Metals or substances which will produce metal, on being heated, should not be fused in a platinum crucible, because the metal will alloy with the platinum and destroy it. Sodium carbonate may be fused in a platinum crucible, but strong alkalis like caustic soda and potash should not be fused in it if a silver or nickel crucible is at hand. Platinum crucibles are so expensive that a few rules will be given, to protect them from injury when using.

Platinum crucibles should not be used when free chlorine and bromine are present. Free sulphur, phosphorous, arsenic and iodine attack platinum, so that these substances when in a free state should not be fused in a platinum crucible, nor should sulphides, sulphates or phosphates, be fused with a reducing agent, in a platinum crucible, because with a reducing agent, sulphur and phosphorous are set free. The blue flame of the gas flame should not touch the platinum crucible.

Since we have mentioned the gas flame, it is best to explain the nature of it. A flame can only be produced by a gas. The carbon compounds, wood, bituminous coal, and tallow are indeed not gases, but burn with a flame because under the influence of heat, they develop combustible gases. The ordinary gas flame is made up of three parts or zones.

(1) The inner zone, that part of the flame directly above the outlet of the burner; this part of the flame consists of the gas which is not burning, it is the black portion of the flame. If the lower end of a thin glass tube is inserted here the gas will rise in it and can be lit at the other end.

(2) Immediately surrounding the inner flame, is middle flame; here the gas takes fire and burns, but it does not burn completely as may be proved by inserting a cold glass rod in it, this will be covered by soot showing that the gas is not completely burned. It is part of this flame that gives us light.

(3) The outer flame can be scarcely seen, in it there is complete combustion; there are no black particles. There is enough air present to burn the gas completely, no carbon is set free, it is all burned. When there is complete combustion, the flame is not bright but is very hot.

The ordinary flame was explained to show how the *Bunsen burner* is used in laboratories for heating and fusing. By bringing as much air or oxygen into the gas as is necessary for the complete combustion of all carbon, none of the latter separates and a faintly luminous but very hot flame is produced. Upon this principle is based the construction of a Bunsen burner. In this burner a large quantity of air is introduced into the gas, which burns up completely all combustible matter in the gas, producing in turn a very hot flame. When this supply of air is shut off, the Bunsen burner is changed into a common gas burner.

(*To be continued.*)

FROM THE BOSS DYER of a prominent Woolen Mill in Maine.

Posselt's Textile Journal:—Enclosed check for another year's subscription. I like the Journal very much. W. C. 1-14-09.

A PROMINENT TEXTILE MAN HONORED.

Seven hundred of the most prominent business men of Greater New York, January 21st, attended a banquet at the Waldorf-Astoria in honor of Comptroller Herman A. Metz, of the prominent dye stuff concern, H. A. Metz & Co., New York. Their presence signified the appreciation of the worth of the Comptroller in placing the finances of the city on a sounder business basis.

Henry Clews, the banker, said in part: "I have long and carefully watched the career of Comptroller Metz in public office, and I think all here will agree with me that he has invariably shown a most consistent and conscientious regard for the duties of the high office of trust which has been delegated to him by the free choice of the people. That trust has never been abused, and it is his intelligent and public-spirited devotion to duty that has raised him in the public's confidence. *Such men are too rare,* and when found it is our privilege to honor them with generous appreciation."

DICTIONARY OF TECHNICAL TERMS RELATING TO THE TEXTILE INDUSTRY.

(*Continued from page 32.*)

FLANNELETTE:—A cotton fabric made in imitation of woolen flannel. Produced by raising of a soft pile upon one or both surfaces of a plain or twilled cotton cloth, the threads of which, in order to provide substance for the pile, must be of a comparatively low count, spun from a fairly long stapled cotton.

FLAT UNDERWEAR:—Undergarments knitted in plain stitch.

FLAVANILIN OR FLAVANILINE:—A crystalline dyestuff derived from acetanilid, which produces a yellow color on cotton, wool and silk.

FLAVIN:—A yellow-brown compound, formed by the action of sulphuric acid on quercitrin, and used as a dyestuff.

FLAW:—An imperfection in weaving, or a dropped stitch in knitting.

FLAX:—The fibres forming a long thick walled cellular tissue, situated between the wood and the bark of the flax plant and used for making linen. The principal sources of supply are Russia, Germany, the Netherlands, and Ireland.

FLAX-BRAKE:—A device or machine, for breaking up the woody parts of flax to facilitate their removal from the fibre.

FLAX-BUSH:—New Zealand flax, a strong fibre useful for making ropes, mats, etc.

FLEECE:—The pelt or mass of wool removed from one sheep by the process of shearing, and then tied into a bundle.

FLEECE-LINED:—A term applied to a variety of heavy-weight undergarments knitted with an extra backing thread. A heavy nap of fleece is then produced by running the cloth through a napper or a stiff brushing machine. Said extra thread is used so as not to tender the body structure of the fabric.

FLEECE-WOOL:—Wool shorn from the live sheep.

FLEMISH-STITCH:—A stitch used in making certain kinds of point-lace.

FLEUR DE SOIE:—A trade name for a Satin de Lyon, interlaced with a 12-harness satin weave.

FLEUR DE VELOUR:—A superior grade of velours.

FLIPED-WOOL:—Skin wool from certain breeds of one year old sheep by which the wool as pulled off adheres so much together that it retains the form of the fleece.

FLOAT:—In weaving, threads that have by accident not been intersected in the body of a fabric, but lie loose upon its surface.

FLOCKS:—Wool stock ground very fine.

The soft fluffy fibres cast out of different machines used in various finishing processes in a woolen mill.

Shear-Flocks are produced at shearing and brushing processes.

Gig Flocks are produced by gigging or napping.

Cheaper grades of flocks are such as are produced from woolen rags by grinding them up in special machinery.

Flocks are felted into lower grades of woolen fabrics during fulling, both for lowering cost of production as well as increasing their weight and firmness.

FLOCK-CUTTER:—A machine for grinding woolen rags into flocks.

FLOCKONEES:—A heavy woolen cloth used for overcoatings constructed with 2 or 3 system of filling. The face filling forms the face of the fabric and is cut in the finishing process, the fabric being afterwards rubbed by machinery to give the face of the cloth the appearance of being covered with fine locks of wool.

FLORENCE:—A thin silk taffeta.

FLORES:—The first quality of indigo dye.

FLOSS OR FLORET SILK:—A fluffy silk yarn from the waste cocoon, hence of better quality than the noil yarn; carded and spun, but not twisted, so as to be extremely soft and downy in its body, while retaining a high lustre. It is used chiefly for embroidery. (Oftentimes called Filoselle.)

FLOUNCE:—A deep ruffle; a gathered or plaited strip of any material used to decorate a garment.

FLOUR:—Chemically, flour may be considered a mixture of starch and a peculiar substance called gluten. It is the amount of starch that renders it more or less valuable. The gluten has no sensible thickening power of itself. Used in sizing and finishing yarns and fabrics.

FLY, FLYINGS:—The loose, short fibres liberated during picking, carding, combing and spinning yarns.

A strip or lap on a garment, to contain or to cover the buttonholes; a flap.

FLYER:—A steel tube, something of the shape of an inverted U, fixed on the top of an upright revolving spindle in spinning machinery.

FLY-FRAMES:—The name collectively given to the set of machines used for converting the sliver of the drawing frame into the roving for the ring-frame or mule.

They comprise the following machinery in cotton spinning: Slubber, Intermediate, Roving and Fine Frame; the latter only being used in the manufacture of the finest counts of yarns, the intermediate being sometimes omitted in spinning low counts of cheap cotton yarn.

FLY-REED:—In weaving, a loose reed, provided with springs which limit the force with which it strikes the filling when so requred. Used in the weaving of turkish towelings or similar warp pile fabrics, where a change in beating up of the filling is required.

FLY-SHUTTLE:—The name given to the shuttle, with wheels, propelled by a cord and driver, invented by John Kay, of Lancashire, England, in 1733. Previously to Kay's invention of the fly shuttle it required two men to work a broad loom, one at each side of the loom, and the shuttle was thrown from one to the other alternately. By means of Kay's invention, the weaver, sitting in the middle of the loom, worked the shuttle by pulling a cord.

FLY-SPINNING:—The process of spinning on to a bobbin by means of a flyer.

FOLLICLE:—The involuted sac or bag which contains the hair or wool within the skin.

FORMALDEHYDE:—An excellent preservative for thickenings and dressings, effective in very small quantities and having no action on the fibres. It should not be used in the presence of easily reducible metallic salts, as there is a tendency to produce stains in certain cases. The danger is greatest in the presence of chromic acid.

FOULARD:—A soft, fine, untwilled, washable silk fabric, dyed in the piece.

FOULARDINE:—An imitation in cotton of silk foulards.

FOUNDATION MUSLIN:—A fabric used to give stiffness to parts of garments. It is loosely woven like canvas, and is stiffened with a suitable substance.

FOUNDATION WEAVES:—Plain, twills and satins are known as the foundation weaves.

FRAME:—A machine which carries the rollers and accessories for spinning or doubling by means of a flyer, cap, or ring and traveller.

Technical grading of Brussels carpets.

FRAME-KNITTING:—Weaving or knitting yarns, upon a frame or board, bearing projecting pins, which when completed resembles knitting.

FRAYING:—One set of threads slipping upon the other, and so producing imperfections in the fabric.

(*To be continued.*)

THE LIGHTING OF TEXTILE MILLS

(*Continued from Vol. II, No. 3.*)

A very important fact for the mill owner to consider is that because of the higher efficiency of the tantalum lamp, he can get fully 50% more light in his mill from, say, 50 tantalum lamps, than from the same number of carbon lamps, with about one-half the power consumption. This means that if a mill needs more illumination than its power plant can furnish, instead of buying more engines, dynamos, etc., it can get the required illumination by using tantalum lamps instead of carbon lamps, the same power then operating with twice the lighting effect, or even more. Similarly, where the mill buys its electric current, it can get more light, with smaller bills, if tantalum lamps are used in place of the ordinary incandescent types.

No doubt extended use and competition will soon lower the price of these new lamps, meanwhile their greater cost is repaid by their greater efficiency and lower power consumption.

Arc Lamps. There are two commercial sizes of enclosed arc lamps, one operating with a current of about 4 amperes, the other about 6 amperes, on the same voltage as the incandescent lamp, 110 to 120 volts. A type of enclosed arc lamp made by the General Electric Company operates with a current of 6.6 amperes, requiring about 72 to 76 volts, alternating current. Each of these latter lamps consumes about 500 watts, with an efficiency of 95%. The current for the former lamps costs about ten cents per kilowatt hour, the 4 ampere lamp giving about 250 candle-power, 6 ampere lamp about 300 candle-power, on a consumption of 300 to 400 watts per light hour. The open arc lamp is usually operated on a higher voltage than the enclosed arc, and consumes 400 to 600 watts per light hour, giving an average of 400 to 600 candle-power. The cost of the open arc lamp, in series, averages about 33 cents per night of eight hours, or about four cents per light hour. This price,

however, is only for a number of lamps arranged in series.

One point in favor of arc lamps is that they give a much higher efficiency than do incandescent lamps in the conversion of electric power into light, as less of the current that they consume is wasted by being transformed into heat than is the case with incandescent lamps. However, for mill lighting, the open arc lamp has several drawbacks and the loss of power is compensated for by certain advantages of the incandescent lamp. The enclosed arc lamp has the disadvantage of excessive glare and brilliancy.

Gas Lighting. Since the invention of incandescent mantles of the Welsbach type, gas lighting has again become a competitor with electricity for indoor illumination, these mantles having a very high lighting efficiency on a small consumption of gas. The discovery of practical methods of using acetylene gas has also placed a very efficient illuminant at our disposal. Candle-power for candle-power, either common gas or acetylene is probably cheaper in most places than electricity; however, in textile mills there are grave objections to their use. Still, as in some cases the illumination of a mill by gas may be necessary, either because electric current cannot be secured, or for other reasons, a brief summary of the important points about gas lighting will be given in this article.

The greatest objection to the use of gas for illuminating a mill is because of the great heating effect it has, this requiring extra ventilation and seriously affecting the relative humidity of the rooms. A cubic foot of gas when burned will give about 650 heat units, a cubic foot of acetylene gas gives about 1000 heat units, all of which is given off to the air of the room, increasing its temperature and lowering its relative humidity. Burner for burner, acetylene gives off less heat because less is used for the same amount of light.

Another objection is the contamination of the air by the products of combustion. One gas burned will give off as much carbon dioxide gas as will five or six persons working there, and this gas must be removed and fresh air supplied, or else the room will be unfit to work in. This also means more power for ventilation.

In estimating the comparative cost of gas lighting and electric lighting, this increased ventilation and humidification necessary must be figured in with other items to arrive at a true conclusion. Of course, if the only means for ventilation are doors and windows, this item does not enter, but only in the smallest mill could these be at all depended on, and even then there would be no adequate way of getting rid of the extra heat, etc., without causing damaging air currents.

Cost of Gas Lighting. With gas estimated at $1.00 per 1000 cubic feet and carbide of calcium at 4 cents a pound (one pound of the carbide giving 5 cubic feet of acetylene gas), the following table shows the cost for the same candle-power of light with plain gas burners, gas mantles and acetylene gas, with incandescent lamps with current at 1 cent per hour for a 16 candle-power lamp added for comparison:

Table of Cost of Lighting.

Acetylene Gas, *ten ½-foot burners* give 250 candle-power, cost per hour—4 cents.

City Gas, *fifteen 5-foot plain burners* give 250 candle-power, cost per hour—8 cents.

Gas, *with common mantle, ten 5-foot burners* give 250 candle-power, cost per hour—4 cents.

Incandescent Lamps, *16 c. p. each,* sixteen give 250 candle-power, cost per hour—16 cents.

From this table it will be seen that electric lighting will cost, under the conditions stated, four times as much as acetylene or gas mantle burners and twice as much as plain gas burners. The great advantage of acetylene is that its light remains constant in its intensity, whereas the incandescent lamp and the gas mantle steadily lose in illuminating effect with every hour of use, the former diminishing to 75% to 50% of its intensity, the latter to only 66% to 50% of its first brightness.

Acetylene gas will give about 250 c. p. per burner when burned at the rate of 5 cubic feet per hour. Ordinary city gas in a plain burner gives about 16 candle-power on 5 cubic feet per hour consumption. With a good Welsbach mantle, city gas will give from 50 to 60 candle-power on a consumption of only 3 cubic feet per hour. Artificial gas, made from gasoline, has about the same efficiency as common gas, *i. e.*, 14 to 16 c. p. in a plain burner and about 50 c. p. with a good mantle. At $1.00 per 1000 cubic feet, city gas will cost only 0.3 cents per hour for 50 c. p. with a mantle.

When using gas, an important point to be noted is the pressure of the gas as delivered at the burners. There is a great waste of gas with an over-pressure, as only a certain quantity can be consumed with a burner and the extra amount forced through by a high pressure will simply escape unconsumed. Where many burners are used, this waste may amount to 10% to 25% of the gas bill. Thus, each 0.1 inch of over-pressure will cause a burner to use ½ cubic foot of gas per hour more than it would use at the standard pressure of 0.5 inch. The standard pressure of gas at the burners should be as follows: Common burners—0.5 inch. Mantle burners—0.5 inch. Atmospheric burners—1.0 inch. The pressure of gas is measured as being equal to the pressure of a column of water 1 sq. in. in area.

(To be continued.)

Cotton Prices Advance.

Speculation in cotton is broadening, and prices in turn have advanced. Large spot interests have been heavy buyers of March and May, and spinners have bought a good deal of July and October. There has been so much covering of October that the differences have narrowed. Europe has evidently become alarmed over the outlook. It is heavily short here, particularly against October straddles, originally made by selling in New York and buying in Liverpool. Now Europe begins to suspect that the crop may not be so large

as it at one time expected it to be. It has therefore been liquidating the October straddles on an increasing scale as prices have advanced, which means buying in New York. There has also been a good deal of general covering, both in this crop and the next by people who have become nervous over the National Ginners' Association report stating that the ginning from January 1 to 16 was only 158.000 bales, as against the Census Bureau figures of 388,046 bales for the same time last year; 435,168 in 1906-07, and 264,-208 in 1905.

Years ago a feeling pervaded New England, New York, New Jersey and Pennsylvania that supremacy in cotton goods manufacturing had passed to the South, and investors with the exception of the most far-sighted ones, were not anxious to invest their capital in this field.

Since that time a radical change has taken place in sentiment. The possibilities of the northern States with their intelligent and efficient help, and climatic superiority, have shown a combination enabling their manufacturers to constantly expand their output along the finer classes of fabrics where the combination of a maximum of skill and intelligence with a minimum of raw material required in their construction, means relatively greater profit and growth in manufacturing, leaving to the South the manufacture of the more common, plain structures.

During the late commercial depression the value of linen fabrics in bonded warehouses shrunk considerably. The goods were entered at top figures and importers were compelled to mark off as much as 40% of the cost at one time when computing the market price. To save some of the loss was a problem that puzzled many, an appeal to the Government being out of the question. The goods had been appraised at a certain price, a declining market never affecting the values of goods in bonded warehouses. It then looked as though the cloths had to remain where they were, until prices rose again.

One importer solved the problem by withdrawing 250 cases and placing them on board a steamer, presumably for export. When landed in Ireland the cases were re-marked, put aboard the same vessel and entered here at a figure so much lower, that after deducting freight and other charges it was found that the sagacious Irishman had saved his house $10,000. This plan was followed by several others to their great profit, and, the practice was considered legitimate.

THE ELECTRIC DRIVE FOR TEXTILE MILLS.

(*Continued from Vol. II, No. 3.*)

14. The possibilities of concentration and specialization by use of the electric drive. If it is possible for one mill to operate more economically with the electric drive, it certainly will be still more economical for several to operate from one central power station and thereby save the cost of several independent power plants and the cost of their maintenance. This is one of the most important possibilities of the development of the uses of electric power, but it has been given little consideration, because the textile manufacturer is not an engineer and seldom studies power economics and also because of the theory that competition requires a separation into individual activities. Another reason is that previous to the perfection of the electric drive it was impossible to distribute power over areas of any extent, each mill was compelled to have its power generators where they would be applicable to the machinery. Nowadays, it is possible to generate electric power at a central station and from thence to distribute it over wide areas with a very slight loss, the power plant itself being located with a view to the greatest utilization of water power, the cheapest source and delivery of fuel, cheap building site, etc.

There are a number of economies that can be secured by the operation of one large power plant, the items of cost of labor and cost of fuel alone justifying the coöperation of several mills in the maintenance of one plant for all the mills instead of a separate plant for each. Then too the best electrical and mechanical engineers can be afforded, and by their employment the power plant can be operated most efficiently and economically, labor-saving devices can be installed and arrangements be made to utilize the maximum capacity of the power plant at all times and thus to prevent losses from its maintenance in idleness. There is no more reliable a source of power than an electric generating plant operated either by steam or water power, when proper attention has been paid to the duplication of apparatus, and "throwover" connections to another power station can be installed, which will absolutely guard against stoppages from a breakdown.

The comparison in the first costs of a large power plant and of several small plants aggregating the same horse-power is too obvious to need more than a brief mention. One building and one set of engines and generators will cost a great deal less than several buildings and generators, even though they be smaller, and where water power can be utilized it would be simply folly for each of several neighboring mills to install their own turbines and generators. The question is one that merits thoughtful consideration by textile manufacturers, setting aside old prejudices and ideas.

To sum up, the electric drive has the advantages over all other power transmission systems of flexibility and ease of extension; absence of costly shafting, belting, steam-pipes, etc.; compactness and less space needed for both the motors and the power transmitting devices; more regular and more constant operation of machinery; no cost for maintenance when not in use and productive; better regulation of power; independence of machines and groups of machines; the application of power when needed and where needed without affecting machinery not wanted in operation; less liability to stoppages or breakdowns, and if such occur, they are local in effect; and, finally, the ease by which the power can be generated under the most favorable

(*Continued on page xii.*)

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conditions and then be distributed over wide areas and at great distances.

There is but one practical objection to the adoption of the electric drive, and that is the present cost of the motors. It costs more to equip a textile mill throughout with the electric drive than it does to equip it with a mechanical drive of equal horse-power, the more the motors are applied to individual machines, the greater will be the cost. But here the comparison ends, for in cost of maintenance, repairs, operation, etc., the electric drive is much less than for any other system. If the power operating the mill be purchased from a central supply station, then in the long run, (a few years only) the greater cost of the electric installation will be repaid by its greater economy of power consumption and the absence of cost when the machinery is idle and not productive. Another feature of the electric drive that will make it pay for its greater first cost is that by its use a cheap source of water power at a distance from the mill can be utilized and the cost of engines and fuel can be saved. No other power can be thus transmitted and used.

For a time the cost of power was considered the deciding factor in comparing the electric drive with other methods, the loss by friction and slipping between the engine and the machine with shafts and belting necessitating an allowance of from 30% to 50% more horse-power in the engine than was required to run the machines. However, the cost of the power required to operate a mill is a small item in its total expenses, seldom averaging over 4%, the following table showing the distribution of costs in an average plant.

Cost of raw material	50%
Cost of labor	40%
Cost of power	4%
Cost of supplies and repairs	3%
Cost of insurance, taxes, etc	3%
Total	100%

The cost of raw materials depends upon the laws of supply and demand and can be lessened by foresight and prudence in buying alone, so it has no relation to the cost for power. The item of cost for labor is related to the cost of power, for it can be reduced by any application of the power that will give an increased production per person and per machine, and this is just what the electric drive does.

Another feature of importance, especially in textile mills, is the greater cleanliness that is obtained with electrically driven machines because of the absence of overhead shafting, pulleys, belting, etc., in great measure. For the same reason there will be better lighting and ventilation, and a clean, well-lighted, well-ventilated workroom will enable the employees to do more work and better work. There is also less heating of the air from electrically driven machinery, because of the absence of the friction heat from long lines of belts or shafting. All of these items make for a better sanitary condition in the mill, which means an increased production.

TEXTILE WORKER'S BUREAU

Manager. Textile expert with practical experience on wide variety of silk and cotton decorative fabrics will shortly be open for engagement.

Has successfully filled some of the most important positions in the U. S. as Head Designer Colorist, Salesman and General Manager. Is prepared to take financial interest in live concern. Address, Manager (203) care of Posselt's Textile Journal.

Asst. Supt., Boss Weaver, Designer. Married man, temperate; has had extensive experience in Wool, Cotton and Silk. Fully acquainted with Jacquard work. Was Designer and Overseer for several New England Mills during the last ten years. At present employed. Will go anywhere. P. J. (205) Posselt's Textile Journal.

Boss Weaver or Designer. Now with a New England Mill; has had three years' practical experience. Will go anywhere. C. E. (204) Posselt's Textile Journal.

Boss Carder. Young man, married, temperate and steady, at present employed in New England mill, desires to make a change. Will go anywhere. References. O. W. (207) Posselt's Textile Journal.

Manager for Fancy Mill.

A practical man of over 20 years' experience as Manager and Head-Designer of prominent fancy mills in Philadelphia and New York, formerly of Scotland, is open for engagement. Satisfactory reason for change.

A reputation in Philadelphia and New York City as reference.

Expert Jacquard Designer and Colorist, also well versed in Harness Work and Fabric Structures. *"Novelties"* which pay a specialty. Address, *"Jacquard,"* care of Posselt's Textile Journal.

Asst. Designer, Expert Jacquard Cutter. Young man, single, thorough knowledge of Jacquard head, at present employed in a New England Mill, desires to make a change. References. Will go anywhere. F. T. (206) Posselt's Textile Journal.

Wanted. To make connections with some good Worsted Yarn Mill, or Commission House, to sell Production in New England. Either commission or salary. Would also take on cotton account if desired.

Have had a large experience in these lines and am thoroughly acquainted with the New England trade. Address: W. H. (208) Posselt's Textile Journal.

Foreman. In silk milk, 21 years experience in silk mill, 6 years as foreman in winding, quilling, warping, twisting, managing of stock throughout, and the inspection of cloth. Total abstainer,

(*Continued on page xiv.*)

BOOKS ON TEXTILE SUBJECTS.

Wool Dyeing (Part 1), by W. M. Gardner. Price $2.00.
TABLE OF CONTENTS: Fibre, Scouring, Bleaching, Water, Mordants, Assistants and other Chemicals.

Wool Dyeing (Part 2), by Gardner and Knaggs. $3.00.
TABLE OF CONTENTS: Classification of Coloring Matters; Natural Dyestuffs: Logwood, Redwoods, Madder, Cochineal, Kermes and Lac-dye, Orchil; Cudbear and Allied Coloring Matters, Yellow-Dyes, Indigo; Artificial Dyestuffs: Classification of Coal-tar Dyes, Artificial Mordant Dyes, Acid Mordant Dyes, Acid Dyes, Direct Cotton Dyes Suitable for Wool, Basic Dyes, Dyes Applied by Oxidation, Reduction and other Special Processes, Metallic Dyes, Methods of Dyeing Wool in Various Forms, Suitability of Dyes for Different Classes of Work, The Theory of Wool Dyeing.

The Dyeing of Cotton Fabrics, by F. Beech. Price $3.00.
TABLE OF CONTENTS: Fibre; Action of Alkalies, Acids and Oxidising Agents; Bleaching; Dyeing Machinery and Manipulations; Principles and Practice of Cotton Dyeing; Dyeing Unions, Cotton-Wool, Cotton-Silk; Washing, Soaping, Drying; Testing Color; Experimental Dyeing and Comparative Dye Testing.

Silk Dyeing Printing and Finishing, by G. H. Hurst. Price $2.00.
TABLE OF CONTENTS: Fibres; Boiling Off; Bleaching; Dyeing Blacks and Fancy Colors; Weighting; Dyeing Mixed Fabrics; Printing; Dyeing and Finishing Machinery and Processes.

Dyeing of Textile Fabrics, by Hummel and Hasluck. Price $2.00.
Three Volumes Bound in One.
Vol. 1: Textile Fabrics and Their Preparation for Dyeing.
Vol. 2: Coloring Matters for Dyeing Textile Fabrics.
Vol. 3: Mordants, Methods and Machines used in Dyeing.

Wool, Cotton, Silk; Fibre to Finished Fabric, by Posselt. Price $3.50.
TABLE OF CONTENTS: Raw Materials; Preparatory Processes; Carding, Drawing, Spinning and Twisting; Winding, Warping; Weaving Machinery and Supplies: Knitting. Processes and Machinery; Dyeing, Bleaching, Mercerizing. Processes and Machinery; Finishing. Processes and Machinery; Heat, Power and Transmission.

Color in Woven Design, by R. Beaumont. Price $7.50.
This work contains on 32 plates 126 colored illustrations of Diagrams illustrating the Mixing of Colors; Fancy Yarns, Fancy Cassimeres, Worsteds, Trouserings, Coatings, Suitings, Ladies Dress Goods, Cloakings, Fancy Cotton and Silk Fabrics. Besides said 126 colored illustrations, the work contains 203 illustrations, in black and white, of Weaves and Color-Effects in Fabrics, etc., accompanied by 440 pages of reading matter.

Chemistry of Dye-Stuffs, by G. von Georgievics. Price $4.50.
A textbook presenting to the student in as condensed a form as possible the extremely wide domain of the modern chemistry of dye-stuffs; bringing into prominence all the relations known to subsist between the various dyes and groups of dyes, as well as the connection between color and constitution, since the proper appreciation of these relations forms the main object of color chemistry.

The Jacquard Machine, by E. A. Posselt. Price $3.00.
TABLE OF CONTENTS: Different parts of the Jacquard Machine and its Method of Operation; The Jacquard Harness; The Comberboard; Tying up of Jacquard Harnesses for all kinds of Fabrics, Modifications of the Single Lift Machine; Stamping, Lacing and Repeating of Jacquard Cards; Practical Hints on Jacquard Designing.

Testing of Yarns and Textile Fabrics, by J. Herzfeld. Price $3.50.
A Guide for the Manufacturer and Large Purchaser, who observe definite specifications to insure standard material and workmanship; also giving a collection of tests, both of physical and of chemical nature.

Woolen Spinning, by C. Vickerman. Price $1.75.
TABLE OF CONTENTS: Fibre, Supply, Sorting, Scouring and Drying, Bleaching and Extracting, Dyeing, Burring, Mixing and Oiling, Carding, Spinning, The Mule, Miscellaneous.

Wool Combing, by H. Priestman. Price $1.50.
TABLE OF CONTENTS: Fibre, Washing, Water, Carding, Preparing, Intermediate Processes, Combing, Finishing, Tops and Top Testing.

Silk Throwing and Waste Silk Spinning, by H. Rayner. Price $2.50.
A Treatise on the Principles of Silk Throwing and Waste Silk Spinning, with Illustrations and Descriptions of the Machinery used.

Textile Calculations, by E. A. Posselt. Price $2.00.
A Complete Guide to Calculations Relating to the Construction of All Kinds of Yarns, Fabrics, and the Analysis of Cloth.

Cotton Spinning, by T. Thornley. 3 Volumes. Price $6.50.
A Complete Self-Instructor (with Questions and Answers) on this subject, treating machinery and processes as used abroad.

The above books, as well as any other books on Textile Subjects, no matter where published, sent charges prepaid. Remittances should be made by Check or Money Order, or in Registered Letters. Not responsible for money lost, when otherwise sent.

TEXTILE PUBLISHING COMPANY
Lambert and Berks Sts. PHILADELPHIA, PA.

and can give best of references as to character and ability. Address, Foreman (209) Posselt's Textile Journal.

Overseer of Weaving. Situation wanted as overseer of weaving on fine woolen or worsteds. Experienced. A 1 references. Can come at once. Address G. R. (210) Posselt's Textile Journal.

Designer for Woolen or Worsteds. Graduate from Textile School, with four years practical experience in New England Mills, is open for position either as Designer or Assistant Superintendent. H. B. (211) Posselt's Textile Journal.

Assistant to Carder. Wants position as Second-hand in Woolen card room. Steady worker and strictly temperate. Will go anywhere. F. H. G. (212) Posselt's Textile Journal.

MILL NEWS

Philadelphia. The Textile Overseers' Association of Philadelphia, which was started a few months ago at the offices of Posselt's Textile Journal, held its first annual banquet at the Phoenix Hotel, Front street and Lehigh avenue, January 28th. This Association represents not only the textile trade in Philadelphia, but several of its members are overseers in cities in the upper part of the State.

Officers have been elected for the coming year, as follows: President, William Secor; vice-president, James Stock; secretary. William Mugford, and treasurer, John Bellis.

At a reorganization meeting of the Leicester and Continental Mills Company the number of directors was increased from seven to eleven, and Everette H. Brown, former secretary, was elected manager.

Norristown, Pa. The Penn Art Square Mills, recently destroyed by fire, have been sold to Lee Harris & Son, of Philadelphia, who will rebuild the plant.

A Philadelphia textile company has leased the old mill at Valley Forge and is making alterations preparatory to installing machinery.

Allentown, Pa. Klotz & Bregenzer, proprietors of the Rittersville Silk Mill, have purchased the tract of land between their mill and Central Park, comprising a little more than an acre of ground, to enable them to enlarge their mill.

Siegfried, Pa. Construction of an addition to the plant of the Central Silk Manufacturing Company has been begun. The new section will be 27 by 60 feet, two stories high and provide room for 50 looms.

Mauch Chunk, Pa. The Mauch Chunk Silk Mill Company has voted to increase its capital stock from $50,000 to $100,000, the increase it is rumored to be used to establish a mill in Nesquehoning.

Paterson, N. J. F. J. Day & Company, manufacturers of ribbons, will erect a three-story brick and concrete mill at Harrison and Summer streets, to cost $30,000. They will add a number of new looms and occupy the second and third floors, while the first will be let.

The plant of the Ramsay & Gore Silk Company was purchased by Nathan Barnert for $25,000. The machinery was sold some time ago for $7,000.

The Radium Silk Finishing Company has taken room in the William Strange Silk Mill. They will make a specialty of ribbon finishing, moireing and reblocking.

Passaic, N. J. The growth of Passaic and its vicinity as a textile centre during the past few years has been very rapid, and when the new Forstmann & Hoffmann mill is completed this little town will rank with the most important woolen and worsted manufacturing districts in the United States.

The largest men's wear and dress goods mills in this country are located at Lawrence and South Lawrence, Mass. While exact data is difficult to obtain, the figures published show that the looms available there total 8,090, and the spindles 236,264. Probably more wool is consumed in Lawrence than in other parts of the country, but Passaic is pushing the great New England centre for first place.

The spindles given in the latest returns show that in this New Jersey town and in Garfield, just across the river, there are above 200,000 spindles. The number of looms given for Passaic is 5,470.

South Amboy, N. J. The Acme Underwear Company has been incorporated with a capital stock of $100,000.

Phillipsburg, N. J. The Mauchline-Firth Silk Company has been incorporated with a capital stock of $50,000.

Troy, N. Y. Organization of the Troy Bleaching Company has been completed and a contract for the building and equipment placed. George Bothamley is president and manager.

Hudson, N. Y. About 100 operators have been put to work in the *U*-branch of the Union Mills which has resumed after a year's idleness.

Pleasant Valley, N. Y. Two hundred new looms will be installed in the building of the old Harmony Cotton Mill, who will again start in April manufacturing print cloth for the big mill at Wappingers Falls.

North Tonawanda, N. Y. The Niagara Silk Mills has applied for a permit to construct an addition to its factory, which will be used as a dry house.

Construction of an addition is planned by the Niagara Silk Mills.

Oneonta, N. Y. The Paragon Silk Company is to install forty additional looms, and expects to add as many more.

Boston, Mass. At a special meeting of the directors of the American Woolen Company it was unanimously voted to authorize the increase of the worsted production of the company by additions

(*Continued on page xvi*)

to the Wood Worsted Mills and the Fulton Mills.

During the year 1908 the company sold in the neighborhood of $30,000,000 worth of goods, and at the ratio at which they are moving now, which is on a par with previous years, they expect to do a business of between $50,000,000 and $60,000,000.

New Bedford, Mass. Early in 1909 New Bedford cotton mills will have in operation 2,137,811 spindles, an increase of 49,408, or about $2\frac{36}{100}\%$ over those operated in 1908; the Dartmouth, Grinnell, Hathaway, Manomet, Soule and Taber all contributing to the increase. The number of looms is 38,061, an increase of 133. The operatives number 21,520, an increase of 650.

There was a net gain during the year of 1908 in capital stock invested in New Bedford cotton industries of $317,000; the Beacon Mfg. Co. increased its capital $87,000; the Bristol $100,000; and the Taber mill $130,000. Three new mills were added, bringing the number up to 50—the Grinnell, Potomska, and Wamsutta, each having completed a weave shed.

The Page Manufacturing Company will expend $200,000 in providing room and installing 12,000 spindles and 500 looms.

New Bedford's cotton mills paid, in 1908, $1,798,595 in dividends on $20,287,000 capital, while Fall River's cotton mills paid but $1,741,135 on $27,125,000, New Bedford's mills paying $57,460 more in dividends than those of Fall River. New Bedford investors, it is rumored, in 1908 added largely to their already large holdings of Fall River mill shares.

The average dividend rate paid in 1908 on the capital stock of New Bedford's cotton mills, excepting the Taber, which is new, was $9\frac{3}{10}\%$. On $20,287,000, the entire capital stock, old and new, the average was $8\frac{86}{100}\%$.

Fall River, Mass. Locally, spindles will be increased 150,000 to 200,000 by plants already under way or by additions to existing ones.

The annual meeting of the trustees of the Bradford Durfee Textile School was held at the school, Jan. 18, President Leontine Lincoln presiding. It was voted to ask the State for an appropriation of $25,000 for maintenance and the city for $8,000, and also ask the State for a special appropriation of $10,000 for equipment. These bills have been placed in the hands of Representative Brayton.

Worcester, Mass. After a successful run of fifteen years, the affairs of the Southgate Woolen Co. will liquidate and the corporation dissolved as soon as possible.

Leicester, Mass. Ashworth Bros. mill has started on three months' orders, giving employment to about 75 hands.

Millbury, Mass. The National Crash Mfg. Co., formerly the U. S. Linen Co., are installing one hundred additional looms, as well as spinning machinery, and will manufacture another line of goods besides crash.

The Mayo Woolen Mills, of Bramonville, Mass., which have been running on a reduced time for some time past, have resumed full time schedule.

Seventy of the hundred looms have been installed in the Wilkinsonville Mill and it is expected that operations will be commenced in a short time. They are Crompton and Knowles Looms.

Cherry Valley, Mass. The Darling Woolen Mills Co. has resumed operations after a long period of idleness.

Rochdale, Mass. With the reopening of the A. W. Howarth & Sons' mill, which had been idle for seven weeks, and the resuming of a full time schedule by the E. J. Carlton & Sons' mill, better times have appeared.

Southbridge, Mass. The Hamilton Woolen Company is adding new looms.

Fitchburg, Mass. The Parkhill Manufacturing Company are adding 200 looms to their weave shed, making in all 700 looms for their manufacture of ginghams.

West Fitchburg, Mass. The long idle and dismantled Cambridge mill is now to resume operations. J. D. Armitage, formerly superintendent of the Arlington Mills, is to be agent of the mill and will operate it for the American Woolen Company.

Unionville, Mass. George R. Whiting's woolen mill has been started up after being closed for several months. Mr. Whiting also operates a mill at South Milford.

North Brookfield, Mass. The Oxford Linen Mills will more than double the capacity of their plant. A new weave shed is to be one of the structures, also a larger power plant.

Webster, Mass. If the plans of Mr. H. H. Phillips, of Boston, are favorably reported on by the business men of Webster a factory will be built before July, with a capacity of 25,000 spindles, and employing 500 hands. Those who heard of the offer of the worsted concern for whom Mr. Phillips is agent, are enthusiastic.

Lowell, Mass. The Lyon Carpet Company will erect a new building in the spring to accommodate 20 new looms.

Lawrence, Mass. The Everett Mills are to double their plant.

North Andover, Mass. The Brightwood Manufacturing Company is operating its plant on a full time schedule, two shifts being run night and day.

North Chelmsford, Mass. Fire destroyed the brick building occupied jointly by the George C. Moore Wool Scouring Plant and the Brookside Worsted Mill No. 2, Jany. 19th. Through loss of business, of money on contracts, etc., the fire did far greater damage than can be estimated. The total loss is estimated between $600,000 and $700,000, partly covered by $500,000 insurance.

Great Barrington, Mass. It is stated that the Edgemere Mills have resumed on full time.

Hudson, Mass. The Hudson Worsted Co. has recently been completed, the capital stock being $175,000. Work has begun on an addition to the main mill.

North Adams, Mass. The plant of the Blackington Manufacturing Co. has been sold to Arthur G. Meyer, of New York, for $43,000, who states he intends manufacturing the same line of woolen goods as now made.

Providence, R. I. Four carloads of looms for the new weave shed of the Elston Worsted Mills have arrived. It is reported that the company has work for the looms, although the weave shed is not completed nor are the looms in place.

The preparatory departments of the Riverside Worsted Mills are said to be very busy and additional wool sorters have been engaged.

Pawtucket, R. I. Announcement was made to the 1,200 employees at the Royal Weaving Company's mill that their wages are increased one-quarter of a cent per yard on all qualities of goods.

Valley Falls, R. I. The Penikese Silk Company, who operates a mill of 300 looms, has announced an increase in wages of 15 per cent.

Warren, R. I. Frank S. Drowne, treasurer of the Warren Manufacturing Company, died at his home Jan. 13th from an attack of grip. Mr. Drowne, who was 66 years old, was one of the best known mill men in Rhode Island, prominent also in banking circles and in other ways.

Bridgeton, R. I. The Bridgeton Worsted Company has been incorporated for the purpose of buying, selling, manufacturing and dealing in woolen and worsted yarns, and all manufactures of woolen. The capital stock is $50,000.

Woonsocket, R. I. The Lafayette Worsted Company is operating its plant day and night at its full capacity.

Manchester, N. H. The Amoskeag Manufacturing Company has declared a regular semi-annual dividend of $6 per share, paid February 1.

The Amoskeag will add 100,000 spindles.

Salmon Falls, N. H. The local weavers' union voted, Jan. 25, to return to work at the mills of the Salmon Falls Manufacturing Company, ending their strike of one week's duration. The wage schedule was revised. There are 271 weavers at the mill.

Dover, N. H. The Cocheco Manufacturing Company at a special meeting, Jan. 27th, voted unanimously to accept the offer of the Pacific Mills of Lawrence for the purchase of the entire plant. The offer made and accepted by the Pacific Mills was the sum of $1,125,000 in cash, with its assets and all outstanding obligations and liabilities of the company. The plant employs about 7,000 hands.

Bridgeport, Conn. The Bridgeport Webbing Company has filed a certificate of incorporation. It has a capital stock of $5,000 and will manufacture elastic webbing.

Buckland, Conn. It is reported that the E. E. Hilliard Company will erect an addition to its finishing department, 50 feet square.

Central Village, Conn. Many of the mills here are running overtime. These plants include the Fletcher Woolen Mills, employing 300 hands; the Plainfield Woolen Mills, the Central Worsted Company, the Cutler Mills Company, at Kennedy City, and the Cutler Mills at Packerville. About $40,000 worth of new machinery is now arriving for the Aldrich Mills.

Danielson, Conn. An equipment of 96 looms is to be installed at once by the Danielson Cotton Company, another enlargement being expected to be equipped by spring.

New London, Conn. The contract has been awarded for the additional factory which the directors of the New London Wash Silk Company recently decided to build. It will be two stories high.

Plainfield, Conn. The cotton mills of this county are experiencing the greatest business boom ever known, it being assumed that a million dollars will be invested in additions and new machinery this spring.

Putnam, Conn. The Putnam Woolen Company, whose plant has been closed for some time, has resumed operations.

Greenville, S. C. An additional mill is to be built by the Brandon Mills, to be equipped with 25,000 spindles and 700 looms. By a recent action of the directors, the capital stock was increased to $900,000.

The Woodside Mill will, with the new machinery they will install, have 70,000 spindles and 1,100 looms, making it the city's largest mill.

Anderson, S. C. The Anderson Cotton Mills are preparing to operate 19,000 spindles in Mill No. 1, which has long been idle, an evidence of the return of prosperity for the South.

Concord, N. C. Creditors of the Odell Manufacturing Company are to be paid a first dividend of 75 per cent., which has been declared by the receiver, Cæsar Cone. It is stated that the creditors will receive 100 cents on the dollar of their claims without interest.

Laurinburg, N. C. The Waverly Mill has been chartered, the capital stock being $300,000.

J. P. McRae has purchased 18,000 spindles for a big new mill to be built here at once.

Tryon, N. C. The Tryon Hosiery Mills, employing from 200 to 400 hands, are being moved to Flat Rock.

Belmont, N. C. W. J. Willetts, overseer of spinning at the plant of the Erwin Cotton Mills Co., at Cooleemee, will erect a 3,000 spindle mill here.

Mount Holly, N. C. Work is rapidly progressing on the addition to the Woodlawn Cotton Mill. 22 spinning frames will be added to the plant in this way.

Gastonia, N. C. Arrangements are being made to add 3,000 more spindles to the Arlington Cotton Mill.

Harden, N. C. The Harden Mills are planning the installation of 4,000 more spindles.

Cliffside, N. C. It is rumored that the Cliffside Mills are to double their equipment.

The amount of capital invested in cotton mills in North Carolina is $56,000,000, while the amount in South Carolina is $54,000,000.

Sparta, Ga. The Sparta Cotton Mill, the operation of which has been delayed several months on account of the financial depression, has begun operations.

Norfolk, Va. Removal from its former to the new plant has been completed by the Parker Hosiery Mills. At full capacity the factory will make 1,000 dozen pairs of hose daily.

Lebanon, Tenn. The Lebanon Woolen Mills intend erecting a building for the manufacture of woolen blankets.

Hawkinsville, Ga. The Hawkinsville Cotton Mills, which were sold, will be incorporated as the Southern Cotton Mills, having begun operations.

Dublin, Ga. The Dublin Cotton Mill has been sold for $82,000 to J. C. Cooper of Atlanta, Ga., who will operate the plant under the title of the Georgia Cotton Mills.

Louisville, Ky. The Hope Worsted Mills, recently reorganized with a capital stock of $125,000, have begun operations. Within three weeks it is expected to have the plant at capacity operation, which will require the employment of 160 hands. The maximum output is estimated at 50,000 pounds of woolen yarns daily.

Houston, Texas. The Oriental Textile Mill of this city has increased its capital stock from $100,000 to $300,000.

Denison, Texas. The Denison Cotton Mill Company has ordered ninety-six looms additional to present equipment.

Fort Worth, Tex. It is now definitely settled that Fort Worth will have a $350,000 cotton mill within thirteen months.

Cleveland, O. Construction of a factory for the Standard Knitting Company has been begun. It is expected to be ready for occupancy in the spring. O. F. Schmidt is president, and the concern has $65,000 capital stock.

Salem, Ore. The Salem Woolen Mills have been incorporated, the capitalization being $50,000.

Los Angeles, Cal. The only cotton hosiery mill west of Chicago, to be known as the Pioneer Hosiery Mills, soon will begin operation in Los Angeles, expecting to turn out their first product by April 1.

San Francisco. The steamship Chiyo Maru, which has arrived, brought raw silk valued at $700,000.

EXPLANATIONS FOR THE CHART OF WEAVES ON

"Textile Designing Simplified."

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

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

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

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

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

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

HOW TO PUT A BACK WARP ON single cloth.

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

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

THREE PLY CLOTH is shown by one example.

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

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

HOW TO WORK THIS CHART OF WEAVES.

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

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

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

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

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

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

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

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

Example.—Backed by filling *e* 8, means the common $\frac{2}{3}$ 4-harness twill *e*, (fifth weave on second row) and the 8-leaf satin is used in the construction of this weave.

Example—The complete design of double cloth, marked *e* 8 A, means that the common $\frac{2}{3}$ 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.

Posselt's Textile Journal, Philadelphia, Pa.

"TEXTILE DESIGNING SIMPLIFIED."

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