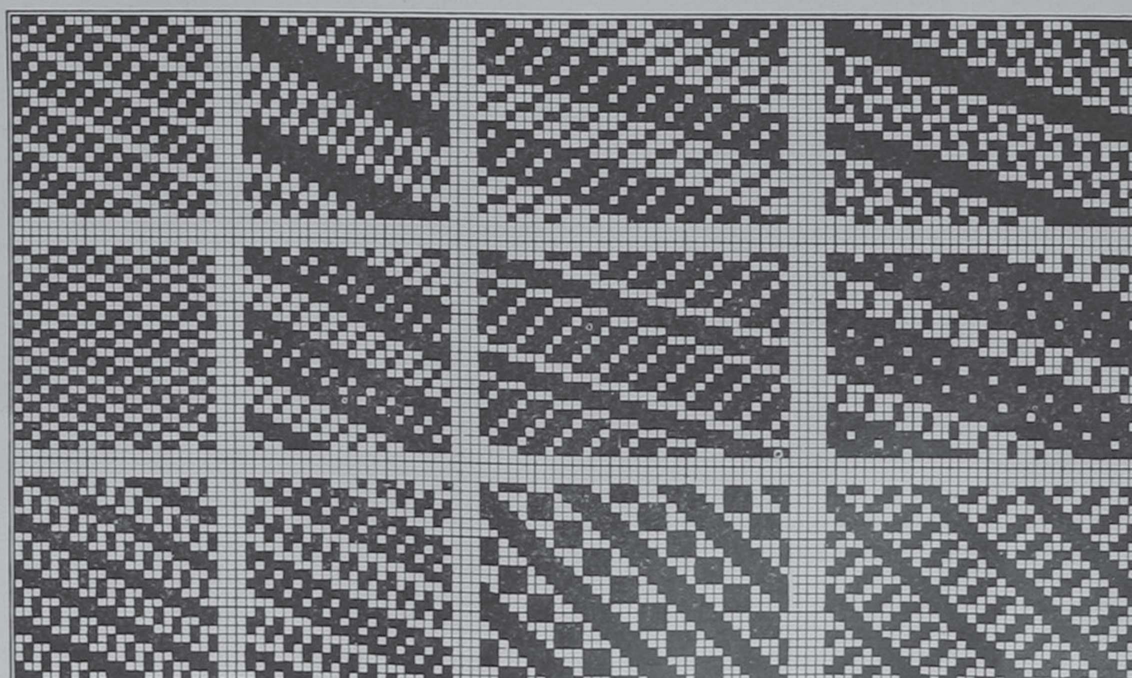
# DICTIONARY OF WEAVES.*

ELEVEN HARNESS



11 × 22 and 11 × 44

ELEVEN HARNESS



11 × 11, 11 × 22 and 11 × 33

*858 weaves have thus far been given.

## COTTON SPINNING.

### The Ring Frame.

(*Continued from page 36.*)

FAULTY WORK OF ROLLS.—The defects in yarn that originate in the roll stand and drafting rolls are chiefly the following: weak spots or lengths, due to imperfect drafting or wrong inclination of the roll stand, or to licking up of fibres by the rolls; soft or hard lumps and knots on the yarn, from waste being carried over from the clearer roll; imperfect twist, from irregular drafting.

Assuming that the roving used is good and that the drafting rolls and roll stands are correctly set, the most frequent cause of bad running work is defective top rolls, the use of rolls that have been neglected or allowed to become flat, uneven, fluted or roughened, out of line, or dry at the bearings. If the top rolls get in such condition, they will continuously lick up fibres of cotton from the roving passing through and will crowd waste up onto both the under clearer and the top clearer, until the latter get so full that waste jams in between the drafting rolls, comes through with the roving and either breaks the ends or forms a lump on the yarn. Not only this, the licking up of waste weakens the yarn considerably by taking many of its fibres from the roving, and besides, just at the finishing stage, destroys the parallelism and regularity of the fibres which have been built up by all the preliminary processes, at the cost of much time and labor and material. The only remedy is to get rid of defective rolls and replace them with new ones, tinkering with them will only add to the trouble. Of course, any defects due to improper adjustment of the drafting rolls or of the roll stand will have to be looked for and corrected, for the reasons that have been given in preceding pages, it being wrong to lay all the fault of bad spinning on the parts of the machine without first having set them with the best of mechanical skill, so that they can do their work to best advantage.

Roller waste is one of the worst troubles to contend with, sometimes a lump will be thrown along the thread board and will break two or three threads, or, if it does not break them, will catch on the yarn and be carried down and wound up on the bobbin. This will make a soft lump on the yarn that will afterwards appear as a fault in the cloth after weaving, which may be attributed to bad piecing instead of to the cause just mentioned. It is often necessary to be able to ascertain just where the fault lies and in what machine or part the trouble is located, as often it is attributed to improper speeding or spacing of the rolls. The method here given is a simple one for this purpose:

Draw the thread from the bobbin and put a strain on it until it breaks and note the breaking point. If it breaks at a soft place or lump, the fault may lie with roving, or, as is more usually the case, the defect is due to the imperfections of top rolls, and these must then be overhauled to find the exact trouble. If the thread breaks away from the soft spot, the lump is then generally caused by a bit of roller waste having been caught up by the yarn and lapped around it during the twisting. As a further test, try to slide the lump along the thread; if this can be done without breaking the latter, it shows that the lump is only soft waste.

Sometimes the lump may be caused by waste picked up from the separator where it has dropped and lodged from the clearers, but this goes back, eventually, to the original fault, *i. e.*, defective rolls causing too much waste and the lump can usually be moved along the thread. Clearer waste in the roving, except when it is small, almost always breaks in or at the drafting rolls, on account of the shortness of the fibres. It may be detached from the roving by the traverse guide, and fall onto the clearers or thread board and then be picked up by the yarn and pass on to the bobbin. The best test to distinguish this is to hold the thread tightly and try to remove the lump by gentle slapping or picking. If it can be easily removed in this manner without breaking the thread, it is certain to be loose clearer waste that has worked through the front roll only, or has been caught up by the yarn after the twist was formed.

The leather covering of top rolls requires more frequent renewal when spinning colored yarns than with uncolored, as the dyes are destructive to the leather. Cleaning and varnishing with shellac will prevent the dye from acting on them as rapidly and for which reason in connection with colored work it should be done at least once a week.

Difficulty is often met with when trying to spin yarn from two rovings of different sizes, the smaller size passing through the drafting rolls without receiving its proper share of drawing and the larger size receiving too much, as the rolls do not grip them alike and if set for one will not be suitable for the other. The only way that this kind of yarn can be satisfactorily spun is to make the coarse roving with as little twist as possible and to put more twist than is usual into the finer roving, setting the rolls for a size a little finer than usual for the coarser strand. Or, the rolls may be set for the coarse roving as if alone—both methods may be tried. The finer roving should be as even as possible and have no excess of twist over that necessary, and for best results, should be made from a better grade of cotton.

As previously stated, the remedy for poor spinning and excessive production of waste at any one spinning frame is to give it a thorough overhauling to detect faulty parts and to replace them with better ones or to clean it thoroughly, as may be found necessary. Sometimes, however, it may happen that all the frames in the spinning room will be turning out poor yarns and running up an excessive amount of waste without any apparent reason and with every frame in perfect order. The cause of poor spinning will then invariably be found to be due to the condition of the atmosphere and the temperature of the room, and changing these conditions will alone correct the state of affairs. If the temperature is high and the air of the room dry, the air will act like a big sponge and will absorb the moisture from yarns and rovings until they are almost bone-dry, then, the cotton fibres will be elec-