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# CANADIAN Journal of Fabrics

THE JOURNAL OF THE  
Textile Trades of Canada.

Vol. XVI.

TORONTO AND MONTREAL, MAY, 1899.

No. 5.

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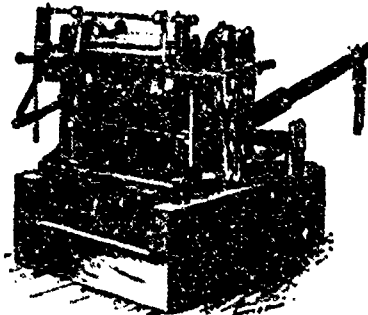
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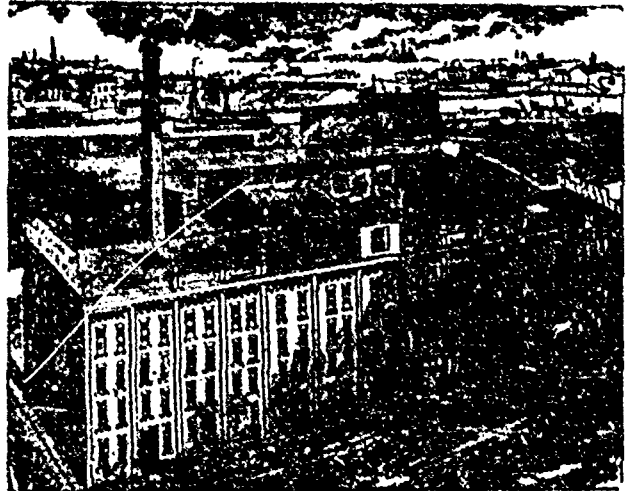
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# CANADIAN Journal of Fabrics

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Vol. XVI.

TORONTO AND MONTREAL, MAY, 1899

No. 5.

## Canadian Journal of Fabrics

A Journal devoted to Textile manufactures and the Dry Goods and kindred trades.

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Business correspondence should be addressed to Montreal; but cuts, news items and editorial correspondence to Toronto; cuts from abroad should be sent by post wherever possible, not by express; changes of advertisements should be in our hands not later than the 10th of each month to ensure insertion.

### THE CANADIAN TEXTILE DIRECTORY

A Handbook of all the Cotton, Woolen and other Textile manufactures of Canada, with lists of manufacturers' agents and the wholesale and retail dry goods and kindred trades of the Dominion, to which is appended a vast amount of valuable statistics relating to these trades. Fourth edition now in hand.

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### NOW PUBLISHED.

The fourth edition of the Canadian Textile Directory is now issued and is being delivered to subscribers as rapidly as possible. In the preface the publishers state that the neglect of a few manufacturers and dealers to send in their reports occasioned a good deal of delay, but notwithstanding the great difficulties encountered in these and other matters and the enormous amount of work involved, the edition is the most complete yet published and the work contains an amount of information which can be found in no other publication. Subscribers who have not

yet ordered, should do so at once, as the unsold portion of the edition is limited. In the next issue we shall give more interesting facts gathered from the Directory relating to the Textile Manufacturers of Canada.

### THE CANADIAN CLIP.

There is still about a million pounds of last year's combing wool in Canada. The past season's business has been unprofitable, as it has been done in a declining market. There will probably be the usual amount of wool come on the market this year, and buying will have to be at a low figure if last year's conditions are to be improved.

### THE SHIRT AND COLLAR TRADE

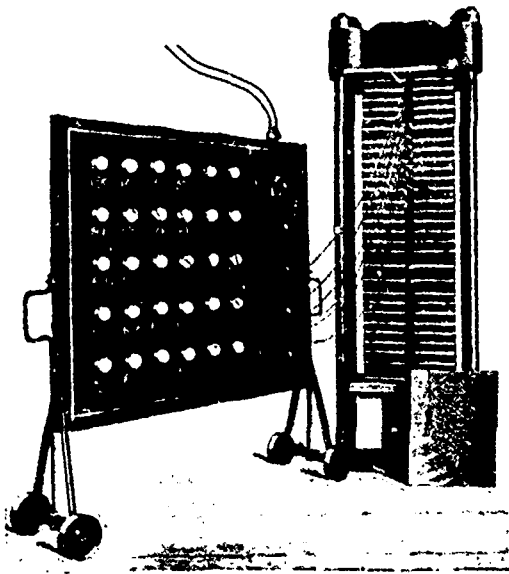
The manufacturers of shirts, collars, etc., are not entirely satisfied with the present tariff, which we have several times referred to, and recently a strong deputation waited upon the Government to ask a change in the duties. The deputation consisted of B. Tooke, Charles Graham, S. C. Skelton and A. H. Sims of Montreal, and they had an interview with Sir Wilfrid Laurier, Sir Richard Cartwright and Hon. Mr. Fielding. It was pointed out that in arranging his tariff Mr. Fielding had so managed the cotton duties that the raw material for making shirts and collars paid as high duty as the finished product. The Government did not commit itself to any line of action at the time, nor did the Budget speech contain any relief for the shirt and collar makers. This is understood to have been done so that the Finance Minister might state that the tariff would remain as at present and thus sustain the feeling of confidence in the Government policy which is getting abroad. At the same time it is understood in well informed quarters that a change in the duties specially affecting the shirt and collar makers will be made at an early date.

### THE ELECTRICAL PRESSING MACHINE.

The use of electricity in the textile industries of Canada is increasing, but not so rapidly as the developments in European countries would lead us to expect. Canada is a land abounding in cheap electric power, and our Canadian mills should avail themselves of every opportunity to employ advantageously this element in production which is possessed in an equal degree by no rival producer for the markets of the world. It is true that it has recently been

introduced into our factories on a large scale as a lighting medium, and to a certain extent for the transmission of power, but after these two varieties of service its adaptation appears to almost end, though the clothing manufacturers have installed some special machines as cloth cutters, etc., and it has been found both economical and comfortable to use electrically-heated smoothing irons in the pressing departments.

The electric pressing machine here illustrated is the invention of G. Schreihage, Chemnitz, Germany. This is now coming into use in Europe and is described in the *Textile Manufacturer*, Manchester, England. By its employment it is possible to hot-press any description of fabric for any duration of time, at any required temperature, and all this in an apparatus which is perfectly clean and dry, and in an atmosphere free from superfluous waste heat or escaping steam. An ordinary press is used, and may be operated hydraulically or by any other method. The press is identical with those in use, no change or alteration being required in this respect. Press boards are provided for the press composed of suitable insulating



ELECTRIC PRESSING MACHINE.

material, inside which are embedded the heating wires. The ends of these wires terminate at a double plugway in front of each plate, in a convenient place for the insertion of a plug which terminates the connecting wire. Our illustration shows a machine adaptable for supplying heat current to thirty plates, or any number less than thirty. The switchboard, which, along with the special plates, completes the additions to the press, is mounted on wheels for convenience. It can thus be utilized for any press, or can be wheeled into a corner out of the way when not required. The current is taken to the switchboard by wires from some wall plug, and the wires transmitting this current can be removed or introduced by plugs in the same manner as the plate wires. On arriving at the switchboard the current is connected to the five distributing switches and distributed in shunt to the connections in each row. Each connection or plugway is fed through a safety

fuse placed just above it, and for additional safety another fuse is allotted to each complete row. The board is completed with the usual switches, one for each row of connections. The fabric is placed in the press in the usual manner with the electrical plates at requisite intervals. The plugs are inserted, and the current switched on, and, if required, the heating may be regulated in different parts of the pile by switching off or on the different rows of connections. The plates become hot almost immediately the current is switched on, and are soon cool enough to handle after the current is switched off. Immediately one press full of goods is finished, the apparatus is ready to take another; no time is lost, and fewer presses are required. Cleanliness is such an obvious advantage that its attainment will be at once appreciated.

The apparatus illustrated is made to work on a circuit of 110 volts, and takes, when all plates are in work, from 5 to 6 amperes. A similar apparatus has been made for a 65 volt circuit, taking from 8 to 9 amperes of current. It is, however, simply a matter of arrangement to adopt or alter so as to make any current available. It will depend largely upon the cost of the electrical unit as to the economical adoption of these presses. The cost of current is, however, gradually being reduced as more perfect generators are adopted. Then it is only fair, when comparing relative costs, to credit the machine with all the time and labor saved, and also the imperfections in the treated fabrics which its adoption reduces.

#### SOCIAL ENJOYMENT IN THE OLDEN TIMES.

SENATOR FERGUSON IN P.E.I. MAGAZINE.

The social enjoyment of the people in the old days was not without its good features, however uncourtly they may seem to the present generation. In the long winter evenings the custom of "Kaleeving" was universal. Supper over, and chores completed, the huge log was rolled into the back of the chimney, while the dog-irons were made to support a well-builed fire of the choicest wood, through the arms of which a glorious blaze soon passed up the throat of the big old-fashioned chimney, warming and lighting the plain, but comfortable apartment assigned to the everyday use of the family as kitchen and dining room. Then the circle was formed in front of the fire; the mother with her knitting or sewing, the children with their lessons or toys, while the father presided over the scene as proud as a baronet. By-and-by a neighbor, usually accompanied by his wife, drop in and take places in the circle, and the evening passes with pleasant conversation, sometimes interspersed with a song or a story.

This describes an ordinary evening's enjoyment when the settlement is not the scene of a wedding or a thickening frolic. The old-fashioned wedding has its counterpart in the milder festivities of the modern wedding, but the thickening frolic has passed away for ever. The sacrilegious felling-mill came, and the grand old thickening frolic found its occupation gone.

After the industrious hands of the women had put the wool through the various operations of washing, teasing,

carding, spinning and weaving, the service of many hands was required to thicken or full the cloth, before the skill of the tailor would be called on to manufacture it into clothing. When the web was ready and the neighbors invited, tables were temporarily erected around the sides of the kitchen. The web was extended along the centre of the tables, after being saturated in warm water, well plied with soap and sewed together at the ends. The men and women then took their places at both sides of the table. Every hand in the company seized the web, pushing and pulling it athwart the table, at the same time moving it a little to the right and taking a fresh grip to the left. Then a song was started, in which the company joined, the measure corresponding to the motion of the web, which went to and fro across the table, and round and round the room like an endless chain. It was great fun, but it was also hard work, and it did not end until the master of the ceremonies declared the fulling finished. By this time supper is ready in the best room, to which the thickeners repair and do ample justice to the good things which the mistress of the house has taken great pains to prepare. After supper the tables are cleared, the violin is produced, and the company engage in the mazes of the merry dance.

The return of spring found the settler overwhelmed with work. Machinery to lighten the labor in either winter or summer was unknown. There were no threshing or stumping machines, no mowers or reapers, much less binders; no horse rakes or hay lifts in those days. By the strength of the muscle and through the sweat of the brow the husbandman had to accomplish his purposes. Long as were the summer days they were still too short to enable him to overtake the work so absolutely necessary in providing winter's sustenance for his family and domestic animals. Even if the top buggy had been in evidence, there was no place for the picnic or tea-party, for self-preservation required the unremitting efforts of men, women and children to fight the wolf away from the door. It did not follow, however, that the people were deprived of social enjoyment. After the crop had been put in the ground, the men turned with all their might to clearing more land, and the women to converting the wool into clothing for the family. Here came the settlers' opportunity for social enjoyment in the combined spinning and stumping frolic.

In the early summer morning, in response to the invitation of a neighbor the men and women assemble, provided with hoes, axes and spinning wheels. The men with lusty arms force the great unwilling stumps to relinquish their hold on the soil, while the women after ranging themselves and their wheels on the clean swept barn floor, proceed to convert the snowy rolls of wool into yarn good enough to make clothes for the Governor. Twenty or thirty fair spinners, plying together their jaunty, smooth-going wheels, seem to rise before me now as a vision of the days that are gone. I recall the faces of the spinners, their hearty laughter and the airs they warbled, making their sweet voices blend with the gentle hum of their wheels. Old times have changed, old man-

ners gone, and the unpoetic, matter of fact, woolen factory has usurped the throne of the companionable and venerable spinning wheel. The spinners too are going. It does not require the ken of a prophet to observe that soon few will be found in the land who will know how to spin. With the spinners go the wheelwrights, and both making and using the wheel will be classed among the lost arts. In some households the spinning wheel may still remain as an heirloom, to finally pass with other trumpery to a neglected lumber room, where one day it may be scrutinized by people whose last guess may be that it formed part of some very absurd and antiquated bicycle.

At dinner time the spinners and stumpers take their seats around a bounteous table spread in the best room, or sometimes outside, under the shade of the trees, and the hour is whiled away with pleasant conversation. The afternoon or evening repast is similarly enjoyed, and a good day's work being done, the friendly helpers bid their host good-bye and wend their way to their several homes. The events of the day would be repeated on the morrow and so on until all the neighbors had their turns.

The period to which these remarks apply came to its close when I was still quite young, but I have a fair recollection of the state of the country and the customs and manners of the people. The glimpses into life which we get as children are really visions to us, and remain distinct on the tablets of memory, while the impressions received by later contact with the world pass quickly away. This may be the reason why it seems to me that there was more heart in the ways of the old people than there is in the manners of their descendants. It was amid scenes like these that the foundations were laid of the comparatively easy and comfortable state of society now prevailing in Prince Edward Island. The pioneers' work was undertaken and carried to completion amid danger, toil and privation. Yet, through the goodness of their hearts and the simplicity of their lives, they were enabled to extract sunbeams from the most unpromising skies, and strew their pilgrimage road through life with abundant evidence of the good things they enjoyed by the way.

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#### THE LONDON WOOL SALES.

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The wool auction sales opened May 2nd, with a large attendance of buyers. The offerings numbered 11,323 bales, including a fine show of Queensland and New South Wales merinos, principally greasy. The Continental buyers were eager to secure these goods, and entered into strong competition with the home trade, which stimulated the advance, which was most pronounced. Fine well-grown and a small supply of scoured sold briskly. Crossbreds were well represented, with finer grades showing an advance of 10 per cent., and medium selling at 7½ per cent. lower. The offerings of this stock were largely taken by Yorkshire. A small selection of Cape of Good Hope and Natal sold quickly at 7½ to 15 per cent. advance. The trade was

well represented except America. The bidding throughout the sale was very active. The following are the sales of the first day in detail: New South Wales, 4,300 bales—Scoured, 1s. to 1s. 8½d.; greasy, 5¾d. to 1s. 1½d. Queensland, 2,300 bales—Scoured, 1s. 6d. to 1s. 9½d.; greasy, 8½d. to 1s. 1d. Victoria, 300 bales—Greasy, 7½d. to 10½d. South Australia, 300 bales—Scoured, 8d. to 1s. 6d.; greasy, 5d. to 11¼d. W. Australia, 200 bales—Scoured, 1s. 0½d. to 1s. 5½d.; greasy, 6¼d. to 9d. New Zealand, 2,300 bales—Scoured, 5¼d. to 8½d.; greasy, 5½d. to 11d. Cape of Good Hope and Natal, 500 bales—Scoured, 10d. to 1s. 7d.; greasy, 7½d. to 10½d.

The second day of the wool series opened with the supply numbering 13,523 bales. Scoured merinos and fine crossbreds showed a hardening tendency, the French buyers taking the majority offered. Merinos and fine crossbreds showed animation with Yorkshire paying five per cent. above the prices realized yesterday. The Continental buyers purchased a large number of merinos. Following are the sales in detail: New South Wales, 3,600 bales—Scoured, 1s. 3d. to 1s. 10¾d.; greasy, 6d. to 1s. 1d. Queensland, 1,900 bales—Scoured, 1s. 2½d. to 1s. 9d.; greasy, 8½d. to 1s. Victoria, 2,500 bales—Scoured, 1s to 1s. 10¾d.; greasy, 6d. to 1s. 4d. South Australia, 1,100 bales—Scoured, 1s. 6½d. to 1s. 8½d.; greasy, 6d. to 10½d. West Australia, 400 bales—Scoured, 1s. 3d. to 1s. 4d.; greasy, 8d. to 1s. New Zealand, 2,300 bales—Scoured, 6½d. to 1s. 7d.; greasy, 6d. to 1s. Cape of Good Hope and Natal, 500 bales—Scoured, 1s. to 1s. 0½d.; greasy, 7¼d. to 9½d. Falkland Islands, 1,000 bales—Greasy, 5½d. to 9d.

On May 8th competition was very active, with the Continental buyers operating freely in superfine merino greasy wools, which realized 20 to 25 per cent. above the March series. These goods also met with a strong demand from all directions. The German representatives were more prominent to-day, their operations showing a marked increase. Crossbreds were hardening, and received a strong home trade support. The offerings numbered 14,217 bales, and included a fine show of superfine merino greasy. The daily withdrawals have averaged only about 125 bales. The following is the sale in detail: New South Wales, 6,600 bales—Scoured, 9½d. to 1s. 11½d.; greasy, 5½d. to 1s. 2½d. Queensland, 2,600 bales—Scoured, 1s. 3d. to 1s. 10½d.; greasy, 8½d. to 1s. Victoria, 1,300 bales—Scoured, 9d. to 2s. 1d.; greasy, 6d. to 1s. 1d. South Australia, 800 bales—Greasy, 7d. to 1s. West Australia, 300 bales—Greasy, 6¾d. to 1s. Tasmania, 500 bales—Greasy, 9d. to 1s. 1½d. New Zealand, 2,000 bales—Scoured, 7½d. to 9d.; greasy, 6d. to 10½d. Cape of Good Hope and Natal, 52 bales—Scoured, 10½d. to 1s. 9½d.; greasy, 8½d. to 9d.

## TISSUE OR TEXTILE PRINTING AS AN ART.\*

BY SIR THOMAS WARDLE.

China and Japan.—The printing of fabrics in China and Japan is both curious and interesting. Some of it is done without blocks, especially in Japan, by stenciling through stiff paper in which the designs are cut. This work is often enriched by embroidery being worked upon it, and very artistic effects are thus obtained. Of the antiquity of printing in these countries history does not give us much information, but the treatment of their coloring and designing is of a very traditional kind, the latter belonging to the grotesque and symbolic category; but in flower drawing they excel. We can, I think, safely infer from their modern craftsmanship what was characteristic of their ancient work. A great feature of Chinese designing is their adherence to ancient ideals, and a great reluctance to change or to be influenced by modern styles or forms. Modern Japan is becoming an exception to this insularity, inasmuch as for purposes of competitive commerce her draughtsmen do not hesitate to copy the patterns and textures of European tissues; but Chinese art in textile work rests where it has been for ages. Their fantastic treatment of figure forms may be said to be typified in their dragons, the most important of which has the head of a chameleon, the horns of a stag, the claws of an eagle, and the tail of a serpent—this is symbolic of supreme wisdom. The phoenix, with a peacock's tail and head covered with protuberances, is a symbol of a long and happy life. Of these printers of the farther East I have only two examples of designs (Japanese), and a robe partly printed and partly embroidered.

Japanese Wax Reserve Printing.—In Java and Sumatra the printing is done by drawing the design upon cloth with a very small copper kettle containing melted wax. Women generally do this work. They hold the cloth over one hand, and wax or paint in the design with the finely pointed kettle spout or tube. Both sides of the cloth have to be waxed exactly alike. The cloth is generally done in four operations, as follows: No. 1 (termed "rengingan").—The cloth is simply designed in wax on both sides. No. 2 (termed "tjelpan").—The cloth is steeped in the indigo vat and all the unwaxed parts are dyed blue, leaving the design (when the first wax is melted off), in white on a blue ground. No. 3 (termed "njoga").—After having been dyed blue, the wax is removed and the cloth is again waxed where blue must remain; the rest is then dyed in a bath of reddish brown. No. 4.—The wax is removed from the cloth and the completed result shows the design printed in squares of blue, with white spots, and a reddish brown ground of two shades, dark and light—the dark, owing to a portion of the in-

\*Extracted from a lecture delivered at the Manchester Municipal School of Art Museum on Wednesday, March 15.

digo part, having been purposely unwaxed. [Examples of the four processes were shown on the walls]. Where more colors are required more elaborate waxing is necessary, with repeated dyeings. The results are generally very artistic and costly. The best examples are worn as sarongs by the richer natives and cost from £4 to £8 each. [The lecturer showed one of the more elaborate kinds on the screen; others were hung on the wall].

A very elaborate piece of Corah silk was painted in wax for me on both sides at the Paris Exhibition in 1889, by a Javanese woman in the Javanese village there. It is a marvellously dexterous piece of work, equally wrought in wax on both sides of the cloth. Sometimes a metal block is used, such as the one I now produce, along with the little wax-kettles.

Turkey.—I have no examples of Turkish skill in printing, but the following 4 slides [shown], will show their power of designing beautiful forms closely akin to the large diapers of Italy in the Renaissance.

Spain.—Spain was a country that early practised the printer's art. It was no doubt introduced by the artistic Moors, for it is known that in 1234 James I of Spain issued an edict on "estampados," meaning stamped tissues. I have only one specimen of Spanish printing. It is a pictorial representation of the Apostle St. Santiago, fighting on horseback; it is probably of the last century.

At Antwerp in ancient times the block printers were included in corporations with the painters, under the name "Lucasgilde." At Vienna, in 1542, the art of printing stuffs became a right reserved to painters, as was also the case in Italy. The painter Cennino Cennini, of the school of Gaddi, wrote upon the art of working with blocks on cloth. Louvain, celebrated in the middle ages for its tissue printing, was of opinion (with other neighboring towns practising the same industry), that designing and block cutting were arts properly so-called, and placed the tissue printers in the same category as artistic painters. In fact, the art of printing stuffs became in the 16th century a monopoly of the artist painters. In later times, at the close of the 17th century, the art of tissue printing became a large industry in Germany and much competition was the result, with a consequence that the number of printers at Augsbourg had to be limited to four Protestants and four Catholics, afterwards increased to eight of each. In 1700, permanent dyeing in connection with printing became a necessity in the trade, and dyers became masters in the art of printing tissues. The two branches merged into one corporation, and had their especial corporate coat-of-arms. In Cologne, in 1737, and later, attempts were made to incorporate the dyers and linen printers, but without success. The latter half of the last century witnessed a great change in the tissue printing industry by the erection of very

large works in the European printing countries, and machine-printing gradually drove hand block-printing into the background by its greater cheapness and rapidity of production. Forrer relates that it was Peel in England; Oberkampf, of Jouy, in France; Schule at Ausbourg, and Lertenberger in Austria, who were the principal people to lay the foundation of this gigantic and free industry, as it now exists. To show the close connection between painting on canvas and tissue printing, I have brought two very beautiful examples, one a very old one from China, so old that the silk upon which the birds, trees, and flowers are painted is quite rotted and will scarcely bear touching; the other a fine example of an old Italian painted chasuble, late 17th or 18th century, which I bought in 1885, at Bologna, in an old clothes shop.

Although Italy might have depended more for its Renaissance silk designs upon designers of the craft than upon painters, we know in how many instances painters and architects have excelled, and do still excel, in the decorative treatment of patterned work; and I believe such influence and work can be traced in the designs of some of the great Italian painters' pictures. Take, as an example, Carlo Crevelli, who painted in the middle and latter part of the 15th century. In his pictures we see elaborate designs of brocaded silk, as I shall show you further on, indicative and typical of the conventional Venetian brocades and velvets of that time. The patterns he painted are all different in design, but there is a sameness and individuality of diaper treatment which makes me incline to the opinion that he was also a pattern-designer for the Italian weavers and printers of those days. The patterns in the pictures of Fra Angelico and Paulo Veronese in the National Gallery are worth studying, being suggestive of earlier patterning treatment, as well as of influences which operated for centuries later.

Printing in England.—Printing was introduced into England from Holland by Flemish emigrants, about the close of the 17th century, probably in 1676. It was known in 1677 by the East India Company that calico was imported into England from India, to be printed upon in imitation of Indian chintz. In 1689 Jacques Delure commenced printing at Neuchatel, and the art then soon spread into Germany, Portugal, and France. In 1700 the import of printed fabrics from India into this country was prohibited by Parliament. In England itself home-printed cottons were taxed 3d. per yard in 1702, which was increased to 6d. per yard in 1714. In 1720 the London mobs, principally from Spitalfields, so intimidated the Government of the day, that a law was passed prohibiting the wearing of all printed calicoes whatever, either of foreign or domestic origin. This for a time strangled the rising industry. In 1736 this law was repealed, but the duty of 6d. per yard remained. In 1764 printing was established in Lancashire by Messrs. Clayton, of Bamber Bridge, near Preston, in



consequence of the cheapness of fuel, and of Lancashire being the county of the cotton manufacturer. Scotland did not take up calico-printing until 1738, twenty-six years later than its commencement in Lancashire. In Peel Park Museum, Salford, there is an interesting and artistic specimen of furniture printing, done during the time of this prohibition. It bears the date of 1761, and was printed in madder red from two copper plates, each about 4 feet 6 inches by 3 feet. The full repeat of the pattern measures 6 feet 10 inches by 3 feet 2 inches broad. The subject is a landscape and pastoral scenes with subjects in the foreground. The name "R. Jones, 1761." appears on the print, and "R. J. and Co., Old Ford." The site of the printworks was at Bow.

Designing for the Church; for Furniture Work; and for Personal Adornment.—Designing for the church, for furniture or upholstery, and for personal decoration have been the three important divisions or uses of pattern work from the earlier times. By the Church I mean all religions and their consequent symbolic expression; and I think I am safe in asserting that the decorative and artistic teaching of religious themes and dogmas holds the highest and most important place. At least we have seen that it was so in India, in Egypt, and in Europe in the earlier times. The reason of this is not far to seek. All religious beliefs have always had an outward expression, and it was customary for many centuries, and ought to be so still, to offer to God the best, both of art and of all human effort. Witness, as a wonderful example, the products of Gothic art, whether in cathedrals or churches, and their adornment by the best painters and artists on glass, in mosaic, in woven and printed hangings of the greatest possible glory and beauty, in embroidery, in gold, silver, brass, and laton work. With regard to textile decoration I need not speak further than to ask you to look at the examples of both printed and woven patterned work which hang around this room and upon the photographs I am showing on the screen. These designs are mostly printed ones, some from the original fabrics, some copied by printing from the best examples of Renaissance and other periods; and they well represent the interior decoration of past and present times of our churches, homes, and for dress.

Of the designers, history has shown us to-night that the best painters at one time were also printers. I have, in a paper read before the Society of Arts, called attention to what I believe is correct—that the best painters of the Renaissance in Italy designed also for woven tissues, as I have just stated. As one instance (among others), we cannot go through the National Gallery without feeling that the wonderful and beautiful patterned work on the robes of Madonnas, saints, and royal personages, must have originated in the painters themselves. I have only to ask your attention to one of them, Crivelli, who painted, and I also believe

designed, in the 15th century. I have brought some reproduced drawings of his works, which, from a designer's and decorative point of view, I think are deeply interesting. Conventional pattern designing at this time reached its culminating point. After the Renaissance pattern designing slowly and gradually deteriorated and grew more and more unmeaning until in the last century, and down to the first half of this, it had become a mere language of flowers and patterns, of the most unmeaning and frivolous description. In no domain of art is this more conspicuous than in calico-printing. I defy anyone to look over the printer's pattern books of, say, 1800 to 1850, without feeling that artistic design had been dethroned, and in its place colored and patterned treatments had become the order of the day, which were the productions of men who for the most part were unable to draw an artistic subject, and in the art of coloring displayed the greatest ignorance. I have brought a few examples of this; they will speak for themselves. English calico-printing owes much to Indian patterns, although deprived of the meanings which generally attach to them there. In this respect the patterns are good, but when the designers were left to their own resources the results were generally inartistic and on wrong lines. This rule, however, was not without its important exceptions just as Wedgwood in pottery outshone his contemporaries. There are many notable examples to be found in the printing of the earlier part of this century of both really good designing and of good coloring, particularly in furniture or upholstery work.

#### SPEED AND ITS RELATIONS.\*

Wages and hours of labor are two of the most important questions that are agitating the present industrial world. In the old days, when a boy was signed over to his employer, and as an apprentice was compelled by law to serve his master just when and how the master pleased, these topics that are now so very much alive were absolutely impossible. Much—in fact, we might say all—the warfare and conflicts which have taken place in recent years between labor and capital have been centred around these two topics, wages and hours.

The importance of these subjects makes the question of our paper to-day all the more important, too; for there is perhaps, no factor so closely bound up with wages and hours as the question of speed. Speed makes it possible for an operative to do more on one machine than another; speed makes it practicable for one mill to make more goods than another; speed, if carried to excess on machinery not adapted to it, causes loss and expense in manufacture, and hence gives trouble of an opposite kind. So speed shortens the hours of labor, making it possible to do the same amount of work in less time; and shortened hours bear again on wages, for if the same work is accomplished in less time, it is plain that the laborer should be paid according to the work done rather than the time spent in doing it. Just who are the ones that are to be benefited by labor-saving machinery, who are the losers by an increase of speed? These are all interesting questions, and might give rise to no end of discussion and opinion. Speed

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is at the back of it all; and the subject of speed needs attention and study more now than ever, just because it enters so closely into the great questions that are agitating men, and keeping wide apart the two forces of labor and capital.

The whole tendency of mills of late has been towards the increase in speed of all machinery, with an avowed view to larger production. This is the order of the day. And since it is so, it entails on the part of builders a constant effort to put such machinery on the market as will stand the needed strain, and it entails greater skill, and attention, and effort on the part of the operative to do the larger amount of work, and do it with the required success and satisfaction. The last quarter of a century has seen marvellous changes in this particular respect, and we have often wondered what the older generation of mill men would think, if Rip Van Winklelike, they had been permitted to open their eyes on the mill of twenty-five years ago and the mill of to-day, without having been permitted to view the intervening years of continued and upward progress. It is said that the first steamship that crossed the Atlantic carried on board several printed journals and scientific publications, which demonstrated beyond a shadow of doubt the fact that it was utterly impossible for a steam-propelled vessel to cross the seas. In like manner, we doubt not, it might have seemed utterly impracticable to a mill man of the older day to run a mill and its machinery at the enormous speeds which are common and ordinary now. And so, even to us, there may be surprises in store in the next two decades, along the same line.

Spinning is one of the processes that has gradually been increased in speed, till it is fully twice what it used to be not long since. A speed represented by 12,000 revolutions a minute for the spindles is simply incredible, compared with the speeds in vogue twenty years ago. In the worsted industry, which has come more and more into prominence, the combing machine, which is the distinctive machine of the process, has been so developed and perfected that it can be run twice as fast as originally, and do even a larger and better proportion of work than those figures would indicate. The yarn-making process has particularly advanced in the ease and speed with which it is accomplished. But it has made no greater strides in this respect than the loom or cloth-making process. These two processes require the most help and attention in their operation, and for this reason the speed of the spinning-frame and the spindle, and the speed of the loom seem more closely to enter into the wage question than other processes in the mill.

A loom that formerly on good stock made 70 picks a minute on woolens and worsteds is now so made and managed that it will make 110 picks, and this is even now not its very best. We speak of broad looms now. The amount of breakage and defects is no greater now than before, and the increased speed has been a clear gain in power of production. On the narrow loom even higher speeds are maintained.

In the running of the loom, from the point of view of speed, there are two or three factors that must be taken into consideration. The time taken to throw the shuttle is one of them. Others are the class of stock employed in warp and weft, the solid foundation work of the loom, and the fewness and workability of the various parts. The loom cannot do the fastest work unless the cards and spinning frames have done their work well before them. With all conditions correct, it is possible to attain to very surprising results. A worsted loom running at 130 picks seems out of the question, yet it is a fact that is well known, and is being done to-day.

In cottons, of course, better time is made. Only five years ago there was shown at an exhibition a loom on cotton gingham, running at 280 picks a minute. This is extraordinary, yet taken in general practice the speed of cotton looms is

from one-fourth to one-third faster now than it was 25 years ago. Print cotton cloths are made at from 200 to 210 picks per minute, while ginghams run from 100 to 180 per minute. Plain sheetings run about the same as the last. A like increase has been made in looms that handle other fabrics, such as carpets, silks and linnen. The speed at which a machine can be operated has become a very important feature of its condition at the present time. If our machinists can so construct their mechanisms that they, other things being equal, can maintain the speeds which the call of to-day requires, no doubt the manufacturer will see to it that his yarns and stocks are, as to quality and value, equal to the test. These two features must go together for successful effort. It is this capacity for speed that has been effective in urging English machines into foreign markets, because it is a well-known fact that for ability to make high rates of speed, the products of their machine shops take rank second to none.

Questions arise now as at the beginning. If one man by increased speed can do what two could once, should he get two men's pay? If not, what pay should he get? Who is to profit by the increased production? What law should be laid down as to the standard by which wages should be paid, and workmen have their wages gauged? Which is the better plan when speed increases production; should wages be increased or hours be lessened? A long list of interesting queries presents itself, and each is the legitimate outcome of the question of speed which it has been our task to discuss.

#### TWO-COLORED EFFECTS ON WOOLEN FIFCE GOODS

Heretofore it has been only possible to produce such effects on these goods by weaving threads of two different colors, and also by using threads in weaving that have been mordanted with metallic salts, such, for instance, as chromium, with yarns that have not been mordanted, says an article in *The Textile Colorist*. This method produced effects which have had a wide commercial and industrial importance, but now it is possible to set aside the mordanting process and substitute for such yarn that which has been subjected to the process of "chloring." Chlorod wool absorbing more dye stuff than unchlorod wool, two-colored effects are produced by dyeing. By this method fabrics may be produced which, when dyed or milled, will show the so-called crape or crimping effects, and even to greater perfection than hitherto. These effects may still further be increased by using for the chloring process hard qualities of wool, which are less subject to contraction, and weaving them together with soft qualities of yarns.

In the practical application of this method, strongly chlorod wool, either in the raw state or in the shape of yarn, bobbins or sliver, is woven together in any desired manner with wool scoured as usual. The goods are then dyed with acid or Diamine colors, the latter being especially suitable for producing contrasting effects, as they will dye chlorod wool deep and intensive shades, while scarcely staining unchlorod wool. For producing the crimping effects it is immaterial whether the milling is done in alkaline or acid baths; it is advisable to mill in acid baths, for producing the two-colored effects on goods which require milling. Cotton and silk threads may be interwoven in order to obtain a still greater variety of effects. Tissues composed of the differently prepared wools may be subsequently printed, raised or milled, which processes likewise produce new effects of the kind described, resulting from the different properties of the chlorod and unchlorod wools.

The principal advantages of this method are the lower cost of producing two-colored effects and that a stock of the undyed goods may be kept, which may at any time be dyed according to requirements. The method, covered by English

patent No. 14,372, of 1898, and controlled by L. Cassella & Co. (Wm. J. Matheson & Co., sole United States and Canada agents), is as follows: Treat the well scoured and cleaned wool either in the loose state or in yarn, bobblins or sliver: 1. During 30 minutes in a cold muriatic acid bath containing 1½ lbs. concentrated muriatic acid per 10 gallons, squeeze gently. 2. Enter a cold chloride of lime bath of 0.6-1° Tw., containing 15-25 per cent. chloride of lime of the weight of the wool, the method of preparing this solution being to mix dry chloride of lime, containing about 30 per cent. chlorine with a little cold water into an even pulp, then fill up with about 20 times as much water as the weight of the chloride of lime, allow to settle and use the clear solution. For hard wools about 15-20 per cent. chloride of lime are sufficient; for soft wools 20-25 per cent. are necessary; the quantity of the former is to be about 30 times, for the latter about 40 times the weight of the wool. The chloride of lime solution is best added in 3-4 portions in order to prevent the dye stuff from going on to the fiber too quickly and avoid unlevel dyeing, after having worked for about one-half hour, add 3 ozs. of muriatic acid per 10 gallons liquor, work for another 10 minutes. 3. Re-enter the first acid bath, to which 8 ozs. of muriatic acid per 10 gallons have been added; work for about 15 minutes and then rinse 3 to 4 times in fresh cold water; should in spite of the thorough rinsing a still pungent smell of chlorine be perceptible, it is advisable to treat the goods for another 15 minutes in a bath of 86° F., containing about 5 per cent. of hyposulphite of soda (of the weight of the wool) and then to rinse again. The chlor-prepared wool yarn is then woven together with common scoured wool in any desired weave, or chlored sliver is first spun and then woven; the cloth is milled according to requirement, and then dyed.

As already stated, the production of the colored effects in dyeing the mixed-tissues according to the described method is mainly due to the greater affinity of the chlored wool to many dye stuffs. Different colored effects are thus produced by dyeing first with a dye stuff which has a greater affinity for chlored than for unchlored wool and then topping with other dye stuffs which dye both fibers alike such as the easily leveling acid dye stuffs, or by combining suitable dye stuffs in one bath. It is to be remarked that the lower the temperature is kept during the dyeing operation, the less the common wool is tinged, thus making the effect more prominent, whilst when dyeing at a higher temperature or at the boiling point both qualities of wool tend to become more or less evenly dyed, which is especially the case when the easily-leveling dye stuffs are used.

The dyeing operation is conducted as follows: For ladies' cloth the diamine colors are of great interest, they possessing in a high degree the property to dye only the chlored wool, making it possible to obtain most varied effects by dyeing comparatively very bright shades on the unchlored wool.

The following may serve as illustration: 1. Dyeing first at about 120° F. with Diamine Sky Blue and then topping at the boil with Scarlet or Brilliant Cochineal—the tissue will show a black and red effect. 2. Dyeing first with Diaminogene Extra at 120 to 140° F. and then topping at the boil with Cyanole Extra—the tissue will show a blackish-blue and blue effect. 3. Dyeing first at 140° F. with Diamine Azo Blue RR and then topping at the boil with Orange GG—the tissue will show a dark brown and orange effect.

Some colors, such as Diamine Bronze G, Diamine Steel Blue L, Diamine Catechine B, Diamine Black BH and HW, if dyed by themselves produce good and useful effects. Diamine colors are dyed with the addition of 10% cryst. Glauber's salt, 1 to 2% acetic acid 40%.

The goods are first well soaked in hot and rinsed in fresh water, then entered into the tepid dye-bath, the temperature of

which is raised according to requirement to or above 120° F., and dyed during one hour. They are then rinsed and topped in a fresh boiling bath with leveling dye stuffs and the addition of 5 to 10 per cent. bisulphate of soda. It is, however, to be borne in mind that in this last operation the chlored wool takes up the same quantity of dye stuff as the unchlored wool, and consequently its shade, owing to the bottom of diamine color, is much changed. It is, therefore, advisable to keep a reference sample of all dyeings with diamine colors, by which means the subsequent production of the same effects will be considerably facilitated.

For producing two-colored effects on suitings it is recommended in the first place to dye with the fast acid dye stuffs in one bath. Such goods, however, for which special fastness to light is only of secondary consideration, may also be dyed to advantage with diamine colors in the manner described for ladies' cloth. The method of producing two-colored effects in one bath is based on the combination of dye stuffs which also in a hot or boiling bath produce deeper shades on chlored wool with such, that as much as possible cover both fibers alike.

These products are dyed in the usual simple way with the addition of Glauber's salt and acetic acid. When dyeing with Naphthol Green or combinations of the Alizarine Lanacyl colors, or Naphthol Green with leveling dye stuffs, such as Orange GG, Fast Yellow S, etc., some bisulphate of soda is added towards the end of the dyeing operation. The goods previously well saturated in hot water are entered into the tepid bath, then the temperature is raised to 175 to 210° F. within 30 to 40 minutes and the goods allowed to run for about another hour. For producing blackish-gray with Anthracene Acid Black ST or Naphthol Black it is recommended not to heat the dye-bath above 140 to 160° F., as at this temperature the chlored wool is dyed almost alone. If the goods are to be milled before being dyed, this should preferably be done in a neutral or acid bath as already pointed out, because the increased affinity of the chlored wool for dye stuffs is more or less impaired by a treatment with alkali. For this reason it is recommended to mill in water such goods which are generally subjected to a slight soaping only and resort to acid milling when more heavy milling is required. It is also recommended to use in the place of oil, oleine, etc., for greasing the wool, only products soluble in water, such as turkey red oil and glycerine.

The following mixture for greasing yarns has proved a good substitute for oleine, viz.: 1 part glycerine, 1 part turkey red oil, 3 parts water.

The production of crape or crimping effects is based on the fact that chlored wool almost completely retains its original length when being subjected to acid or alkaline milling, while common wool is under the same circumstances subject to felting and getting shorter. According to the quality of the wool and the time it is subjected to milling, the effects will be more or less prominent; they become very pronounced if very hard wool is used for chloring and woven together with a soft quality which has greater tendency for felting.

### DEPRECIATION.

There is no question on which there is such divergence of opinion, alike as to what is meant by the phrase nor, when that is agreed upon, how the operation is to be conducted, than depreciation.

In the case of a manufacturing concern it is obvious that the land plays a comparatively small part, as the proportion which its cost forms of the total expenditure is small. Not only is the resultant product not obtained by the manipulation of the land, but by that of the plant and machinery placed upon

it. It is, therefore, necessary to deal with a new set of conditions to those existing in the case of agriculture. Instead of expending labor upon the one natural material which is common, it is necessary to use other things which can be so operated as to produce some article useful to us and capable of sale. Thus, the buildings, which contain the machinery, the machinery itself, and the accessories needed, form the greater part of the value, and it is chiefly in respect of these that it is necessary to take into consideration the question of providing a sum to enable them to be replaced when they are no longer able to produce the articles required. The amount thus indicated has come to be known as depreciation, and it is worth considering for a short time what this should cover. What, then, is depreciation? Primarily it is, of course, that allowance which should be made to cover the inevitable deterioration in any machine or article used, so that at the expiration of the period when it is no longer capable of economical employment a sufficient sum will be accumulated to replace it. In short, it is a payment out of revenue of a sum equal to the amount of capital absorbed in earning the revenue. In a sense this is a reserve fund, and should be treated exactly in the same way as the latter—that is, the amount set aside should be rigidly reserved, in order that it will be available for the purchase of the machines or articles which need replacement at the period when that is needed. It is a common practice to deal with the allowance made for depreciation merely as a matter of account; but it is only a sham unless the actual sum so accumulated is at the termination of the predetermined time available either in cash or kind—preferably the former. A reserve fund is thus created, which differs from that ordinarily known by that name only because it is ear-marked and set aside for a specific purpose, the ordinary fund being available for any of the purposes of the business. The charge for depreciation is one which constitutes a special expenditure for a specific purpose, and must be so regarded. It diminishes the profit made to the extent of the charge, and would, if not taken into account, be reckoned as part of it. It is, therefore, in its essence, reserved profit, and as such should be tangibly represented either in cash or some other form equivalent thereto.

There are, however, other considerations of importance in the case which are more complex. Primarily, it was said, depreciation is an allowance for the natural deterioration of the machine or utensil, which means capital expended, and in this form should always be made. As to the amount of the allowance, this depends on many conditions, which will be fully considered a little later; but there is another aspect which demands special thought. The writer may be excused if, under the special circumstances, the illustrations given are confined to textile factories, although it may be truly said that the same principles underlie all cases, and need only special application. In the case of a machine it is requisite to consider that not only does it wear out, but that owing to the efforts of inventors and constructors it may become, if not obsolete, not equal to machines of a later date. It is quite clear that in some few cases where a startling invention occurs the whole value of any machine may be destroyed at one stroke; but this is an extremely rare—nay, almost unknown occurrence. As a rule, the work of evolution proceeds in stages, sometimes quickly, sometimes more slowly; so that the unfortunate manufacturer does not find his machinery and plant suddenly rendered obsolete and of no value. But it is obvious that, however slow, this factor is one to be reckoned with, and undoubtedly does diminish the value year by year.

As an example of what is endeavored to be enforced, take the spinning frame. The old throstle or flyer spinning machine was—although in some respects the best ever used—in capable of producing more than a given quantity of yarn per

hour. In consequence, the efforts of inventors were turned to other modes of continuous spinning, and the ring frame was evolved. At first, owing to imperfections in the method of manufacture, the gain was not large, and to some extent was diminished by the comparative great power needed to drive the machine, and the frequent breakages. The great conception of Sawyer, that it was possible to obtain a point of support high up the bobbin, speedily led to improvements, and the combination of this principle with that of a self-contained spindle, which was the work of Rabbeth, carried the process further. But evolution was not yet at an end, and the application of the humming top principle to the spindle gave a further impetus to the productive capacity of the machine. Moreover, while the inventor was busy, the constructor was not idle. Grateful as we ought to be to those whose conceptions have led to the evolution of the best forms of spindle, it is certain that at least as much is due to those able constructors whose constant vigilance and effort have so improved them as to add considerably to their value and efficiency. The instance given shows that changes take place gradually, but it is quite clear that a spinner whose mill was equipped with frames having flyers would find its value much diminished on the introduction of ring spinning, and similarly would suffer proportionate loss if, having put in machines fitted with the common ring spindle, the newer type became an operative success. Further, the diminution in value is affected not only by the increase in the working velocity of the spindle, but also by the greater efficiency, owing to better construction, which leads to a greater continuity of work. An increased production, at all approaching the amount arising from the introduction of ring spinning, renders it imperative, in the face of competition, that the new instrument shall be adopted, and thus, unless it can be applied to existing machines—utilizing some of the parts—destroys the entire value of the latter, except that of the material.

Let it be assumed that a still further step is taken. It is common knowledge that many attempts have been made to spin the yarn on the bare spindle of a ring frame. Hitherto success has not followed any of these efforts, but let it be assumed that someone solves the problem. Part of the cost of a ring mill consists of the bobbins which are perforce used. This at least would be rendered unnecessary, and the bobbins would cease to have any value in this connection. Further, let it be assumed that in order to produce cops on a continuous spinning frame a radical change is made in the character of the spindle used so as to obviate the necessity for a ring and traveller; it is clear that the value of existing machines would at once suffer diminution. Much more striking would be the effect if some change in design resulted in the capacity to spin much finer counts than is possible on a ring frame, while retaining the continuous principle. This would be little short of a revolution, and would lead to an enormous diminution in the value of mule plants.

There can be no doubt, therefore, that in considering the question of depreciation, it is essential to take into account fully not merely the deterioration arising from wear and tear, but also the decrease of value consequent upon the production of new mechanical contrivances of greater power and capacity. These considerations apply in a lesser degree to buildings, but they do apply, because a given class of machinery is best arranged in a building of specific dimensions which may not be the best under other conditions. For instance, it is customary to provide so many cards and speed spindles for a given number of spinning spindles. It needs no demonstration that an increase in the productive capacity of any of these will affect the required number of the others, and that where a building has been designed to hold conveniently and economically the specified machinery, it will not be so well adapted under the

changed conditions. It is quite true that this consideration has not as much force in the case of buildings as it has in that of machinery, but it is not to be lost sight of entirely, as will be admitted readily if a mental comparison be made between the mill building of twenty years ago and that of to-day. Having thus laid down the principles of the subject, it will be easy to deal with their application, although there are many considerations of importance to deal with.

It is urged that there are many considerations to be taken into account in reckoning depreciation. These are: (1) The loss of capital by the natural wear and tear occasioned by work and by neglect or carelessness. (2) The addition to the value at any given period which results from effective repair. (3) The character of the work to be performed, and its effect upon the construction, operation, and amount of wear of the machine. (4) The loss of capital caused by a decrease in the relative value owing to the introduction of superior instruments capable of more economical results. In fixing the amount set aside for depreciation, we are at once met with a bone of contention: shall the fixed amount be deducted yearly from the original or depreciated value. In other words, shall the life of the machine be taken as the period during which its cost shall be provided for, or shall there be at the expiration of that time a residual value which is equivalent to an extended life? It is quite certain that every machine which is replaced has some residual value. The material of which it is composed is worth something, and to that extent the absolute wiping out of its value in a given period is unjust. Generally speaking, however, the amount is not large and may in any case be allowed for in making the calculation of the yearly allowance. On the whole it is better and simpler, considering the purpose of depreciation, to deduct annually a fixed sum from the original cost, so that there may be some period when the account will close. As depreciation forms a special reserve fund for a specific purpose, it should be adequate to provide for it, as it is better to err on the side of excess. It is becoming the practice in the English cotton trade to charge a definite yearly sum to depreciation, instead of a percentage, care being taken to make it adequate. Loose plant and accessories should be charged against the revenue, and not counted as plant, and care should be taken to keep them up to full value year by year.

#### PHILADELPHIA EXPOSITION.

Of the numerous indications of effort on the part of the United States manufacturers to secure the markets of the world the national exhibition projected to be held in Philadelphia in September, October and November, of the present year, is in many respects the most important to the commercial interests of the country. It is to be an exposition for the development of United States manufactures and the expansion of the export trade, and it will be the first national exposition of that character ever held in the country. It is the purpose to exhibit every line of manufactured products of the United States especially suitable for export. Such exhibits will form the principal department of the exposition, and will comprise everything which is, can or might be exported, from locomotives and heavy machinery to the smallest novelties.

There will also be a department of foreign manufactured goods but it will not contain a single exhibit made by a foreign manufacturer, states The Boston Journal of Commerce. This department will consist of collections of samples of goods made in the commercial countries of Europe and successfully sold in all foreign markets in competition with United States goods and in foreign markets in which United States trade has not yet been developed. These samples will be exhibited side by side with United States products of the same class and will show the manufacturers just what competition they must meet

abroad, as well as the peculiarities in the demands of every foreign market. A third department of the exposition will show how United States goods must be packed, labeled and shipped in order to meet the requirements of foreign trade.

In October a Commercial Congress will be held in Philadelphia in connection with the meeting of the International Advisory Board of the Philadelphia Commercial Museum. The leading Chambers of Commerce of the world have been invited to send delegates, and the Commercial Museum has sent out invitations to its agents and representatives abroad to send to the exhibition their buyers or members of their firms. There is every reason to believe that at least 800 representatives of foreign firms will be present at the sessions of the Commercial Congress, and in attendance on the exposition, in addition to the official delegates and those representing commercial organizations.

Sanction and support has been given to the exhibition by the National Government, the United States Congress having appropriated \$350,000 to aid it. The city of Philadelphia has given \$200,000, and the State of Pennsylvania \$50,000, and \$100,000 is being raised in Philadelphia by private subscription. A bill now pending in the Legislature of Pennsylvania appropriates \$200,000 more, making a total fund of about \$900,000. The main buildings, which are now under construction, cover eight acres of ground, and the available exhibition space will be at least 200,000 square feet.

#### NEW ANILINE DYESTUFFS.

New Patent Blue G. A.—New patent Blue B and 4 B have been on the market since May, 1898. The Farbenfabriken Co. of Elberfeld have produced a new homogeneous dyestuff, under the name of New Patent Blue G. A. which differs from the older brands, in that it exhausts the dye bath almost completely. It is greener and brighter in shade and possesses greater covering power. The ease with which it dyes level, its fastness to alkali, light, rubbing and milling corresponds very closely with the B and 4 B brands. New Patent Blue G. A. is specially recommended as a level dyeing color for the production of fancy shades on ladies' dress goods and yarn, and owing to its fastness to milling, can be safely employed in combination with Alizarine colors. Dyes with 20 per cent. Glauber salt, and 4 per cent. sulphuric acid.

Direct Blue Black 2 B.—Owing to the general tendency to a decline in price of direct black dyestuffs, Direct Blue Black 2 B has been placed upon the market to meet the demand for a good cheap black. In many respects it closely resembles the Direct Blue Black B, differing only in its brighter blue shade, and cheaper price. Direct Blue Black 2 B is adapted for the production of blacks, either as a self color or in combination with Direct Deep Black R W or "E." and further, with Benzo Chrome Black B, for dyeing dark navy blues. Owing to its solubility and excellent dyeing properties, this new product can be employed for dyeing loose cotton in a machine or apparatus, and also for dyeing yarn, as well as piece goods. In the dyeing of half wool, Direct Blue Black 2 B dyes the wool fuller than the B brand. Pattern card No. 729 shows shades of Direct Blue Black 2 B, on suitable material.

Benzo Dark Green 2 G.—In appreciation of the success attained with Benzo Dark Green B, the makers have added a new brand to this group of direct green dyestuffs, known as Benzo Dark Green 2 G. It is a homogeneous dyestuff, and is both yellower and clearer than the G brand. In properties, it is identical with Benzo Dark Green B, and while it is not as bright in shade as Benzo Green, it is considerably cheaper. The new brand is especially suitable for cotton, and has a great affinity for vegetable fiber. Is less suited for mixed fibers as it

dyes the wool or silk in a neutral bath deeper shades than the cotton.

**Fast Red P R Extra.**—Is an acid wool color, possessing good level dyeing properties, and being very cheap can be utilized for the production of Bordeaux reds. Is also suitable for shading scarlets bluish. In properties, it is the same as most of the well-known fast red brands. For a good full Bordeaux shade use 3 lbs. Fast Red P R Extra, 20 lbs. Glauber salt, 4 lbs. sulphuric acid, per 100 lbs. woolen goods. A number of shade cards have recently been compiled by The Bayer Co., showing latest color and combinations on suitable goods.

Any of the above cards, samples, shades, etc., to be had from the Dominion Dyewood & Chemical Co., Toronto, sole agents in Canada for the Farbenfabriken, vormals Friedr Bayer & Co., Elberfeld, Germany.

## Foreign Textile Centres

**MANCHESTER.**—The dispute in the cotton-weaving industry has naturally attracted a considerable amount of attention. It is not often that the operative weavers take it upon themselves to stand forth with a definite demand. Their organization has always been too weak to permit of such a thing. There are many conflicting elements to consider in connection with the weaving position. The homogeneity existing in such a department as that of spinning cannot possibly exist, neither now nor at any other time, in the weaving department. Spinning, to a certain extent, requires brains. But the weaving trade, beyond its elementary department, requires still more. And that is why one sees strong spinning organizations and unions comparatively weak in the weaving industry. There is not much activity in the shipping departments of the linen trade, but the home branches are doing fairly well. The home trade is not locally in touch with the export department as a rule. This accounts for the divergence of views often entertained as to the real condition of affairs. In the fancy departments there has been a good turnover. The arrival of some grades of Swiss lancies has troubled some houses. They cannot trace the origin of the goods, a fact due, of course, to the consignments by low country ports. There is not much doing in the silk departments. The position of affairs in Lyons hampers business considerably. There has been a considerable amount of activity on United States account, largely due to orders from Paterson for "raws."

**LEEDS.**—There is a further improvement in many lines of worsted and woolen cloth, and the summer trade has attained a good average, with prices very firm. Manufacturers are cautious in accepting repeat orders at former quotations, as they have an abundance of work on hand. Finishers and dyers are fully occupied, and all round there is a disposition to stand out for better remuneration. Shippers are doing more business, and there is no danger of an overstocked market. There is a substantial improvement in union cloths and fancy mixtures for the costume trade, and low-priced tweeds are having a good run. Covert and habit cloths are active, and prices have improved somewhat. For heavy woolens, however, there is no extra demand. The Army cloth trade is steady on both home and foreign account. Ready-made clothing has a large turnover.

**HUDDESFIELD.**—The recently noticed improvement in the heavy woolen districts of Huddersfield continues, but there seems reason to expect that the old times of prosperity will never return to the former place unless up-to-date alterations are made in machinery, etc.

**BRADFORD.**—The excitement in this market with respect to

the finest wools continues, and there is some anxiety with regard to the future. Despite the higher prices which can be obtained, top makers prefer to await developments. The finer crossbreds are hardening, and lower and medium descriptions are moving more freely, occasionally making more money. There is no material change in English, but mohair is somewhat steadier, says the *Textile Mercury*. In the yarn department there is a better enquiry for singles on export account, and spinners insist on higher prices for botanics. Mohairs are also wanted, and spinners are covered for some time to come. The piece trade is improving. A fine bengaline or poplin which cost 24d. per yard to the maker a year ago could not be made at the present price of raw material under 28d. per yard, and the advance is proportionately great in the case of fine worsted Italians, cashmeres, merinos and coating cloths. The keen competition for the trade of leading firms will create a delay in the time when the consumer will really have to pay the full advance, but if the same fabrics are to be used this advance will have eventually to be paid. Although it is extremely difficult to arrange to put all business now offering through in a profitable manner, on account of the above sudden market development the present situation opens out a great opportunity for Bradford, where crossbred wools can be dealt with better than anywhere else in the world, whilst their Roubaix competitors seem likely to be placed in a position very like that of the Lancashire manufacturers in the American war cotton famine. Prices of crossbred wools, although slightly dearer, have not as yet advanced sufficiently to interfere to any extent with the ordinary tenor of the market, and there is no change in the values of English wools, says the *Drapers' Record*, London, under date April 29th. Prices of raw mohair have been again advanced, and, as spinners are as a rule well employed, they are asking rather more money for any new yarn business. The rise in fine wools seems to have caused a considerably increased enquiry for most kinds of worsted yarns for Continental export account, and a very considerable business has been done in wet yarns for that market in both mohair and worsted yarns. The condition of all classes of manufactures of dress and lining fabrics here has shown a most marked improvement during the past few weeks, and, although it is now too late for any great amount of business to be put through for the coming summer trade, and the autumn season is not looked upon as a large one for Bradford, there can be no doubt that nearly all makers have sufficient work on hand to keep their looms employed for some weeks ahead, and some are engaged up to October. There is a large business in mercerized crepons for the United States and the Continent, and Bradford makers are getting a much better share than usual of the high class costume cloth trade for the coming autumn season. The recent cold and wet weather, and the disturbances in the labor market have, no doubt, had an adverse influence on the home trade in dress goods, but a few days of real sunshine would speedily put quite a new complexion on business, and this little break has in most cases been quite welcome to houses whose resources were taxed to the utmost to keep up supplies to their customers.

**HALIFAX.**—The following is the Chamber of Commerce trade report for April: **Worsted Yarns.**—Upon the whole spinners have been steadily employed during the month and are getting better prices, but they find new business coming to hand very slowly, and at prices quite out of proportion to the advance which has taken place in wool tops. This is what we may expect until the cheap lines have run out. **Wool.** During the past month there has been a little improvement in the wool trade, and this is more especially noticeable in merinos and fine crossbreds, which show a considerable advance. Pieces. There has been more general business for various markets, but



manufacturers of fine goods have found it difficult to obtain the full advance which they are compelled to demand, owing to the increased price of yarns. The Eastern trade is a little better. Spun Silk: An advance in raw material has been established, and in some classes to a considerable extent. It is more difficult to get higher prices for finished yarns. Machinery is pretty well kept going. Dyeing—Slubbing dyeing trade for the present month has been fairly steady, and the prospects for the coming season are good. Yarns, however, keep quiet, and there is not much doing yet in dyed worsted warps. The piece dyers are pretty well employed, but still the trade is not as brisk as could be wished. Cotton—The demand for twofold 42's is almost nil, hence spinners complain loudly of their trade, and with good reason. Fustians and Ready-mades—Fustians and ready-mades continue about as last month, without any material change. Woolens—There has not been any improvement in the demand for woolen goods during the past month. The advance in price of fine wools should eventually stimulate the trade. Carpets—There has been a lively demand for goods throughout the month, and looms are well employed.

**ROCHDALE.**—At the flannel market recently, a fair amount of business was transacted. The amount for April was fully up to the average, notwithstanding the heavy buying previously. Whatever the result the stocktaking may show at the end of the year there is no doubt that at present the turnover will fully equal, if it does not exceed, the average of recent years. The manufacturers are very well employed and some do not care to take any more orders. Prices are unchanged.

**KIDDERMINSTER.**—Manufacturers are still being pressed for the immediate execution of small orders, and it is probable that this condition of things will last for some weeks. It is true that raw materials are now considerably cheaper than some time ago, but the constant changing of patterns and colors in the loom, which these small orders entail, swallow up the advantage which manufacturers would otherwise secure from the low price of materials. A trusted correspondent travelling the northern district writes to-day declaring that "the retail trade is booming." Spinners are rather better employed consequent upon the gradual development of the home and continental trade, and prices for wools and yarns are decidedly firm. The exception to this was at the London Low wool sales week when Persians and inferior wools showed a slight decline.

**NOTTINGHAM.**—There is a moderate demand for the higher counts of fine lace yarns and also for the lower counts suitable for nets and curtains. The demand for ordinary lace yarns, however, is slow, and the market all round is less favorable to sellers. Merino and cashmere yarns for hosiery continue to harden in value, and buyers who delayed placing their orders find the market further against them. Bobbin nets are firm in value at the highest quotations. Reports are somewhat contradictory in the fancy lace warehouses. Here and there manufacturers are well engaged with cotton goods. Business has picked up considerably since Easter, and both plain and fancy goods are enjoying a good trade. In fancy cotton millinery laces the situation is brisk, and good orders have been booked for cotton and linen torchons, both for home and for shipment. Valenciennes of various kinds and qualities are well in favor for all markets. The latest novelties in Renaissance and other fashionable styles are making good progress and manufacturers are fully employed. Oriental laces are less to the front, Maltese, Breton and Brabant laces are moving in fair quantities. A few specialties in point de Paris and malines are selling, and there is a demand for guipure and other styles of insertions. American crochet and heavy warp goods are moderately good for shipment. Irish crochet, everlasting and beau ideal embroid-

ery trimmings move slowly and sales are below former seasons. Much of the machinery has been adapted to produce more salable goods. There is a good demand for special kinds of headings, Honiton braids, tapes and purls, in cotton, linen and silk. Manufacturers of caps, ruffles, collarettes, aprons, blouses and other fancy goods are well employed. Silk chantilly laces are only in limited request and there is not much encouragement to produce novelties. Comparatively little machinery is now at work on silk laces. Business in bobbinets and light tulle remains large in volume and stocks are light, while prices are good. Orders for mosquito nets are still in arrear and prices are firm at the highest quotations. There is a steady demand for spotted nets and light tulle for millinery purposes. Moderate quantities of stiff foundation nets are selling, the prices of which remain unaltered. Special qualities of silk nets and tulle are selling, but not to the same extent as during former seasons. Veilings are moving in good quantities, but there is a superabundant supply both of plain and fancy kinds, with consequent severe competition, so that remunerative prices are difficult to obtain. An extensive business is being done in fancy cotton millinery laces. Lace curtains, window blinds and toilet goods are enjoying an output and a volume of sales rather above the average.

**LEICESTER.**—Cords, braids and beltings are in good request for home and Continental markets. There is more activity in hosiery; the deliveries both on home and export account are much larger. The upward movement is resisted, but orders are promptly declined at old rates. The yarn market is brisker, with larger contracts on hand and offering. Prices are decidedly firmer, and spinners decline to book heavy orders with open dates unless at the full limit of the advance. There is heavy business in cashmere yarns, and French cashmeres can only be secured at very heavy advances, and the upward movement still continues. Lambs' wool and fancy yarns are in fair request at better quotations.

**SOUTH OF SCOTLAND (Glasgow).**—The weather during the past week has not been particularly favorable. There has been a good deal of rain, and the temperature has been much too low for this season of the year. The dress and millinery departments have not been so active, and there will probably be no spurt until the weather becomes warmer. Clothiers and the outfitting sections of the trade have been active. Spring suits are, as a rule, invested in, despite the atmospheric conditions. As the result of action on the part of the local Chamber of Commerce, the Kirkcaldy linoleum and floorcloth manufacturers have obtained considerable concessions in the shape of special rates to grouped English towns. The improvement in the Scotch tweed trade continues. Generally speaking, looms are well employed, some makers having two months' before them. There is still a steady demand for worsted cloths, the result being that a number of carding machines are idle. Spinners of carded yarns are short of orders. It is expected that there will be a further advance in the price for merino wools.

**BELFAST.**—The steady improvement which has characterized the linen market for some time has been more than maintained recently. All sections of the trade share in the greater activity, and prices are higher, with a further upward tendency. Yarns are selling more freely. Tow yarns are especially in demand, and there is also a continued improvement in the demand for the coarser counts of line wefts. The finer numbers have sold to a moderate extent. Rates all round are rising. The brown cloth market has been increasingly active. Business has steadily improved since the beginning of the year, and the improvement gives every indication of being maintained. Progress has been slow but sure, and manufacturers occupy a much stronger position than they have done for a very long

time. Thirty-eight-inch power-loom linens for bleaching are selling steadily at full rates. The demand for unions is fully maintained at top prices. The sales of tow-made goods show a distinct increase at higher rates. For damasks and house-keeping goods demand continues to be active, and the handkerchief trade is very good. Rates have advanced, and are likely to go still higher. Handloom linens for bleaching continue to sell steadily. The bleached and finished end of the trade shares in the general activity. Orders are coming forward to a satisfactory amount, and prospects are considered very hopeful. Cross Channel shipments have been rather heavier, and the home trade all round is going ahead. Makers-up continue to order freely of white goods. The export trade continues to expand. Advices from the United States are of a most promising character, and orders placed are more satisfactory, both in regard to the quantities and qualities of goods required. There is a gratifying improvement in the latter respect. Cuban trade is improving from week to week. The demand from the South American markets is about the same as before. Trade in Canada is still active. Continental demand is slowly growing.

LYONS.—The Lyons market for silk is quiet. There are few sales from stock, for the simple reason that stocks in styles favored by fashion are very low. As to new orders, the difficulty with prices continues. It is reported that commission houses hesitate to place their orders in the vain hope of seeing manufacturers reduce their prices, but while they are prepared to pay an advance of about 5 per cent., prices keep going higher. Orders made a few weeks ago had to be withdrawn, reports the special correspondent of *The New York Dry Goods Economist*. The Paris houses have had a good season. They have very considerably reduced their stocks, and will have to buy sooner or later, when they will have to pay the prices asked by the manufacturers. This applies principally to the better grade of goods and rich fancies, while in lower grades, where the advance is not much felt, the mills are employed and re-orders are liberal. *Satin*. Liberty in printed styles are the leaders at present, and the supply appears inadequate. Pongees and twills are also in active demand, and prices for the latter, which are scarce, have risen during the season from 15 to 20 per cent. Warp prints have become neglected, and do not answer the expectations entertained at the beginning of the season. The tendency in general is for softer goods, in which new styles are being prepared. The velvet trade shows little animation, although the mills keep busy on plain velvets in black and colors. Fancy velvets meet with much favor, good orders having been received lately. The styles most favored by fashion are stripes and pekings. The ribbon trade was rather slack, but striped and checked taffetas continued to be bought. Warp print ribbons have not proved a success.

CREFIELD.—The most important developments in the Creffield market recently is the final settlement of the velvet weavers' strike, which has resulted in a victory for the mill hands, after a fight lasting for more than three months. All the mills resumed work again during the week, and although not all the demands originally brought forward by the weavers were conceded, the concessions made by the mills are substantial enough to justify in the end the patience with which the mill hands held out to the last. As may be supposed, the number of orders which had accumulated in the hands of the manufacturers are considerable. Much satisfaction is felt in view of a good velvet season and the production of the goods is no longer interfered with. The market in general was quiet during the week, but showed a slight improvement over the preceding weeks, particularly with silks, for which good orders came to hand. As to dress and trimming silks, the activity witnessed during March has not returned, and the demand from

the cloak trade also continues slack. Stocks, however, are not accumulating, nor is any decrease noticed in the activity of the mills. The looms are well employed on orders. The sentiment of the market is not impaired, and a good fall season is confidently looked forward to. The higher cost of silk goods, no doubt, has some influence on the activity of the market, but as there are no indications of an impending change of the fashion by which silks would lose in favor, the falling off in the demand is considered only temporary.

MILAN.—A calmer tone has prevailed in the raw silk market, which appears natural after the large purchases made by the mills during the preceding period. It would, however, be a mistake to accept this as a sign of weakness. The situation remains unchanged and is very satisfactory as well as regards the continuing consumption. Extreme firmness prevails in the quotations of reduced stocks. No lower prices can be quoted, but, on the contrary, despite a diminished demand, some grades obtained a fractional advance. Fine greges for throwing and for exportation predominated, however, and best organzines also were in active demand. There were likewise some deals for America in greges for later delivery, but these attained no importance.

ZURICH.—The raw silk market was only moderately active lately, but no change in its tendency can be reported. There were few deals of importance, the large figures published by the conditioning house being mainly due to deliveries against former contracts. The prices ruled firm at the former quotations, and, although the advance seems to be halting for the present, the development of the market is being followed with close attention, as we are approaching the crop season. Reports from the Italian producing districts state that large quantities of cocoons have been secured in advance at high prices. Among dealers it is believed higher prices will prevail. The large purchases made by them in Asiatic grades would seem to confirm this opinion.

### THE PRODUCTION OF LOOP YARNS.

Amongst the wide variety of fancy yarns now placed upon the market, few have played so important a part as loop yarns, although they are not always in demand, their adoption in some form or other is constantly to the front, especially in the construction of winter over-clothing. The looped or curled condition of the yarn, as also the production of knots in finishing the goods, is on the one hand a result of the inherent tendency of the yarn to curl, and on the other as a consequence of properly selected weaving combinations. In addition to these, the shrinkage of the wool during fulling or steaming plays a by no means unimportant role.

Broadly speaking, there are three different kinds of looped fabrics: First, those qualities wherein the looping is effected after the goods are woven—i.e., developed by the aid of moisture in washing or fulling; second, goods that are made of single or twisted yarns and then subjected to special treatment for the production of curly effects; and third, those wherein this effect is produced in the beginning by suitably twisting and treating the yarn by special machinery.

To the first-named class belong a number of mohair or cheviot twists prepared in a simple and ordinary manner, the cheviot lustre yarns being highly appreciated. The principal factor governing the number of curls per unit of surface is the weaving combination employed and the resulting float of the threads. The pattern Fig. 1 shows, for example, a fabric with warp loops, which perfectly suffice for practical utility. For the warp in this case a 2-28 skein would suit, and a similar yarn (combed or carded) for the weft. The number of warp ends per 72-inch reed would be 1,450—1,500, and the allowance for shrinkage on fulling 10 per cent in the length, and down



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FIG. 1.

FIG. 2.

to 57—58 inch in the breadth. Fig. 2 is the design for a double fabric, the upper warps and wefts being two-fold cheviot lustre yarn or mohair twist, and the under warps and wefts of single-carded yarn of equal weight. As the float of the upper weft is not excessive, the difficulties to be overcome in finishing the cloth are slight in comparison with those met with when certain other combinations are used. As a precautionary measure, it is advisable to sew the goods in bags for fulling. The shrink-

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FIG. 3.

age reckoned for a warp of 2,800 threads per 72-inch reed is 10 per cent. in the length and down to 56—58-inch in the breadth.

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FIG. 4.

Frequently the production of the loops is effected by the wet only, their float being the greater. Figs. 3 and 4 are suitable designs for this purpose. Cheviot or combed yarn or two-fold carded yarn about 2-60 skein would be suitable with a doubled cheviot lustre yarn 2-28 skein for the weft, the number of warp ends being 2,100 per 78—80 in. reed. The combination represented by Fig. 3 would also furnish good results with 2,000 warp threads, allowing for a shrinkage of 8 per cent. in the length and to 57—58 inch in the width. Careful fulling is essential, and the pieces should be sewn together, treated warm in the washer, and only slightly fulling.

The second class of looped goods, or rather yarns, comprises those curled by artificial means. Highly divergent methods are adopted for the attainment of this object. For instance, the single or doubled yarn is wound on tubes heated with gas, and exposed during winding to pressure from two rollers acting in a direction opposite to the spiral formed by the threads until the latter are forced off the tube; or a number of threads are twisted into a rope, exposed to severe steaming or boiling, and the hanks untwisted, the yarn being then reeled and woven, whereupon a curly appearance is developed immediately, as the result of the loops formed during the steaming or boiling process. Again the yarn is knitted into a web on a knitting machine, and after being boiled or steamed for some time and unravelled, the material of the web will be found to have acquired a fixed tendency to curl or loop. This method was practised by the firm of Dictus-Lejeune, Verviers, some thirty-five years ago, though at that time the operation was expensive, the knitting being done by hand labor. When the loops are produced according to the third classification by twisting the yarn in opposite directions, this also is effected in several different ways. For instance, a very fine yarn may be doubled with a thick soft yarn of opposite twist in such a manner that the former forces its way into the more open yarn and forms a series of pads or rolls. Another method for producing weft effects consists in doubling the yarns on an ordinary machine, taking the precaution, however, that only one of the threads passes through both cylinders, the other merely running over one of the top cylinders, and then under the lower one; the thread must be at very low tension, and is therefore wound as a large cop. The resulting yarn, or the loop structure thereof, is too weak to serve as a warp, and consequently when it is to be used as such, a third thread is drawn in from the one side and through both cylinders, in order to impart the necessary strength to the yarn and more stability to the loops. The resulting doubled yarn may also be twisted with a third thread in a reversed direction. For producing good yarn two pairs of cylinders are advisable, the one conveying the lustre thread being set at high speed, whilst the other lags behind. At a certain distance apart the two threads pass between both pairs, another thread from the side giving union and twist to the others. The cylinders are fitted with change wheels to enable a great variety of effects in point of speed, draft, etc. to be obtained. For yarns with differential loops the machine must be fitted with an arrangement for regulating the feed of the loop-forming thread. Multi-colored knopped yarns are prepared by the aid of printed rove in lustre yarn, on a three pair cylinder machine, arranged vertically or with the third pair of cylinders in front, by which means large loops can be made from the one thread of the doubled yarn and small loops from the other. Sometimes, also, the third thread of the two-cylinder system is left out, the resulting yarn being then doubled in a reverse direction with another thread on an ordinary machine. Finally, says "Oesterreich's Woolen und Leinen Industrie," the most effective and diversified forms of loops are obtained by causing the threads to loop by a preliminary treatment of boiling or steaming, and then doubling on an ordinary or two-cylinder machine.

## PIN AND NEEDLE.

In a review of a German work on the needle—"Die Nadel und ihre Entstehung; eine technologische Skizze," von Franz Hutgenbach (Aachen: Ignaz Schweitzer, 1898)—in the Journal of the Society of Arts, it is stated that there is no record of the period when pins and needles were first employed in their primitive forms. The earliest needles were not pierced at the end opposite the point; but the prehistoric needle was rather an awl, which served to make holes in furs or skins ages before textile fabrics were invented. The long underground roots of plants or bindweed, and leathern thongs, were passed by hand through the holes thus made; and it was only in more recent times that the idea was conceived of attaching the thong to the primitive needle, for forcing it to follow the path thus made, whence arose the first idea of the needle proper. In remains of the Stone Age splinters of stone, pierced with a hole at the end opposite the point, are met with; and it is evident that these tools, sometimes a little curved, served as needles in those remote periods.

Flat needles with a split in the end opposite the point are found among the remains of the Bronze Age, the two branches being slightly separated, then brought together again and crossed at the ends, whereby a kind of eye was formed, while the two parts were sometimes united by a rivet. It is not known when the eye was first formed by piercing the end, which must have been a difficult operation on a cylindrical rod of iron or steel, so that subsequently the place was flattened where the eye occurs; but no correct idea can be formed as to the shape of these needles, because they could not withstand atmospheric influences, while, on the contrary, specimens of the early pin, for which bronze or the precious metals were often employed, have been very well preserved. The true type of a sewing needle was, so early as the Greek and Roman times, pointed at one end, and it was only when the sewing machine was invented that needles were made with the eye near the point. Even in the period when the first true needle made its appearance be unknown, as also its exact form, there can be no doubt that this essentially domestic implement had attained a very high degree of perfection in ancient times. So ancient a poem as Homer's "Odyssey" gives a detailed account of the mantle woven and embroidered by Penelope for Ulysses on his departure for the Trojan expedition. It was not, however, women only who used the needle, because needlework ranked among the fine arts, and it is probable that the embroiderers of the period made their own needles, just as, so late as a century or two ago, painters made their brushes and prepared their own colors. It was only about 1785 that the first mechanical process producing the double steel rod, for making two needles joined together, was introduced. At first, needles, before they were completely finished, underwent a great many manual and mechanical operations, passing several times between the factory and the workman's dwelling; and it was only about 1870 that the needle was made for the most part by mechanical methods, while during the last fifteen years only has it been entirely finished in this manner.

After Sheffield, Aachen, or Aix-la-Chapelle, has been celebrated for the needle industry during the last two centuries; and it is in this city that were established the first mechanical appliances connected with it. Before the invention and perfection of the pointing machine, a skilful workman could point 25,000 needles in a day of ten hours; but a machine now performs this operation with greater precision on 300,000 needles in the same time and with one workman. The needle manufacture is now concentrated in England, the United States of America, and Germany—namely, at Aix-la-Chapelle, which is by far the most important seat, and also at Iserlohn, Altona-Schwabach, Chemnitz and Ichttershausen. While no needles

are made in France, that country produces a large quantity of pins—it is stated ten thousand millions—while consuming more than ten millions daily, so that French imports of this domestic article are considerable.

There are at least 250 varieties of the needle for sewing alone, to say nothing of those for embroidery, packing, cartridge-making, bookbinding, sail-making, knitting, larding (cookery), and many other purposes more or less connected with the original object. The pin, called Steck-Nadel in German, has even more varieties than the needle, while being still more largely and generally used. The pin must also have been employed before the needle for connecting the skins which served as garments before the idea of sewing them together was conceived. Examples of artistically wrought pins are found among Egyptian as well as Greek remains; but it was especially the Romans who made very elaborate fibulae, which have developed into the modern brooch. Simple pins with mere head, shank and point, were, however, largely used in antiquity; and the estimation in which they were held is proved by many proverbs and popular sayings connected with the pin in many languages. Different kinds of wire are required for making the pin and the needle, for while that of the latter must be stiff and yet yielding, to a certain extent, as well as polished to the highest degree, that of the pin must also possess a certain amount of stiffness, while it must also permit of bending without being broken, though a too highly polished pin becomes easily detached. Scarcely a hundred years ago the steel pin was rarely used; but this variety has now been so much improved that the steel pin may be said to have now come into general use. The lengths of steel wire are prepared in the same manner as those for the needle, so as to constitute two pins, separated into equal parts before the operation of heading; and one end must be softened before receiving the head. For this delicate operation alone an automatic machine has been devised, that brings each head in turn within the influence of small gas flames, and which can soften 150,000 shanks in a day, five or six machines being tended by one person. Very small brass or iron pins are headed by simple "upsetting" or crushing down the end, as in riveting; but for those of larger size the heads must be prepared previously, in a particular and very ingenious manner, from a piece of wire twisted spirally, two-and-a-half turns being required to make the head, of which 500,000 may be produced daily by one worker. Whereas before 1835 each pin was headed separately by hand, between 5,000 and 6,000 pins may now be headed mechanically in ten hours.

Enamel headed pins constitute a branch of industry special to Aix-la-Chapelle, where was first conceived the idea of adapting the "enamel" or glass head to the steel shank. A manufacturer of that city, seeking means for utilizing the needles spoiled in manufacture, conceived the idea, after visiting some Venice glass bead factories, of fixing the bead on the end of one of the "waster" needles, so as to form a pin. But it was only after long and tedious trials that he succeeded in attaching the enamel strongly to the shank, and also in finding a composition of glass sufficiently tough to stand the usage to which a pin may be subjected. The general introduction of the steel pin was not easy, because it was found that the early examples readily became detached, owing to their high polish, while they often broke through for want of sufficient pliability. During the last thirty years, however, the consumption of steel pins has greatly increased; and at a single Aix-la-Chapelle factory it has been found necessary to put up separate works to make the glass for heading pins, that now turn out half a ton of "enamel" daily for this purpose, while the same establishment consumes two-thirds of it. The consideration that only 0.2 gram (3 grains) of this glass is, on an average, required for heading a pin, will afford some idea of the enormous quantity of pins that can be headed with half a ton. Owing to the greatly increased

consumption of steel pins, the "waster" needles now form only a very slight proportion of the shanks required. For preparing the latter, pointed lengths of iron wire are introduced, a million together, into a cast-iron drum containing a special carbon dust for cementing them—i.e., turning them into steel, by subjecting them to the necessary heat during a certain length of time. This process imparts the necessary degree of hardness; and the almost imperceptible flange formed in cutting the wire to length is favorable to the holding fast of the head, while it is seldom that an enamel-headed pin loses its head.

The enamel, or glass, has to be made specially for the purpose, because it must be easily fusible, and must also remain viscous sufficiently long for the forming of the head, while it must also be bright without the necessity for polishing, and yet not brittle. Two workmen with iron rods, like that of the glassblower, except that they are not hollow, take up on the end of them sufficient glass, which is rounded by turning so as to assume the form of a pear. With their rods they proceed quickly to a drawing-out walk, like a rope-walk, straight, horizontal, and about 50 metres (56 yards), long. Standing in the middle, the men unite the balls of viscous glass, and then proceed in opposite directions to the ends of the walk, thus drawing out the glass to the whole length, its thickness varying with the rapidity of the movement between three and seven millimetres (mean 3-16-in.), after which the glass rod is cut into lengths and made into bundles. The head is formed and fixed at the same operation with great skill by a workwoman, seated before a table on which are mounted a frame, about 15 cm. (6-ins.), high, carrying the glass rod placed horizontally (its end being brought to a convenient distance), a gas burner at about the height of the rod, and an air jet for giving a blowpipe flame, all adjustable. The workwoman, who has before her a quantity of steel shanks, takes several in each hand and passes each one in succession, alternately with the right and left, into the heated and viscous portion of the glass rod, withdrawing the shank by a special turning movement, so as to take up a little of the glass, and a turn of the thumb and first finger gives the shank a rotary movement, so that the glass taken up becomes formed into a head which remains attached to the end of the shank, the head cooling while the complete pin falls into a channel. This somewhat complex operation is executed with remarkable address and rapidity, and a skillful worker can head from 25,000 to 30,000 pins daily. There are fifteen sizes of these pins, the heads of which vary in diameter from 1.5 to 3.5 millimetres—from 1-16-in. to 1/8-in.—while the length of the shank varies from 1.5 to 5 centimetres (19-32-in. to 2-in.).

According to the report of the Aix-la-Chapelle Chamber of Commerce there are now in that city nearly forty pin and needle factories, employing more than 4,000 workpeople, or two-thirds of the total number employed in that industry in Germany. For making needles alone 800 to 900 tons of steel wire are worked up yearly; and the following are the numbers of the principal finished products that are turned out per annum: Hand-sewing needles, 3,100,000,000; sewing machine needles, 65,000,000; various other needles, 35,000,000; and pins, 1,300,000,000, making a total of 4,500,000,000, representing a value of 6,000,000 marks (£300,000), and giving a mean price of 1s. 4d. per thousand, although the prices actually vary from 7½d. to 8s. per thousand.

Of the lightest needles there are 40 in a gram., and therefore 1,200 to an ounce, while no less than 7,000 of the lightest enamel headed steel pins go to a pound avoirdupois. Manufacturers who produce none but needles of the highest quality, complain bitterly that much harm is done to the Aix-la-Chapelle market by inferior products, which can scarcely be distinguished by their appearance from those of good quality.

While a good needle may be bought at the rate of ten a penny; those of inferior quality are sold 30 for a penny; but the difference in price is far more than set off by frequent breakage, bad work, difficulty of threading, wearing of thread, and loss of time, to say nothing of temper. It is only the middleman who gains by the bad needle, the producer and consumer both suffering.

#### VALUATION OF TEXTILE MANUFACTURING PROPERTY.\*

It is not at all improbable that some mills which are running at a loss or making a slight profit, would be better off to abandon their present site and move their machinery to some more favorable location.

It may have been that when such a ruling was made the choice of locations was not as wide as now, and that it was intended not to consider such broad questions as must be considered by a purchaser, and which to him might render a property of no value to purchase, and yet it might represent a large investment.

It would seem, therefore, that in considering the taxable value of a mill, the assessors must ignore the broad questions of labor, location, transportation, etc., and confine themselves to the physical condition of the plant existing at a certain place, which place is assumed to be advantageous to the carrying on of the business. Even in this limited consideration they cannot be as severe upon the plant as a purchaser would be. For example, suppose that the looms in a mill are old, and so constructed as not to be able to run at anything near the speed and production of modern looms, and that the price of weaving is consequently so much higher than on modern looms as to wipe out what would otherwise be a fair profit on the goods. A purchaser, taking this into consideration, would say that the looms were of no value; but, unfortunately, they are in the mill, and if the company prefers to keep them, they are taxable property, and the company is unfortunate which possesses much of such property to be taxed.

The cost of construction and machinery has been considerably reduced in the last few years. The old high and narrow mills have given way to wider mills of a less number of stories. The walls and foundations are very large items in the cost of construction, as they cost nearly as much for a narrow mill per foot of length as for a wide one, and even more, considering the less thickness and size of foundations required for the lower mill. The cost per square foot of floor area on this account is largely diminished. The cost of materials has also been reduced and contractors figure much closer than formerly. With wide mills and more area on a floor, there is a less percentage of the room occupied by alleys and spare floor. And with modern machinery less space per spindle or loom, including all the machinery under one unit of spindle or loom, is required, and a greater production is made per spindle or loom.

A consideration of all these items will show why the total cost of construction and equipment, per unit of measure, the spindle, is less now than formerly, and why valuations made on the same unit in the past may need reduction at the present time. The cost per pound or yard of production is less than that per spindle in comparison with former cost. No mill will have the value of its machinery and buildings after a few years of operation equal to what it is new; for depreciation, although not visible, begins almost immediately, and no matter how much care is taken with repairs and renewals, the value of the plant is not that of a new plant. Depreciation must be considered in the same way as for determining the market value. For this reason the valuation in some places is placed low to cover the lessening in values.

\*From a paper read by Charles T. Main, Boston, Mass., before the American Society of Mechanical Engineers.

If the mill buildings are radically wrong for light, owing to their antiquated construction, thus requiring artificial light, their value is lessened. Their selling value is lessened if, since their construction properly, other buildings have been attached, thus shutting out the light. This should receive attention from the purchaser. How far the assessors should go in this matter is doubtful.

The value of the land where restrictions are placed upon it in connection with water power is a nominal sum, and the burden of taxes might be great if the values were placed as high as adjacent land used for other purposes and unrestricted. It is of no more value for manufacturing purposes than a lot in an open field, instead of being located perhaps in the congested portion of a city. The valuation should be moderate in order not to make the tax too great in proportion to the purpose to which it is put.

The value of the steam plant should depend upon its age and condition; but I do not see how the assessors can pay any attention to its economical working. If the owners choose to run an uneconomical plant, whose cost is not quite but nearly as great as an economical one, that has no bearing upon its value for taxes. If, however, it is necessary to go to great expense, for instance in foundations for engines, boilers, and chimney, owing to bad soil to build upon, or to build an extraordinarily long smoke flue, the taxable value should be no more than if these extraordinary expenditures had not been required, for the return is no more, and the market value is no more, than that of a much more simple plant. The tax value of a water-power privilege should be ascertained in comparison with the cost of steam power produced in the most economical method at any convenient location where coal is cheap, or by comparison with the cost of other water power favorably located. Unless this is done, false values will be obtained. If the value of the water power varied directly as the cost of fuel, then the farther from a railroad the power is located, and the more it costs to haul coal to it, the more valuable would be the power. If raw material is to be brought to the mill and finished product to be taken away, it is a self-evident fact that the nearer the railroad or sea-port the mill can be located, the more valuable the power which drives it. All the other items before mentioned which go into the value of a water power should be considered. The tax value of shafting, belting, and piping should depend upon the present cost of the proper amount of the same to do the work and upon its physical condition. The fact that much more has been installed, owing to peculiar and perhaps unfortunate circumstances, does not add to its value; in fact, it is a detriment to have more property to care for than is absolutely necessary to do the work properly. In Massachusetts the stock which is in the raw state or in the process of manufacture, and finished product which may be on hand in a corporation, are not taxable property. In a private plant this is taxable. This fact will account very largely for the wide difference in the schedule of valuation prepared for taxes and insurance, as all the stock of whatever kind must be insured. In a corporation the stock in trade is taxed indirectly by the State as the excess of the selling price of the capital stock above the valuation of the real estate. The standard insurance policy adopted in most of the United States contains these words: "This company shall not be liable beyond the actual cash value of the property at the time any loss or damage occurs, and the loss or damage shall be obtained or estimated according to such actual cash value, with proper deduction for depreciation, however caused, and shall in no event exceed what it would cost the insurer to repair or replace the same with material of like kind and quality." This sort of valuation is more liberal than any which has been so far discussed. Its theory is that if any loss occurs, the insurance paid shall be sufficient to replace the portion lost, in exactly the

same manner as it was before, less a fair amount for the depreciation of the property from age. No depreciation, to my knowledge, however, is allowed for items that reduce the value, as lack of light, inconvenience of arrangement, character of the construction, the fact that a machine may not be economical in its working, or that the steam plant may be an uneconomical one, although such consideration is contemplated in the first portion of the statement quoted. For this reason it is sometimes the case that, if a concern is completely wiped out of existence, after the effect of the first blow is over and the property is rebuilt on new lines, it is vastly better off than before the loss.

The story is told of a man who was sent a few years ago to make an examination of a mill in order to see if anything could be done to make its running more successful by re-organization. His examination was brief and his report still briefer; it was to the effect that the only thing which could do any good was a first-class fire. This mill was afterwards sold in open market. Its selling price was very much less than it was taxed or insured for. The adjustment of fire loss is usually made upon the basis above stated, that the sum paid should be sufficient to replace new the burned or injured property in the same manner as it existed previous to the fire, less a fair depreciation for age. As it is almost impossible, even by very careful examination, to consider every item of loss, and as the owner is subjected to many losses which are not covered by the insurance, it is the policy of many of the factory insurance companies to be liberal in their settlements, although they state that nothing will be paid for unless in an inventory to which the assured will make oath as true to the best of his knowledge and belief. These losses are almost always adjusted amicably and without recourse to law. Sometimes they are determined between the adjusters of the insurance companies and the owner or manager, and sometimes the insurance companies appoint an adjuster and the mill another adjuster, and these two determine the loss; and if they cannot agree on any item they call in a third party, and the decision of any two of the three is final. These adjusters should be men who are familiar with the value of the property destroyed, and more than one set may be required to cover the various kinds of property. Perhaps one set for buildings, one for machinery, and one for goods and stock. The findings of these adjusters are final and conclusive.

#### CULTIVATING COCHINEAL: AN INDUSTRY OF OLD MEXICO.

Until not so very long ago cochineal, a dried insect which furnishes the most brilliant red color known, occupied a very prominent position in the world's commerce, says a writer in a contemporary. The market quotations of this article were watched with as much interest as those of coffee are to-day. Immense sums of money were invested, both in the production of cochineal, and in its marketing and transportation. While Spain was the ruler of the western world cochineal was one of the principal sources of revenue for that nation, and her Government as well as her merchants were guarding with jealous care the monopoly they enjoyed in this much sought after dyestuff.

The centre of the State of Oaxaca, with its many high plateaus and valleys, seems to be the native home of the tiny insect which produces the cochineal of commerce and probably has been the chief seat of the cochineal industry for many centuries, as cochineal was extensively used for generations before the discovery of America by modern civilization. It is well known that Montezuma and other Aztec rulers before him sent merchants to Oaxaca to procure the prized color with which to adorn works of art and even of common use. No doubt

the civilization known to have undoubtedly existed in the western hemisphere long before the advent of European conquerors made extensive use of the product of the Oaxaca valleys.

It is a matter of record that during the last half century over \$20,000,000 was paid out in Oaxaca to the cochineal producers, which probably does not represent more than one-fifth of the price paid by the actual consumers. The Spanish Government alone exacted a tax of about \$1.75 per lb., and the cost of transportation, which must have been very great, and the commissions, amounted to enough more to make cochineal bring \$5 per lb. in the wholesale market of Europe. But since the middle of the present century a dangerous competitor for the Oaxaca insect has been discovered in coal tar, from which science is producing the brilliant colors known as aniline at an extremely low cost. If it were not for the fact that there are certain classes of goods which cannot be dyed except with the aid of cochineal, the industry would have been killed entirely. While the producer formerly would refuse less than \$1 per lb. the price went down as low as 15 cents. Quite recently, however, the demand for cochineal has increased and the price has gone up to 50 and even 60 cents per lb., at which rate the cochineal industry is a paying one. In consequence the interest in the insect has been revived in Oaxaca, and many new plantations for its cultivation have been laid out in the valley of Oaxaca.

The cochineal insect, which is the female of a species of wood louse, feeds upon a plant belonging to the great cacti family commonly called the "nopal." This plant grows from leaf to leaf, the leaves being oblong in shape, rather round and heavy at the upper end, with but few spines on the edges. If left alone the plant adds new leaves from year to year, and will reach a height of from ten to twelve feet. The cultivators of the plant use the new leaves, after they have grown to be about four inches broad in the largest diameter, as sprouts for replanting and making fields for the cultivation of the insect. The planting is done in shallow trenches, about two or three inches deep, dug about two and a half feet apart. The sprouts are set at a distance of about eighteen inches from each other, and generally take root very rapidly after having been set out, and grow new leaves. Within a year's time they are ready to receive the insect.

As a rule there are men who make a business of supplying planters with the seed or mother insects, which are set out in October or after the rainy season is over, as a heavy rain would wash the insects off the plants and cause irreparable damage, because the insects would be either a total loss by drowning or become so weakened by the rain that they could not return to the plant. The insects are planted on the leaves, in the following manner. About twenty or thirty are placed in a small tube, closed at one end, about two inches long and half an inch in diameter, made of the fiber of a species of the maguery plant. The tube is closed with moss, after having been loaded, and fastened to a leaf by running a spine through it and on to the leaf. From two to six of these tubes are fastened to each leaf, according to the size of the latter, and the entire plant is then covered with a mat. Within a few days after tiny white specks, barely visible to the naked eye, except that of the trained Indian, begin to appear on the leaves, covering them at first awhile with larger spots looking like mildew. If one of them is touched it will leave a bright crimson stain.

After the leaves appear to be covered the little baskets are removed. They still contain the mother insects, most of them dead. Those that are still alive are carefully preserved for future use. The dead ones have been partly eaten by their offspring, but what remains of them produces the finest quality of cochineal, and it is generally rated at several cents more per

lb., the color produced by them being of special richness. The mat covering is removed from the plant as soon as the leaves appear covered with healthy colonies or groups of the insects, but they receive another protection from the sun in the shape of brushwood and dry stalks, which permit the free circulation of the air. The insects keep growing in size until the entire nopal plant is almost completely covered with what appears at a small distance like a white mould. This appearance is due to the covering of a very fine fuzz possessed by each insect and probably provided by nature as a protection against the weather. When full grown the insects are about five-sixteenths of an inch thick. How the males arrive at the state of maturity I have not been able to find out myself, and careful enquiry has failed to enlighten me on the subject. They have wings and are about the size of a small guat. When the insects on the nopal are "ripe" they are scraped off from the leaves into dishes, baskets, or on to mats. They are taken to a preparing place, where they are usually put into sacks, dipped into boiling water for a few seconds and then spread out on mats to dry in the sun. Another process, producing the best results, but rarely employed on account of the expense attached to it, is to place the insects upon trays in an oven, the heat of which is carefully regulated, and which requires constant attention, as the trays have to be turned frequently to secure a uniform drying. After the insects have been dried by either process they are subjected to a rolling process by hand in order to remove the fuzzy covering, then sifted and assorted to be ready for the market, the larger ones bringing the best price. Cochineal ready for use looks very much like shrunken buckwheat grain, which it resembles both in size and shape. The color is iron grey, with pinkish shade, and the whole product resembles far more a metallic substance than any product of insect life. If the price of cochineal keeps on the present level the old industry will likely be revived, and perhaps it will receive the attention of enterprising men who will discover means to simplify the cultivation and modernize it wherever possible. The present way seems to be the same that has been followed by the natives since time immemorial.

#### THE SCOTCH WOOLEN TRADE.

It seems only a few years ago that the Yorkshire woolen manufacturer, in his struggle for existence, looked with envious eyes at the seemingly easy and lucrative business enjoyed by his Scotch brother. "Scotch tweeds" were in demand, their colorings were universally admired, and the general style of the goods was considered unattainable by any other than a Scotch manufacturer in combination with a Scotch designer. Tweed manufacturers amassed fortunes, and Scotch designers, when induced to cross the border, generally did so for large salaries. Times, however, are now changed, and we find a correspondent in the Glasgow Herald lamenting the decline of the industry. The chief cause of its decay is stated to be the rapid growth of the ready-made tailoring trade, which, in its aim at cheapness, prefers the Yorkshire tweed with its admixture of shoddy. Some rather strong language is used anent this production, but as it is also stated that the difference between it and a genuine Scotch tweed is sometimes so slight as to baffle even experts, it must be presumed that shoddy is not quite so bad as it is painted. The other causes blamed are the usual scapegoats of a declining trade, change of fashion, foreign tariffs, foreign competition, etc. It is difficult for an outsider to see how any of these should affect the Scotch trade to an appreciable extent. The trade was originally a high-class one; it still has pretensions to this title, but in a lesser degree, since Yorkshire competition was counterbalanced with Dewsbury yarns. Formerly a Scotch tweed was considered as being

worth some pence a yard more than any other make, but since Scotch manufacturers themselves cut down the price and tried to eke out the difference by the use of cheaper and inferior yarns, they have stepped down and allowed themselves to rank in the same file as Yorkshire manufacturers. Scotch tweeds made with Dewsbury yarns naturally cannot claim an advantage over cloths made of the same yarns in the Yorkshire district. Going still further out of their course, the Scotch manufacturers tried the introduction of worsted yarns, which meant the enforced idleness of scores of carding sets and thousands of spindles. Naturally, the competition with districts better equipped in their own class of trade made business difficult to get; firms have had to give up business and submit to forced realization. The hopelessness of affairs is pointedly illustrated by the writer by the depreciation of mill property. Quite recently a factory in the Ochil district, which had cost over £80,000 was sold at less than £10,000, full of excellent machinery. Another in the South of Scotland, which stood in the firm's books at the depreciated value of £18,000, cannot find a purchaser at £5,000. Not long ago a quite new mill, which cost over £12,000, was sold by a bond-holding bank for less than half—payable in easy instalments at an interest of, it is said, only 2¼ per cent.

### FLAX GROWING IN QUEBEC.

The advisability of growing flax in the province of Quebec was brought up at the regular weekly meeting of the *Chambre de Commerce*, Montreal, recently. A letter was read from the Dominion Oilcloth Company regarding the same. It went on to say that some years ago a quantity of flax was raised in this province, principally in the fiber, but as the demand has fallen away greatly, owing to the advent of cheap cotton, the business of growing flax in this province was now of very little account. However, now that the company was going into the manufacture of linseed oil, they were of opinion that it would be of interest to farmers to look into the matter, as they were satisfied that the requirements of the Dominion would amount to over 1,000,000 bushels, produced principally in Manitoba. Although that province raised over 1,000,000 bushels in 1895, since then the production has fallen off to only about 300,000 or 400,000 bushels per annum. Considering the low price at which it has been sold for some years past, the company thought that flax at from 80 cents to \$1.20 per bushel ought to deserve the farmer's attention. It was now worth about \$1.25 per bushel in Great Britain, and \$1.15 in the United States.

### THE CANADIAN MANUFACTURERS' ASSOCIATION.

The twenty-fourth annual meeting of the Canadian Manufacturers' Association was held in Toronto, April 18th. Among those present were: George Booth, P. W. Ellis, J. J. Cassidey, W. K. McNaught, R. E. Menzie, J. P. Murray, W. Parsons, George H. Smith, J. M. Taylor, A. M. Thomas, A. E. Kemp, J. H. Paterson, J. F. Wildman, W. B. Rogers, Chas. Boeckh, S. H. Chapman, R. W. Elliot, Samuel May, J. O. Thorn, J. Alexander, Alfred Burton, J. W. Cowan, John Taylor, W. K. George, C. Boeckh, Toronto; H. P. Coburn, Hamilton; C. R. H. Warnock, Galt; Wm. Thoburn, Almonte; J. Hewton, Kingston.

The following officers and committees were elected for the ensuing year: President, J. F. Ellis; first vice-president, P. W. Ellis; second vice-president, R. E. Menzie; treasurer, George Booth; secretary, J. J. Cassidey.

Executive Committee.—Chairman, R. W. Elliot, Elliot Mfg. Co., Toronto; J. F. Ellis, Toronto; P. W. Ellis, Toronto; R. E. Menzie, Toronto; George Booth, Toronto; W.

K. McNaught, Toronto; J. J. Cassidey, secretary, Toronto; Edward Boisseau, Toronto; A. W. Thomas, Toronto; J. M. Taylor, Toronto; Gerhard Heintzman, Toronto; Robert Kilgour, Toronto; Matthew Langmuir, Toronto; Alfred Burton, Toronto; T. A. Staunton, Toronto; F. B. Wright, Toronto; Thomas Roden, Toronto; T. A. Stanton, Toronto; F. B. Hayes, Toronto; John Milne, Hamilton; W. E. Blandford, Hamilton; F. W. Fearman Hamilton; S. C. Greening, Hamilton; C. S. Wilcox, Hamilton; Hon. W. E. Sanford, Hamilton, E. P. Hawkins, Guelph; D. F. Burke, Port Arthur; J. R. Barber, Georgetown; T. D. Craig, Port Hope; W. J. Crossen, Cobourg; L. H. Laine, Levis, Que.; G. H. Clare, Preston; George Pattinson, Preston; John Baillie, Montreal; B. McNally, Montreal; J. C. Watson, Montreal; C. R. H. Warnock, Galt; A. M. Newlands, Galt; F. Hurlbise, Plessisville; G. C. W. Lang, Berlin; R. McLaughlin, Oshawa; E. C. Walker, Walkerville; James Kendry, Peterborough; John Penman, Paris; John Hewton, Kingston; W. B. Rogers, Toronto.

Tariff Committee.—Chairman, W. K. McNaught, Toronto; J. F. Ellis, Toronto; P. W. Ellis, Toronto; R. E. Menzie, Toronto; George Booth, Toronto; R. W. Elliott, Toronto; J. J. Cassidey, Toronto; A. R. Clarke, Toronto; J. W. Cowan, Toronto; Oliver Newcombe, Toronto; J. W. Flavell, Toronto; F. A. Ritchie, Toronto; E. A. Simpson, Simpson's Sons, Toronto; E. G. Gooderham, Toronto; A. W. Porte, Toronto; C. J. Osmond, Hillsboro', N.B.; H. J. Bird, Bracebridge; L. J. Breithaupt, Berlin; T. H. Smallman, London; S. E. Garnet, Cote St. Paul, Que.; John Turnbull, Cornwall; W. H. Rowley, Hull, Que.; G. D. Forbes, Hespeler; George Smith, Toronto; J. T. Montgomery, Guelph; G. H. Lees, Hamilton; C. S. Wilcox, Hamilton; P. Hobson, Hamilton; C. J. Armstrong, St. Catharines; Thomas Cantley, New Glasgow, N.S.; G. E. Drummond, Montreal; F. W. Thompson, Winnipeg, Man.; E. G. Swift, Walkerville; E. H. Clement, Walkerville; D. W. Robb, Amherst, N.S.; N. Curry, Amherst, N.S.; W. H. Storey, Acton, Ont.; James Kendry, Peterborough.

Later, an executive meeting passed a resolution urging the establishment of technical schools. We have frequently discussed this subject in the *Canadian Journal of Fabrics*, and we will return to it next month.

### THE WOOL MARKET.

Toronto.—There is some unwashed wool coming on to the market at about 8½c. The washed wool is not expected on the market before the end of May. The prices will be low, probably 13c. to 14c.

Montreal.—The wool market is strong with an advance of at least 2c. per lb. on all merino wools since our last report. London Colonial wool sales opened May 2nd, and since then 15 to 20 per cent.—on all merino wools—has advanced over the March series. Crossbred wools have made an advance of 5 to 10 per cent. Canadian fleece is dull at 16c. to 17c.

### LITERARY NOTES.

The Century's plans for the treatment of the Spanish War culminate with the publication in the May number of a series of papers in which the commander of every vessel but one describes his share in the battle off Santiago. In this number David Gray begins a series of golf stories that bids fair to be liked as well as his "Gallops;" Frank R. Stockton records some further adventures of "The Vizier of the Two-Horned Alexander," including his narrow escape from marrying Samson's Delilah and a dowager-Empress of China; an eclipse in India

is vividly described and pictured by the painter R. D. MacKenzie; and Jacob A. Riis tells a police-reporter's story of "The Last of the Mulberry Street Barons." Among the miscellaneous papers is Mrs. James T. Fields' sympathetic sketch, from personal acquaintance, of the lives of "Two Lovers of Literature"—Charles and Mary Cowden Clarke. Prof. Wheeler's "Alexander the Great" deals with the Macedonian Conqueror in Egypt and the founding of Alexandria; and Mr. Crawford's romance, "Via Crucis," continues its course. There is a variety of poems; and the special art feature of the month is an engraving by Wolf from Gilbert Stuart's portrait of Mrs. Griffith.

## Textile Design

### CHEVIOT TWEEDS.

The following design may be termed a cheviot tweed and mixture, and is of simple construction. These goods are made entirely of wool, and for an every-day suiting cannot be beaten. Of late the tendency has been toward worsted goods for suitings, one reason of this being that more attention has been paid in the coloring and design of worsteds, but if the manufacturer of woollens will make a neat design with suitable coloring the woollen goods will again be the business suit. In making these goods harshness of feel should be avoided as much as possible.

This design is woven with eight harnesses, but may be drafted to four, although it is not advisable to do so. This makes a good mixture. Use good material and give a velvet finish.



Design.

#### Warp:

- 1 thread white, } 6 times,
- 1 thread brown, }
- 1 thread white, } 5 times,
- 1 thread brown, }
- 1 thread white,
- 1 thread black and white twist,
- 1 thread white, } 6 times,
- 1 thread brown, }
- 1 thread white,
- 1 thread black and scarlet twist,
- 1 thread white, } 5 times,
- 1 thread brown, }

125 reed, 4 threads.

#### Filling:

- 1 pick white, } 6 times,
- 1 pick sage drab, }
- 1 pick white, } 5 times,
- 1 pick sage drab, }
- 1 pick white,
- 1 pick black and white twist,
- 1 pick white, } 6 times,
- 1 pick sage drab, }
- 1 pick white,
- 1 pick black and scarlet twist,
- 1 pick white, } 5 times,
- 1 pick sage drab, }

48 picks per inch.

Spin all the yarn for the above warp and filling 400 yards per ounce, having the warp and yarn a little harder twisted than the filling.—B. J. of C.

—Wallace Manufacturing Co., importers and dealers in potash, and manufacturers of potash fig mill soaps, 629 N. Front street, Philadelphia, Pa., publish the following directions for using ammoniated carbonate potash, for scouring wool in woollen mills: Dissolve 25 lbs. of ammoniated car-

bonate potash in a barrel or tank containing 40 to 50 gallons of hot water, and feed into scouring tub or scouring machine as necessary. A little soap liquor added to scouring tub or machine will improve the lustre on the wool and leave the wool open, soft and thoroughly clean; rinse off the wool in clean water thoroughly. The superiority of potash over soda for scouring wool is unquestioned.

### TEXTILE IMPORTS FROM GREAT BRITAIN.

The following are the sterling values of the textile imports from Great Britain for March and the three months ending March, 1898-1899:

	Month of March.		Three months ending March.	
	1898.	1899.	1898.	1899.
Wool .....	£ 5,781	£ 496	£18,599	£3,599
Cotton piece-goods .....	41,954	47,717	161,036	184,519
Jute piece-goods.....	12,264	8,528	35,481	23,786
Linen piece-goods.....	10,787	18,158	43,094	56,053
Silk, lace.....	672	1,354	3,348	4,249
" articles partly of.....	1,775	2,424	7,524	8,835
Woolen fabrics.....	19,080	25,663	73,890	84,645
Worsted fabrics.....	47,667	42,147	206,764	183,502
Carpets .....	27,568	31,699	75,250	74,384
Apparel and slops.....	33,212	27,722	81,256	63,920
Haberdashery .....	16,998	16,592	48,896	56,680
Writing paper, etc. ....	2,028	1,819	4,794	5,045
Other paper .....	505	771	1,882	1,984

### FABRIC ITEMS.

J. P. McCall, formerly dry goods merchant in St. Johns, Que., has started a store in Sherbrooke.

The Royal Electric Co. is installing in the premises of the Hudson's Bay Co., at Winnipeg, a complete electric lighting plant.

J. B. Boisvert and Jules Dufresne, doing business under the name of Boisvert, Dufresne & Co., dry goods, Montreal, have consented to assign at the instance of Thibaudeau Brothers.

April 12th, at the home of the bride's father, Wm. Thornburn, woollen manufacturer, Almonte, Ont., his youngest daughter, Mae, was united in marriage to A. M. Ivey, of the John D. Ivey Company, Limited, Toronto.

A well-attended and successful meeting of the dry goods section of the Toronto Board of Trade was held recently. The meeting was primarily for the purpose of reorganization. The following Executive Committee was elected: John Macdonald, W. L. Brock, H. J. Caulfeild, A. A. Allan, C. B. Lowndes, James Allan, J. C. Black, J. D. Ivey, A. Ansley, and J. R. B. Hutchison. John Macdonald was appointed chairman of the committee, and W. L. Brock vice-chairman.

The bogus tender of fabulous Brown Bros., for buttons for the police uniforms in Montreal, was detected, as we stated in a former issue. It appears that apart altogether from the fraud, which had doubtless been prevented, the re-opening of the question of the supply of buttons had resulted in a big saving to the city. The Brown Brothers' tender would have cost the city \$9.72 per gross for large buttons, and \$6.08 for small ones. The new tender accepted by the latest report was for \$3.65 for large buttons, and \$2.35 for small, and was with the English manufacturers who had previously supplied the department and given complete satisfaction. The new tender would cost the city \$423.75, while under the terms of the Brown Brothers' tender the cost would be \$1,012.50, a saving of \$588.75.



## Among the Mills

Co-operation is one of the guiding principles of industry to-day. It applies to newspapers as to everything else. Take a share in "The Canadian Journal of Fabrics" by contributing occasionally such items as may come to your knowledge, as receive a dividend an improved paper.

Thos. Darling's woolen mills, Wisawasa, Ont., is for sale. It is now idle.

The Kingston, Ont., Hosiery Co. is running full time, and has orders some months ahead.

A storm in Almonte, Ont., May 7th, stripped the tin roof of part of Wm. Thoburn's woolen factory.

The T. Eaton Co., of Toronto, is installing in its new whitewear factory two Canadian General Electric Co. motors.

A bridge, connecting two of A. W. Blodie's mill properties at Hespeler, Ont., was carried away by the floods last month.

S. Falla, Fallbrook, Ont., has bought the old woolen mill building at Port Elmsley, Ont., and will convert it into a custom mill.

The Canadian General Electric Co. has sold D. Manchester, woolen manufacturer, of Ottawa, Ont., one of its latest type 15 h.p. motors.

The Toronto Rubber Shoe Co. has completed all arrangements for rebuilding its factories at Port Dalhousie, Ont., burned down some time ago.

The Dominion Cotton Mills Co. has ceased manufacturing in Coaticook, Que., and is now desirous of selling its buildings and water power to the town.

The dyers in the Canadian Colored Cotton Mill Co.'s mill at St. Stephen, N.B., went out on strike last month, and they were replaced by new hands almost at once.

The Qu'Appelle, N.W.T., Felt Boot Co. is now manufacturing woolen, as well as felt, and has installed one set cards, five looms, and 240 spindles. Blankets, tweeds and yarns are produced.

The business of James Lockhart, Son & Co., is being continued by James Lockhart, and Reginald Lockhart is acting as Ontario and Western agent for the Paton Mfg. Co., Sherbrooke, Que.

Roderick Chisholm, head of the dyeing department of the Rosamond Woolen Co., Almonte, Ont., was married recently to Miss Jessie Cameron, B.A., eldest daughter of Robert Cameron, contractor, Almonte.

The Almonte Knitting Company is having a large iron water tank built on its premises to give force to the sprinklers. The tank will rest on an iron frame based on four stone piers, and will extend twenty-five feet above the mill.

The mills of the Dominion Brussels Carpet Co., at Elora, Ont., were very badly damaged by the recent floods, which affected so many towns in Western Ontario. The damaged portion of the mill will probably not be rebuilt.

Incorporation has been granted to T. J. Wardell, Ida S. Wardell, E. A. Taylor, E. J. B. Duncan, and A. Miller, Toronto, as the Maple Leaf Rubber Company, Limited; capital, \$250,000; chief place of business, Toronto.

The J. C. Coulter Company of Toronto, Ltd., has been incorporated; capital \$10,000; to manufacture and deal in jewelers' cases and paper boxes, and to acquire the business of J. Coulter & Company, of Toronto. The incorporators are J. Coulter, W. Radcliffe, I. J. Radcliffe, Annie E. Coulter, M. Elizabeth Radcliffe, and Mabel L. Graham, of Toronto.

Fire recently did \$15,000 damage to the Alaska Feather and Down Co.'s factory, Guy street, Montreal. The loss is fully covered by insurance.

Dr. Bucher, managing director of the West Indies Chemical Works, Ltd., is at present in New York and is expected to visit Canada sometime next month.

The Empire Carpet Co., St. Catharines, Ont., has bought a three-story brick building for mill premises. A quantity of new machinery has been installed.

The by-law granting a bonus to W. D. Van Egmond, Seaforth, Ont., has been passed by a large majority. Very large improvements in the plant will be made.

The Rosamond Woolen Co., Almonte, Ont., has recently placed on the market some lines of cloth which for quality are ahead of anything turned out of Canadian mills in recent years. The goods were taken up almost as soon as shown.

J. Coristine, C. Coristine, B. W. Grigg, D. B. MacPherson, and C. B. Carter, Q.C., Montreal, are applying for incorporation as the James Coristine & Company, Ltd., to manufacture hats, caps, etc., and to carry on the business of James Coristine & Co., in Montreal; capital, \$300,000.

St. Henri, Que., town council has passed a by-law authorizing the town to effect a loan of \$35,000, as a bonus to Tooke Bros., for moving their shirt and machinery factory to St. Henri. Tooke Bros., in turn, are to erect a building and manufacturing plant of not less value than \$100,000, employing 600 hands, and paying yearly salaries amounting to \$150,000.

J. H. S. Parke, who resigned his position in the office of the Cornwall Ont., Manufacturing Company, and removed to Chambly, Que., where he secured a more lucrative situation in the Richelieu woolen mills, disposed of his stationery business to R. M. Pitts & Co., who will carry on the business.

The girls and boys employed at the Merchants' Cotton Company's mills, St. Henri, Montreal, who went out on strike May 8th, for an advance of ten per cent., have returned to work. The strikers accepted the company's offer of 6½ per cent. advance, on piece work. This includes not only those who struck, but the entire staff.

An accident occurred at the matting factory, Cobourg, April 26th, by which Annie Lavis, an employee of the mills, had her arm broken in two places, and her shoulder dislocated. Miss Lavis was engaged in putting yarn on a spooler, when, while in the act of reaching to adjust something, a skein, which she held in her arm, caught and drew her into the machine.

The Eagle Clasp Mfg. Co., Baltimore, Md., U.S.A., has lately increased the capacity of its plant for the manufacture of trouser clasps to one hundred thousand per day. The trade extends from Maine to California, and the import trade has greatly increased during the last six months. The style, finish and durability of the goods, as well as the low price of \$2 per thousand, have induced the leading manufacturers to adopt the goods. Samples are always sent free on application.

The disagreement between the Cloak Manufacturing Company and its employees is still unsettled. The firm wishes to refute the statements of the strikers, who claim that they cannot make more than \$25 per week, on an average all the year around of \$10. According to the company's statement, a man with a little experience, may, and did, earn last year from \$20 to \$40 per week, and when the present trouble cropped up the firm offered an advance equal to 10 per cent. The strikers, however, refused this offer, and made demands equal to about 20 per cent.



A triple event was celebrated in Kingston, Ont., May 1st, it being the seventieth birthday of T. S. Murray, the veteran woolen mill superintendent, the thirty-fifth birthday of his son in law, and the eighth anniversary of his son's marriage.

During the past thirty days the Canadian General Electric Company has received many orders for its standard three-phase induction motors; among which was one 100 h.p. and one 20 h.p. to the Montreal Cotton Co., Valleyfield, Que.

The John McPherson Co., Ltd., manufacturers of boots and shoes, Hamilton, Ont., has placed its order for a 40-h.p. "S.K.C." two-phase induction motor, which is to be used to operate the entire plant, replacing its present steam equipment. The company is also having its factory lit throughout by electricity.

At the annual meeting of the Dominion Cotton Company, held in Montreal, April 13th, the president's report showed that the profits for the past year had been \$435,888, an increase over the previous year of \$129,000, and that the sum of \$148,000 had been carried forward. The assets of the company were \$8,000,000, the capital \$3,000,000, and ten per cent. had been earned, and six per cent. paid. The company sold during the year goods to the amount of \$2,325,000. The statement also showed that the company had \$900,000 worth of raw cotton on hand. A. F. Gault was re-elected president.

**FOR SALE.**

Woolen Mill in the Province of Quebec, near St. Lawrence River, and on line of railway; substantial stone buildings, both flour mill and carding mill, excellently situated for a large flour, pulp or woolen mill, and having the good will of a large country trade, owner wishes to retire because of advancing age, stone dwelling house attached, and the property in every way a desirable one. Address O. G. P., care Canadian Journal of Fabrics.

**WANTED**—Man thoroughly acquainted with the manufacture of Worsted and Mohair Braids. None but experienced hands in the manufacture of braids need apply. Address No. 6, Canadian Journal of Fabrics.

**POSITION WANTED**—By a designer, eleven years' experience in Cloakings, Beavers, Kerseys, Cassimeres, Coverts, Worsteds, Dress Goods, etc. Competent to take charge of weave room or dressing room. At references. Address "DESIGNER," care of Canadian Journal of Fabrics, Montreal, Que.

**POSITION WANTED**—Young man of good education, at present employed as superintendent in a large woolen mill in the south of Scotland, would like similar position in Canada. Can assist in designing. Address "SUPERINTENDENT," care of Canadian Journal of Fabrics, Montreal, Que.

**FOR SALE**

**Entire Equipment of Cotton  
... Mill ...**

Spinning, Weaving and Twisting; 8,000 spindles all in first-class condition; cash or part cash and part bonds. For particulars address COTTON MILL, Office of the Canadian Journal of Fabrics.

The actions for smoke nuisance, taken recently in Montreal by the city boiler inspector against the Canadian Pacific Railway Company for its power house, Robert White, factory; W. Macdonald, tobacco factory; the Montreal Steam Laundry, and the Laval University, have been settled. All pleaded guilty before the Recorder of neglecting to install smoke consumers when so ordered by the boiler inspector, and were allowed time by the Court to introduce them.

—J. S. Larke, commercial agent in Australia, reports that South Australia is suffering from drought, and the Government has voted \$2,500,000 for the relief of the distressed agriculturalists. Victoria has had good rains, but the drought rules in New South Wales, except on the Victorian and Queensland borders and the northern coasts. Trade is therefore dull, and unless things change, it promises to be the worst year since 1893, the year of the panic.

**CHEMICALS AND DYESTUFFS.**

Business continues fair; bluestone has again advanced to 6½c; sumac is also firmer; bleaching powder continues strong. The following are current quotations in Montreal:—

Bleaching powder .. .. .	\$ 1 95	to \$ 2 00
Bicarb. soda .. .. .	2 00	" 2 05
Sal soda .. .. .	0 70	" 0 75
Carbolic acid, 1 lb bottles .. .. .	0 35	" 0 37
Caustic soda, 60° .. .. .	1 75	" 1 80
Caustic soda, 70° .. .. .	2 00	" 2 10
Chlorate of potash .. .. .	0 13	" 0 15
Alum .. .. .	1 35	" 1 50
Copperas .. .. .	0 70	" 0 75
Sulphur flour .. .. .	2 00	" 2 50
Sulphur roll .. .. .	3 00	" 3 50
Sulphate of copper .. .. .	4 50	" 5 00
White sugar of lead .. .. .	0 07	" 0 08
Bich potash .. .. .	0 09	" 0 10
Sumac, Sicily, per ton .. .. .	60 00	" 65 00
Soda ash, 48° to 55° .. .. .	1 15	" 1 25
Chip logwood .. .. .	1 90	" 2 00
Castor oil .. .. .	0 09	" 0 09½
Cocoon oil .. .. .	0 06½	" 0 07

**A. KLIPSTEIN & CO.**

122 PEARL STREET, NEW YORK.

*Chemicals & Dyestuffs*

Fast Color for Wool—Dry Allzatine, Phenocyanine, Gallocyanine.  
Direct Cotton Colors—Auramine, Congo Red.  
Azo Colors—Naphthol Yellow, Orange, Scarlets, Fast Red.

**HEADQUARTERS FOR**

Caustic Potash 90%	Carbonate of Potash
Chlorate of Potash	Bleaching Powder
Phosphate of Soda	Refined Cutch A.K.C.

**WRIGHT & DALLYN, Agents, Hamilton, Ont.**

**JOHN W. LEITCH & CO.**

Milnsbridge Chemical Works, near HUDDERSFIELD.

**Bismarck Brown.**

**Chrysoidine** Crystals & Powder.

Largest Makers in the World.

**SOLUBLE BLUES**—all shades.

**BINITRO BENZOL & BINITRO TOLUOL.**

Phenylene Diamine and Toluylene Diamine.

**Reduced Indigo. Wood & Leather Stains.**

Specialties for Cotton, Wool and Silk Dyers, Paper Makers, &c

"WE HOLD THEE SAFE."

# The Dominion Burglary Guarantee Co.

LIMITED.

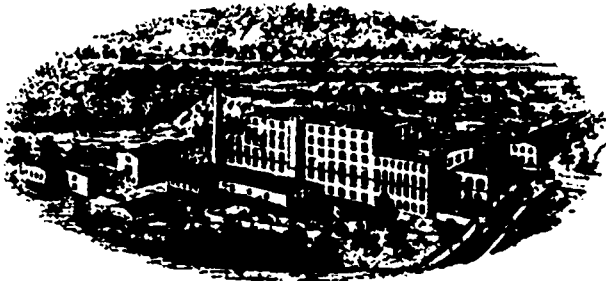
Head Office, Montreal, Can.

CAPITAL, \$200,000.

Insurance against burglary and housebreaking. Policies clear and free from vexatious or restrictive clauses.

CHAS. W. HAGAR, General Manager

## ROSAMOND WOOLEN CO., ALMONTE, Ont.



Fine **TWEEDS, CASSIMERES, and Fancy WORSTED SUITINGS AND TROUSERINGS**

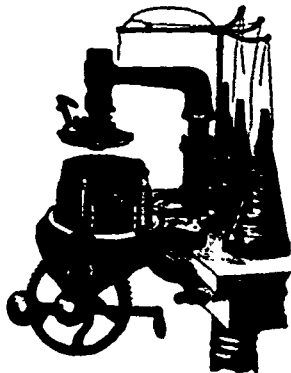
Colors warranted as fast as the best British or Foreign goods

## CREELMAN BROS.

GEORGETOWN, Ont.

Manufacturers of

# Knitting Machines



"THE DOLLAR." Family,  
AND  
"THE STAR." Steam Power,  
AND  
"THE WORLD'S STAR." for  
Knitters

## H. W. KARCH,

HESPELER, ONT.

Manufacturer of

Woolen Machinery,  
Rotary Fulling  
Mills, Kicker Fulling  
Mills, Soaping  
Machines, Cloth  
Washers,  
Wool & Waste  
Dusters, Rag Dus-  
ters, Drum Spool  
Winders, Reels,  
Spooling & Doubling  
Machines, Ring  
Twisters, Card  
Creels,



Dead Spindle Spooler for Warp or Dresser Spools,  
Pat. Double Acting Gigs, Dyeing Machines.

## Richard Schofield, Toronto

Manufacturer of all kinds of

# Power Knitting Machines

Cylinder Dials

Cams

Yarn Guides

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Mill Supplies

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Fluted Rollers

Gear Wheels

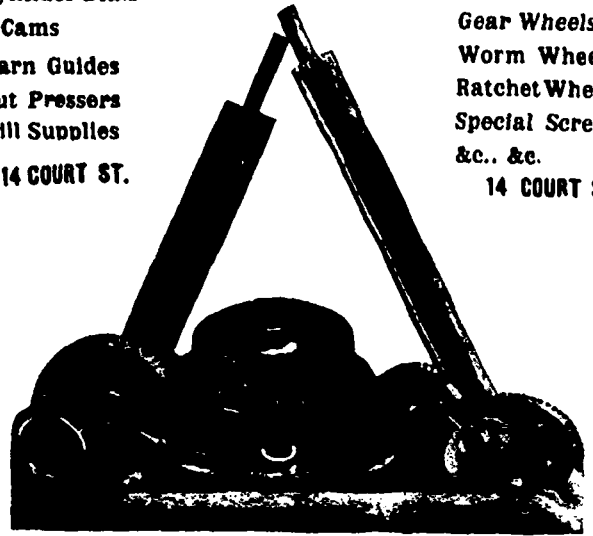
Worm Wheels

Ratchet Wheels

Special Screws

&c. &c.

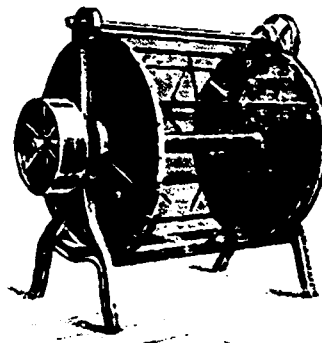
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Ontario agent for the well-known **Union Special** Sewing Machine for plain and ornamental stitching, as used in the manufacture of shoes, gloves, underwear, etc. **14 Court Street.**

# PATENT WASTE CLEANER

For Cleaning Woolen Card-Waste.



Does not Damage the Staple!

Loses Nothing but the Dirt!

Over 500 at Work.

Price £25 packed at Liverpool.  
Space occupied 5 ft. 6 in. x 3 ft. 6 in.  
Power required 1/2 H.P.  
Production 1000 lbs. per day.  
Weight packed, 14 cwt.

**HENRY ISITT,**  
BRADFORD, ENGLAND.

## DICK, RIDOUT & CO'Y

TORONTO, ONT.

Manufacturers of

Jute and Cotton Bags

Horse Blankets, Hessians, Buckrams

Tailors' Canvas

Hop-Sacking, Binder Twine, Yarns, Etc.

Agents for **LOUIS BEHRENS & SONS**, Manchester, England,  
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**DEFECTIVE DYEING EXPLAINED.**

Some defects in dyed pieces are occasionally attributed to impurities which are supposed to be in the chemicals used in dyeing, if not in the very dyes themselves, but it is believed that most experienced dyers will agree that imperfections in the goods can very seldom be traced to such a cause. It is not to be supposed, either, that the various chemicals and drugs that a dyer uses are of the highest degree of purity, for such is not the case, the chemical manufacturer being only able to put out his products under what is known as a grade of commercial, or ordinary purity, says a writer in a technical journal. Take, for instance, Glauber's salt. To refine this article, and bring it up to a pure state as is usually understood, would raise its price far beyond that which a dyer would be willing to pay, and even then he would not obtain a better shade with a refined article over one that is "crude," and the same applies to other articles used. Again, a chemical works, unlike a dye house, keeps working all the time, year in and year out, on a very few products; their raw materials never change nor their methods of working them up. Consequently, faults in dyeing have a very poor chance of being remedied if errors in chemical manufacturing are to be looked for as the cause.

Of course, an error or mistake in an acid works, such as filling a carboy with vitriol that had once contained a solution of nitrate of iron, is likely to occur, due to negligence on the part of someone. Such an acid once caused untold trouble in a dyehouse, and the cause was not found out until every possible avenue had been exhausted and the acid used was tested with the result above mentioned. Once a dyer who used a fairly large quantity of fustic extract met with considerable trouble, which could not be very easily sifted to the bottom. "off" shades to a very marked degree being obtained. When complaint was made to the maker of the extract he found out that, owing to a rush of orders or something similar, the extracting apparatus had not been washed out thoroughly after a batch of quercitron bath extract had been made before the chipped fustic was put in.

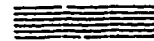
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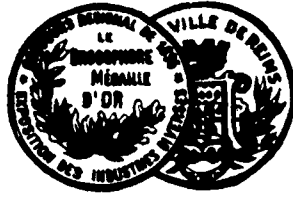
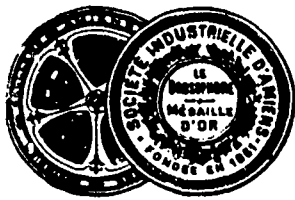
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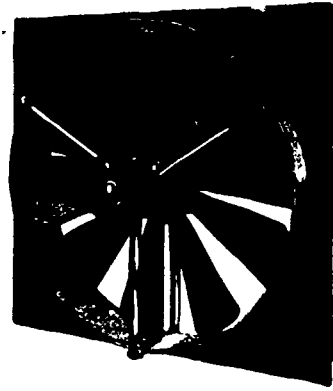
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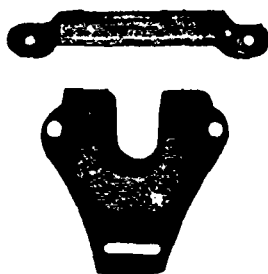
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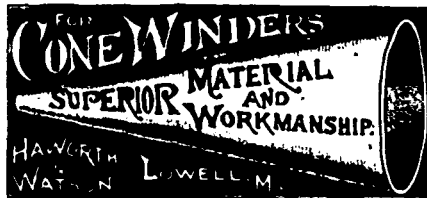


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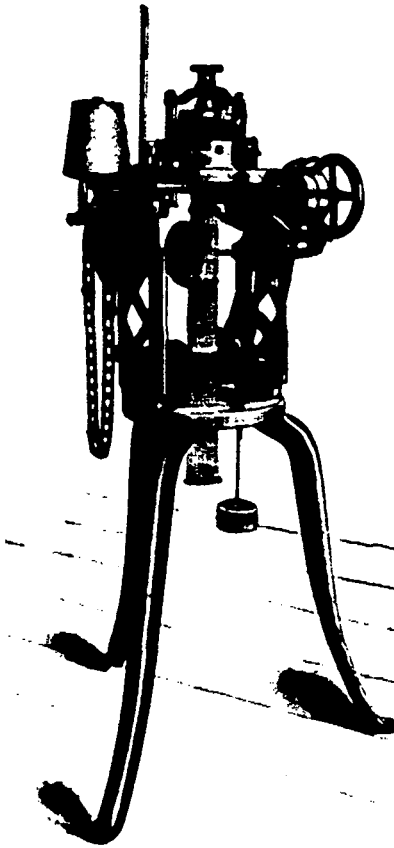
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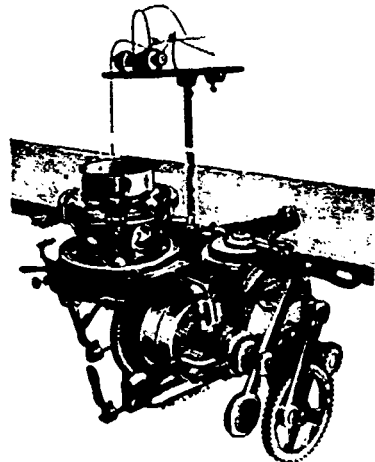
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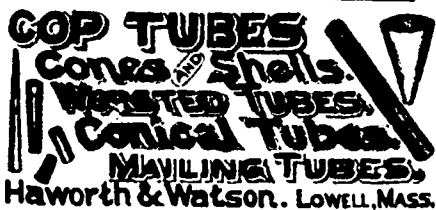
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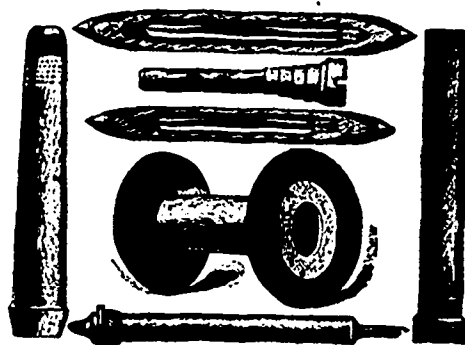
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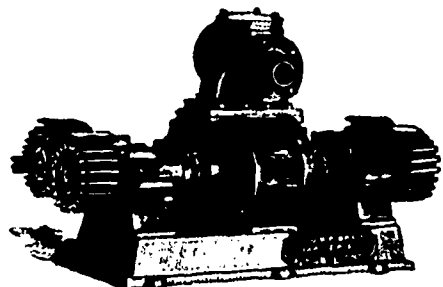
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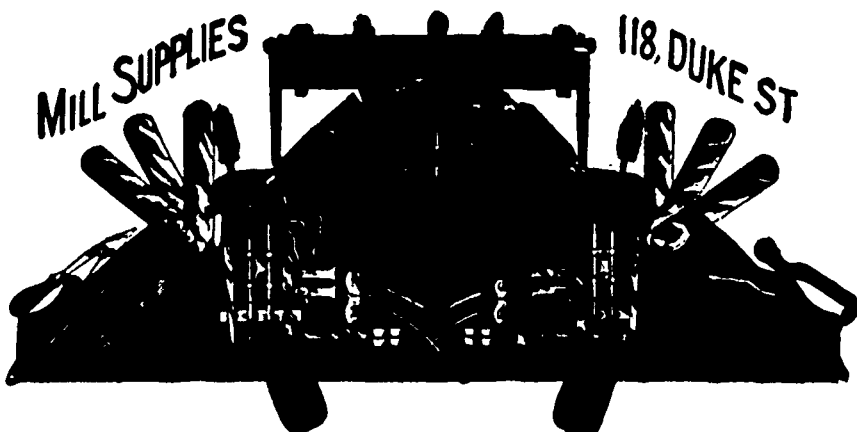


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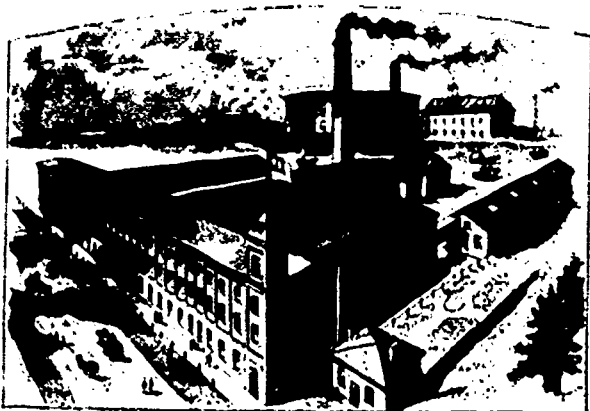
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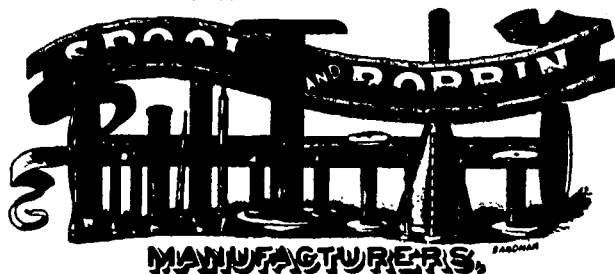
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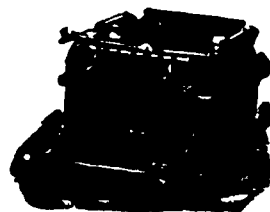
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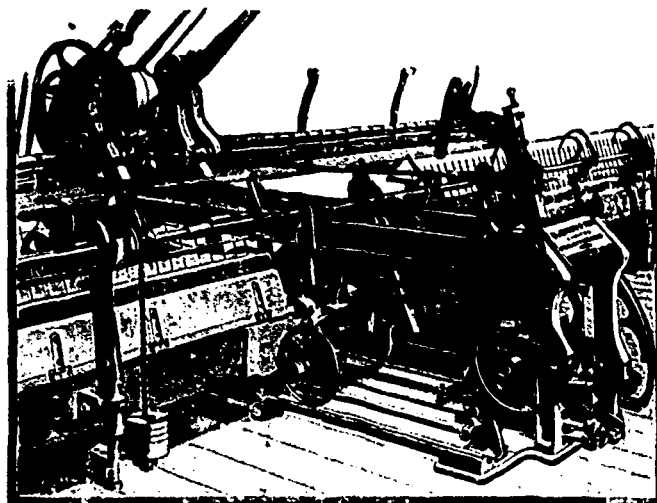
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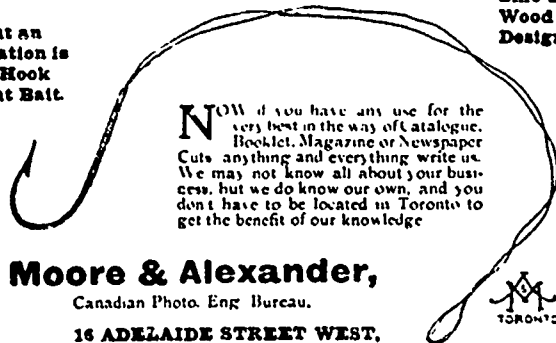
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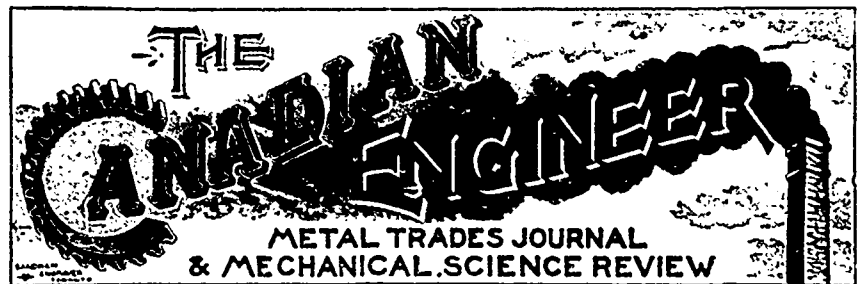
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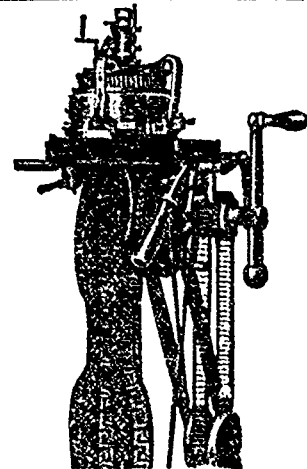
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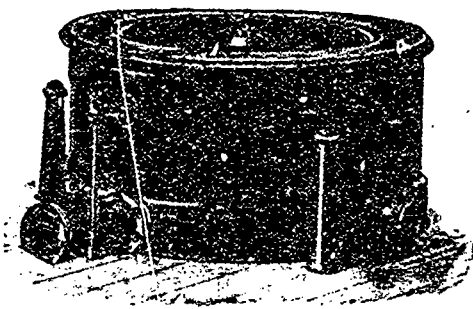
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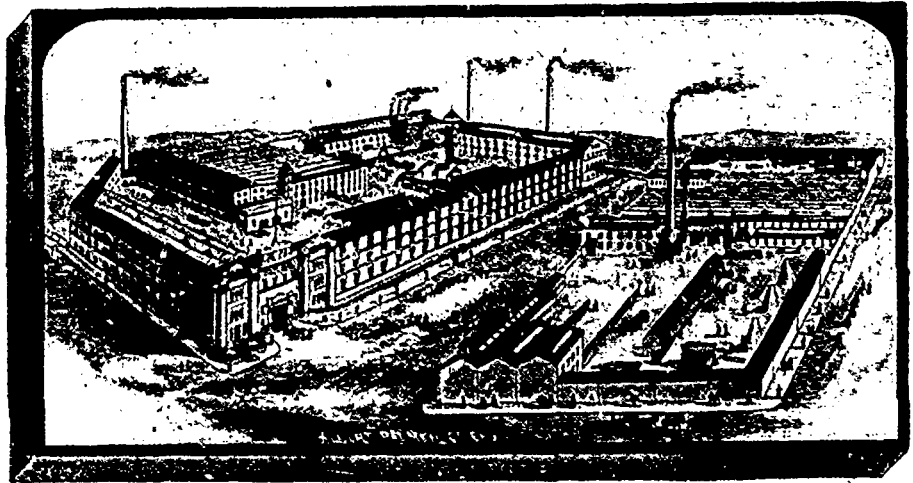
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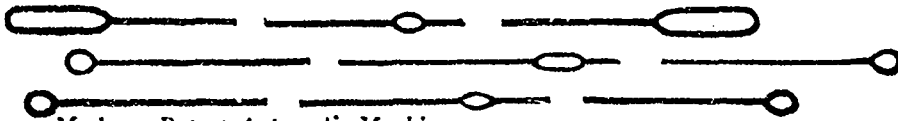
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