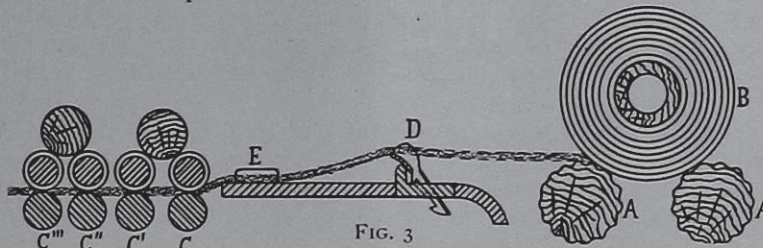


sliver lap machine, minus a drawing frame process, is then put through what is known as a

WHITIN RIBBON LAP MACHINE, the object of which is to make a more uniform lap, ready for the combing process. This machine draws the fibres composing the lap more parallel, and makes the lap more uniform, in the same way that the drawframe makes the resultant slivers more uniform. By this process of drawing the laps out, the individuality of the slivers which compose the lap made on the sliver lap machine is also taken out of the lap, the fibres being more amalgamated so as to make a lap which is more uniform in thickness all across its width than is possible to be gotten from the sliver lap machine alone.



A third advantage aimed at by the use of this ribbon lap machine is that by means of this process, the nippers of the combers are able to get a more perfect grip on the fibres, a feature most beneficial to the satisfactory combing of the cotton.

Four or six laps from the sliver lap machine, each $9\frac{3}{4}$ " wide, are placed in the ribbon machine creel and drawn through four lines of fluted rolls. Highly polished, curved brass plates, guide the ribbon evenly on top of each other on the sliver plate, along which the ribbon is drawn through several press rolls to the lap head, where it is compressed and formed into a lap 12" wide and 16" diameter ready for the combing machine. The superposing of the four or six webs one upon the other gives a very uniform section through the width of the lap, a feature which enables the comber nippers to hold the fibres more firmly, the result being a substantial reduction in the amount of noil made on the comber. This procedure of doubling the laps on the ribbon lap machine is similar to that employed at the feed end of a finisher scutcher, the chief difference being that the scutcher has a traveling lattice for passing the laps forward, while the ribbon lap machine has carrying rolls instead.

Metallic rolls are strongly recommended for use in these machines. The machine is provided with a *Back Stop Motion* which stops the machine whenever a lap in the creel breaks down or runs out; a *Full Lap Stop Motion* in the lap head which insures the laps to be of uniform length; and also the *Holmes Patent Stop Motion* which prevents breakage due to lap winding about the front rolls.

A *Weight Relieving Motion* is also provided, whereby the pressure on the top rolls may be removed when desired, thus preventing the flattening of the leather covering of the rolls as would happen without this device if left under weight pressure any length of time.

Extra Laps are held on a *low down* creel at back

of machine, thus permitting the employment of smaller help. The draught is from 4 to 6 according to the number of doublings, but varies to some extent, as the sizing for the combing machine is done on this machine. The rolls in this machine should be spread $\frac{1}{8}$ " to $\frac{3}{8}$ " over the length of the staple, according to the weight of the lap going in at the back.

The Whitin Ribbon Lap Machine is built with four or six heads, each complete in itself, except the drive which is common to all; the production of all the heads being finally combined into one 12 inch wide lap ready for the comber.

Fig. 3 shows the principle of operation of one of these six heads, of which, if so desired in certain

instances, only four may be used. The lap *B* as coming from the sliver lap machine is placed in the creel in back of the machine on wooden fluted lap rollers *A*, said rollers by means of frictional contact with the laps *B* unwinding the same slowly. The lap is then taken forward by passing through the four pairs of drawing rollers *C' C'' C''' and C''''*. Between the wooden rollers *A* and these drawing rollers, the lap in its course through the machine passes over the balanced plate lever *D* of the back stop motion. From there the lap is passed through guides *E*, which prevent it from spreading out, as is its natural tendency to do all through the machine. The cotton emerges from the rolls in the form of a fine sheet and from there passes over a curved brass plate on the sliver plate, which necessitates deflecting the cotton film 45° . As each sheet comes from its curved brass plate on the sliver plate, it passes through a pair of carrying rolls, and as the sheets pass along the sliver plate toward the winding mechanism, they become superposed on each other (each head delivering its film on the preceding one) and in this position pass forward, together, through the next pair of carrying rolls. The last pair of carrying rolls is near to and delivers to the winding motion, which in turn winds the combined sheets upon a spool.

(To be continued.)

LINEN FINISH ON COTTON. A mixing, which according to the Deutsche Färber Zeitung will give to cotton the appearance of linen, can be prepared from the following recipe:

Apply to bleached material:

Wheat starch	4 lb.
British gum	4 "
Carrageen mucilage	2 "
Talc or other white mineral	1 "
Linseed oil	$\frac{1}{2}$ "

Boil ingredients for fifteen minutes in ten gallons of water, and use the dressing lukewarm.

THE BLEACHING, DYEING AND FINISHING OF KNIT GOODS.

(Continued from page 295, Vol. II.)

Finishing. After being bleached or dyed, rinsed and extracted, piece goods (small wear), whether underwear, hosiery, etc., must be at once shaped and dried, whereas roll goods or flat goods, if dyed in the piece, according to the nature of the goods under operation, are either brushed and dried, or napped and dried, or only dried, and in turn forwarded to the cutting up department to be there transformed into the desired garments. This subject will be treated later on in a special chapter.

THE SHAPING OF HOSIERY AS WELL AS UNDERWEAR, ETC., whether made originally on a circular or a flat machine, is carried out by pulling the garments on wooden forms, allowing them to dry while in this condition. In stretching the goods on the form, they should be carefully drawn to the form so that every part of the garment, whether hosiery or underwear, fits the form perfectly. If this care is not exercised, distorted garments will be the result, and when for example with hosiery, the hose is apt to be baggy at the toes, or the heels will be uneven, and underwear will not be of uniform shape. If rib hose, be careful to have the ribs boarded straight, or they will present an unsightly appearance. The drying is carried out by placing them in this condition in a drying room and allowing them to remain there till dry. The drying room is heated to hasten the drying, however, they should not be heated too high or the fibre might be injured. All steam that arises from the goods in drying should be allowed to escape, and the heat should be kept uniform so that the drying will be uniform, the goods being removed from the dryer as soon as dry. The forms are then removed and when the stockings or garments, as the case may be, are ready for pressing, which operation forms one of the most important factors in the sale of the finished goods, as the appearance of the goods is greatly due to the way in which this operation is done. The style of finish varies with the kind of fabrics as well as with the purpose for which the goods are intended.

Hosiery, for instance, is divided into plain and ribbed fabrics, which differ as to the methods of their pressing.

In the instance of the former, after smoothening them by hand on the forms, they are hot pressed between press paper boards, under screw or hydraulic pressure, the latter producing the most desirable finish, although great care must be taken not to exert too much pressure on the goods, since this might give them an undesirable, glazed or shiny appearance, instead of the desirable soft effect.

It is a practice among some finishers to press the goods when they come from the drier, then steam and re-press them, in order to further the desired appearance, but as a general rule one pressing only is sufficient in connection with the bulk of the goods.

Pressing smooths the fabric and imparts a finished appearance to it, while heat in connection with such pressure imparts gloss to the fabric. The time that a

fabric has to remain under pressure varies with the character of the goods under operation.

In connection with ribbed fabrics, the press should be so adjusted that the feet of the hose only come under pressure, and at the same time having the leg in such a position that it will be free of pressure. This is done so that the moisture coming from the steam-box may be absorbed by the stocking and the heat from the press plates cause the ribs to swell and become prominent. The success of the operation depends on the operator's good judgment as to when the goods have been in the press the required time and as to when they have attained the bright glossy appearance and the rib is well brought up.

It is at this point that any defects in the fabric become visible, for it often happens, if the scouring has not been performed with due care, that such goods will, under the action of the hot press, become spotted. The oil used in the preparation of the wool for spinning the yarn, and which if not properly removed in the scouring will be still more spread by the hot press plates and spot the fabric. Such goods should be kept separate and marked to that effect.

After the goods are pressed, they are sent to the menders, whose duty it is to fix up all imperfection in knitting. From here they go to the pairers and folders. These three operations require care and precision, in order that mending shall be unnoticeable to the untrained eye, that the heels, toes and length of legs of the pairs conform with the standard as to sizes. The latter is of great importance, since with irregular mated stock, the goods would be considered from a commercial standpoint *not well finished*, and the manufacturer would be the loser. Another thing which leads to the same result is placing seconds or badly mended goods in with first quality stock. Again, see to it that uniform boxes are used for the different sizes.

To add to the attractiveness of the product, the dozen pairs is generally divided into halves and bound together by a neat band. Another thing which tends to keep the boxes and goods in an attractive condition is to use care when packing cases for shipment, to be sure and have the boxes fit snug in the case so they cannot knock against the sides in transit and come on the market in a battered condition.

Roll goods as well as flat goods are cut up and transformed into garments, either after coming from the machine or after the goods have been scoured, bleached or dyed, *i. e.*, as the nature of the fabric under construction directs.

Roll goods come from the knitting machine with its face inside the roll, based upon the fact that the inside of the circular web presents a clearer, more defined fabric structure, showing the wale or rib formed by the knitting process more distinct, whereas the other side (outside on machine—back in the garment) shows the annular courses formed by the knitting process. This feature of taking the fabric wrong side of the machine compels us to turn said web inside out, and what most often is done before the fabric leaves the knitting department, by means

of what is known as a *web turning and rolling up machine*. The process itself consists in drawing the web on a tube or cylinder until the other end of said web can be introduced into and drawn through the inside of the web, after which it is automatically, at the further end of the machine, rolled up in shape for conveniently handling in the mill, whether to the cutting department or the scouring, bleach or dye house, as the case may be.

(To be continued.)

A STUDY OF KNITTING.

(Continued from page 354, Vol. II).

We will now give a description of the construction and operation of the most prominent makes of knitting machinery for the various knit fabrics made.

The Rib Top Machine.

For explaining this class of knitting machinery, we have selected the Brinton Full Automatic Rib

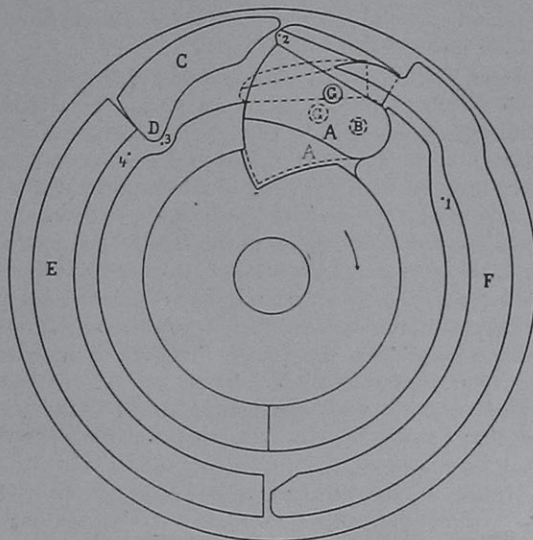


FIG. 22

Machine. The same is a single feed machine, that is, one yarn carrier is used to feed the yarn, from one, two or more cones, as required to produce the proper weight of fabric to the needles.

The machine consists essentially of a head motion for performing the knitting operation, a pattern motion for producing the welts and slack courses in the desired positions on the plain rib tops, and a take-up motion for giving an even tension to the knitted fabric, with any length of stitch used in its production.

THE HEAD MOTION contains two separate sets of needles, but which work in conjunction with each other, the needles being placed alternately in the proper working positions in the machine. One set of needles, known as the *Dial needles*, are placed horizontally in the head and rest in grooves in the *dial plate*, said needles being placed radially from the centre of the dial plate. This dial plate is circular, being provided with radial grooves on its top surface for holding the dial plate needles, and is held in position in the machine

by having a shaft from the yoke extending vertically through it with a collar attached to the lower end. The dial plate is prevented from turning, by means of two projections on the side of the plate, which rest in slots provided for them on the frame, and hence the dial plate needles receive no rotation.

Situated directly above the dial plate is the *dial cap*, which is secured to the shaft extending from the yoke and thus it receives its rotation. The under side of the dial cap is made with a cam groove for receiving the upwardly projecting shanks of the dial plate needles, said cam giving the required horizontal movement to the dial plate needles for knitting.

In order to explain the operation of the *dial cap cam* on the dial plate needles, and also to show the proper outline of the cam groove, Fig. 22 is given, which is a view taken from the under side of the dial cap. The cam revolves in the direction of the arrow and the dial plate needles are operated by the inside surface of the groove. The cam *A* is made movable, being centred at *B*, in order to change from the plain stitch to the welt.

The method of making a stitch may be seen by examining the outline of the cam groove.

First, consider position as indicated by 1 on the cam groove. It will be noticed that at this point the groove is beginning to curve outwardly from the centre of the dial cap. As the motion of the needles is controlled by the cam groove, the needle acted upon by this point of the cam will be moved outwardly until the point 2 acts upon it. During this time the latch of the needle, which was closed by the last inward movement of the needle, is opened by being forced against the stitch in the hook of the needle, said stitch, when the point 2 acts, resting on the needle behind the open latch. When the latch was opened by the stitch, the yarn carrier, situated on the dial cap, deposited new yarn into the open hook of the needle, the yarn carrier being placed on the dial cap so as to deposit yarn at a point just in front of the point 2. From the point 2 to point 3, the needle is drawn inwardly in order to have the stitch, as resting behind the latch on the needle, slide over the hook (thus closing the latch), and be cast off, thus completing a single knitting operation by the dial needle. From the point 4 to point 1, the needle is at rest, when it again performs the same operation as described and makes another stitch. It will be noticed that only one needle has been referred to in connection with the operation, although the cam, as it revolves, acts upon each needle in succession in the same manner as described.

The movable cam *A*, as shown in full lines, is in the position for giving the plain stitch, while the position shown in dotted lines is for making the welt. The cam is operated from the pattern wheel through pin *G* (corresponding to pin *G* in Fig. 26). The welt is made by having the needle move outwardly only half way in order that the stitch in the hook may just open the latch without sliding behind it, so that

the yarn carrier may deposit another stitch, thus having two stitches in the hook when the needle is drawn back by the cam. This half way movement of the needle is obtained by having the cam *A* move only half way in, which is controlled by the pattern wheel. Before the cam *A* comes around again to the needle, said cam, that is, the groove, has been moved entirely in, so that the needle is not moved outwardly and thus loses a stitch, this being repeated again, in order to make two lost stitches which form the welt. It will be understood that the cylinder or vertical needles, not yet referred to, are always in operation during this change of working by the dial plate needles.

The plate *C* is made adjustable with screws and is used to regulate the length of stitch taken by the dial needles. For a long stitch, the nose *D* is set farther in towards the centre of the dial, so that the needles will be correspondingly pushed farther in and thus draw a longer length of yarn with them, in this manner producing the longer stitch. By setting the nose *D* outwardly, a shorter stitch is obtained, as in this case, the needles do not go in as far and consequently take less yarn for a stitch. The rings *E* and *F* are used to prevent any possibility of the needles flying out when they should be at rest.

The set of needles used in connection with the dial needles are known as the *Cylinder needles* and are placed vertically in the grooves of a needle cylinder for holding them. The body of the needles extends below the dial plate, in fact, the needles go entirely below said plate when they are at rest, and only slightly above when in the highest position, in order to catch the yarn which was laid on the dial needles. The cylinder needles are placed so that each needle rises between two dial needles and draws down enough yarn to allow of a stitch by a needle from each set.

(To be continued.)

New Colors.

As always, the Farbenfabriken of Elberfeld have again this month surpassed others in their new fancy colors submitted. Amongst these are:

DIAZO GERANINE B EXTRA. It produces very clear pink shades fast to boiling as well as bright dark reds of excellent fastness to washing and cross dyeing in connection with loose cotton, yarns, cops, cheeses and piece goods. It will be found particularly useful for the dyeing of cotton material required fast to washing, say for shirt blouses, tickings and dress goods, furthermore for effects to be fast to cross dyeing.

AZO ACID BLUE 2 G is another new color, particularly recommended for the dyeing of ladies' dress material as well as for other woollen yarns which are required to be fast to washing or moderate fulling alongside white wool. This dyestuff may be employed in combination with Benzo colors for the dyeing of half-wool. In wool-silk, the wool is dyed a darker shade than the silk. It is also well suited for direct printing on woollen material; the prints on wool as well as on silk are very fast to washing. Another dye is their

QUINOLINE YELLOW N EXTRA AND EXTRA CONC. Both are dyed in an acid bath according to the ordinary method applied for acid wool colors, and they can be employed on wool for the same purposes as the older Quinoline Yellow; they are useful for toning fashion shades and in combination with the Brilliant Acid Blue A and V or Brilliant Acid Green 6 B of the Elberfeld, produce very bright yellowish green shades. Cotton effects are not stained. The new Quinoline Yellows are furthermore especially adapted for the dyeing of weighted and unweighted silk.

THE DYEING OF CARPET YARNS.

By E. T. Heuser.

Carpet yarns are dyed in the acid bath for two reasons:

- (1) On account of the less expensive process, and
- (2) That on account of the simplicity and quickness of the process the character of the wool fibre is preserved, the same retaining its lustre and handle in the finished fabric, the colors coming up bright and full.

To accomplish the latter, it must be remembered that these yarns must be thoroughly scoured previously to the dyeing process, since otherwise dirty, cloudy colors will be the result; besides during wear, dust and dirt will adhere to greasy places in the carpet and when such defects can only be remedied by a free cleaning with benzine, always an expensive process. On account of the coarse wools used for carpet yarns, the same require plenty of lubricant in the mixing and picking process to permit satisfactory carding and spinning of the yarn, using in many cases a cheaper class of lubricant, for which reason the dyer must be careful and sure that the scouring of these yarns is done properly, using in most instances two scouring baths—the first to clean the yarn roughly, the second to complete the process, *i. e.*, produce a yarn absolutely clean. The yarn is then rinsed in cold running water and afterwards hydro-extracted. The latter process (hydro-extracting) is most important, since even with the most careful rinsing, traces of dirt and soap will adhere to the wet yarn, which must be thrown out by the centrifugal action of the hydro-extractor.

The strength and heat of both scouring baths depends on the nature of the yarn under manipulation. For example, a fine quality and count of carpet yarn, intended for the best qualities of carpets only, will scour easier than yarn intended, for instance, for Axminster carpets, the latter again being easier scoured than the coarse counts and qualities of yarns manufactured for Smyrna carpets.

In order to obtain satisfactory results in scouring carpet yarns previously to dyeing them, it will be advisable that the dyer knows the kind of oil that has been used in the conditioning of said wool for carding and spinning. The Germans use chiefly oleine for this purpose and which is best liberated from the yarn by using soda and ammonia as cleansing agents in the scouring bath. England and America use cotton seed oil for the lubricant of carpet wools and when soft soap must be used in the scouring bath with the addi-

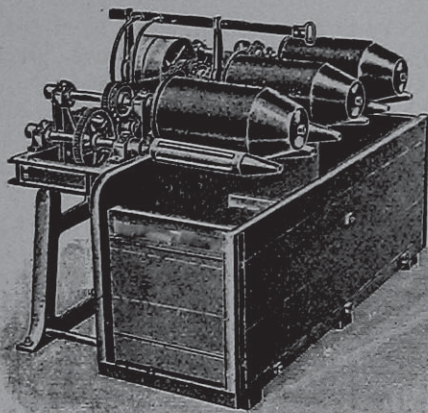
tion of soda, but no ammonia. To ascertain whether oleine or cotton seed oil has been used is readily ascertained by the characteristic smell of the cotton seed oil provided the latter has been used in the mixing process.

To give a standard recipe for scouring any kind of carpet yarn is impossible, since condition of water at our disposal, as well as character of wool and lubricant used, vary, however, the following recipe will do for average yarns you will come in contact with:

Prepare the scouring bath for 100 lbs. of yarns with
 15 lbs. ammonia soda
 6 lbs. ammonia
 5 lbs. best soft soap

Boil the latter first in a separate kettle and then add it to the scouring liquor.

A fresh prepared scouring bath must froth on stirring and feel substantial to the touch of the hand. As will be readily understood, the scouring bath is used over and over again during the day, being kept up to its standard strength by adding scouring liquor as the case requires. Always keep the first scouring bath con-



siderably stronger than the second. As a rule, the first bath is run off every evening, the second bath being used the next day as first bath after having been brought up to its full strength, and a new second bath is prepared. Keep the first bath from 108 to 115° F., and the second bath from 117 to 122° F., depending on the character of the wool; keeping both baths as low as possible (consistent with a clean resultant yarn) if dealing with a yarn that is apt to readily felt. The process requires from 1½ to 2 hours in each bath.

One of the latest styles of washing machines built is provided with rotating rollers which squeeze the yarn in the scouring bath, with the result that the scouring liquor is most thoroughly brought in contact with the wool fibres and a most thorough cleansing of the yarn effected. Previously to the yarn leaving the washing bowl, the same passes between a pair of heavy squeeze rollers which express most all of the scouring liquor the yarn holds and which runs back into its bowl. After leaving bowl No. 2, the yarn passes onto an endless apron, which carries it under the influence of a number of high pressure sprinklers, to rinse off any of the scouring liquor still adhering to the yarn, after which the latter passes again between a pair of

squeeze rolls. This procedure makes hydro-extracting unnecessary.

The machinery acts in a continual process, one person only being required for their operation. The yarn is not hurt by the process and delivered in a perfectly clean condition. The accompanying illustration shows us one of the bowls in its perspective view, the pair of squeeze rolls as are secured to one of its end being omitted, neither is the rinsing section shown; the chief object being to show the rotating rollers as squeeze the yarn while in the bowl, as well as the arrangement of a drive used. The machine in question is built by one of the most prominent builders of textile machinery in Germany and will interest builders of scouring machinery here. To ascertain whether the yarn is quite clean, take a few ends from scoured skeins and place them between tissue papers for some hours under the full pressure of a copying press. If, after taking them out of the press, the tissue paper shows no traces of grease spots you may proceed with the dyeing process.

If called upon to dye light, delicate colors, such as cream, salmon, pale pink or blue, etc., the dyer must first convince himself whether the color of the yarn is such that these delicate, light colors can be obtained. If the yarn is too dark (too yellow or too gray) for such colors, it then must be first bleached. This is done in a bath containing bisulphite and sulphuric acid, in proportions of 1 to 2, at a temperature of 140° F. A recipe for the strength of the bleaching bath cannot be given, the same depending upon the condition of the yarn. When starting a fresh bath it will be advisable, if possible, to use a batch of yarn destined for darker shades, in order to thus remove any dirt in the water and when after strengthening the bath with bisulphite and sulphuric acid, proceed with bleaching batches of yarn destined for more delicate colors. The duration of the bleaching process is from 1 to 2 hours. After the yarn has been sufficiently bleached, we then can color delicate shades, like cream, salmon, pale pink, etc., by the addition of Auramine and Rhodamine; pale blue, by the addition of New Victoria Blue, and other shades by other acid wool dyestuffs, adding the same direct to the bleach bath, without change in temperature (140° F.), at the same time quickly revolving the skeins during the process, in order to obtain even shades.

Another method to obtain delicate and clear shades is to dye the yarn, well cleansed in a Glaubersalt-sulphuric acid bath, with dyestuffs that will stand stoving, such as Fast Light Yellow, Rhodamine or New Victoria Blue, etc., after which the dyed yarn is rinsed and placed in the sulphur chamber. This process requires considerable practical experience, since the dyer must be fully aware in which direction a shade of color under operation will change in stoving.

The most important process, and the one coming more and more in favor of all others in connection with these delicate, light shades of carpet yarn, is bleaching the scoured yarn with Peroxide of Sodium as brought in the market by the Roessler & Hasslacher Chemical Co. of New York. This process is just as

cheap as the others, besides has the advantage that it does not influence, *i. e.*, alter any dyestuff nor injure the strength of the wool fibre in the least, and is fast superseding the older processes. The Roessler & Hasslach Chemical Co. issue special pamphlets to the dyer on this subject, (mailed free upon application) giving full directions as to procedure, etc., and to which the reader is referred to.

As will be readily understood, bleaching in connection with carpet yarns only refers to white, or light, delicate shades, whereas with the bulk of this class of yarns, bleaching is unnecessary and when the yarns can be dyed direct with Glauber's salt and sulphuric acid or for dark shades with tartar preparations.

There are 2 rules which must be observed in connection with the dyeing of carpet yarns:

(1) To work with standing baths, as far as possible, to assist leveling. For this reason it is preferable to first dye a dark color, in order to be able to afterwards use the standing baths (in place of running it off) for coloring by it a lighter color. Not only is the result, *i. e.*, the color required, quicker obtained, but at the same time a saving in steam and labor expenses is effected.

(2) To adhere to the same mixture of colors in making combination shades. For instance, if one lot of yarn has been dyed olive with a mixture of green, yellow and red, the next must not be dyed olive with a mixture of green, yellow and orange. Example quoted is rather drastic, but omit shading with another dyestuff, no matter how inviting, in some instances, it may appear to you.

Following this rule will simplify the work for the dyer, the shades will remain uniform, both on face as well as section of thread, neither will artificial light show a variation. We will now, in the interest of dyes fast to light, give a short description as to the dyeing of the different shades.

To obtain bright and distinct tones, it is necessary to boil 1 or 2 lots previously to dyeing bright shades, whether we are to use a fresh or a standing bath, no matter if the latter only stood for one night. It will be in place, to mention here, that it is advisable to reserve 1 or 2 dye tubs specially for the dyeing of light colors, and have the same provided with indirect heating. When dyeing light colors, see to it that the dye bath is transferred, in order that dyeing *to sample* don't require too much time, since the quicker a shade (more particularly a light shade) is obtained, the clearer and distinct the same will be. Light colors, if boiled excessively, will always present a dull appearance, which is more particularly noticed in the section of the thread, *i. e.*, where most carpet yarns are shaded by. (Specially translated for the Journal from Textil und Färber Zeitung.)

(To be continued.)

The Evolution of Silk Manufacturing in Lyon.

The same formed the subject of a paper recently read at a meeting of the Silk Manufacturers' Association, in Lyon, the silk centre of the world, and which will be of more than passing interest to our readers.

Lyon's silk industry may be classed in three divisions, each operating independently of the other, viz: (1) the manufacturer, who buys the raw material and prepares it for weaving by dyeing or otherwise, has it woven and sells the merchandise; (2) the master weaver, who has the silk woven on hand or power looms, and (3) the dyer and printer, who either dyes or prints the yarn or the woven fabric and delivers the finished goods to the manufacturer.

During many years these three divisions of silk manufacture were concentrated in Lyon. Gradually a large part of the hand-loom work was driven into the surrounding country, then caused by the erection of large silk manufacturing plants, worked by steam power. These hand looms were distributed in seven neighboring departments, the office of the manufacturer, however, remaining in Lyon, and where the finishing of the silk is done.

From statistics furnished there were in 1888 in Lyon 34 silk mills belonging to manufacturers, and 154 belonging to men who worked on contract for silk merchants. To-day there are 36,000 power looms in Lyon, many of which belong to workingmen. To these must be added from 55,000 to 60,000 looms scattered over the country in the neighborhood, making nearly 100,000 looms in the district, outside the large silk mills.

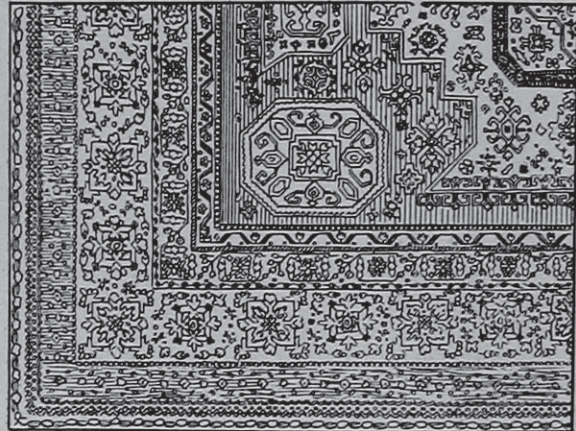
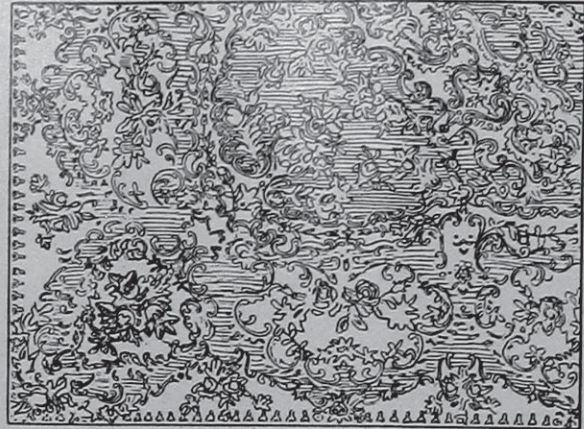
The great object of the silk interests of Lyon is to give steady employment to the men and women, who have been thrown out of work in the city by the introduction of looms into farm houses and the erection of large silk mills there, worked by steam or electricity.

In 1881 a number of citizens organized a company for the purpose of furnishing the hand weavers of Lyon with power looms to be run by steam, a contract being entered into that the weavers should pay a small sum per month for the new apparatus. For various reasons this society dissolved after five years of intelligent and conscientious effort. One reason for the failure was the aversion of the weavers to abandon the old process. They insisted that the material made by the power loom was inferior to that made by hand loom, and some of the large dealers encouraged their opinion. The failure of the experiment seemed fatal to the weaver, he being compelled to return to the hand loom. Several new, large mills were started, and more power looms than ever distributed throughout the country.

By this time the use of electricity had become so common that it was thought possible to furnish the journeyman weaver with a motor power cheaper than steam. A company was organized for this purpose. The weavers had been out of work so long that they cheerfully accepted any plan that offered relief. The men at the head of the movement contracted with users of electricity for their surplus power and obtained the right from the city authorities to run wires into a quarter of the city called the Croix Rousse, the traditional home of the silk weavers.

A contract was made with the weavers that they should pay 10 per cent. of their earnings for the new machinery, and electricity was soon employed in

NEW RUG DESIGNS.



THE ABOVE ARE SPECIMENS OF NEW DESIGNS FOR RUGS, LATELY PATENTED BY THE J. W. DIMICK COMPANY OF NEW YORK

throwing, winding, weaving, and all the work of producing silk. The great electrical works of Lyon furnished electricity for one loom at 75 francs (\$14.48) per year, representing a fraction less than 5 cents per day of ten hours. In 1901 there were 500 looms worked by electricity on the Croix Rousse hilltop in Lyon. The silk loom was again running in the homes of the weavers, beside the kitchen and bedroom. A telephone was also placed in an office convenient to all the weavers that they might communicate with the office of their employers in the centre of the city, without loss of time.

After an experience of four years the promoters of the new movement reported that a weaver could do as much work on the power loom placed in his apartment as was done on the average loom in a large factory; that power looms were worked in all the rooms of many five and six story buildings without any complaint from landlords or inconvenience to anyone.

The results thus far reached have demonstrated that in spite of the establishment of large mills, where silk is made on a hundred or more power looms, men and women can pursue their work, as of old, in their

homes, without being at the mercy of great aggregations of capital. It is better understood than ever before that the interests of capital and labor can be united and made to work together. The great silk merchants who a few years ago furnished looms to farmers, and whose principal aim was to get their work done, have combined in an effort to furnish steady employment and to prevent the surplus production by factory looms from depriving any part of the people of work.

A movement is now on foot to build a workingman's city upon the Croix Rousse hilltop, where labor will have cheap rents and all the advantages that accrue from great combinations of capital. It has been demonstrated that the important advantage of power looms can be utilized by the individual families. It is now desired to bring back the looms from the country to the homes of the weavers in the city in order that the people of the city may enjoy steady work, and that the silk industry for which Lyon is famous may enjoy the benefit of the technical knowledge that several generations of work have given to the Lyonnese weavers.

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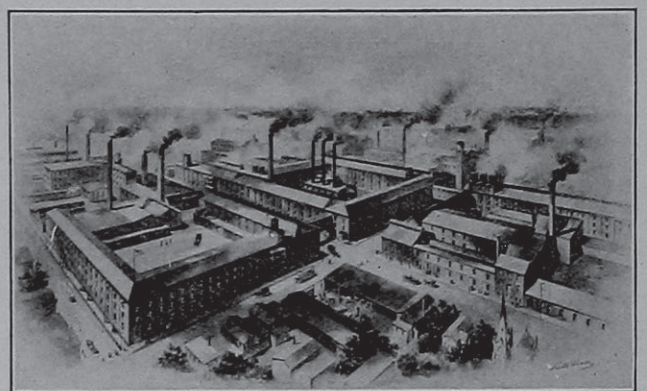
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useful in the dyebath to ensure evenness. More washing is required after dyeing, and if the goods have to be extra fast and clean, another round of tannin and fixing bath must be given. Thus it is readily seen that these irreplaceable basic dyes are expensive to manipulate, and when manufacturers of fabrics are ever calling for reductions in the price of dyeing, the dyer is compelled to look around for more economical methods. The cheapest tannin material is myrabolam extract, and the cheapest fixing agent ordinary potash alum, after which little or no washing is necessary; indeed, the most economical arrangement of all is to impregnate the cotton with extract (strength according to depth of shade required), squeeze, pass into an alum bath, lift and add dye to the same liquor, and finish without washing. But while this is scamping, and does not give either fast or clear shades, it is often satisfactory for low-class goods where prices are cut down to lowest points. For light clear shades myrabolam extract is too dark colored, and sumac, or, still better, pure tannic acid must be used. With these mordants tartar emetic or antimonine must be used as fixing materials, and then washed well. In the treatment of hank yarn considerable economy may be effected by keeping up the tannin and fixing baths for further use; an addition of acetic acid to the former helps absorption very perceptibly. Even then only half quantities are needed to freshen up the baths. There is no *short cut* in the labor of mordanting hanks. A process was patented some years ago by a German firm, says James Barker in the Textile Manufacturer, whereby the tannic and antimony materials were mixed together, and, with the addition of 2 per cent. oxalic acid, fixed on to the cotton in one boiling bath. Very little seems to have come of this ingenious suggestion. With warps and chains, however, very material economies may be brought about with the right sort of machinery. Formerly it was the universal practice to steep the warps over-night in a decoction of sumac, then draw them out by hand and give two ends through a one-hole machine containing tin spirits. Washing well on another machine finished the preparation for dyeing. This cumbersome process still obtains in dyehouses where space and capital are limited. A great improvement is to mordant the warps on a three or four hole machine, having the tannin in the first hole, antimony salt in the second, and running water in the others. The chains may be passed through several times until the suitable depth of mordant is attained.

When a six-hole machine is available the improvement may be carried still further. Then the tannin

matter is put in the second box, the antimony salt in the third, the fourth containing running water. The fifth box may be got up as the dyebath, while the sixth may be utilized to wash the loose color away, this method giving very good results indeed. One precaution with this arrangement must be rigorously observed by the machine minder. He must regulate the roller wrappings so that the chains or warps are not tight in the dyebath, otherwise uneven results may be expected. The really good machine-man will see that the warps are loose and easy in every hole, so that the materials can thoroughly penetrate the fibre. Some men, however, are so afraid of damages resulting from warps getting round the rollers that they keep them inordinately tight.

A machine arranged in the manner described lends itself to endless variations, and any kind of basic color can be produced with efficiency and economy. Rhodamine baths are difficult to exhaust, and many a good liquor is run down the drain. Rhodamine pinks and reds may be dyed as described above, and the bath will be almost entirely used up, as may be perceived by tying a grey thread on the end of the chains at the last passage. This will be seen to be scarcely dyed. Again, cotton mordanted with tannin after one passage through the machine has more affinity for the tannin, and nearly exhausts that bath at the second passage. Moreover, part of the dye is tanned on the top by passing through the second time, and the shade is made all the faster. Three ends will serve to dye very deep and fast pinks, greens, violets, etc., and by careful management good matches may be got at the second passage. For opals and royals with Victoria Blue B the tannin bath must be proportionately weak, or uneven dyeing will be the result. Excess of alum in the dyebath is advantageous. For the production of dark shades another modification may be made with the best results. The first box is boiled up, and direct dyestuffs added along with Glauber's salt; Diamine Black B H in the first hole, and Victoria Blue or Methyl Violet 3 B in the fifth, give fine bright navy shades. Direct Green and Chrysophenine with Brilliant Green give splendid greens. The arrangement may be graphically represented thus:

Direct { Tannin } Antimony } Water { Basic } Water.
 Dye { Matter } Salt } { Dye }

With this machine another class of ordinarily expensive dyes—namely, the ingrain colors—may be produced at minimum cost. Primuline reds, yellows, oranges, developed blacks, blues, etc., are obtainable with two ends. The graphic representation for this process would be as follows:

Primu- } Water { NaNO₂ } Water { Devel- }
 line } { H₂SO₄ } { oper } Water.

Very fast and serviceable maroons are obtained by mixing a diazotizable blue with primuline in the first box. The addition of a direct yellow to the same gives really fine washing colors in dark red browns. Other modifications all tending to greater economy readily suggest themselves to the intelligent dyer.

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Full particulars on request.

POSSELT'S TEXTILE JOURNAL, Philadelphia.

MILL NEWS

Philadelphia. Messrs. Firth and Foster, the large public Dyers and Finishers, are running their plant to its full capacity. They have been kept extra busy this season with re-dyeing and re-finishing cold pigs, a sure sign that the dry goods market has been cleared of all stale goods.

The Bromley Lace Company, which was organized by Philadelphians, has purchased the Jonas lace mill at Tariff-town, Conn., and part of the machinery has been sent to the International Lace Manufacturing Company's plant at Gouverneur, N. Y., which was taken over by the Bromley interests recently. The Gouverneur plant is thus doubled in capacity.

A. Boyle & Co., hosiery manufacturers, 2555 Fairhill street, are erecting an addition to their plant.

The Shelbourne Mills have about finished the addition to their present plant, consisting of a building 52 by 110 feet, three stories and basement, with provision for future additional stories; also, an additional story over the present building 52 by 200 feet.

Solomon S. Miller has retired from the firm of Miller, Bain, Beyer & Co., dry goods merchants, at 1001 Filbert street. The business will be continued by the remaining members of the firm under the same name.

W. W. Bentley has resigned as general superintendent of the Pequea Mills, owned by William Wood & Co., being succeeded by H. Clayton as superintendent and Penniman Wood as assistant.

The Berkshire Mills, of Frankford, cotton dress goods, after operating 40 per cent. of the plant on a full schedule for two months, have reduced the running time to 40 hours a week, working five days a week.

Robert F. Kennedy, manufacturer of men's wear, Germantown, has started up his plant again after being idle for several weeks.

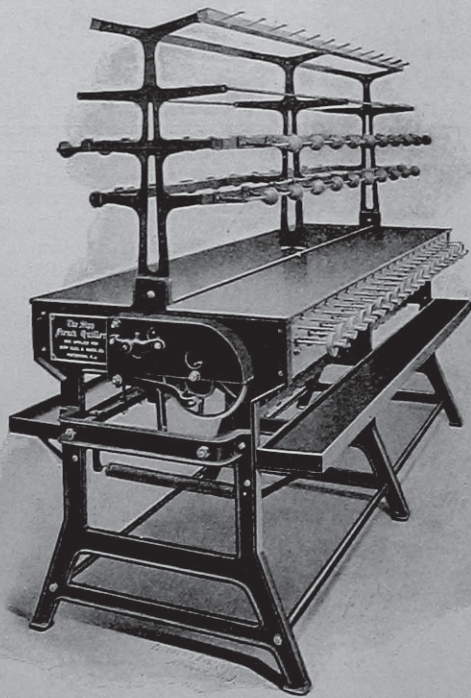
The Roxborough Hosiery Mills have removed from 2731 North Sixth street to 2011 East Arizona street, so as to be able to enlarge their equipment.

The mills of Joseph Greer, manufacturer of woolen and worsteds, 4528 Worth street, Frankford, have gone back on full time, after running on short hours for a long period.

Holden & Co., upholstery manufacturers, Frankford, have increased their running time from 45 to 50 hours a week.

Chester, Pa. Business is improving at the plant of the Emmott Worsted Spinning Company, Sixth and Morton streets. The members of the firm are now making arrangements for the erection of an addition to the buildings.

Scranton, Pa. The Ashley Silk Company of Academy street are to make a



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$\frac{3}{4}$ of the raw silk quilled in the United States is wound on these machines, aside from their use for soft silk and cotton yarn. : : : : :

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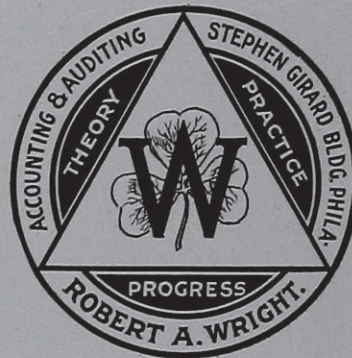
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FINE SINGLE, TWO AND THREE PLY UP TO 200's.
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big addition, 38 feet long and 48 feet wide, to their plant, which then will cover a full city block.

York, Pa. It is reported that the American Silk Company, which went into the hands of receivers last November, resumed operations with the reelection of M. G. Collins as president, operating the Monarch Silk Mill here and the mills at Clifton and Reynoldsville. The receivers, it is stated, will be discharged on August 15.

Wilkes-Barre, Pa. The Wilkes-Barre Lace Mills, which have been on half time for some months, have gone back on full time.

Nazareth, Pa. The Kraemer Hosiery Company have decided to erect a large three-story addition to their plant.

Paterson, N. J. The old Todd & Rafferty Mill at Packson and Taylor streets has been sold by the Manhattan Silk Company, which concern will occupy only a small portion of the property, while the balance will be occupied by the Eclipse Silk Company.

Riverside, N. J. William Taubel, a hosiery manufacturer of this place, will erect a five-story building, 260 by 60 feet, costing about \$60,000, to be used as a finishing plant.

Wilmington, Del. The Wilmington Silk Company has purchased a building on West Fourth street, and will change it to suit their wants. They will manufacture silk ribbons.

Le Roy, N. Y. The cotton mills here are erecting an addition to their mills to be equipped with combing machinery to manufacture a high grade of cotton yarn. The present plant is running full time, with orders ahead.

Oswego, N. Y. The Oswego Knitting Company has doubled its capital stock. The plant is rushed with orders and running day and night.

Falconer, N. Y. The capital stock of the Lynndon Worsted Company has been increased from \$75,000 to \$200,000.

Delhi, N. Y. The Delhi Silk Mill was sold at auction by H. J. Hewitt to Walter Dornitzer, the only bidder, and who expects to sell the property to parties who will at once commence running it.

Utica, N. Y. The Utica Steam and Mohawk Valley Cotton Mills have gone on a 50 hours a week schedule, or 10

hours more than has been the case for some time past.

Boston. The labor bill limiting the hours of employment for women and children to 54 hours a week was amended in the Massachusetts Senate by providing that they may work 56 hours a week, and that the bill shall not take effect until January 1, 1910, instead of on its passage. The amended bill was ordered to a third reading.

The directors of the American Woolen Company have declared a regular quarterly dividend of $1\frac{3}{4}$ per cent on the preferred stock, payable July 15, 1908. This is the thirty-seventh consecutive quarterly dividend declared on the preferred stock, equivalent to \$64.75 a share, making the aggregate payment \$15,050,000.

The directors of the Bates Manufacturing Co. have chosen Charles H. Fiske as president. A regular semi-annual dividend of 5 per cent was declared.

The Bigelow Carpet Company has declared the regular semi-annual dividend of $2\frac{1}{2}$ per cent.

P. Y. De Normandie has been elected treasurer of the Androscoggin Mills, succeeding the late O. H. Alford.

Fall River, Mass. A special meeting of the stockholders of the Davis Mills to act upon the proposition to increase the capital stock and build a second mill was held June 18, and the proposition was unanimously adopted. The directors were authorized to build a new mill of 65,000 spindles and equip it with about 40,000 spindles and the corresponding carding and weaving.

Fall River, Mass. The following regular quarterly dividends have been declared: Chase Mills, 2 per cent, Osborn Mills $1\frac{1}{2}$ per cent, Tecumseh Mills $1\frac{1}{2}$ per cent, Ancona Company $1\frac{1}{2}$ per cent in preferred stock, Barnard Mfg. Co., $1\frac{1}{2}$ per cent, Cornell Mills 2 per cent, American Linen Co. $1\frac{1}{2}$ per cent, Merchants Mfg. Co. $1\frac{1}{2}$ per cent, Seaconnet Mills $1\frac{1}{2}$ per cent, Granite Mills 2 per cent, Narragansett Mills 2 per cent, Stafford Mills $1\frac{1}{2}$ per cent, Richard Borden Mfg. Co. 2 per cent, Hargraves Mills $1\frac{1}{2}$ per cent, and Parker Mills $1\frac{1}{2}$ per cent.

Pittsfield, Mass. The W. E. Tillotson Co. is very busy—with plenty of orders ahead.

Lawrence, Mass. The Pacific Mills will soon place in operation at its mills a new electric plant of 3,000 horse power capacity. In the equipment of this electric plant about \$30,000 was expended for copper wire and cables alone, while the turbines cost about \$23,000 each and contain about 7,500 pounds of copper.

The woolen mill of Brown & Whittier, which has been running on short hours during the slack season, has begun on full time.

Holyoke, Mass. The Lyman Mills will erect their big No. 5 mill this year, the contract of which has been given out. The cost of the work will be about \$150,000, and give employment to about 400 hands, and when in operation the Lyman mills will provide work for about 1,800 employes. Their present mills are now running on full time.

Worcester, Mass. The Sterling Worsted Company has been organized here, Abbot A. Jenkins being elected president.

Webster, Mass. The Puritan Woolen Mill of the Intervale Mills Corporation after a shut down of several months have resumed operations. Several hundred hands are employed.

New Bedford, Mass. Returns made by eight mills in this city to the Board of Assessors show an increase of nearly 175,000 spindles during the past year, or more than a million and a half dollars in valuation.

N. Dighton, Mass. The Chadwick Print Works is in full operation, the equipment for printing and dyeing heavy drills and sheetings having been started with plenty of orders on hand.

Ware, Mass. The Chas. E. Stevens & Co. woolen mills have closed for two months. About 200 employes are affected.

Providence, R. I. Weybossett Mill is running their yarn department overtime, to catch up with trade.

The Earnscliffe is running night and day.

It is reported that the Oriental Mfg Co. plant here is closed down, having been sold to a Boston party who intends to run it as a silk mill.

Pawtucket, R. I. The Lumb Knitting Company is enlarging its plant, also building a new mill, providing double floor space.

The American Haircloth Co. are run-

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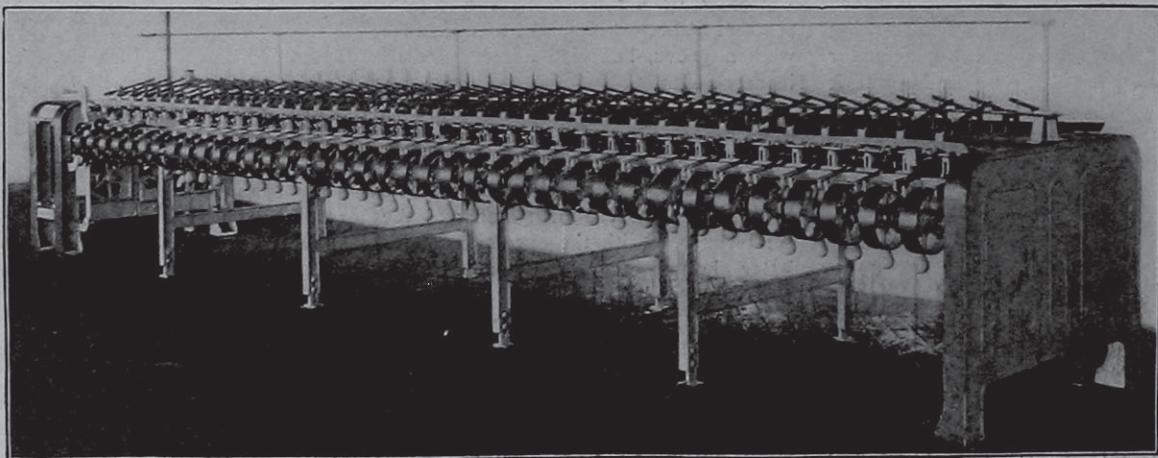
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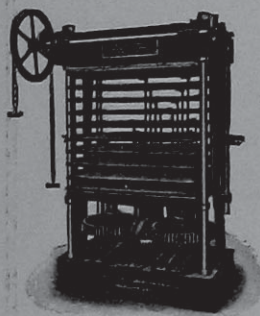
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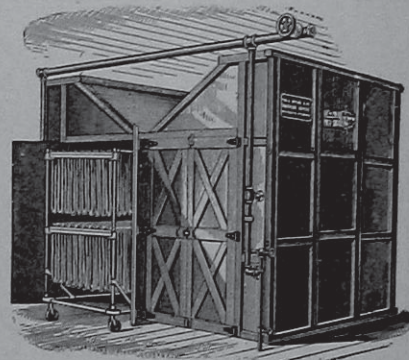
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ning 4 days a week. Have been on 2 day schedule for some time past.

Centredale, R. I. The Centredale Worsted Mills are running to their full capacity with orders ahead, covering several months.

Central Falls, R. I. The Waypossett Mill is running overtime on their product.

Bristol, R. I. The Namquit Worsted Mills, which has been manufacturing fine skein dyed worsteds, has gone under new management, known as Merrill & Rubenstein. Harvey Merrill will remain in charge. They will add the manufacture of piece dyed worsteds.

Washington, R. I. The Livingstone Worsted Co. are running night and day and are enlarging their plant, adding another story to the plant.

The Narragansett Worsted Mills are running up to 9 P. M. every night.

Georgiaville, R. I. The Bernon Mills, manufacturers of prints, sateens and twills, are building an addition to their plants.

Woonsocket, R. I. The Social Mill (Manville Co.) have installed 500 Draper looms and are running on full time.

Work has been started on an addition to the Lowland Worsted Company's mill on lower Villa Nova, manufacturers of French spun worsted yarns. The addition will be 150 by 75 feet, and will comprise two stories and a basement.

Killingly, Conn. The woolen mills

here have gone on full time. This affects 1,600 men.

Stafford Springs, Conn. F. E. Brazeal, of Monson, Mass., has taken charge of Finishing for the Rhode Island Worsted Co., and has been succeeded in Monson by Chas. N. Taft, formerly with the Geo. H. Gilbert Mfg. Co., Ware, Mass.

Hartford, Conn. The E. A. Tracy Company of Coventry, with a capital stock of \$50,000, which will manufacture woolen goods, has filed a certificate of incorporation.

Rockville, Conn. The Hockanum Co.'s mills are running all full, making many duplicate orders. The mills included in this syndicate are The Hockanum, The Springville, The New England and the Minterburn. With the exception of the latter branch they all are on fine worsteds and high picks.

Nashua, N. H. The cotton mills here have started on full time. This change has affected about 3,000 operatives.

Milford, N. H. The Middlesex Linen Company has started on full time after a shut down of several weeks.

Manchester, N. H. The Amoskeag Corporation will go on full time at once, and when its 13,000 workers will round out a full week for the first time since March. The announcement was hailed with delight throughout the city, in the mills and on the street.

Salmon Falls, N. H. The Salmon Falls Manufacturing Company's cotton mills have gone on a five days a week

schedule, after running four days a week for some time. The change affects about 700 hands.

West Buxton, Me. It is rumored that John W. Crowther and his brother have secured the mill formerly operated here by W. & R. Brier, and will begin the manufacture of worsteds, adding new looms to the plant.

Elkton, Md. The Spring Lawn Rug Mills, ten miles north of Elkton, were destroyed by fire June 17. The loss, estimated at \$30,000, is partly covered by insurance.

Charlotte, N. C. At a largely attended meeting of the Southern hard yarn spinners' association, June 24, a resolution was adopted that no mills should, until further notice, accept orders which did not show a profit.

The Meadows Mill Company of Porrs Knob has been incorporated with a capital stock of \$300,000 to manufacture cotton goods.

The incorporators of the Jewel Cotton Mills are: W. W. Hagood, president; W. A. Watson, vice-president, and Thomas J. Lillard, secretary-treasurer. Capital stock is quoted at \$250,000. It will be a fine yarn mill of 5,000 spindles capacity.

Roanoke Rapids, N. C. The Rosemary Manufacturing Company has completed its additions, but the machinery, consisting of 5,000 spindles, 104 looms, although delivered, will not be erected until market conditions justify it.

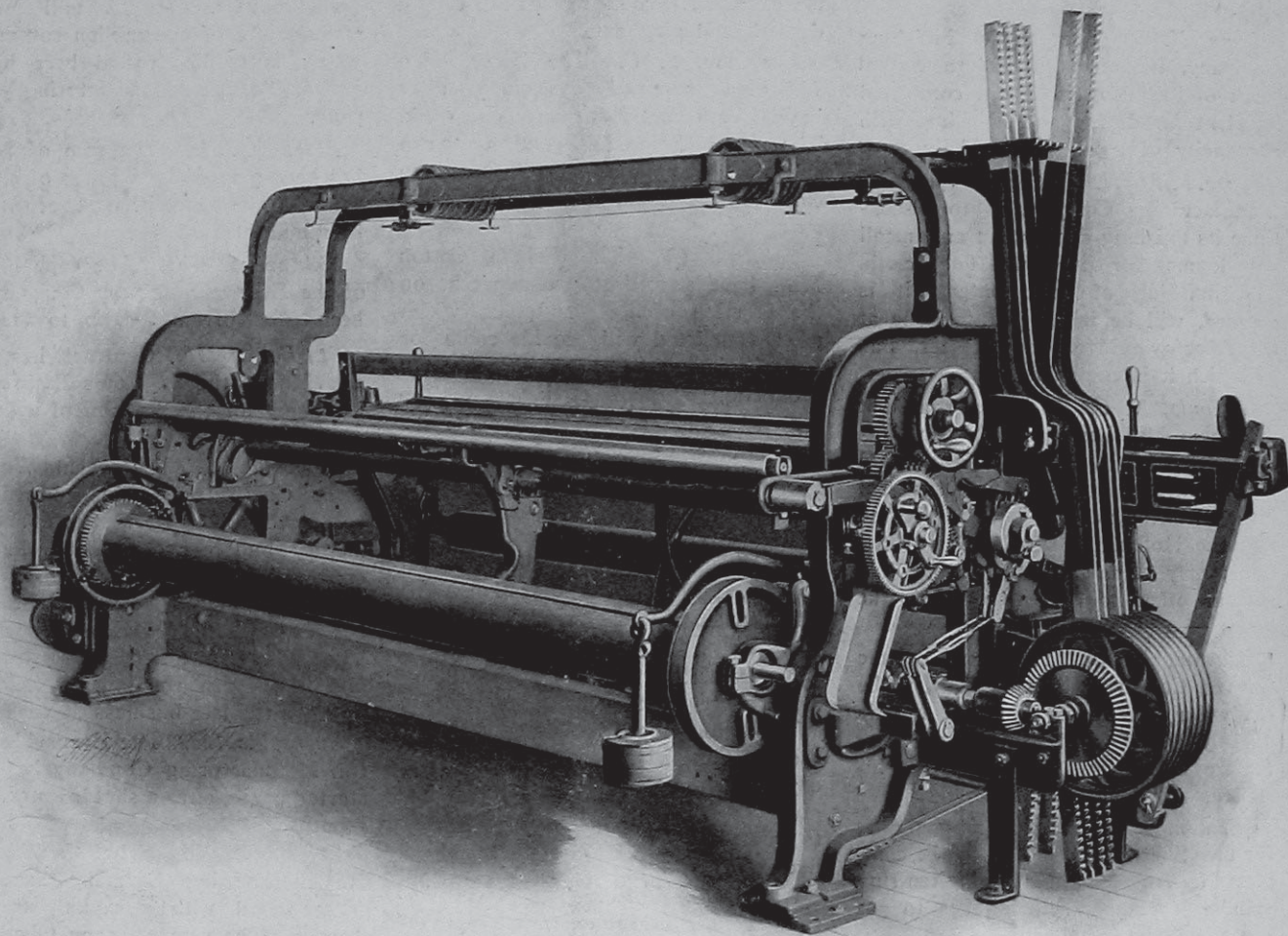
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