

From description given, it will thus be seen that as the skein carrying section is moved in one direction along the tank, the skeins will not only be moved bodily in a horizontal position along within the tank but will also be caused to travel around their supporting reels in one direction, and when the skein carrying section is moved in the other direction, the skeins will be caused to travel on their supporting reels in the opposite direction. This compound movement of the skeins will insure a thorough treatment on the part of the liquid within the tank, thus insuring a most satisfactory result.

Textile Soaps and Oils.

Mr. G. W. Slatter in a lecture on the above subject, before the Huddersfield Textile Society, after giving a history of the art of soap making, from its earliest to the present days (the remains of a soap factory having been found amongst the ruins of Pompeii), then explained a few of the more interesting items for the practical man of to-day and from which we quote:

Soap exercises an emulsifying action upon greasy matters, which accompanies the dirt and enables it to become diffused through the water.

There are two kinds of soap, *viz*: potash and soda soap, either one made from different materials.

A soap made entirely from tallow is very good for filling purposes, whereas for scouring purposes, a soap composed of a mixture of tallow and cocoanut is recommended. Generally speaking, for all manufacturing purposes, resin of no kind should be used in the manufacture of soap, yet at the present day, soft soaps are sold containing resin, with the consequence that where such soaps are used, in most manufacturing processes, great difficulties arise afterwards in the dyeing and subsequent operations.

It is important that all the fatty matter be completely saponified, taking at the same time care that there is no excess of free alkali, which would do great harm in soaps used by calico printers, as it would cause the colors to run.

A soft water is a most important item in scouring. Mr. Slatter quoted a case which came under his observation in which by accident many pieces were spoilt through the scourer washing off the soap after scouring with water, about 20° hard, with the result that decomposition of the soap took place, causing lime soap to form in the pieces, which cannot possibly be removed by ordinary scouring processes. Pieces in such a condition cannot possibly be dyed evenly. Apart from the damage hard water will do, there is an enormous loss in the soap itself. For example, 1000 gal. of water of 12° hardness use up and absolutely waste from 14 to 15 lbs. of soap.

For lubricating purposes, the best wool oil undoubtedly is olive oil. Gallipoli, is generally stated to be the best, but other pure olive oils, such as Malaga are equally as good. The important thing is to obtain a pure olive oil which contains a very low percentage of free oleic acid. Olive oil is too costly to use for the shoddy trade.

Bleaching Dyeing and Finishing of Poplins.

Poplins are union fabrics, constructed with a silk warp and a rather hard twisted woolen filling, and for which reason in the processes of dyeing and finishing these fabrics, difficulties frequently arise, a reference to which will be of interest to the reader.

Poplins must be degummed previous to dyeing and during which process the wool fibre invariably shrinks, causing the fabric to become ribbed and cockled. Again, if the goods have been previously crabbed there is then a possibility of their presenting a *moiré* appearance.

The fundamental principle in the handling of Poplins in the dyeing and finishing process is simplicity, the various operations must be quickly accomplished, the quicker the better, although in no sense should they be unduly hurried.

Crinkling or cockling, if met with, is invariably due to allowing the fabric to remain an unnecessary length of time in the degumming bath or in some cases subjecting them to an overheated dyebath. Rapid dyeing results in securing a level shade on the silk and wool. A *moiré* or watered effect, if met with, is generally caused by having the fabric stand in rolled condition for an unnecessary length of time, it being no uncommon affair in a mill to leave them stand in this condition over night.

During the degumming process of the fabric, the whole piece should be passed through the boiling soap solution under sufficient tension to prevent the formation of creases, and at the same time arrest as much as possible the tendency of the wool fibre from shrinking. The process is continued until the fabric takes on a pale yellow color, usually requiring from 30 to 40 minutes. This yellowish tint must be removed from white or light-colored goods by bleaching (best with *Sodium Peroxide*) but for goods that are to be dyed dark or medium shades such is not necessary.

The process of bleaching and dyeing must follow degumming immediately, in order that the goods are not left lying around in a wet condition. If however, bleaching and dyeing must be held up, then the fabric should be dried on a cylinder machine or a tentering frame, to avoid the possibility of forming creases.

In dyeing, the bath must be kept far below the boiling point. For light shades, a temperature of about 80° F. is sufficient, while on the darkest colors, for instance black, the temperature used should not be over 144° F. The dyeing must be carefully done, using sufficient Glauber's salt and not too much sulphuric acid.

The fabric will retain sufficient Glauber's salt to necessitate but a slight dressing, accomplished by means of a dilute solution of gum-arabic, mixed with a little fish glue which must be free from odor, and to which just sufficient tartaric acid has been added to sour it. If a *moiré* or watered effect appears, straining may be resorted to and will oftentimes overcome the objection. *Specially translated from Oesterreichs Wollen and Leinen Industrie.*

THE DETECTION OF BLACKS UPON DYED TISSUES.

By Dr. Louis J. Matos.

It is a matter of very frequent occurrence in the dyehouse to have to ascertain with some degree of certainty, the kind and character of black upon a given fabric, what, in order to do it satisfactorily, requires some familiarity with blacks in general, and the reactions of each.

From time to time there have been published descriptions of methods more or less explicit, but in the hands of dyers some of them fail to give the positive results desired, so that the choice of a general method, applicable to the range of blacks now employed, must be for a scheme that can be followed without any confusion. The dyes indicated in the process or method following are:

ANILINE BLACK. If a small cutting, or a few strands of yarn are heated in a test-tube containing a few drops of a solution of stannous chloride (tin crystals), the color becomes greenish to greenish grey; if now, the material is washed well in water and exposed to the air, the original black color gradually returns. By immersing in a few drops of a weak solution of bichromate of potassium, the black color returns instantly. By boiling a sample of dyed aniline black in a solution of hydrosulphite of soda it is decolorized, but the color returns upon exposure to the air (distinction from sulphur blacks which do not return). A 5% solution of hypochlorite of sodium changes aniline black to a very reddish tone or nut brown.

SULPHUR BLACKS. With hypochlorite of sodium, these blacks are completely and permanently decolorized. By treating a dyed sample with stannous chloride, a brown color is obtained which changes to black on exposure to air, or upon spotting with bichromate of potassium.

DIRECT BLACKS. The commonly employed test applied to this class of blacks is that of boiling with Solvay Soda (a 5% solution is quite sufficient) when the color is observed to bleed considerably, if not removed altogether. As the direct blacks belong to the tetrazo group, they are completely changed into grey or white, when boiled with a solution of stannous chloride, and the color can not be restored by subsequent exposure or oxidation. With sodium hypochlorite, the direct blacks are destroyed, producing brown-yellow oxidation products.

DEVELOPED DIRECT BLACKS are somewhat difficult to detect with certainty, but the tests for them should be made parallel with known dyeings of a direct black, an aniline black, and a dyeing of a sulphur black, treating each sample separately in a test-tube with *killed* bisulphite of soda or *hydrosulphite*, when it will be noticed that the three blacks are decolorized, but only the aniline black and the sulphur black are restored by washing and exposure. It is presumed, in making this test that the black has withstood the action of boiling Solvay Soda solution.

LOGWOOD BLACK is positively identified by the red reaction upon boiling with dilute acid.

From the above special reactions, the systematic method to follow is:

(1.) Boil a small piece of the cloth or yarn for 2 or 3 minutes with a solution of stannous chloride.

(2.) Boil a separate portion for $\frac{1}{2}$ to 1 minute with a solution of sodium hypochlorite.

(3.) Washing the material of test No. 1, putting into water, and adding 2 to 4 drops of a 10 per cent. solution of bichromate of potassium.

1. Stannous Chloride.	2. Sodium Hypochlorite.	3. Bichromate.	Nature of Dye.
Greenish or Greenish-grey.	Reddish-black.	Black.	Aniline Black.
Brown-yellow or Brown.	White.	Black.	Sulphur Black.
Grey or White.	Brown-yellow or Yellow.	Grey or White.	Azo (Direct) Black.

The detection of the most important developers used in producing the so-called diazotized and developed blacks is conveniently discussed with the foregoing. The commonly used developers are beta-naphthol and meta-toluylene diamine (frequently termed *diamine*).

Beta-naphthol, when ordinarily pure is insoluble in water, and must be dissolved by the aid of soda-lye. If in powder and mixed with caustic alkali it is easily dissolved in hot water. To recognize it, add to its solution in cold water, sufficient acetic acid, to neutralize the soda, and when the beta-naphthol is precipitated, but the *diamine* remains in solution. Now, add a few drops of a cold 10 per cent. solution of nitrite of soda, when a yellowish precipitate of nitroso-beta-naphthol forms which is insoluble in acids.

By the same treatment the *diamine* produces a brown coloring matter which dyes tannin mordanted cotton a brown shade (Bismarck Brown).

A more refined method of detecting or identifying the various developers is as follows:

A solution of 1 c c Aniline Oil in
3 c c Muriatic Acid
is made, and dissolved in
10 c c Water.

To this is added 7.5 c c of a 10 per cent. solution of nitrite of soda.

This gives a diazotized aniline solution, which when added to an alkaline solution of the several developers gives distinct colors, as follows:

Beta-naphthol.....Orange-red insoluble precipitate.

Meta-toluylene diamine..Brown-yellow insoluble precipitate, which is soluble in dilute acids with a yellow-brown color (chrysoidine).

Schäfers Salt.....An Orange-red coloring matter, soluble in hot water.

Resorcine.....An Orange-yellow precipitate, difficultly soluble in hot water with a yellow color.

These various reactions, while not of themselves

difficult, should always be made a number of times for practice, in order that the details of the operations may become familiar, and the eye accustomed to the changes of color.

In making the tests for blacks, it is well to have on hand a few strips of fabrics dyed with the type of colors, so that certainty in identifying the particular black may be secured. A few hours' practice will give a valuable fund of experience.

Silk Thread Finishing.

In the manufacture of silk fabrics, the subject of finishing the thread previous to weaving is a most important question to any silk manufacturer, since by means of it, the thread is put in a better condition for weaving as well as with reference to the resulting face of the finished fabric.

There are many machines and methods in use today for accomplishing this result, but the one that is giving entire satisfaction and an increase in loom production is the Keyworth Silk Thread Finishing Machine, built by Wm. C. Keyworth, a well known designer of machinery for the silk industry, in Paterson, N. J.

The object of the process of silk thread finishing is to lay the fibre and at the same time reduce the chance of the yarn cockling in the fabric, to a minimum, resulting in the production of a smooth, lustrous face of the fabric.

The result obtained by this Keyworth process of finishing the thread with reference to lustre obtained is superior to that obtained by means of the metallic process.

DESCRIPTION OF THE PROCESS.

With the Keyworth process, the spindle of the delivery bobbin, containing the silk yarn to be treated, is secured to the centre beam of the machine, and the end then passed through a porcelain guide eye, and into the finishing bath. A separate bath is supplied for each thread, thus allowing a variety of colors to be run off on the machine at one time, each color having its individual bath and spindle.

From the guide eye, previously referred to, the thread passes under a porcelain guide which keeps it immersed in the bath until the thread reaches the bristle brush placed above the bath tub and which removes any superfluous liquid. After passing through said brush, the thread then passes over a wooden guide roller to the drying chamber. The latter three parts are all secured to a white metal handle which rests on one end upon the pan, the far end being immersed in the bath. This attachment facilitates matters in threading the device, not having to bring your fingers in contact with the bath.

From this wooden guide roller the thread passes through a porcelain guide eye, secured to supports under the pan and to which is imparted a reciprocating motion, which gives a rolling action to the thread, *i. e.*, rolls it over the polished surface of the heated chamber and by this action, lustres, *i. e.*, polishes the thread.

After leaving the guide eye which thus gives the thread this rolling motion, the thread passes down on side of the upright heated chamber, keeping in contact only with its polished surface, which is of special composition, and to which the finishing size will not adhere. After passing down one side, the thread then passes around a porcelain guide wheel which is supplied with keepers in order that the thread may have no opportunity to get off the guide wheel, said keeper being of such a construction to afford easy threading. The thread now passes up the opposite side of the heated chamber, through a porcelain guide eye and onto the take up bobbin.

By this arrangement, the production per spindle, it is claimed, is increased from 50 to 100%, on account of the individual spindle drive and at the same time it is impossible to get two ends on the same spool. There is less waste than with other machines constructed for similar work, the operator having no unnecessary walking to do in tying up and putting in new spools a feature which alone is a great time saver and naturally increases production. All the parts are protected from rust and are easy to keep clean. The machine is adaptable to gas and steam heating, but the latter is preferred.

The machine is well adapted for handling Canton silks, and excellent for treating Souples and heavy weighted silks, the treatment increasing strength of the thread.

The speed of the machine is regulated by a variable cone drive, to suit the class of thread in operation. Machines are now successfully running in prominent silk mills, some of them it is claimed using up to 25 machines of this style.

GLEANINGS FROM ABROAD.

Under this heading, hereafter we will bring every month to the notice of our readers Reports on Lectures, New Processes, and Machinery, etc., from abroad, or in other words, a review of items of interest collected for our readers from special correspondence and the leading foreign Textile Journals.

A Novelty in Color Effect for Ribbons, Cords, etc.

The same refers to an English patent, just granted abroad, for fancy effects to ribbons, cords, etc., used for tying up fancy articles, etc.

Dyes or bronzes of various kinds may be used, the same being either sprayed from an aerograph upon certain places of the ribbons or cords, or the latter are wrapped around a card, immersing then one edge of this card in the dye bath, thus coloring only a portion of the fabric. Cutting then through the centre of the dyed portion, lengths of ribbons or cords are produced, having colored ends, the object being to produce a ribbon or cord for tying up fancy articles and in which the bow differs in color from that of the ribbon or cord. White ends on colored ribbons are similarly produced by means of bleaching agents. According to length of ribbons desired, larger or smaller cards are to be used.

Providing a Uniform Stretch to Elastic Fabric Structures.

Elastic fabric structures, such as suspenders, hose supports, garters, belts, boot-gusset webs, etc., if dissected, will show that the length of the india rubber warp threads used in their construction varies in different portions of the one fabric. This indicates that certain portions of the web will have more or less elasticity than others, with the result that that portion of the fabric which has the least elasticity, and therefore is of less value as a commercial article, has more india rubber in it and consequently costs more to produce, but on account of the deficiency of its elasticity may be found of less commercial value.

A recent English invention in loom construction has for its object the correction of these disadvantages and the producing of an elastic fabric in which the rubber warps are more equally disposed, and which exist in approximately the same degree of tension throughout the whole length of the fabric. This result, the inventor accomplishes by the combination of an improved method of winding the rubber threads upon the warp beams, and of letting-off these rubber threads from the warp beams, on the loom, *i. e.*, the rubber threads are woven into the fabric at a constant or uniform tension, from beginning to end.

The warp beams which contain the rubber threads, are for this reason wound in such a manner that each successive series or row of coils contains the same length of rubber thread, or, in other words, every coil of rubber thread wound upon the warp beams is of the same length, notwithstanding the increase of diameter of the threads on the warp beam as the latter is being filled during the winding process.

This warp beam is placed in the loom, and is rotated at a uniform speed throughout the running of the loom, the result being that one coil of rubber thread is woven into the fabric at each revolution of the warp beam, and as each coil is of the same length, when in its normal or unstretched condition, it follows that with a uniform feeding of the warp threads while the loom is in motion, there will be an equal and regular distribution of the rubber warps throughout the fabric as it is being woven, and therefore also in any given length or section of the same when it is cut up.

The World's Silk Production.

The Continental Union of Silk Merchants has just published the following estimate of the world's silk production for last year, together with the average annual output during the period 1902-6:

	1907. Kilos.	Annual average. 1902-6. Kilos.
Europe	5,909,000	5,399,000
Levant, etc.	3,026,000	2,450,000
Shanghai (export)	4,155,000	4,066,000
Canton (export)	2,250,000	2,092,000
Japan (export)	6,370,000	5,163,000
Sundries	350,000	258,000
Totals	22,060,000	19,428,000

The Inventor of Foam Dyeing.

According to an article in *Färber-Zeitung*, Foam dyeing was invented by Conrad Wanke, a Boss Dyer of Zwickau, Austria. He met with the usual fate of mechanics, a class of persons who, as a rule, although clever enough to endow trade with some rich acquisition, can not turn their discoveries to any profit to themselves. The inventor of a process which now finds employment for many hundreds of hands died poor, about two years ago, being compelled to see his discovery become common property without receiving the least share in the great advantages which it conferred upon his profession.

A New Finish for Cotton Fabrics.

According to a late British patent, wet starch is exposed for from ten to fifteen hours to gaseous sulphuric acid, whereby the adhesiveness of the starch is diminished and the starch is transformed in a very specific manner into a product between starch and dextrine. 100 parts of the treated starch and 30 parts of a soap-like compound of ammonia, with oleic acid, are then mixed together, and the resulting product is dried for use. Goods treated with this mixture, it is claimed, do not require to be hot calendered.

Germany's Census of the Textile Industry.

The German Imperial Government has decided to take a complete census of production in the textile industry. Cotton spinning will first be dealt with, and it is expected that the inquiry forms will soon be in the hands of the manufacturers. Cotton weaving will follow, as also dyeing, printing, and finishing. Woolen and other textiles will be similarly dealt with. It is ten years since the authorities required these returns from the textile industry, and although approximate estimates as to the German output can be made, the publication of the official figures will be looked forward to with interest.

A Novel Construction of Squeeze-Rolls for Wool Washers.

The new squeeze-rolls made up of annular sections of vulcanized rubber compound, are secured upon a shaft upon a series of supporting collars of such construction that slipping of the roll sections is obviated without the employment of great pressure in clamping the roll sections together. The parts of the roll are so designed that in case of injury to one or more roll sections the parts can be readily removed from the shaft and new sections introduced to replace those that have been damaged.

In assembling the elements of the roll structure, the collars and roll sections are fitted upon the shaft successively, then the assembled roll sections and collars are forced together by the application of sufficient pressure to insure close contact of the roll sections and a sufficient degree of compression of the material of the roll sections, to prevent separation of the sections at the periphery of the roll when in service.

Then the end plates 6 are secured firmly upon the shaft of the roll and the structure is complete.

The supporting collars upon which the roll sections are mounted and between which the roll sections are positively gripped, are thus positively locked upon the shaft so that no rotation on the shaft is possible. The corrugated faces of the flanges of the collars and the lugs provided thereon obtain a firm hold upon the roll sections and effectively prevent any distortion of the latter and any circumferential movement thereof on the shaft when in service.

To Lifen up (Wool and Cotton) Unions.

Dyed unions, more particularly blacks containing a great percentage of cotton, often come up dingy and lifeless, or the black may be bronzy and red. In such a case, a soap bath will be found of service, the bath being either a soap solution only, or containing a portion of free oil. As will be readily understood only a soap or oil without an odor can be used. The result of such a soap bath is that the greasy matter of said bath covers, *i. e.*, forms a thin film on the surface of the dyed cotton, increasing the brilliancy of the dye by helping the light to penetrate into the cloth.

A Wage Registering Device for Looms.

The same is of Austrian origin, the apparatus being driven from the spindle of the pattern cylinder, as in the ordinary pick counters. The new apparatus consists essentially of a transmission system corresponding to the prevailing rate of wages in monetary units, which is placed on a spindle making one revolution per work unit of 1000 picks, the spindle of the pattern cylinder driving a counter so that the wages, corresponding to the total work done by the weaver, can be any moment read off by the weaver from the dial of the device.

BRILLIANTE. Brilliante is a cotton fabric of light or medium weight, distinguished by small, detached figures, usually of geometrical or simple character, arranged on a plain ground. The figures are formed with the filling, which is soft twisted. These goods are usually subjected to the English or French nainsook finishes, mercerized or printed. By the English finish the fabric, after it leaves the loom, is boiled off, then bleached, after which it is softened by immersing in a light solution of glycerine, or cocoanut oil, and flour or farina, after which it is dried by passing over heated cylinders, then run through a rotary press with very light pressure. In the French finish, after the fabric is bleached, it is stiffened by immersing in a solution of size, composed of the following ingredients; flour, wax and gelatine, after which the fabric is dried, then slightly sprinkled with water, then run through the calender, which completes the finishing process. Brilliante is a type of goods in which the essential qualities of the pattern are improved by the mercerizing process. When they are printed, the printed patterns are secondary to the weave effects, and usually consist of small detached sprig or floral effects arranged a great distance apart.

New Colors.

(*Farbenfabriken of Elberfeld Co.*)

BENZO FAST HELIOTROPE 2RL AND B. L.

These dyestuffs produce shades both excellently fast to light and clear in tone, as could not hitherto be obtained with other substantive violet colors. They are recommended for the production of *bright lilac*, *heliotrope* and *violet*-shades on any cotton material for which a particularly good fastness to light is required. They can furthermore be employed in combination with the *Brilliant Fast Blues*, of this company and which are also remarkably fast to light, for the production of blue tones, and amongst others mixed with *Chloramine Yellow* for fashion or mode shades; the 2R brand will be found very serviceable in many cases for reddening fashion shades. Both colors, on account of their brightness and excellent fastness to light, are particularly well adapted for padding delicate tones and for the direct printing of light shades.

FAST GREEN BLUISH G. S.

The new product is remarkable for its clear green shade and fairly good fastness to alkalis, is dyed acid and dyes easily level and produces shades of fairly good fastness to washing. It is recommended to be used in combination with other level dyeing colors for the dyeing of *Greens*, *Olives*, *Browns*, *Navy Blues*, etc., on ladies' dress material and cheap gentlemen's suitings as well as on Berlin wool. White cotton effects in wool pieces are not tinged. It is also adapted for the direct printing on wool, the fastness to water of such prints being good.

KID-FINISH CAMBRIC. Kid-finish cambric is a name given to a soft-finished plain cloth which is fairly lustrous on both sides, but more so on the face than on the back. It is used exclusively for dress linings. It varies in width from about 24 to 27 inches, and is shown in black and staple shades. The finishing process is really the principal one in making these goods, giving them, as it does, the characteristic name. It gives to the cloth a somewhat leathery feel, not too harsh or stiff, while yet adding a fair amount of foreign matter. After bleaching, dyeing and mangling, the cloth is dried on the drying machine and allowed to cool. It is then conditioned on the damping machine and allowed to lie for about two hours, after which it is hot swiss calendered on a five-bowl compound lever calender, using light pressure. It is afterwards filled on an ordinary two-bowl compound lever starch mangle, with a mixture somewhat as follows:—

Dextrine	200 lbs.
Potato starch and farina.....	20 lbs.
Cornstarch or maize	20 lbs.
Oleine oil	2½ gal.
Carbolic acid	½ pint.

Water, sufficient to make 120 gallons when boiled 15 minutes. After being filled, the cloth is dried on the drying machine and allowed to cool, then conditioned on the damping machine, and allowed to lie at least two hours. It is then hot swiss calendered on a three-bowl dead set calender with light pressure.

BUYERS' INDEX—Continued**Looms.**

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

Measuring Devices.

Draper Co.
Knapp, Chas. H.
Sipp Electric & Machine Co.

Metallic Rolls.

Metallic Drawing Roll Co., The.

Mohair.

Littauer, Ludwig.
Queensbury Mills.

Mules.

Mason Machine Works.

Patent Attorneys.

Crosby & Gregory.
Howson & Howson.

Peroxide of Sodium.

Roessler & Hasslacher Chemical Co.

Pneumatic Conveyors.

Philadelphia Drying Machinery Co.

Power Transmitting Machinery.

Philadelphia Drying Machinery Co.

Presses.

Philadelphia Drying Machinery Co.
Woonsocket Machine & Press Co.

Printing Drums.

Crompton & Knowles Loom Works.

Pumps.

Philadelphia Drying Machinery Co.

Quillers.

Knapp, Chas. H.
Lever, Oswald Co., Inc.
Sipp Electric & Machine Co.
Whitin Machine Works.

Railway Heads.

Mason Machine Works.
Whitin Machine Works.

Reeds.

Whitaker Reed Co.

Reels.

Draper Co.
Knapp, Chas. H.
Sipp Electric & Machine Co.
Whitin Machine Works.

Revolving Flat Cards.

Mason Machine Works.
Whitin Machine Works.

**Ribbons and Piece Silks for Trimming
Knit Goods.**

Cheney Bros.
Sauquoit Silk Mfg. Co.

Silk Machinery.

Altemus, Jacob K.
Crompton & Knowles Loom Works.
Halton's, Thomas, Sons.
Keyworth, Wm. C.
Knapp, Chas. H.
Mason Machine Works.
Sipp Electric & Machine Co.

Silk Yarns.

Cheney Bros.
Littauer, Ludwig.
Ryle, William, & Co.
Sauquoit Silk Mfg. Co.

Sizing Compounds.

Cummings, J. W.

Soap.

Holbrook Mfg. Co., The.

Spindles.

Draper Co.

Spinning Frames.

Mason Machine Works.
Whitin Machine Works.

Spinning Rings.

Draper Co.
Whitaker Reed Co.

Tanks and Tubs.

Philadelphia Drying Machinery Co.

Tapes, Braids and Edgings.

Chapin, George W.
Welmar Brothers.

Temples.

Crompton & Knowles Loom Works.
Draper Co.

Threads.

Chapin, George W.
Littauer, Ludwig.

Thread Guides.

Palmer, The I. E. Co.
Whitin Machine Works.

Tinsel.

Littauer, Ludwig.

Twisters.

Draper Co.
Mason Machine Works.
Whitin Machine Works.

**Winding, Beaming and Warping Ma-
chinery.**

Altemus, Jacob K.
Draper Co.
Globe Mach. & Fdy. Co., Inc.
Knapp, Chas. H.
Lever, Oswald Co., Inc.
Sipp Electric & Machine Co.
Whitin Machine Works.

Wool, Hair and Skins

Northeastern Trading Co.

Wool Combers.

Crompton & Knowles Loom Works.

Woolen Machinery.

Altemus, Jacob K.
Crompton & Knowles Loom Works.
Hunter, James, Machine Co.
Lever, Oswald Co., Inc.
Philadelphia Drying Machinery Co.
Woonsocket Machine & Press Co.

Woolen Yarns.

Littauer, Ludwig.
Queensbury Mills.

Wool Washing Machinery.

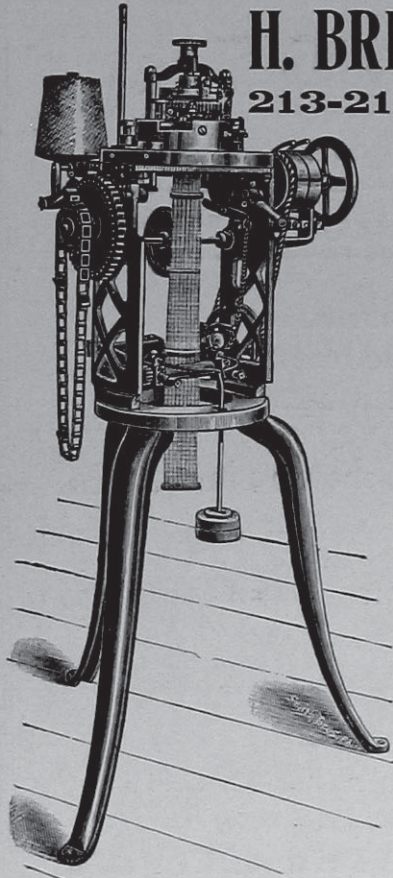
Hunter, James, Machine Co.
Philadelphia Drying Machinery Co.

Worsted Yarns.

Campion, Richard.
Littauer, Ludwig.
Queensbury Mills.

Yarn Testing Machinery.

Knapp, Chas. H.
Sipp Electric & Machine Co.



H. BRINTON CO.
213-215 Race St.
PHILADELPHIA, PA.

— BUILDERS OF —
**KNITTING
MACHINERY**
for
**HOSIERY
and
UNDERWEAR**
COMPLETE
ESTIMATES
FURNISHED

The Cut shows our
**IMPROVED
AUTOMATIC
RIBBER**
with Welt and Slack Course for Half Hose Tops and Ribbed Legs.

IF YOU WANT

**Superintendents,
Overseers,
Second Hands, Etc.,**
WOOL—COTTON—SILK

For any department of the mill and for any class
of goods write to our

**TEXTILE WORKERS'
BUREAU**

We are in constant communication with the most
competent men in the various lines, throughout the
world, who can furnish excellent references from past
employers.

ADDRESS:

POSSELT'S TEXTILE JOURNAL
2028 Berks Street - - - - PHILADELPHIA, PA.

GEORGE W. CHAPIN
COTTON YARNS

TAPES, BRAIDS, THREADS
LACE EDGINGS

229 CHURCH STREET 231
PHILADELPHIA, PA.

N. Y. Office, 350 Broadway

R. E. SCHNEEBELI, Res. Manager

LUDWIG LITTAUER

Successor to Moeller & Littauer

**Y
A
R
N
S**

Thrown Silk
Artificial, Shappe and Spun Silk
Domestic and Imported, Plain
Gassed, Mercerized and Polished Cotton
Polished and Glazed Threads
Mohair and Worsted
Tinsel
Turkey Red

**Y
A
R
N
S**

109 GREENE ST., NEW YORK

Best Quality Harness Twine

Alex. D. Stelle, President

Walter H. Rossmässler, Treasurer

Sauquoit Silk Mfg. Company

MANUFACTURERS OF
**ORGANZINE, TRAM, TWIST
FRINGE AND HOSIERY SILKS**

Fast Dye Organzines for Woolen Manufacturers a Specialty

Mills: BETHLEHEM, PA.
PHILADELPHIA, PA.
SCRANTON, PA.

New York Representatives: WILLIAM RYLE & CO., 54 Howard Street
PHILA. OFFICE: 4015 Clarissa St. (18th St. & Hunting Park Av., Nicetown)
CHICAGO OFFICE: 188 Market St. BOSTON OFFICE: 78 Chauncy St.
Silks For Insulating Purposes

WILLIAM RYLE & CO.

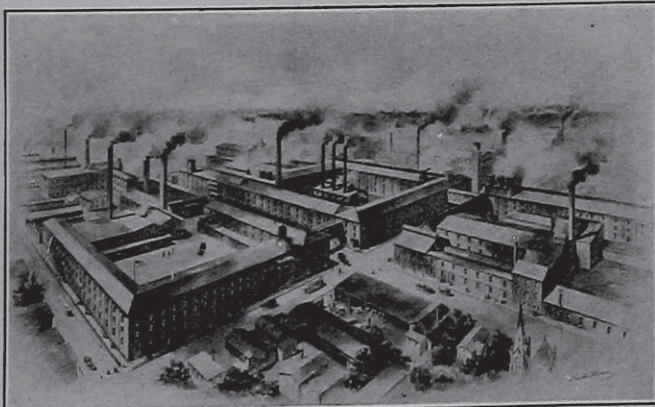
Foreign and Domestic

Spun Silk Yarns and Noils

Domestic Thrown Silk of every description. Fine Pure Dye Silks for the woolen trade a specialty. Importers of European and Asiatic Raw Silk

54 Howard St. NEW YORK

FIRTH & FOSTER CO.
DYERS and FINISHERS
OF PIECE GOODS EXCLUSIVELY



The best equipped plant for the DYEING and FINISHING of fine wool and worsted goods, also silk and wool fabrics.

EMERALD, YORK AND ADAMS STREETS
PHILADELPHIA

NEW YORK OFFICE: Silk Exchange Bldg., Room 702

QUEENSBURY MILLS

H. HODGSON, Pres. and Treas.

FRED. HODGSON, Gen. Mgr.

MOHAIR

FLYER

SPUN
YARNS

*Mohair Tops
and
Yarns for Weaving
Single and 2-ply*

ALPACA
AND
WORSTED
YARNS

WORCESTER, MASS.

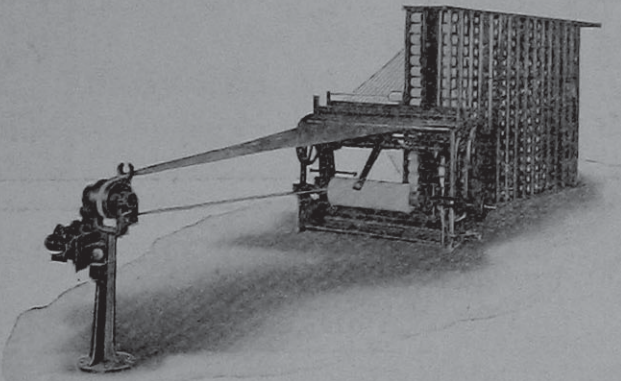
Good Mills turn out Good Work
Good Work requires Good Soap

"The Best is Good Enough"

THE HOLBROOK MFG. CO.
470 Washington St.,
NEW YORK

Write Dept. P for a Letter Opener—sent free.

Globe Machine and Foundry Co.
(Incorporated)
Frankford, Philadelphia, Pa.
Builders of the
Denn Warping Machinery



Our New Design Ball Warper

(Patented and Patents Pending)

Spindle Driven
No Slipage
No Lifting

Regular Wind
Ends Square
Drops on Truck

Can Use Three-inch Shells

SAMUEL S. VINAL & CO.
Cotton Dealers ^A *AND* ^D *Exporters*

BURNT AND RECLAIMED COTTON A SPECIALTY

52 India Street, Boston, Mass.

FREDERICK JONES & CO.

Race above Fourth Street, Philadelphia

TEXTILE DESIGN PAPERS

for all Fabrics

How to Distinguish Cotton and Linen.

One plan is to use the microscope, another by means of a chemical test.

In the latter case, mercerize a sample of the material as is given to you for testing with caustic-soda lye of a strength of about 40° B., then rinse, dry, and enter into a solution made up of 30 oz. of zinc chloride, 5 oz. of potassium iodide, and 1 oz. of iodine, in 24 oz. of water. After three minutes, lift and without rubbing, rinse in cold water. If the deep blue color disappears on rinsing, the material is linen, but if, on the other hand, it becomes only lighter, it is cotton.

Another test is to moisten the material with oil; linen absorbs oil rapidly, turning yellow, while cotton absorbs oil slowly, and such small quantities only that the fibre remains white.

JOHN C. EDWARDS NATHAN HEARD LOUIS C. SMITH

CROSBY & GREGORY

Established 1854.

Old South Building -- Boston, Massachusetts

PATENTS AND PATENT CAUSES

Textile Work a Specialty



F. G. LENTZ & CO.
Designers, Card Stampers
and Harness Builders

FOR ALL TEXTILE FABRICS

Mascher, Waterloo and York Sts.
Both Phones PHILADELPHIA, PA.

Yates's Patent **AUTOMATIC SHUTTLE GUARD**

Over 800,000 now in use in Great Britain and foreign countries. Adapted for all makes and widths of looms.

TIMOTHY YATES, Richmond St., Preston, Lancs., England (Only Address).

Agents wanted in weaving centres in the United States

"GLAZINE" For Softening, Filling White and Colored Goods, and Giving a Bright Finish

Inquiries: **J. W. CUMMING**, Irish Moss Exporter
Clonliffe, Dublin

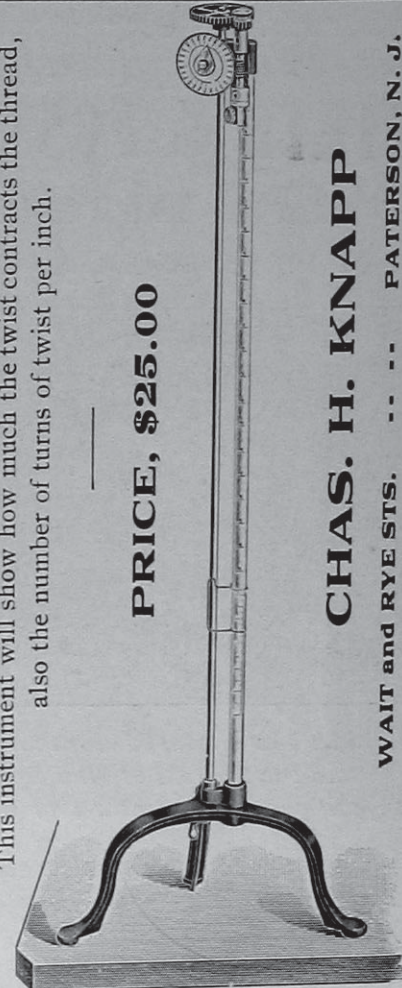
Code Used A, B, C, 5th Edition

Telegrams: Cumming, Dublin

CONTRACTION
BY
TWIST

This instrument will show how much the twist contracts the thread, also the number of turns of twist per inch.

PRICE, \$25.00



CHAS. H. KNAPP

WAIT and RYE STS. -- -- PATERSON, N. J.

WORSTED YARNS
RICHARD CAMPION
 Selling Agent for
BRISTOL WORSTED MILLS
HIGHLAND WORSTED MILLS
 300 Chestnut Street - PHILADELPHIA

CHEMICALS AND APPARATUS
FOR THE DYE TRADE
J. & H. BERGE
 Best Bohemian Chemical Glassware and German Porcelain.
 C. P. Chemicals and Reagents, Chemists' Supplies of all kinds.
 95 JOHN STREET, - - NEW YORK

KILBURN, LINCOLN & COMPANY
LOOMS FOR
COTTON AND SILK WEAVING
 FALL RIVER, MASS.

HOWSON AND HOWSON
ATTORNEYS AT LAW
 West End Building, 32 S. Broad Street
 Philadelphia
SOLICITORS OF PATENTS New York, 38 Park Row
 Washington, 918 F Street

The number is ever increasing.
 There is a good reason why.

THE SCHAELLIBAUM GRID

The grid with a comb is getting in general use all over the country. It does the work. You get better cleaning and lose less cotton in the process than by any other grid. : : : : :

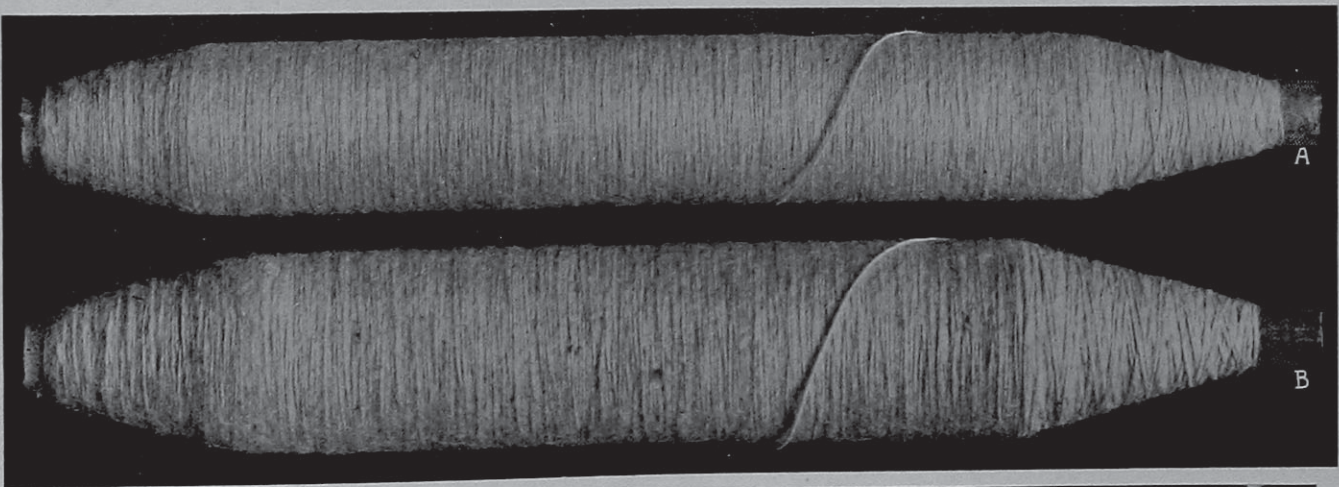
The ROB. SCHAELLIBAUM CO.
 288 Dyer Street, Providence, R. I.

Keyworth "Model B"
Silk Thread Finishing Machine
for Best Results \ WHY ?

Because the new features embodied in "Model B" do away with all the difficulties to be met with in silk thread finishing and make it the peer of any machine ever placed on the market. Investigate and see the number of duplicate orders we have received to date. Summed up, our success is due to the fact that we have the best and most complete system, and always honestly represent it and say to those who have tried the rest to try the best and see the difference. In ordering solutions, state the class of goods you wish to make. Correspondence solicited.

Wm. C. Keyworth, Engineer and Designer : : :
Textile and Special Machinery
219 Van Houten St., Paterson, N. J.

OSWALD LEVER Co., Inc., BUILDERS OF
 Lehigh & Mascher Sts. **PHILADELPHIA, PA.** TEXTILE MACHINERY
SPECIALTY: WINDING MACHINERY IN ALL VARIETIES
FOR ALL CLASSES OF WORK



Illustrations, Actual Size, Showing What We Do. We Invite Comparison.

Send Samples for Rewinding and We will convince you Where you are short.

- A:** Single 25's soft spun Cotton Yarn.
Amount of yarn on tube 456 grains or 1368 yards.
- B:** Single 12's soft spun Cotton Yarn.
Amount of yarn on tube 458 grains or 660 yards.

CIBA DYESCiba Blue
Ciba Violet
Ciba Red**Vat Dyes for Wool, Cotton, Silk**
Fast to Light, Chlorine and
Washing

Made by Society of Chemical Industry, Basle

A. Klipstein & Co., New York, American Agents

Announcement:

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

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

Full particulars on request.

POSSELT'S TEXTILE JOURNAL, Philadelphia.

MILL NEWS

Philadelphia. M. B. Laubach, manufacturer of children's full-fashioned and seamless ribbed cotton and lisle hosiery, has increased the capacity of his plant by the installation of five new full-fashioned knitting machines.

The Amherst Knitting Company, at Allegheny avenue and Boudinot street, has removed its plant to Baltimore.

The Lee Hosiery Mills, which have been very dull the last few months, have again resumed operation on full time.

The Derby Knitting Company has established a plant at No. 4958 Boynton street, Germantown, running eleven knitting machines, ribbers, loopers and sewing machines on ladies' underwear and cardigan jackets.

The Marlborough Mills, operated by John E. Hanifen & Co., it is reported, have sufficient orders on hand to keep them running on full time for several months on stockinette, eider-downs, astrachans, etc.

Owen Osbourne, manufacturer of women's and children's hosiery, who has been running five days a week for some time, has increased the running schedule of his plant to full time.

The Girard Worsted Company, manufacturers of all-worsted dress goods, which has practically been shut down for a month, has started up a number of looms.

The Overbrook Carpet Company is erecting an addition to its plant at Fifty-sixth street and Lancaster avenue, at an estimated cost of \$20,000.

F. W. Maurer & Sons Co., manufacturers of tapes and narrow fabrics,

have erected an addition to their branch plant at Nicetown.

The Stratford Worsted Mills have incorporated with a capital stock of \$4,000.

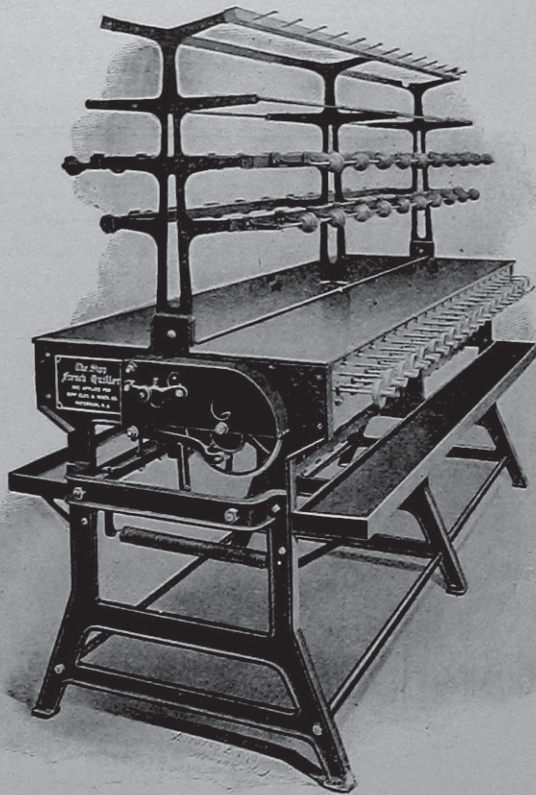
Albany, N. Y. The Norwich Knitting Company has increased its capital stock from \$25,000 to \$50,000.

Altoona, Pa. The Altoona Silk Mill has been working overtime for the past few weeks and is still unable to meet the demands of the trade.

Armourdale, Mo. The Kansas City cotton mills in the west end of Armourdale, which have been closed for more than a year, will in all probability be running by this time, giving employment to at least 200 hands.

Allendale, R. I. It is reported that Herman Ambach, formerly agent for the Lymanville Company, will install

(Continued on page xiv.)



The Sipp High Speed French Quiller Patented

The QUILLER that Will Produce More

GOOD QUILLS

IN LESS TIME

Than Any Other QUILLER Made

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

Prices and Circulars on Application to

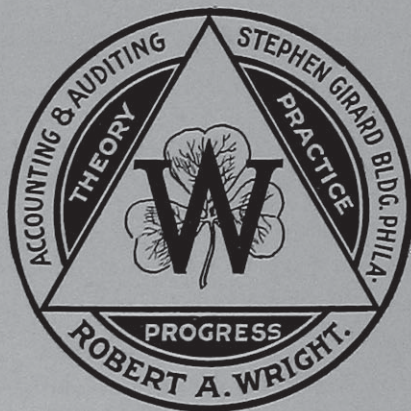
THE

Sipp Electric and Machine Company

Keen and Warren Streets and Erie R. R.

PATERSON, N. J.

Cost and Accounting Systems
Periodical or Casual Audits



Consultations and
General Accounting

WEIMAR BROTHERS

MANUFACTURERS OF

Tapes, Bindings and Narrow Fabrics

2046-48 AMBER STREET
PHILADELPHIA

WHEN QUALITY COUNTS WE GET THE ORDER



Cuts in this Journal are a sample of our work.

ESTABLISHED 1869

INCORPORATED 1906

The Whitaker Reed Co.

MANUFACTURERS OF

LOOM REEDS OF ALL KINDS

"Royal" Ring Travelers, Mill Wire Goods and Heddles

Worcester, - - Mass.

THEODORE H. STROUSE & CO. 426-428 MARKET STREET,
PHILADELPHIA, PA.
COTTON YARNS, MERCERIZED AND PLAIN.
FINE SINGLE, TWO AND THREE PLY UP TO 200's.
 Sole American Agents for Messrs. Wm. A. Holt, Ltd., Cotton Spinners and Doublers, Bolton, England.

60 broad looms in the local mill, and will manufacture piece dyed worsteds.

Augusta, Ga. The Phoenix Mill, originally known as the Richmond Factory, one of the oldest, if not the pioneer mill in the State, will be sold at public auction to satisfy a mortgage foreclosure.

Bennington, Vt. Some departments in the knitting mill of H. E. Bradford & Co., of the Cooper Manufacturing Company, are being operated evenings.

Brunswick, Ga. The Brunswick Knitting & Manufacturing Company of Brunswick, Ga., recently incorporated with a capital stock of \$15,000, has completed the installation of machinery, which will be used in the production of men's seamless half hosiery, with a daily capacity of 225 dozen pairs.

Cameron, N. C. The Regal Hosiery Mills Company has been incorporated with a capital stock of \$25,000.

Central Falls, R. I. The Pawtucket Hosiery Company has established a plant in the building of the Hemphill Manufacturing Company.

Charlotte, N. C. The plant of the Fidelity Manufacturing Company has resumed operations after a shutdown of three months.

Concord, N. C. Night work has been resumed at the Cabarrus Cotton Mill in the weaving department.

Cherryville, N. C. The Vivian Cotton Mills, which have been idle most of the summer months, have resumed operation on full time.

Clifton Heights, Pa. The Caledonia Mills Company's plant was sold to Nelson Kershaw, the prominent manufacturer of Turkish towels, etc., at this place.

Davidson, N. C. The Delburg Cotton Mills have begun spinning with an installation of 4,000 spindles on the production of 8's to 24's hosiery yarns.

Douglasville, Ga. The stockholders of the Lois Cotton Mills have decided to increase the capital stock from \$200,000 to \$300,000. The plant will begin operation about the latter part of this month.

East Brady, Pa. The Valley Yarn & Woolen Company has incorporated with a capital stock of \$10,000.

Enfield, N. C. The Enfield Hosiery Mills will enlarge their present plant.

Farnumsville, Mass. The Excelsior Mills, engaged in the making of woolen and cotton worsteds, will change hands and become the property of the S. Slater & Sons, Inc., of Webster, Mass. The plant is now in active operation and it is predicted that under the new ownership and management the mill will be operated steadily.

Hargrove, N. C. The Tar Valley Manufacturing Company has incorporated with a capital stock of \$75,000, and will engage in the manufacture of cotton goods.

Hornell, N. Y. The Merrill Silk Company has resumed operations, giving employment to 1,200 operatives.

Huntsville, Ala. The West Huntsville cotton mill, which has been shut down, has resumed operations and every spindle in Huntsville is busy.

Louisville, Ky. The Mayfield Woolen Mills, which have been idle for the past eighteen months, have resumed operations, and General Manager C. H. Norman states that the mill will shortly be running in full blast.

Ilion, N. Y. The Mohawk Knitting Mills, which changed hands, will be put in shape for business at once. They expect to have it running in December.

Kansas City, Mo. The Messrs. Marshall S. and Samuel A. Walker, Jr., of Grand Rapids, Mich., will establish here a mill for knitting underwear.

Lawrence, Mass. The additional two stories added to section D of the Wood Worsted Mills have been completed; machinery has not yet been installed.

Lexington, S. C. The Nokomis Cotton Mill will add 500 spindles and 16 looms to their present equipment.

Lumberton, N. C. The National Cotton Mills have resumed operations on a full-time schedule.

Moosup, Conn. The Aldrich Manufacturing Company, which has added a 500-loom extension to its plant this year, will, it is stated, erect a similar addition within a few months.

Mystic, Conn. The Ninigret Mills Company, manufacturers of cotton goods, which was recently incorporated, has completed its new building and the

machinery is almost all installed and operations are expected to begin at once.

Netcong, N. J. William H. Ashley, the well-known silk manufacturer of Paterson, Hackettstown, and several other places, will erect a silk mill here, which will give employment to about 100 hands, when the mill will start running early in the winter.

Newark, N. J. Upon the announcement of Taft's election the operatives in the two great thread mills in this city were notified that full time work is to be resumed November 9th.

Orange, Conn. The Narrow Fabric Corporation, manufacturers of elastic garter webbing, has increased its capital stock from \$75,000 to \$100,000.

Newton, N. C. The Newton Hosiery Mills have installed additional machinery.

Oswego, N. Y. The Ontario Knitting Company is contemplating the erection of a new plant at the cost of about \$300,000.

Paterson, N. J. Stehli & Co., who operate plants at Lancaster, Pa., and High Point, N. C., have taken over and will re-equip the old Cramer & Kinn Mill, and will operate same as a silk piece dyeing plant.

Providence, R. I. Operations have been started at the Colored Worsted Mills, most all of the machinery being installed. James A. Lister is president and treasurer, and Benjamin F. Lister, secretary and superintendent. The plant is equipped with 1,464 spindles and 800 twisters.

Quinapoxet, Mass. The Woolen Mills of C. G. Wood & Co., after being idle for five weeks, resumed work in all departments.

Reading, Pa. The Brossman Hosiery Mill, manufacturers of fine silk hosiery for men's wear, has resumed operations on full time.

Salisbury, N. C. The Vance Cotton Mills will erect a building, 40 by 50 feet, and install an equipment of beam and ball warpers. This company is operating 10,000 ring spindles and accompanying equipment, producing warps and yarns.

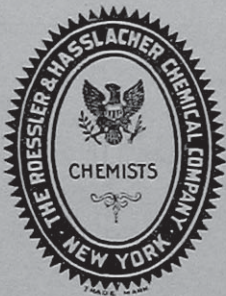
Sabattus, Me. The carding and spinning departments of the Webster Woolen Company have been started up on full time.

(Continued on page xvi).

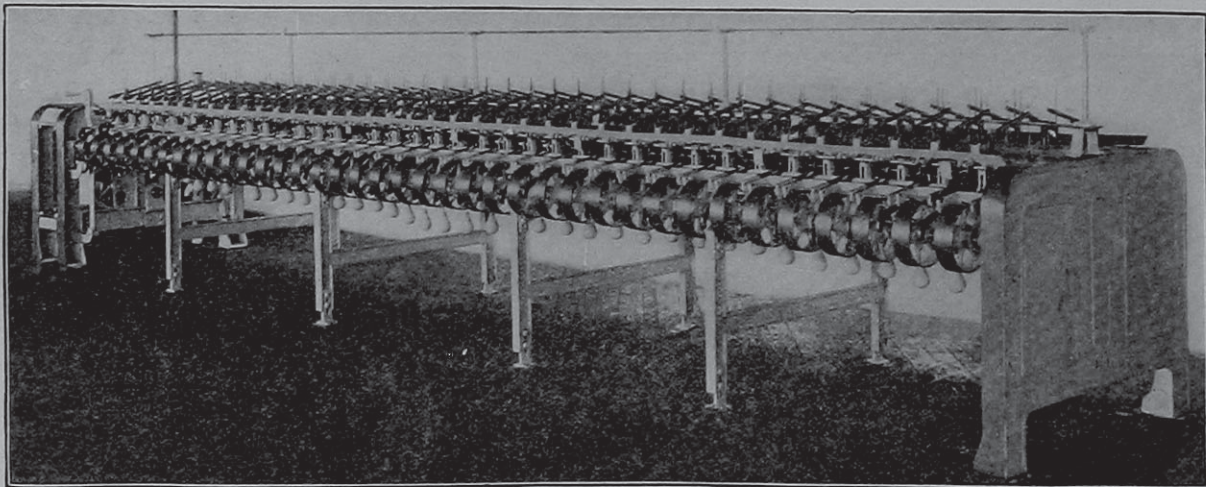
We are prepared to prove that Peroxide of Sodium for

Bleaching

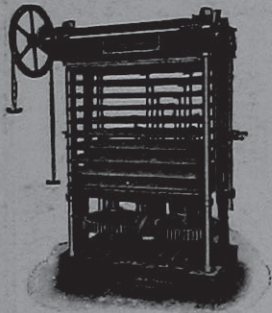
animal & vegetable fibres or their mixtures is the best.
Roesler & Hasslacher
Chemical Co.
New York



WOONSOCKET YARN GASSING MACHINE



Woonsocket Machine & Press Company, **WOONSOCKET,**
R. I.
Builders of Cotton and Woolen Machinery



"HURRICANE" DRYERS

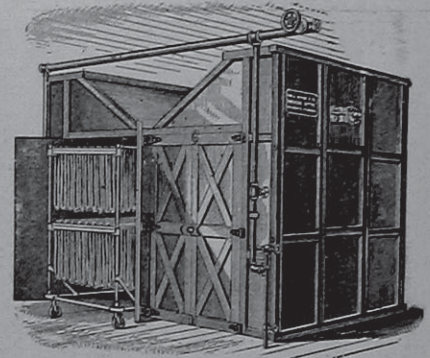
For Wool, Cotton Stock, Yarn, Knit Goods, Etc.

Belt-Driven **FANS** Motor-Driven

Power Screw **PRESSES** Hydraulic

WRITE FOR CATALOGUES

THE PHILADELPHIA DRYING MACHINERY CO.,
6721 GERMANTOWN AVE., PHILADELPHIA, PA.



Boston.

Providence.

Philadelphia.

Chicago.

Charlotte.

Albany.

Toronto, Can.

FARBENFABRIKEN OF ELBERFELD CO.,

IMPORTERS OF ANILINE & ALIZARINE COLORS

P. O. Box 2162

NEW YORK

117 Hudson Street

New England Butt Co.

Providence, R. I.

Braiding Machinery, both American and German types, for making Dress Braids, Shoe and Corset Laces, Underwear, Trimmings, and all kinds of Round and Flat Braids.

NORTHEASTERN TRADING COMPANY

IMPORTERS AND DEALERS

Russian, China, Turkey, Iceland and Other Foreign
Wool, Hair, Mohair, Eiderdown and Skins

New York Office:
74-76 WALL STREET

114 Arch Street
PHILADELPHIA, PA.

Boston Office:
620 ATLANTIC AVE.

Rockville, Conn. The Rockville Woolen Mills, which have been on short time all summer, are again on full time with enough orders ahead to keep the mills busy for some time.

South Manchester, Conn. Orders for ladies' dress materials are pouring in so rapidly at the plant of Cheney Brothers Company that several of the departments are being run overtime.

Springfield, Tenn. The Springfield Woolen Mills Company will double the capacity of their plant and which, when completed, will increase the production to 3,000 pairs of blankets per day.

Stafford, Conn. The Phoenix Woolen Company, after a shutdown of two months, has again resumed operations.

Taunton, Mass. The Westville Spinning Company, which has been working four days a week for the last ten months, has resumed operation on full time.

Tupelo, Miss. The Tupelo Cotton Mills will increase their capital stock to the extent of \$110,000, for the purpose of providing funds for needed additions and improvements.

Tuscaloosa, Ala. The Sanders Cotton Mills have been incorporated with a capital stock of \$40,000, and will continue the business of the plant of that name which has been unincorporated heretofore, which operates 4,000 ring spindles and 108 looms, manufacturing cotton duck.

Union, S. C. The Union Mills will run to full capacity; all idle machinery will be started up as rapidly as possible. This means that 400 looms and 15,000 spindles will be put in operation as soon as operatives can be secured.

Utica, N. Y. The Shenendoah Cotton Company's four mills, which have been running on part time for nearly a year, have started running on full time.

Wakefield, Mass. The Winship Boit Knitting Mills, which have been running on a four-day schedule the past seven months, have returned to the six-day, full time schedule. These mills employ about 500 hands.

Williamstown, Mass. The plant of what was formerly the Boston Finishing Works has been sold to George A. McDonald, of North Adams, who, it is said, made the purchase for other persons. The sale price is kept a secret, though it is understood that the amount is \$25,000.

Willimantic, Conn. The large plant of the American Thread Company, which has been on a four-days-a-week schedule for several months past, has resumed operation on full time in all departments.

Yorkville, S. C. The York Cotton Mills, after a shutdown of five months, have resumed operations on a full time basis.

“Textile Designing Simplified.”

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

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

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

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

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

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

HOW TO PUT A BACK WARP ON SINGLE CLOTH.

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

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

THREE PLY CLOTH is shown by one example.

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

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

HOW TO WORK THIS CHART OF WEAVES.

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

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

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

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

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

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

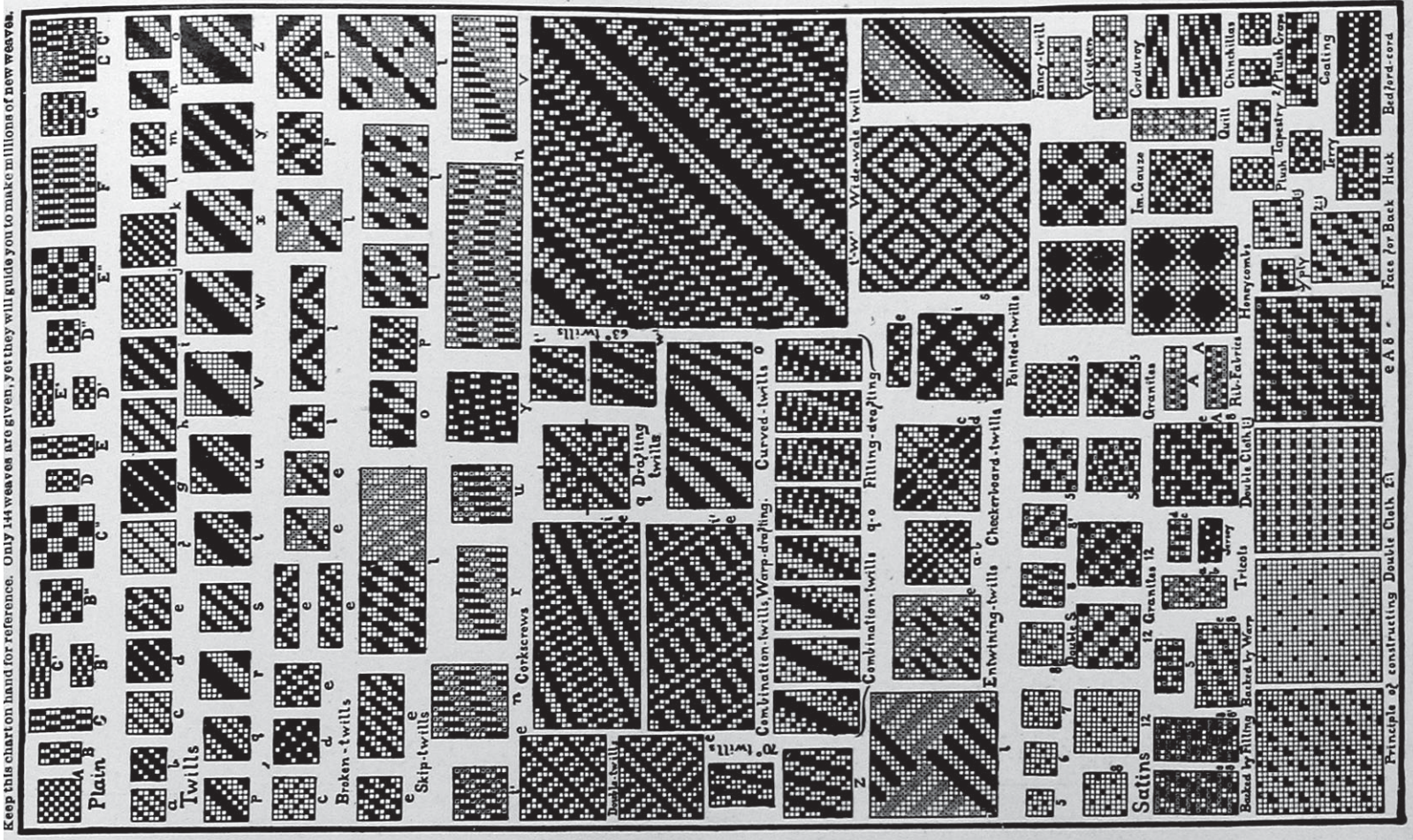
Example.—The wide wale twill *l' w'*, has for its foundation the 63° twills, marked also respectively *l'* and *w'*, the latter two weaves have again for their foundation respectively the common twills marked *l* and *w*.

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

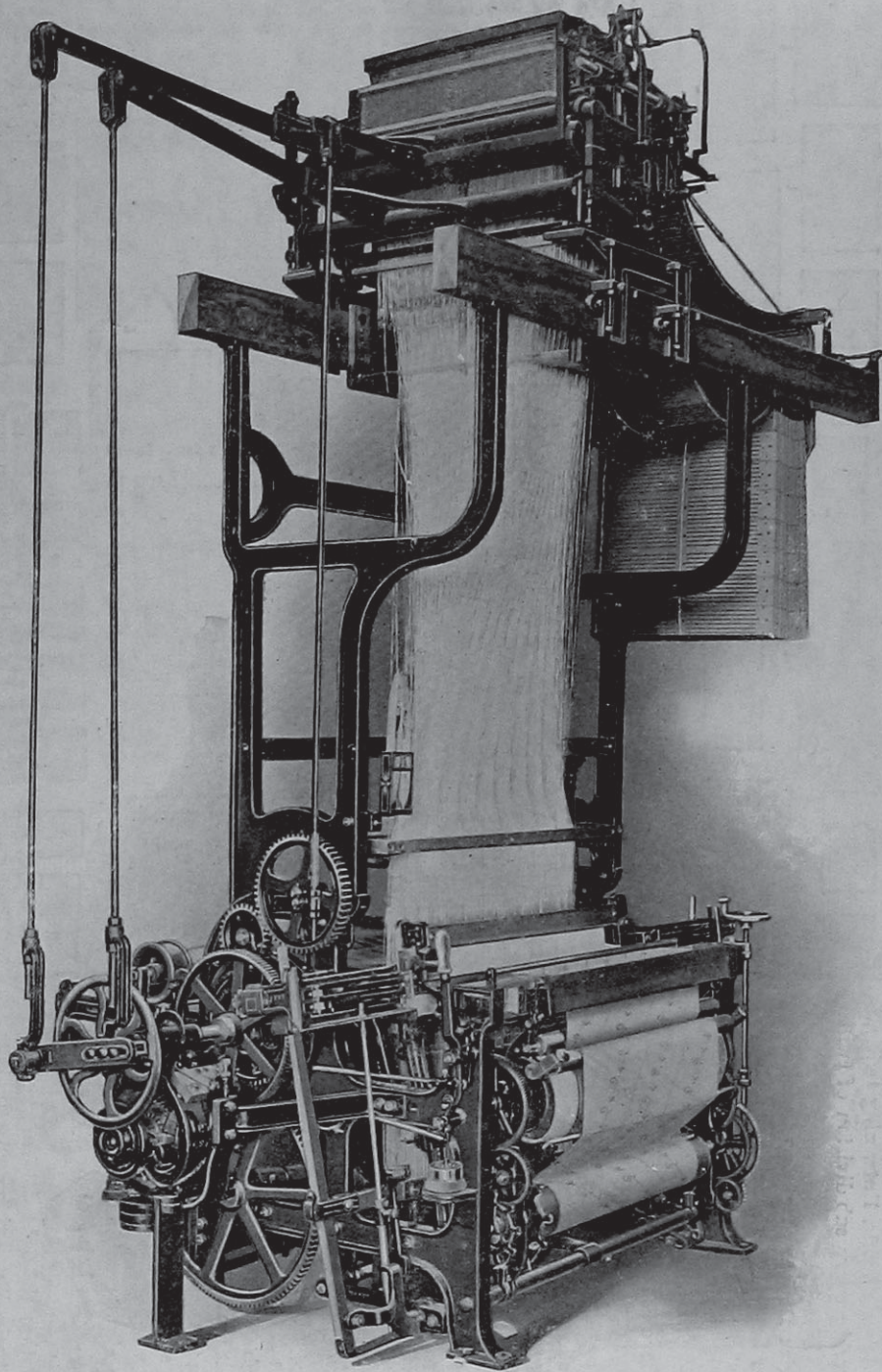
Example.—Backed by filling *e* 8, means the common 2/4 4-harness twill *e*, (fifth weave on second row) and the 8-leaf satin is used in the construction of this weave.

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

Example.—Rib fabric A, indicates that the plain weave forms the foundation. It will be easy to substitute different foundations in constructing weaves for heavy weights. In reference to single cloth weaves we only want to indicate that by following rules shown in the chart, millions of new weaves can be made up from it.



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



C. & K. JACQUARD SILK LOOM WITH MOTOR DRIVE

THE combined efforts of our experienced builders are directed toward a steady advancement year after year in all our varieties of weaving machinery. We want you to expect the best in every machine bearing our name.

CROMPTON & KNOWLES LOOM WORKS

WORCESTER

PROVIDENCE

PHILADELPHIA