Technical and Bibliographic Notes / Notes techniques et bibliographiques

The Institute has attempted to obtain the best original copy available for filming. Features of this copy which may be bibliographically unique, which may alter any of the images in the reproduction, or which may significantly change the usual method of filming, are checked below.

L'Institut a microfilmé le meilleur exemplaire qu'il lui a été possible de se procurer. Les détails de cet exemplaire qui sont peut-être uniques du point de vue bibliographique, qui peuvent modifier une image reproduite, ou qui peuvent exiger une modification dans la méthode normale de filmage sont indiqués ci-dessous.

- [x] Coloured covers/ Couverture de couleur
- [x] Covers damaged/ Couverture endommagée
- [ ] Covers restored and/or laminated/ Couverture restaurée et/ou pelliculée
- [ ] Cover title missing/ Le titre de couverture manque
- [ ] Coloured maps/ Cartes géographiques en couleur
- [ ] Coloured ink (i.e. other than blue or black)/ Encre de couleur (i.e. autre que bleue ou noire)
- [ ] Coloured plates and/or illustrations/ Planches et/ou illustrations en couleur
- [x] Bound with other material/ Relié avec d'autres documents
- [x] Tight binding may cause shadows or distortion along interior margin/ La reliure serrée peut causer de l'ombre ou de la distorsion le long de la marge intérieure
- [ ] Blank leaves added during restoration may appear within the text. Whenever possible, these have been omitted from filming/ Il se peut que certaines pages blanches ajoutées lors d'une restauration apparaissent dans le texte, mais, lorsque cela était possible, ces pages n'ont pas été filmées.

- [ ] Coloured pages/ Pages de couleur
- [x] Pages damaged/ Pages endommagées
- [ ] Pages restored and/or laminated/ Pages restaurées et/ou pelliculées
- [x] Pages discoloured, stained or foxed/ Pages décolorées, tachetées ou piquées
- [ ] Pages detached/ Pages détachées
- [x] Showthrough/ Transparence
- [x] Quality of print varies/ Qualité inégale de l'impression
- [x] Continuous pagination/ Pagination continue
- [ ] Includes index(es)/ Comprend un (des) index

  Title on header taken from:/ Le titre de l'en-tête provient:

- [ ] Title page of issue/ Page de titre de la livraison
- [ ] Caption of issue/ Titre de départ de la livraison
- [ ] Masthead/ Générique (périodiques) de la livraison

- [x] Additional comments:/ Commentaires supplémentaires: Pagination is as follows: 1-2, 45-66, 3-14.

This item is filmed at the reduction ratio checked below/
Ce document est filmé au taux de réduction indiqué ci-dessous.

10X	12X	14X	16X	18X	20X	22X	24X	26X	28X	30X	32X
								✓			

Canadian Journal of Fabrics

THE JOURNAL OF THE Textile Trades of Canada.

Vol. XXI. TORONTO AND MONTREAL, MARCH, 1904. No. 3.

Canadian Journal of Fabrics

THE JOURNAL OF THE Textile Trades of Canada.

Vol. XXI. TORONTO AND MONTREAL, MARCH, 1904. No. 3.

Canadian Journal of Fabrics

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

Subscription: Canada, United States and Great Britain, $1.00 per year Foreign, 5/. Advertising rates on application.

Offices 18 Court St., cor. Church, Toronto, and the Fraser Building, Montreal

BIGGAR-SAMUEL, LIMITED, Publishers

Travelling Representative: A. W. SMITH.

Toronto Telephone, Main 4310 | Montreal Telephone, Main 2589

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 1st of each month to ensure insertion.

CONTENTS OF THIS NUMBER.

WOOL IN ONTARIO AND QUEBEC.

The Dominion Government recently issued advance bulletins of the agricultural census for 1901 in Ontario and Quebec, containing statistics of the sheep and wool products of these provinces. In 1891, Ontario had 1,021,769 sheep with a clip of 733,632 lbs. fine, and 3,871,421 lbs. coarse wool. In 1901 there were 1,046,456 sheep with a clip of 892,182 lbs. fine, and 4,125,403 lbs. coarse wool. This is an increase in ten years of only 24,687 sheep, and 412,532 lbs. of wool. Quebec in 1891 had 730,280 sheep with a clip of 906,001 lbs. fine, and 1,641,244 lbs. coarse wool. In 1901 the number of sheep was 654,503, and the clip 1,196,597 lbs. fine, and 1,576,297 lbs. coarse wool. This is a decrease of 75,783 sheep, and an increase in the clip of 225,649 lbs. The Ontario clip in 1891 averaged 4.5 lbs. per sheep and in 1901, 4.79 lbs. In Quebec the average clip per sheep in 1891 was 3.488 lbs. and in 1901, 4.236 lbs. Taking the Quebec figures first it is disappointing to find that there has been a decrease in the number of sheep during the past ten years, although there is a morsel of satisfaction in the fact that the average clip of wool per sheep has increased. This would seem to indicate that Quebec farmers are paying more attention than formerly to the production of wool and is a healthy sign; they are still, however, behind the Ontario farmers in this respect. It may be well to point out that had the number of sheep been maintained the total wool clip in 1901 would have been, taking that year's average, 3,093,490 lbs. an increase of 320,596 lbs. which at the average value of 20½ cents per lb. would have produced an additional revenue of $65,722, in wool alone.

In regard to Ontario, there is a considerable difference between the figures of the Dominion Census Commissioner and those issued by the Bureau of Industries for the provincial department of agriculture. These latter show the number of sheep in 1901 to be 1,715,513 or 669,057 more than the census report, and the wool clip as 5,834,097 lbs. or 716,512 lbs. more than the census report. These differences are so great as to suggest some explanation on the part of the compilers, but inasmuch as the Provincial Government are in a position to obtain more accurate information and publish returns more frequently, we prefer to take their figures as more correct. While, however, the provincial returns show a much larger production, it is disappointing to find that they also indicate a decline in the number of fleeces and amount of clip. In 1893, the number of fleeces was 1,015,497 and the clip 5,896,891 lbs. In 1902, there were 916,092 fleeces and 5,690,673 lbs. of wool clipped, a decrease of 99,405 fleeces and 206,218 lbs. of wool. The average clip per fleece has however increased from 5.81 lbs. in 1893, to 6.21 lbs. in 1902 and it is gratifying to note that since 1895 the average clip has been steadily increasing year by year. This fact should be an incentive to farmers to pay more attention to the production of wool. An authority on this subject recently pointed out that wool is worth ten cents a pound more than ten years ago, and that with "good luck and good management" for the capital invested, the amount of labor involved and the risk, sheep will to-day pay larger dividends than any other stock. The same authority goes on to say that "If gone into systematically, a one-hundred-ac

farm can carry three hundred breeding ewes, from which can be sold fifteen or sixteen hundred dollars worth of mutton and wool," and he adds: "The most of the time you may sit under a shade tree and watch the lambs grow."

The following statistics are from the report of the Ontario Bureau of Industries:

Wool Clip in Ontario 1893-1902.

Year.	Fleeces.	Pounds.	Per Fleece lbs.	Value. $
1893	1,015,497	5,896,891	5.81	1,073,234
1894	1,092,467	6,235,036	5.71	1,053,721
1895	1,109,140	6,214,811	5.60	1,242,962
1896	991,371	5,581,387	5.63	1,026,975
1897	887,003	6,139,984	5.79	945,757
1898	865,179	5,104,686	5.90	847,378
1899	928,184	5,525,122	5.95	790,092
1900	957,307	5,805,921	6.06	894,112
1901	950,229	5,834,097	6.14	781,769
1902	916,092	5,690,673	6.21	728,406

* * *

THE CARPET TRADE.

In a recent article dealing with the carpet trade of Great Britain, the Kidderminster Shuttle gives some interesting figures which must afford encouragement to those engaged in this industry in Canada. The statistics given show, that while the exports from Great Britain are increasing from year to year, those of the United States are decreasing. The exports of United States made carpets to all parts of the world for the past three years have been as follows:

1901 .... 119,514 yards. .... value, £19,368
1902 .... 98,509 yards. .... value, £15,628
1903 .... 71,434 yards. .... value, £12,184

The total exports of British carpets for the past two years were:

1902 ....7,672,100 yards. .... value, £870,000
1903 ....8,595,100 yards. .... value, £947,633

The returns show further, that the export of British carpets for the month of December last, was five times greater than that of the United States for the whole year. Great Britain also during those years, notwithstanding the hostile tariff, exported to the United States, British-made carpets to more than five times the value of the American-made carpets exported to all the markets of the world.

	English Carpets to America	American Carpets to all the World
1902	.... £73,799	..... £15,628
1903	.... £73,457	..... £12,184

These figures indicate that Canadian carpet manufacturers have nothing to fear from United States competition, and the further fact that last year carpets to the value of £310,357 were imported from Great Britain into Canada serves to show that there is room for further development of this industry in the Dominion. Canada at the present time takes one-third of Great Britain's total exports of carpets, and there does not appear to be any adequate reason why a few British carpet manufacturers could not successfully transfer some of their plant to Canada, to cater to the demand on the spot. The consumption of carpets per head of population is evidently far greater in Canada than in Great Britain.

* * *

THE COMING SYSTEM OF MEASURES.

In another part of this issue will be found Mr. Halsey's reply to the letter of the secretary of the Decimal Association of Great Britain, referring to the continued use of certain old terms of measures in countries using the Metric System. The survival of terms used in special trades might naturally be looked for alongside of the acceptance by the general public of any national system of weights and measures. But while the terms referred to are used in the silk factories, they are not recognized beyond. When the silk merchant puts his goods on the market, he uses the terms of the Metric System. The sailor still takes his soundings in fathoms, but when he goes ashore he finds he cannot buy cloth by the fathom. He must buy by the yard. So with the silk manufacturer; and the survival of a factory custom in a particular trade or place does not diminish the significance of the steady and uninterrupted advance of the Metric System for general purposes over the world. The circumstance that some English terms are still used in the textile trades on the continent merely follows from the predominance hitherto held by British textile manufacturers in the markets of the world, and not because there is any inherent disadvantage in adapting the metric measures to the trade. At the recent international congress, at Paris, held to promote a universal standard of yarn counts, it was agreed by the British representatives that such a *universal system* should be in metric terms and no other; and Mr. Halsey's present arguments on these points are pretty fully answered in a report published by the American Chamber of Commerce, in Paris, last year on a conference with the Société des Ingénieurs Civils de France. The Chamber, with a view to weighing all objections to the Metric System, submitted thirty questions to the society, and these were answered in detail. Considering the conservatism of British manufacturers, the report of the yarn congress referred to is a striking testimony in favor of the Metric System. We have this report before us and two paragraphs are worth quoting. They are: "The urgent need of the trade is a system of counts which will embrace all classes of yarns, be convenient for the spinner and reeler, and also for the manufacturer, and which will be understood in all countries. 'Count' being the re-

lationship of length to weight it is obvious that such a system could not be attained unless there were one uniform system of weights and measures. The Metric System of weights and measures is so perfect and has been adopted so widely that it forms the most suitable basis for a uniform system of counts of yarns."

Mr. Halsey is struck by the fact that the United States appears to be the strongest fortress of the English system of weights and measures. This is because the United States has, nationally speaking, lived like the oyster, self-contained within its shell, and with comparatively little foreign trade outside of the English-speaking peoples until in recent years. Great Britain lives by her foreign trade, and her past refusal to adopt a system now used by practically all the rest of the world has cost her the loss of millions of pounds. Now she realizes it, and hence the House of Lords has passed the second reading of a bill to render the Metric System compulsory in Great Britain on and from 5th April, 1906. Inasmuch as a majority of the members of the House of Commons have already signed a memorial in favor of the system, there appears to be little doubt that it will pass. Canada and the other colonies will fall into line, because the Premiers of all the colonies at the last Colonial Conference in London, expressed themselves formally in favor of the change. Costly and inconvenient though the change may be for the time being, the gain will be worth the cost, as all Canadians will realize when they compare our present decimal coinage with the old Canadian currency of pounds, shillings and pence.

* * *

—Speaking at Westmount, Quebec, last month, Hon. W. S. Fielding made a more explicit statement on the tariff than has yet been vouchsafed by a cabinet minister since tariff revision has been agitated under the present Government. He said that "time would not allow of the systematic investigation necessary for a general revision at the next session, but urgent needs of special branches of trade would be dealt with." The tariff has remained practically untouched for seven years. The woolen manufacturers of Canada take this to mean that the discriminations against which they have vainly striven for the last three or four years, will be remedied. As will be remembered from quotations in these columns in recent months, a number of independent journals as well as newspapers on both sides of politics have frankly conceded that the woolen manufacturers are peculiarly placed, and that while their mills have been equipped under high tariff conditions, necessitating heavy expenditure for machinery, their goods are sold under almost free trade conditions, in competition with the best organized industry of Great Britain. The Bradford Trade Annual Review, for 1903 shows that the shipment of goods from that district to Canada for the year were valued at $7,222,400, and that these shipments were larger than to any other country in the world. No one will envy the British merchant or manufacturer a large trade in Canada, but when this trade is done at the cost of extinguishing an industry that has been built up by great labor and the outlay of large capital, and has as many ramifications with other home industries as the Canadian woolen industry, the question may well be asked, is the policy that brings such destruction fair or wise?

* * *

—Captain C. A. Madge, of the Royal Warwicks, who fought in the Boer war, is visiting the United States in the interests of the Transvaal Consolidated Land Co., which controls 3,250,000 acres of fertile land in the Pretoria district, a large part of which it proposes to plant in cotton. He is travelling through the cotton belt of the south, studying the conditions of cotton culture. He says Pretoria is similar to this section as to climate, and he is of the opinion that the staple can be successfully raised.

* * *

—St. John Broderick, the secretary of state for India, replying recently to a deputation of the British Cotton Growers' Association and representatives of the cotton manufacturing centres of Lancashire, said the cotton acreage of India would be greater this year than ever before, and added that he believed the viceroy of India, Lord Curzon, would make every endeavor to further promote cotton growing with the view of supplying the British market. Nothing would be left undone to utilize the vast fields of India.

* * *

—"Woolman," writing to the American Wool and Cotton Reporter, states that on the whole the British wool market has suffered but little from the outbreak of war, due, probably, to the fact that the hostilities are being waged in a district so remote from the great centres of the woolen industry. The exports to Japan for the month of January of this and last year compare as follows:

	1903.	1904.
Worsted goods ....yards.	490,800	159,100
Woolen goods .....do.	185,400	105,300
Cotton piece goods...do.	5,775,200	1,871,200
Cotton yarn and twist.do.	284,800	62,000

showing a serious curtailment in shipments already.

* * *

THE METRIC SYSTEM.

Editor, Canadian Journal of Fabrics:—

Sir,—Referring to the letter on the Metric System, by E. Johnson, which appears in your issue for February, I note the statement that: "It is not a fact that in France and Germany there are used old units side by side with those of the Metric System. There do exist old names—or nicknames—for some of the present units," etc.

That statement could only have been made by some one who is in entire ignorance of the facts.

I have in my possession a scale, "made in Germany," on which there are graduations for the Rhenish and the French inches, which are in large use in their respective countries. Mr. Johnson may find an engraving of this scale on page 40 of The Metric Fallacy. Will he be so good as to say for which metric units the Rhenish and the French inches are nicknames?

In Zeitschrift des Vereines deutscher Ingenieure for September 5th, 1903, he may find a table (reproduced on page 42 of The Metric Fallacy), of a standard of pipe and pipe threads, which was adopted at the annual meeting of the German Society of Engineers last July, and in this table he will find the bore of the pipe and the pitch of the threads given in English inches and in no other way. Will Mr. Johnson please tell me for what metric unit the term English inch is the nickname?

In Leipziger Monatschrift for October 31st, 1902, he will find a German yarn table (reproduced on page 186 of The Metric Fallacy), in which, against the set of the loom in threads per Vienna inch, he will find the weight in English pounds of the yarn required for 100 meters of cloth. Will he tell me for what metric units the Vienna inch and the English pound are nicknames?

In L'Industrie Textile for October 15th, 1902, may be found an article by a leading French textile authority, M Paul Lamoitier, reading in part as follows:

"It is absolutely unworthy of us French, who were the first to find and apply the Metric System, to retain the aune and denier for measuring silk. Ah! these Americans are not considerate of our feelings and they are right. We are as much in the anarchy of weights and measures for the textile industry as at the time of the Revolution, for we have the denier of Montpelier and of Milan, for silk, with the aune as a unit of length. We still have the diverse standards of Roubaix, Fourmies and Reims for worsted, the moque of Sedan, the livre, the quart and the sous of Elboeuf, the yard for linen, etc. Ah! the famous aune, do you know its equivalent? Exactly 3 feet 7 inches 10 lines and 10 points, or in other words, 1 188447 metres, the foot being equal to .324839 metres and divided into 12 inches, the inch into 12 lines and the line into 12 points.

"The yarn count in the north of France is a length and in the centre, a weight. I will take my oath that the manufacturer of Rouen, if he has not studied each section separately, has no idea what is the standard of Reims or the denier of Lyons or Milan. And on the other hand, the manufacturers of Reims and Lyons are likewise puzzled in making comparisons of the diverse numberings of the diverse materials.

"And this is the reason why they are right in mocking us when they say we do not use the Metric System for numbering yarn and for weaving calculations. Nothing is more arbitrary than to reckon the yarn by the thousand metres and the width of the cloth and the picks of the filling by the inch. It is nonsense and a derision. Note also that, while I speak here only of France, I could say as much of all Europe."

You will note the value of the aune, given with so much care by M. Lamoitier, but Mr. Johnson would have us believe that the word aune is only a nickname for metre! Let him not overlook the last sentence by M. Lamoitier, and let him also note that the value given for the foot stamps it and the inch, line and point as French units, and will he then tell us for what metric units the French foot, inch, line, and point, stand as nicknames?

In Kalkulator für Artikel der Textil branche, by Friedrich Frowein, page 79, may be found a table (reproduced on page 181 of The Metric Fallacy), giving the value of eight of the old ells, which are still in use in German textile mills. The values are given in centimeters, as 67, 62, 78, etc., but Mr. Johnson would have us believe that the word ell is only another nickname for aune.

Since the exposure by my associate, Mr. Dale, and myself of the persistence of old units in metric countries, the explanation given by Mr. Johnson has appeared many times, but, in unfeeling Yankee slang, it is "too thin," it "won't wash." In hastily adopting this explanation of uncomfortable facts, the metric advocates are only continuing the convenient process of assuming anything to be true which they would like to have true, as described in the following extract from the preface of The Metric Fallacy:

"Whenever the metric advocates have learned that a government has passed a law favorable to the system, they have straightway conveniently assumed that it has become the common system in trade and commerce. They have not enquired into the working of these laws nor into their scope or nature. Their logic has been: 'Such a country has passed a Metric System law, therefore the people of the country have dropped their old units and taken up the new.' Their stories of the imposing number of hundreds of millions of people who use the system have no other basis than this. They have simply added the figures for the population of those countries which have passed some kind of a metric law, including those in which the laws are simply permissive, and those in which the system has been adopted for government purposes alone. If the facts which are given in these pages turn their case to ridicule, they have nothing to thank but their own credulous willingness to believe anything favorable to their system and to their free use of their own imagination without regard to facts."

Mr. Johnson should try again; really, though, Mr. Editor, doesn't it strike you as a little odd to see the English system assailed from England and defended from the United States? I do not need to remind you that Mr. Johnson is not at liberty to ignore or evade my questions. The large use of these old names is proven, and, having made this ridiculous explanation, he will now show for what metric units they are used as nicknames, or your readers will understand that he has abandoned his explanation.

I probably know about as much about the present state of the Metric System bill before the American Congress as Mr. Johnson does, and I am ready to stake my reputation as a prophet on the prediction that it has no better chance of becoming law than Mr. Johnson has of being struck by lightning.

New York, February 22nd. F. A. Halsey

Foreign Textile Centres

Manchester.—Yarns—In some quarters rather more trade has transpired making a moderate turnover. In other directions, chiefly medium and coarse counts of twist and weft, spinners complain of slackness of demand and unremunerative prices. Shipping yarns said to be in fair enquiry. Cloth —Enquiries continue to a fair extent, and given steady raw material there would be a healthy flow of business. Just now buyers and sellers are hampered by the constant fluctuations

in the raw material. In some quarters is heard of more trade going on both for leading and minor outlets, and manufacturers—notably of light goods, such as dhoolies and mulls—seem to be moderately engaged, as is also the case in certain descriptions of fine reed printing cloths. Shirtings are reported very slow, and salesmen are uneasy in regard to the state of their order books. In heavy goods very low prices have to be taken to move even sorting-up lots. Home trade enquiry is fair, but generally at limits unworkable, though isolated sales of moderate weight are noted.

Bradford.—There is a continued quietness among yarn spinners, although those engaged on crossbreds have their frames going on old contracts, and do not seem concerned about the future. The opening of the year has seen a hardening of prices of all Bradford goods. On the whole, spinners and manufacturers are fairly well occupied, but the general advance in raw material tends to check new business.

Leeds.—For the spring trade prospects much improved. The sale for shipment has improved somewhat, and Australian spring orders are readily coming in, while South Africa is taking numerous small consignments. For ready-mades there was a good demand from the Cape, and a considerable bespoke trade is steadily developing.

Leicester.—Yarn spinners complain of the impossibility of doing profitable business at current rates. Cashmere yarns, lambs' wool, fancy and worsted yarns selling slowly. The hosiery industry is improving very slowly.

Huddersfield.—Little progress made with orders for spring, and not many confirmations for the winter. Trade in the iron districts and in Lancashire is slow, and travellers find great difficulty in doing business. Much short time is prevalent in mills, both woolen and worsted. The Canadian and Australian markets are fairly prosperous, but the Continent, South Africa, and particularly the United States, dull Wools meet a hand-to-mouth sale without change in prices.

Kidderminster.—Manufacturers are busy. The delivery of carpet continues on a large scale, partly on account of an improved demand from London. The yarn trade tends to improve, though spinners are not tempted to sell or make local carpet yarns at the prices offered. The trade can be quoted as fully firm with a better all-round demand.

Rochdale.—An undoubted move in the direction of new business, but, as yet, too early to ascertain what has actually been concluded; the fact, however, that mills have now gone on full time gives some indication of the position.

Bolton.—Tone in spinnings strong. Has been a big trade done and producers are well fortified with orders for carded yarns. Their position has been strengthened since the beginning of the year.

Kirkcaldy.—The linoleum trade is not so busy, and a number of workers are idle. Linen manufacturers complain of scarcity of work, and there is keen competition. Some fair orders received from Australia and South America, and Canadian buyers now on this side; but high prices seriously affect contracts.

Dundee.—Jute yarns quiet, and fancy trade dull. In brown flax not much doing. The ordinary linen trade shows signs of more life, and is altogether better.

Belfast.—Spinning branch quiet. No material change in manufacturing for past few weeks. More doing with the United States, present orders being satisfactory.

* * *

The warehouse of the Merchants' Dyeing Co., Toronto, was damaged by fire on February 29th. Loss, $20,000; covered by insurance.

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, and receive as dividend an improved paper.

The new 125-h.p. Wheelock engine in the Elmira Felt Factory has been started. The capacity of the factory is the largest in the Dominion.

The Alvinston Flax Company have placed the contract for their new mill with John Brown. The company have also accepted the site offered by the M.C.R.

The Dominion Cotton Company have just received 18,000 bales of cotton for their mills at Magog. As soon as the water rises the cotton and print mills will be run full blast again.

J. Childerhose & Son's woolen mill, Eganville, Ont, was closed down for a couple of weeks recently. Some repairs have been made, and new machinery installed, which will increase the capacity of the mill.

A return submitted by the Perth, Ont., council shows the wages paid by the Perth Woolen Co. during the past three years to be: 1901, $5,978.86; 1902, $4,786.11, and 1903, $7,580.40, together with $1,006.96 for picking.

The Dominion Government has secured three convictions against the Wilson Cordage Company, of Chatham, for infraction of the Binder Twine Act, by selling twine under measure. A fine was imposed of three hundred dollars.

The Ojibwa Knitting Mills, at Sandwich, Ont., was closed recently owing to lack of material, about 200 hands being thrown out of employment. The company manufacture home-made mitts and socks, mostly for the North-West and the Klondyke.

It is stated on good authority that the Singer Sewing Machine Company is likely to locate its Canadian headquarters near Ottawa. The announcement was made some time ago that the concern had decided to locate at St. John's Que., but this move, it is understood has been abandoned in favor of a location at Deschenes, six miles from Ottawa.

On February 19th, fire broke out in the flax mill of the Ripley Flax Company, Limited, totally consuming the building and contents. Estimated loss, $3,500; insurance, $1,500. The engine room being a separate building, with a fire wall between it and the mill, enabled the firemen to save the engine and boiler. The barn, stacks and other buildings, where valuable stock was stored, were saved.

The Master-in-Ordinary has given judgment holding that the assets of the Patent Cloth Board Company, of Parry Sound, Ont., now in liquidation, are not liable for taxes claimed by the town, on the ground that proper notice of the town's intention to abolish the ten-year exemption granted the company was not given to the latter. This will leave a larger amount for distribution among the creditors of the company.

James Kendry, M.P., has resigned his position as manager of the Canada Woolen Mills, Hespeler He will in future devote his whole attention to the Auburn Mills, at Peterboro, of which he is president and managing director. Charles Moore, who has been for many years a successful wool manager, and for the past four years was in charge of the Excelsior Mills, at Montreal, has been appointed manager of the Hespeler Mills.

A proposition is afoot in Brantford to start a factory for making full fashioned hosiery.

An advertisement elsewhere in this issue, announces a good woolen mill property in eastern Ontario for sale.

As will be noticed by card elsewhere, a reputable firm of manufacturers of white and colored worsted yarns, for coatings, serges, and hosiery, is open to appoint a good agent in Canada.

The factory of the Berlin, Ont., Felt Boot Co., (George Rumpel & Son), was destroyed by fire on February 10th. The fire originated in the picking room. The damage is estimated at $150,000, of which $55,000 is covered by insurance. The firm have secured premises in the new building of the Merchants' Rubber Co., and will continue manufacturing. New machinery has been ordered, and the felt department, which was saved, is in full operation. A staff of men are clearing away the ruins of the old building and a modern three-story factory will be erected on the site.

The Alaska Feather and Down Company, Limited, of Montreal, will establish a factory and warehouse, in Winnipeg, and have purchased the business of Bromley & Co., at Winnipeg. The western branch will be equipped with the latest improvements in bedding machinery, including machinery upon which the company have Canadian patents. A. W. Johnson will be in charge of the Winnipeg office, and represent the firm in Manitoba, while Assiniboia, North-West Territories and British Columbia will be cared for by J. A. Loudon.

Joseph L. Haycock, inspector of binder twine, has been appointed by the Trade and Commerce Department to examine all claims for the bounty voted by Parliament last session on manila fibre used in the manufacture of binder twine. The bounty amounts to 75 cents per 100 kilos, which equals the export rate charged by the Philippines on manila shipped to all countries oth r than the United States. There are fifteen factories in Canada manufacturing binder twine. Mr. Haycock left recently for the Nova Scotia Binder Twine Factory, and from that will pass on to the others throughout Canada.

Messrs. Rinaldo and Walthausen, of South Norwalk, Conn., propose to build a hat factory in Cornwall, Ont. The undertaking will be styled the Walthausen Hat Manufacturing Company of Cornwall. They offer to erect a three-story solid brick factory, 150 by 150 feet, and to install plant and machinery costing $50,000. They will employ one hundred men and fifty women, exclusive of book-keepers, travellers, etc., and will pay annually in wages not less than $100,000. The corporation is to give a bonus of $20,000, payable when $100,000 stock is subscribed and the factory in operation, a free site and exemption from taxation, except for school purposes, for twenty years.

Japan has every kind of manufacturing—cotton goods, telescopes, microscopes, watches, knives, spoons, electric machinery, matches, clocks, woolen goods and a host of other lines. In 1870 manufacturing in Japan was almost nil; now she has over 8,000 factories of various kinds, including 201 cotton mills, with 887,000 spindles. The cotton growing and manufacturing industry employs 1,000,000 people. The average cotton production is 360 pounds to the acre, against 250 pounds in the Southern States. Japan does weaving in 660,408 dwellings or establishments, containing 924,123 looms and employing 1,042,866 persons. The weaving is done in cotton, silk, and silk and cotton mixed.

The Hespeler, Ont., branch of the Canada Woolen Mills went on short time on March 7th, and will run 40 hours per week instead of 57. Lack of orders is the cause.

When the Walkerton Binder Twine Co. was being promoted, J. T. May, of Guelph, subscribed for one share, paid ten dollars for it, but was given a certificate for three shares, which he sold to Mr. Thorp, of Guelph. The Board refused to transfer them, the result being a law suit. Judgment has been given in favor of Thorp.

On March 5th the first tapestry carpet ever made in Canada was turned out at the new Guelph carpet mills. T. McMaster, eastern representative of the company, states that the present capacity of ten looms will be doubled. The new building cost $75,000, and expert workmen were brought from Scotland. Tapestry and velvet carpets will be manufactured.

Frank H. Lancaster, manager of the Richter Manufacturing Company, of Tenafly, New Jersey, makers of burlaps, buckrams and house draperies, has interviewed Assessment Commissioner Fleming, of Toronto, on the proposition to establish a Canadian branch in Toronto. The company, which is not incorporated, operates 16 looms, of which 13 are broad looms, at their factory in Tenafly.

The Medicine Hat Woolen Mills proposition is assuming definite shape. The new company, in which Brantford parties are chiefly interested, has purchased the property, and has had a large engine house addition built. The steam plant is being installed, and it is hoped to have the mill in operation in June. The officers of the company talk of putting down a natural gas well to supply fuel for operating the power plant. The machinery is all under order in England, Canada and the United States. When completed, $85,000 will be invested. The company's first work will be on wool blankets, for which there is a big demand in the North-West. The mill will require about half a million pounds of wool during the first season, which will utilize most of the clip of the district, and should prove a great help to the sheepmen. Philip Whelen, the manager, has a high reputation in Ontario as a successful woolen manufacturer. George Whelen is the secretary.

* * *

Personal

J. M. Masson, formerly superintendent of the Hawthorn Woolen Mills, Carleton Place, and previous to that with the Auburn Mills, Peterboro, is now with the Concord Mfg. Co., woolen manufacturers, Penacook, N.H.

E. N. Heney was found dead in his bed at his home in Montreal last month from heart disease. Mr. Heney, who was 58 years old, was a large carriage and harness manufacturer, and was also a manufacturer of horse blankets, having looms of a special type for that class of goods.

William Wilson, president of the Canadian Spool Cotton Company, and a director of the Spool Cotton Company, New York, died on February 28th, at Brooklyn, N.Y., after a lingering illness. He was born in Paisley, Scotland, in 1849, and had been connected with the thread business for over thirty-eight years. He leaves a widow, three sons and two daughters.

It is with deep regret that we have to record the death of Joseph Porritt, chairman of the directors of Samuel Por-

ritt & Sons, Limited, Bamford Woollen Mills, near Rochdale, Lancashire. The late Mr. Porritt was a man who will be greatly missed. His splendid business qualities and upright character had won respect alike among his customers and his competitors. He was a justice of the peace, and was senior deacon of Bamford Chapel, Rochdale, with which place of worship he had been intimately connected for nearly forty years, and he had several times filled the office of Sunday school superintendent.—Paper Maker.

The Toronto Evening News is publishing the portraits of Mayors of leading Ontario towns. Wm. Thoburn, of the Thoburn Woolen Mills, Almonte, is one of the series, and the following sketch appears with his picture; Mayor Thoburn was born in Portsmouth, Eng., and attended the Public Schools of Woolwich, Eng., and came with his parents to Canada in 1857. In 1869 he opened a store in Almonte, which he conducted for some years, and which he disposed of to go into woolen manufacturing. He has been engaged in manufacturing since 1880, having enlarged his plant on several occasions. He has served both on the Board of Education and the Town Council.

* * *

Fabric Items

Villeray, Que., have granted exemption from taxes for twenty years, and $3,000 bonus to the St. Lawrence Clothing Co., who will establish a factory for waterproof clothing, etc.

The customs officers at Brockville, Ont., on March 6th seized 1,100 pounds of upholsterers' silk. This is one of the biggest seizures in fifteen years at Brockville, and was due to the information of a man connected with the smuggling. The name of the owner is unknown, and unless he turns up and makes a settlement, the silk will be sold by auction.

—Graphite is stated to be an excellent preservative for manila rope. One rope manufacturer treats the inner yarns of each strand as well as the core in a bath of lubricant, the ingredients of which are graphite and oil. This lubricant thoroughly permeates all the fibre, thus overcoming internal wear, while sufficient comes to the surface, and the lubricant does not injure the rope.—Engineer, London, Eng.

The Winnipeg Board of Trade have a communication from a man in New England, who proposes establishing a factory for the manufacture of ladies' blouses, skirts, etc. He will furnish half the capital, if the remainder is secured locally; the Winnipeg directorate to control the company.

A rival to India rubber has just entered the field in a cloth known as "Shower-proof," which repels water and yet remains porous, appearing exactly like ordinary wetable cloth. Petroleum is one of the most successful shower-proof preparations. The only reliable shower-proof is obtained by impregnating the cloth outside and in with a fine film of wax. Paraffin wax is the staple, but owing to its low melting point it is not fit for use alone. The composition used is so alloyed with other waxes and chemicals that at the boiling point of water the wax stands firm. A rather elaborate preparatory form must be gone through, and after the wax has been applied a finishing process is required. The interesting fact remains that it is petroleum that keeps out the wet. In tailors' windows many aquatic displays have been arranged to show that cloths can mysteriously be made to exhibit the power of the duck's back. Wool, cotton, silk, linen, awnings and tent cloths are thus wrapped in an invisible film of rock oil.—Oliver J. D. Hughes, Consul-General, Cobourg, Germany.

E. T. CARTER.

The news of the death of E. T. Carter, wool merchant, of Toronto, will have been received with sincere sorrow by the woolen manufacturers of Canada, among whom he has been so long known and so much esteemed. Mr. Carter, who was born in Waterloo, Ont., in 1847, and afterwards moved with his parents to Beamsville, came to Toronto when 17 years old and entered the employ, as bookkeeper, of the late John Hallam, wool and hide dealer. By force of his ability and industry, he gradually rose in the estimation of his employer, till he became manager of the extensive business, the ownership of which he succeeded to on the death of Mr. Hallam, four or five years ago. Since Mr. Hallam's death the business was further extended, till it became the largest in this line in Toronto. Mr. Carter was a member of the Toronto Board of Trade since 1889, and a member of its council during the past year. He belonged to the National Club, having been elected first vice-president for 1904. Mr. Carter married Miss Hall, a sister of Dr. J. B. Hall, and she survives him, with three sons and two daughters. The sons are: W. E. H. Carter, secretary of the Bureau of Mines of the Department of Crown Lands, and Inspector of Mines for Ontario, and H. J. and E. W. Carter, who have been associated with their father. The business now passes into the hands of his three sons, and will be conducted by them. The daughters are Mrs. Wellington and Miss Madeline Carter. When deceased left Toronto for Nassau early in February he was suffering from the grippe. But later, while on the journey, cerebral meningitis developed and finally caused his death. The body was brought to Toronto for burial.

* * *

Mayor Cane, of Newmarket, Ont., and Andrew Yule interviewed the Premier of Ontario recently, regarding a bonus for the Lake Superior and Long Lake Railway Co., which proposes building a line from Peninsula Harbor, Lake Superior, to Albany River and thence to Hudson Bay.

—The exports of raw cotton to Canada from the United States for the fiscal year ending June 30th, 1903, were valued at $5,932,429; in 1893 for the same period they were worth $2,803,326. The ten-year period showed an increase of over 100 per centum in cotton consumption and the figures form an interesting commentary on the growth of the textile industry in Canada. The exports of cotton goods from the United States to Canada for the same period in 1903 were valued at $2,907,906, as against $1,922,680 in 1893, an increase of nearly $1,000,000 in ten years.—Textile Excelsior.

COTTON GROWING WITHIN THE EMPIRE.

A survey of the work and prospects of the British Cotton Growing Association was given by J. Arthur Hutton, vice-president, before the Manchester Statistical Society, recently. Mr. Hutton said that the question of the future supply of cotton was not to be regarded as a local matter affecting the interests of merchants and manufacturers in England, or those of the millions of people directly or indirectly dependent upon the cotton trade, for hardly a country was unaffected by an insufficient supply of raw material. England was not the only country affected. Germany, France, and even the United States, were feeling the effects of this short supply, and the evil was aggravated by the unscrupulous operations of speculators. He did not think that legislation could remedy these evils. The normal annual increase in the consumption of cotton was about 400,000 to 500,000 bales, and if it continued, in ten years we should require an addition of 4,000,000 bales. The production of raw cotton had not increased so fast as the consumption That was due to the want of elasticity in the United States production The present supply of cotton was insufficient to keep the spindles of the world fully employed, and the cotton trade had developed into a scramble for the available supplies

In dealing with the work already accomplished, he alluded to British India, and said that the quality of Indian cotton had deteriorated in the last ten years, no attempt having been made to select the best seed for planting purposes. The methods of cultivation, too, were primitive The establishment of model farms in the cotton fields might remedy this. Representations had been made to the Government on the subject.

In the West Indies, it had been arranged that grants should be made to planters who wished to undertake the growth of cotton—so much when the land was planted, so much when the crop was partly grown, and a further amount on shipment. The cotton would be consigned to the association, and the surplus proceeds handed over to the planter. Formerly principal supplies came from the West Indies, and it was hoped we should again have a large supply of cotton from those islands.

In Egypt there was a want of labor and transport. The first difficulty time alone could overcome, but the Suakim-Berber Railway would solve the transport question. Recently a new field had been discovered near Tokar, on the Red Sea, and in that district there were large possibilities, and the land available was said to be capable of growing a crop as large as the present total Egyptian growth.

Nyassaland was one of the most promising fields. A considerable acreage had been put under cotton, and advances of £1,000 each were being given this year to two planters, under Government supervision, gins and other machinery being supplied. Two thousand acres would be put under cotton, and the crop would be sent to the association for sale, and the profit, less the advances and expenses, would go to the planters. It was said that one or two hundred thousand acres might be cultivated in 1905.

In Southern Nigeria a large tract of country was suitable for cotton-growing. Mr. Prince, an expert, cleared and cultivated a plantation of about fifty acres on the Niger river, near Ouitsha. This was sown with American seed, and a large sample had been sent home, and was just the cotton wanted in Lancashire; and if 1,000,000 bales of it were available every mill in Lancashire would to-day be running full time. One advantage Southern Nigeria possessed was that as natural waterways existed, no railways are necessary.

Northern Nigeria, with an area of over 300,000 square miles and 10,000,000 inhabitants, offered an enormous field cultivation, more so than any other of our West African possessions. The Haussas were intelligent and civilized, and a peaceful race, devoting their energies to agriculture and commerce. $5,000,000 was, however, required to construct a railway connecting the interior with the Niger River.

It had been argued that if the association's efforts were successful, an over-production would result, and the price would fall so low as to make the cultivation of these new fields unprofitable. So far, however as long-stapled cotton was concerned, a substantial fall in prices would still leave an ample margin of profit. The main question was, could West Africa compete with the United States? On this point, while we could not yet tell to a fraction the cost of growing West African cotton, we did know that labor in West Africa was very much cheaper than in the States, for any amount could be had for 6d. to 1s. a day. Land could also be had at an almost nominal rent, and if cultivated by the native, as a rule, no rent at all was paid, except, perhaps, some small tribute to the chief of the community. On the other hand, in the United States a cash rental of 10s. to 20s. per annum per acre had to be paid, or when, as was mostly the case, the rent was paid in kind, about one-third was handed over for rent of the land and another third for the use of implements, fertilizers, etc., if provided by the landlord, leaving one-third for the farmer. Although in the States there were many plantations of considerable acreage, the bulk of the crop was grown on small farms, varying in size from a few acres up to twenty acres. Larger farms were the exception. These small farmers could not afford to wait until the crop was harvested. They had to get credit from the local stores or mortgage their growing crops. This and the rent was a very heavy tax on the cultivator, and a serious addition to the price of cotton. On the other hand it was the opinion of every West African governor to whom the question was submitted, that cotton growing could be carried on without any such advances. Messrs. Neely and Prince, both gentlemen brought up in American cotton fields, and accustomed to the credit system, also confirmed these opinions. Under these circumstances, he, Mr. Hutton, was firmly convinced, that West Africa would soon be able to grow cotton much more cheaply than America, and should production overtake consumption, it was the American farmer who would suffer by the fall in price, and not the West African.

* * *

New Zealand flax is now used in Canada for the manufacture of binder twine. Up till recently the fibre has been going to Canada, via London, but owing to the low freight freights most of the material is now sent to Vancouver. Recently a firm shipped from Wellington 450 bales to Sydney for trans-shipment to the next steamer for British Columbia, and a week later the same firm despatched another lot via Auckland and Fiji to catch the same steamer.—Textile Mercury, Manchester.

The Cosmos Cotton Co., Yarmouth, N.S., has filed a suit for $10,000 damages against the Alabama Great Southern Railway, for shortage. Cotton shipped to them from J. H. Coughlin, Birmingham, Ala., purporting to weigh 52,000 pounds, weighed only half that amount on delivery. Bill of lading for $5,400 was paid by the complainants. J. H. Coughlin failed several months ago, and firms all over the world have charged that he shipped them short weight cotton. Coughlin was recently indicted. Several other firms have filed actions similar to that taken by the Cosmos Company.

BRUSSELS AND WILTON CARPETS.

(From the Textile World Record. Continued from February.)

Fig. 4 shows such a wire, which, after having been placed in the shed of the loom, as if it were a filling thread, is thus covered by the two hundred and fifty-six (or whatever number the texture (pitch) of the fabric may be) warp threads, and then a comparatively thin hempen, jute, or cotton pick (ground filling) is passed across; thus a series of loops are formed over and around the wire, and it is woven into the fabric as though it were a thick filling thread, and intended to form a coarse corded or rep-like fabric. Wire after wire is thus covered by the pile threads and woven into the fabric, till

Fig 4

twenty or more rows of loops have been formed around the wires, when the wire which was first covered by loops, is automatically withdrawn by a hook which catches in its looped end. Another set of loops is formed in front, and another wire is withdrawn behind, and the affair thus continued; but during the process of weaving, a sufficient number of wires are always kept in the last-formed portion of the fabric in order to keep the loops intact; i.e., prevent them from being pulled out.

Thus it is now clear that when a thread of pile yarn is not active in the formation of the figure, it is covered or concealed by the wire and ground picks of filling.

Each class of pile threads interweave with the ground pick on the same system, producing a carpet of uniform strength, and one in which every species of pile is equally permanent.

Brussels carpets are woven upon the double shed principle, the wire forming the loops being inserted at the same revolution of the crank shaft of the loom as when the shuttle is thrown for inserting the ground or body (hemp, cotton or jute) filling. There are three different warps found in the Brussels carpet, viz.: the pile warp c, the body or ground warp k, and the stuffer warp g (see Fig. 3). The first mentioned warp, of course, is operated by the Jacquard harness, the second by means of two common harnesses n, n', and the third either by 1 or 2 common harnesses j, or from spare needles of the Jacquard. Warps number 2 and 3 are carried upon two common beams, l and h respectively, placed at the back of the loom. The face warp, only, consists of worsted yarn, the ground or body and the stuffing warps being of cotton, linen or similar material, as is also the filling.

The pile warp c as forming the face of the carpet is wound upon small bobbins b, placed upon the frames of the creel a, as is clearly shown at the back of the loom in our illustration, Fig. 3. The frames in the creel vary in number according to the quality of the carpet. For what is known as a "five-frame carpet" five frames in the creel are necessary; for a "four-frame carpet" four frames in the creel are required, and for a "three-frame carpet" three frames in the creel. Some times, however, a variation in the pattern causes the use of a sixth frame in the creel for the making of a five-frame fabric, a similar increase in the number of frames in the creel being sometimes necessary in the case of a three or four-frame fabric; the reason for it being that some Brussels carpets are "planted."

For instance, the nature of the design may be such that only very small quantities of one or more colors are visible in some portions of the design, and which should be "stopped out" by substituting some of the other colors. There would, therefore, be a certain number of ends vacant; that is, a certain number of bobbins of yarn of one or more colors would be saved. The same number of bobbins might be placed upon the sixth creel, and thus an extra effect of color would be obtained in the design. This "dodging" of color is, however, oftener resorted to in three and four-frame carpets, four or five creels thus being used. It is by no means an uncommon occurrence in a three, four or five-frame fabric to "stop out" portions of color in any one frame and to abstain from introducing a corresponding amount of color in another place. The result of this is that a certain quantity of yarn is saved, and the general effect of the design is little, if any, the worse for the saving.

In the best grades of five-frame Brussels carpets in the market as a rule the standard pitch is 256 ends, this number of ends (loops) showing upon the face in the width (27 inches) of the fabric, but, in reality, this number (256) of ends must be multiplied by five, in connection with a five-frame carpet= 1,280 ends, the latter number representing the full number of ends of pile warp threads employed in the construction of this fabric, plus the necessary body or ground and stuffer warp threads. There are, therefore, with reference to the pile warp, 256 bobbins of yarn upon each of the five creels. In connection with a four-frame, the affair would equal $256 \times 4 = 1{,}024$ ends = full number of pile warp threads to be used in such a carpet, etc.

Through each dent in the reed o, one end of each color of the frame is drawn plus two ground or body warp threads and the stuffer warp, thus with reference to a five-frame carpet there are no fewer than eight ends in each dent of the reed.

THE JACQUARD MACHINE

employed in connection with weaving Brussels carpets varies from those regular or common wire hook machines as used for weaving upholstery goods, table covers, dress goods, etc., in that in the Jacquard machine as used for weaving Brussels carpets, in most instances, there are no wire uprights or hooks in this machine, their places being taken by cords, yet the result is the same, the necessary warp threads being raised as required. However, machines have been also made in which wire uprights were employed, but those mostly used have cords, in place of the uprights, worked by needles, precisely as in the common Jacquard. The card cylinder is of hexagonal (six sides) shape. There is a "lifter board," situated towards the top of the Jacquard, perforated with holes corresponding with the number of needles employed, which raises the tail cords to which the cords of the Jacquard harness are attached. The "lifter board" is placed so as to impart a tilting movement to the Jacquard harness, and in turn to the warp threads, in order to produce a clear top shed. The comber board rises and falls by the aid of a lever and a cam as fixed to the main driving shaft of the loom. The object of this is that in weaving a five-frame carpet, four frames, according to the exigencies of the pattern, may be lifted out of the way, so that the shuttle may pass for the purpose of binding the fabric. There is no spring box used in connection with this string Jacquard, the needles being pushed back at every pick of the pattern by means of a back board, actuated by gravity, the same as used in connection with an Ingrain carpet Jacquard.

Three sets of Jacquard cards are required for a three-quarters (27 inches) wide carpet. When a greater width is required, an extra set of cards is used for each quarter of a yard in the width of the fabric, for which reason a yard wide carpet will require four sets of cards, etc. The more sets of cards to be used, the larger the Jacquard must be, the more needles, tail cords and harness cords are required. One harness cord, heddle, mail and lingo is required for each pile warp thread.

THE WIRE MOTION.

The wire motion is a very important mechanism of the Brussels carpet loom, it being situated at one end of the loom, and has for its object to actuate several long wires (see Fig. 4) upon which the loops of the fabric are formed. These wires vary from 31 to 31½ inches in length. Wires for weaving Wilton carpets, and which will be dealt with later on, are slightly shorter on account of the knife end varying from 30½ to 31 inches in length.

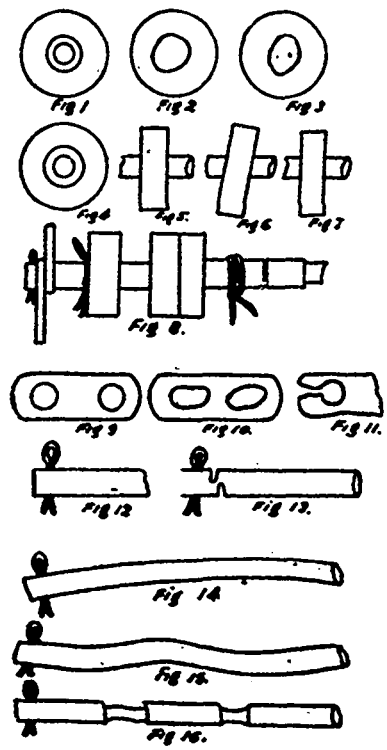
The number of wires used in connection with the motion at weaving varies, as a rule, from 26 to 28, covering about three inches of fabric being employed. Suppose 26 wires are employed and the loom is working, and the 26 wires have been operated upon, that is to say, 26 loops or picks of the pattern have been formed. The twenty-sixth wire being operated upon, the loops of the fabric being formed upon the wire, then at the same moment this has been done, the first interwoven wire in the set is automatically drawn out of the fabric, and, when quite clear, passed forward and inserted in position, that is, taking the twenty-seventh position of a wire in the fabric, and upon this wire the next pick of the pattern is formed. This feature is repeated over and over again, every one of the twenty-six wires in turn being inserted over and over again.

(To be continued.)

LOOM FIXING POINTS.

Some Mechanical Reasons for Imperfect Work in Weaving.—Poor weaving has been the cause of the failure of many textile enterprises, as is well known to interested persons. We will undertake to illustrate some of the chief causes of defective work in the line of mispicks, double-picks, shed-snarls, etc., which are often seen in the finished goods. In Fig. 1 we present the ball of the warp chain in its perfect order. The ball sets evenly on its bar or shaft and no trouble results. After the loom has been in service a few years, the chances are that the bearing of the ball on the shaft will become worn, or the bearing of the ball itself may wear down, as shown in Fig. 2, so that the action of the ball becomes uneven. The result is that the finger of the harness jack is not lifted properly and we have mispicks. Again, if the bar of the ball wears oblong, as frequently happens, as shown in Fig. 3, we get another type of irregular motion which produced mispicks. In Fig. 4 is shown the way some machinists bore out the bearing of a worn ball and make it suitable for further service by inserting a ring. But it is better to put in a new ball, and then we will get the even, firm stand as shown in Fig. 5. Otherwise, if we attempt to run the ball in a wabbly shape, it may assume the attitude shown in Fig. 6, by which the fingers of the jacks may slip off. In Fig. 7 is the position ordinarily taken by a ball in which the bearing is worn so large that the ball is permitted to drop below its proper level. In Fig. 8 we show a very neglectful way in which fixers sometimes tie up the harness and filling chains of looms, to the detriment of effective work. The chain blanks and balls have become so worn at the edges that they do not fill out the space as originally intended, with the result that they are loose on the bar and permit loss of motion and wabble. The fixer finds it to be an easy way out of the trouble to tie in the cords or threads between the blanks, thus filling out the void. But it is a shiftless way and ought not to be done. The proper way is to substitute new balls and blanks for the worn ones.

As to the Links.—Links of chain bars are also neglected more or less in loom work to the disadvantage of perfect weaving. All inspectors have had trouble with harness skips and the like due to the use of worn links on chains. In Fig. 9 is a chain in good order. In Fig. 10 is a chain which has seen so much service that the holes are worn oblong, with the consequence that the bars are elongated and the chain made too extended for sure work. The proper bar may not be pulled over in time for the jacks and we get mispicks in numberless order. In Fig. 11 are the final or worn links. The best way is to make careful examination of the links whenever it is being found that mispicks are being caused. All extended portions of chain ought to be looked into, and new links put on to take the place of the worn ones. Put on the new links in pairs, for if you put a new one on one side only, that side will be drawn up closer, providing the link of the opposite side is worn.



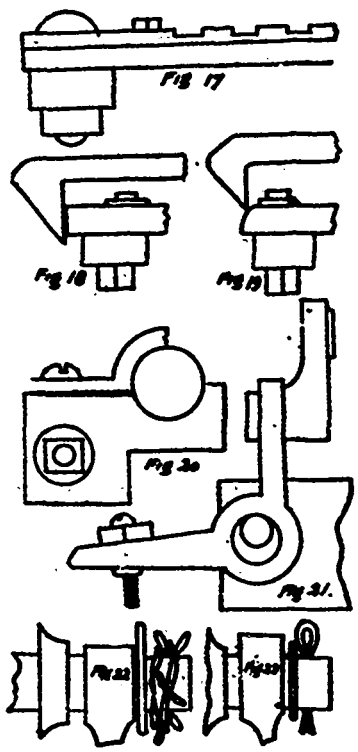
Illustrating Mechanical Points for Loom Fixers.

Bars.—The chain bars also require notice. In Fig. 12 is a bar in good order, the section end being shown only. In Fig. 13 is the end of the bar which has had a few years' service. The links have cut grooves in the ends and the bar is about ready for the waste heap. If used, the chances of causing mispicks are very great. I would remove bars in this shape and restore with new ones. Sprung bars are the horror of the fixer, one of which is represented in Fig. 14. It is hard to detect a bar like this without close watching. It will take a mispick almost every run, and yet it may require some time to find it. Then substitute it with a new one, unless you can straighten it. I have seen bars in as bad order, as shown in Fig. 15, due to the "wrapping" or "doubling up" of chains. Such bars cannot well be restored. In Fig. 16 is the familiar sight to old fixers of bars worn by ball, in which definite grooves appear and permit the ball to sink too low to operate in the head motion. The only remedy is a new bar.

When the Plate is Cut.—In Fig. 17, reference is made to the condition in which the finger plate head is often found in harness motions. The plate is of the best of steel and calculated to last for years. But careless fixers sometimes

get the head motion of the loom set a little too early or a little too late with the result that the fingers of the jacks are forced in too soon on the plate and there occurs scraping due to frictional contact for a brief period in every turn of the loom. The period is enough to gradually wear off either the fingers or the plate and the plate seems to go first. I have seen plates cut into and seriously grooved in a few months when the head is not rightly set. The only way out of the trouble is first to restore the grooved plate with a new one, then set the head over again so that the jacks will not close down on the plate until the plate is clear and in proper position.

But there is as much skill needed in setting the fingers as in regulating the plate. The plate may be worn to the condition referred by the jack fingers slipping off after once gripping, due to improper adjustment of the chain cylinder. If the cylinder is right, so as to bring the fingers at proper level to get a good and full grip on the plate as in Fig. 18, no trouble is liable to occur. If, however, the chain cylinder is so set that the finger is elevated too high, as in Fig. 19, the chances are that the finger will slip over the edge of the plate frequently, resulting in a very short while in wearing off the edge to a rounded condition, as shown.



Showing Defective Condition of Parts of Head Motion of Looms.

Look to Your Boxes.—The head motions of all looms of modern make and in fact of olden types are provided with effective bearings and journals when they are shipped from the builders. But some one may rap a cap with a hammer, or screw down the set screws so far as to fracture a cap, as in Fig. 20, leaving the bearing exposed to lint, dust, etc. The foreign matter gets into the lubricating oil, gums the parts and trouble occurs. I have seen choked parts due to gummed oils with flyings causing endless bother. Such caps as here shown should be removed and new ones put on.

Lost Motion.—The head motion of the pattern or fancy weaving looms will not permit of very great loss of motion. You can have loss of motion to considerable degree in the plain cam loom or the four harness twill loom, but when you get to using 6, 8, 10 or more harness with pick and pick or with any intricate work at all, you must look out for loss of power and motion in all parts. In Fig. 21 we present a common place in which lost motion occurs, due to the wearing of the bearing on which the lever operates. The fact that this bearing is worn compels the lever to be lifted and depressed considerable space before it begins action on the parts operated by it. During this interval, the other mechanical parts of the loom are moving forward, and the loss of motion in the worn part is seriously felt. If it is in excessive degree, the loom will make numberless mispicks, which can be rectified only by restoring the worn part with new. I would look to the levers and the studs upon which they operate whenever mispicks occur.

Don't Be Too Free With Strings and Wires.—The builders of modern power looms put about the best descriptions of power weaving machinery on the market that it is possible for one to conceive. The looms of modern build are marvels of perfection in every particular.

Old fixers need not be told this, for they who struggle with cams and tappets for years, are now able to produce perfect patterns by changing filling and harness chains. There is no need of spending all day examining tappets as formerly. Still we can pass through the weave room of a mill and find that the fixers have not forgotten how to use strings and wires too freely, even on high-class looms. A pin breaks out of the end of a stud, for example, and sometimes, instead of getting a nice, new pin to replace the old one, the fixer grabs a bit of wire and tangles it through the pin bore and wraps it about the stud end, as shown in Fig. 22. The wire holds the washer on and the washer sustains the lever, but it is a poor piece of work. In Fig. 23 is the proper way, showing the pin. Strings are sometimes used to tie up things and this ought not to be. Take time to do the work right and it will pay in the end.—Southern and Western Textile Excelsior.

* * *

SOMETHING ABOUT WOOLS.

To the average man, a sheep is simply a sheep. He knows the meat is good to eat, and he probably pictures it in his mind like Mary's lamb—"whose fleece was as white as snow." He has learned that sheep are sheared, that it is a peaceful animal, and that in a body they follow a leader blindly, beyond this, he has probably very few ideas on the subject.

Wherever the climate is not too cold, or too hot, if protected from savage beasts, sheep will be found. In Asia, the fat-tail variety prevails, and has remained practically without change, in breed, for generations. The wool has a long, coarse fibre, with a short, finer undergrowth, in the colder sections. It is a striking fact that where the climate is severe, nature gradually supplies a fine silky undergrowth for the better protection of the sheep. This is shown particularly in Iceland wool.

The Chinaman, as a rule, combs the wool off the sheep with his fingers, when the warmer season causes their sheep to shed its wool, and he twists it into short rope, which is then twisted into a ball. Bret Harte has said that "for deeds that are dark and for tricks that are vain, the 'Heathen Chinee' is peculiar," and it is not surprising that dirt, gravel and inferior wool are frequently found in these little balls, when they are opened by the manufacturers here. In Western China, India and other sections the wool is twisted into long ropes about as thick as the wrist and in this form is transported to the seaport markets, where in some cases it is

sorted and washed, at other points it is sorted without washing, and the various colors shipped separately. A much larger proportion of colored wool is grown in Asia than in Europe or America. One gets not only black, but fawn, and gray and red wool, and often there is less white than colors in a line of wool from the Orient.

Someone puzzled a body of scientists once, by asking why the black sheep ate less than the white, in this country. After a long, fruitless investigation, they were told it was "because there are fewer of them." On our western plains, the herders like to keep one black sheep in every hundred, and when they round them up at night, if they find all the black sheep in sight, they assume the flock is safe in the fold, but if a few black sheep are missing, they know they have lost some of their flock during the day, and they stir around to find them. While we are discussing black sheep, it might be interesting to mention that there is a great demand for natural black scoured wool, for use in underwear. "The real thing" is very expensive, as only a small proportion of the fleece is fine enough, or dark enough, and the cost is high. Black sheep in the sun all day will get bleached on the back, and the wool turns brown, which makes it unfit in color for natural wool goods. Fashion demands "natural wool goods," and people want them at low prices, and so the chemists come in and dye cotton the right shade, and the weare of the cheap underclothing is none the wiser.

We have spoken of the Asiatic sheep which have remained unchanged in breed for centuries, but when we examine the flocks of Europe, we find distinct breeds which have been perfected by years of care and study, and in a general way we will mention a merino. The Spanish merino, which reached its greatest perfection during Spain's prosperity, declined with her power, though a few flocks are still maintained by the nobility in Spain. These sheep were the progenitors of the merino sheep all over the world, and were almost the only sheep raised for many years in France, America, Australia, and Buenos Ayres But the increase in Australia and South America became so great that wool growing became unprofitable and with the facilities for shipment of frozen mutton, wool became a by-product and sheep were bred for carcass rather than wool; so that in the past few years, merino sheep have been killed off, and English breeds substituted, fashion adapting itself to the changed conditions. Crossbred wool, the product of mutton sheep, are in the greatest demand, and it would seem as if the beautiful fine merino wools, of which the finest flannels and broadcloths, and finest worsteds are made, would soon become a fancy article, to be made into garments only for the very rich - C. F Avery, in the Textile American

* * *

CANADIAN BINDER TWINE DEFENDED.

A correspondent, signing himself "Canadian Manufacturer," writes to the "Cordage Trade Journal," as follows: "We are somewhat surprised to hear that the Treasury Department at Washington, D.C., have issued an official circular to the customs officers, to give close scrutiny to all Canadian twine entering the United States on account of the fraudulent action of a Canadian binder twine factory in turning out twine short of the legal measure. As this circular will have the effect of hurting the reputation of Canadian twine we think it only fair that the true state of affairs should be laid before the American public. The Canadian Government, a few years ago, passed an act, whereby the number of feet per pound and the manufacturer's or importer's name had to be printed on a tag to be attached to every ball of binder twine offered for sale in Canada. To see that this act was enforced, a binder twine inspector was appointed last year, whose duty was to inspect all binder twine offered for sale in Canada and see that it was properly tagged, and measured as many feet to the pound as marked on the tag.

During last year this inspector seized and confiscated fourteen lots of binder twine. Out of these fourteen lots eleven were American, one Mexican, one English, and one Canadian. Now, we think that, when you take into consideration that eleven lots of inferior twine, offered in Canada, were manufactured in the United States, and only one lot in Canada, the American authorities have, perhaps, been a little hasty in taking the matter up in the way they have. As binder twine of any description is allowed to enter into Canada free of duty, the imports into Canada are much greater than the exports to the United States. The Canadian Government will no doubt now issue similar circulars to their officers, which will in all likelihood affect the American manufacturer more than the Canadian."

* * *

INDIAN YELLOW FF ON SILK.

Among new color samples issued by the Cassella Color Co., New York and Montreal, is a card showing dyeings of Indian Yellow FF on silk. Indian Yellow FF is a new dyestuff, which is especially well suited for the dyeing of silk. This new type possesses the good leveling power and properties of fastness of the older brands of Indian Yellow, over which it offers the great advantage of a very much better solubility in addition to a clearer and brighter shade. In point of fastness to rubbing and water, Indian Yellow FF is also somewhat superior to the older types. Indian Yellow FF is dyed, as usual, in boiled off liquor, and has proven very useful for the production of clear yellow shades and for use in compound shades of all sorts. It may be discharged with both tin salt and zinc dust, similar to the other brands.

* * *

INVENTION OF THE POWER LOOM.

In view of the great importance of the power loom, it is perhaps well not to forget the name of its inventor, so that the lapse of time may not obliterate it, and his invention be contended for by a number of claimants, as is the case with so many others.

In the year 1793, a Scotchman, by the name of Andrew Kinloch, who was an instrument maker by profession, with the assistance of an old watchmaker, built the first two power looms that were ever constructed, in his little shop, in a monastery in Glasgow. The money necessary was furnished by two merchants of the city. The actuation of the looms was effected by a common crank, and after about fifty yards of good fabric had been woven on them, the experiment was considered to be successful. Kinloch at once received an order to build forty others, and the first forty-two looms were afterward operated by water-power at Milton, in the vicinity of Dumbarton, Scotland. He was also appointed superintendent of the mill, and taught two pupils to become loom fixers. One of them, Walter McLutheon, was for many years afterward superintendent of the Wellington Mill, Hutcheston, near Glasgow, while the other, Archibald Barlay, received a similar position in the Coterine Mills in Ayrshire. These two men were the first who used a screw wrench for regulating a power loom. The walls of the small old mill, at Milton, are still standing, overrun with ivy, as

a hoary reminiscence of bygone days. The old wheel house still contains the water wheel of thirty-three feet diameter, used for actuating the looms. Two of the old looms had even been preserved, and were to be sent to the London World's Exhibition of 1851. It happened, however, that the warehouse in which they were kept was destroyed by fire, and the looms shared the same fate.

After having been in operation for about twenty years, the mill was finally suspended in 1813, because it was not sufficiently remunerative. The beaming and sizing machine had not yet been invented. A firm at Paisley, Scotland, bought the forty looms, and operated them for a number of years with steam power. A short time after their purchase, however, the beaming and sizing machine was introduced in Glasgow, by which power loom weaving became remunerative, and within a few years after, thousands of such looms were built and operated both in England and Scotland. In 1842, Walter McLutheon was still superintendent of the Wellington Mills, in Glasgow, and also old Mr. Kinloch was still alive. He went once on a visit to Glasgow, and the bosses, fixers, and beamers of the already numerous mills in Glasgow celebrated the occasion by tendering him a sumptuous dinner. At the close a collection was taken up for the old man, which resulted in sixty pounds. He spoke of his early trials and mishaps, and said that, in Scotland, the weavers had offered no opposition to his invention. It had been otherwise in England, however, where the hand loom weavers had been of the opinion that they would be reduced to starvation by the introduction of the power loom. The first mill, at Staleybridge, England, which he had fitted up with one hundred looms, had been destroyed and burned during the night. It had been rebuilt shortly afterward, however, and fitted out on a larger scale than before. His life had been threatened repeatedly, for which reason he had lived for some time in America, where he had on all sides been received with open arms, and every facility had been offered him to introduce his loom in the different parts of the country. A few years afterward his looms had been introduced all over the continent of Europe.—Industrial Record.

FAST BLEACHING ON HOSIERY.

The economical arrangement of a dyehouse depends entirely upon its size, and, like every other enterprise, the larger the dyehouse the better can it be managed, and at the least possible cost. In taking the arrangement of a dyehouse into consideration, it will be discussed entirely from the standpoint of a hosiery manufacturer dyeing aniline oxidized black. In the first place the saturating room, in which the goods are started, should have a concrete or vitrified brick floor, pitched slightly to a gutter or trough with a grating in the centre of the room that will carry away the refuse matter into the sewer. The tomtoms should be placed as close to the extractors as possible, so that in removing goods from the tomtoms there will be a minimum of waste liquor. A separate extractor should by all means be used for saturating and chroming goods. After they have been passed from the oxidizing room, and taken into the ageing room, there are two methods of finishing. One is by allowing them to remain in the oxidizing cages a sufficient length of time to take on a lisle finish. The other is, thoroughly to oxidize them, remove them, and give them sufficient time to age, then pass through the singeing machine. The writer has found that the lisle finish gives a prettier shade and a finer finish, although goods that are singed are probably stronger, The point in oxidized blacks that gives the dyer the most trouble is the question of letting the goods become tender; it is a continual nightmare to every dyer, no matter how careful he may be. There are so many different causes that tend to weaken his goods, that it is only by exceeding caution and care that this can be obviated. But as no other black has yet been discovered that is as fast and as cheap as aniline black, it is still the universal method of dyeing cotton hosiery.

SULPHUR BLACKS.

During the past two years sulphur blacks have claimed the attention of the dyer, and with more or less success, and for those with small plants, who do not care to go to the expense of equipping a dyehouse, they have answered the requirements very fairly. Sulphur black does not dye the fibre black all the way through. The fibre takes the dye only on the outside. Again, sulphur black develops so irregularly that it is almost impossible to get them the same shade twice in succession. In passing from the sulphur black bath into the cold water bath, the coming in contact with the atmosphere has such an effect that it very often ruins the shade of the goods, unless very great care is taken. Some dyers use an open kettle with very good results in dyeing sulphur black, while others use the laundry machine. There are also several special kinds of machines, including Obermaier, Vacuum, and Klauder-Weldon, made expressly for dyeing sulphur blacks. In dyeing sulphur black better results are obtained if the goods are first taken out of the sulphur black bath and put into a cold water bath containing a slight percentage of sulphide of sodium, which will dissolve any of the dyestuff left in a precipitous form on the goods, and afterwards pass through another cold water bath.

There is a fortune awaiting the chemist who will invent a process as cheap as the oxidizing process for fast black, and which will give us as good color, and at the same time remove the great bugbear of tender goods. This drawback to oxidized black is one that must be overcome, and, it is to be hoped, that it will shortly be discovered how this can be removed. There is also the question of cost to be considered, and as soon as a cheaper one is invented the better it will be for all concerned. Mill managers are making experiments with other blacks; one very large manufacturer is using sulphur black with fair success, another both single finish and lisle finish oxidized black, but one and all make the same complaint, and that is that a different process from the ordinary oxidized lisle finish black is required. With so many different manufacturers experimenting, it can only be a question of time before there is some new development, and it is needless to say that the chemist or the dyer who discovers it will be able to make a fortune for himself, as well as place the hosiery trade under everlasting obligations.—Textile Mercury.

SPEED OF SHAFTING IN TEXTILE MILLS.

Textile manufacturers demand high speed in order to get a large production, and as a result the speed of the shafting in textile mills exceeds the speed which generally is found sufficient for all purposes in other manufacturing establishments. Two methods are used in securing the desired speed. The older way is to run the line shaft at a slow speed and use large pulleys on it to transmit a higher speed to the other shafting; the latter method is to run the line shaft at a high speed. It is generally admitted that it is more economical to run the main shaft at a high speed than to in-

crease the belt velocity by using large pulleys, as large pulleys mean a proportionally heavy shaft to carry them, which not only increases the first cost of equipment but also the daily cost of running. In the transmission of the power from the engine to the machines operated a large percentage of the power is lost in overcoming friction and by slippage of the belts.

The larger the diameter of the shaft the greater its weight, unless hollow, and the greater the surface that comes in contact with the bearings, and consequently a greater amount of friction will be created which will require power to overcome. The shafting is subjected to a torsional strain, due to the effort of the belts on the pulleys, and a transverse strain, due to the weight of shaft and pulleys and pull of the belt. The transverse strain has a tendency to bend the shaft, which must have enough weight to resist this tendency. In order that the power consumed in overcoming the frictional resistance of heavy shafting may be used to produce useful work, the shaft should be no heavier than is necessary to enable it to resist the strains to which it is subjected. Some manufacturers hang their shafting in lines the length of the room, which, in long rooms, requires a comparatively heavy shafting to resist the strain. Others use a light-weight shafting and run it in short length, thereby getting rid of loss of power in overcoming the friction of heavy shafting.

The journal bearings in the hangers support the weight of the shaft and is the place where the frictional resistance to the rotation of the shaft is generated by the surface of the shaft grinding on the surface of the bearings. This friction may be so increased by negligence that all the benefits derived by the use of light-weight shafting are lost.

The length of the journal bearing depends on the speed of the shaft and the pressure the shaft exerts on the bearings. With long bearings the pressure is distributed over a larger surface and there is less danger of the bearings becoming heated. When shafts are run in short length the pressure per square inch of bearing surface is less than when the same amount of work is done by shafting hung in a long, continuous line. A pressure of ten pounds to the square inch of bearing surface will not heat the bearing, but hot bearings frequently occur when the pressure is less than this amount. When the bearings are too tight an unnecessary amount of friction is created, which requires power to overcome. Neglect to oil the bearings at regular intervals also creates friction. Babbitt metal, brass bushings, roller bearings and ball bearings will not make up for neglect of this important function, although they do minimize the evil resulting.—The American Wool and Cotton Reporter.

* * *

THE WORLD'S WOOL PRODUCTION.

The following figures, regarding the world's wool production in 1903, are published by the National Association of Wool Manufacturers in the United States:

	Pounds.
North America:—	
United States	287,450,000
British Provinces	12,000,000
Mexico	5,000,000
	304,450,000
Central America	5,000,000
South America:—	
Argentina	370,000,000
Brazil	1,500,000
Chili	7,500,000
Uruguay	96,000,000
Venezuela	15,000,000
All others	20,000,000
	510,000,000
Europe:—	
Great Britain	134,000,000
France	103,610,000
Spain	102,600,000
Portugal	13,410,000
Germany	49,590,000
Italy	21,451,000
Austria-Hungary	64,300,000
Sweden and Norway	8,200,000
Russia, including Poland	361,100,000
Turkey and Balkan Peninsula	67,500,000
All others	14,000,000
	939,761,000
Asia:—	
Russia	60,000,000
Central Asia	46,000,000
British India	85,000,000
Asiatic Turkey	33,000,000
China	35,000,000
All others	15,000,000
	274,000,000
Africa:—	
Algeria and Tunis	30,425,000
Cape Colony, etc.	100,000,000
Egypt	3,000,000
All others	1,000,000
	134,425,000
Australasia	500,000,000
Oceania	50,000
Grand total	2,667,686,000

* * *

WORK-A-DAY THOUGHTS.

"Sir, I am a true laborer; I earn that I get; get that I wear; owe no man hate; envy no man's happiness; glad of other men's good; content with my harm."—Shakespeare—"As You Like It." (Corin., Act iii., Sc. 2.)

"We are but toilers—in whate'er estate,
Weaving our various fabrics well or ill.
Some are, who ply with happy-handed skill
The deft, swift shuttle, and who ne'er abate,
Th' appointed task, but to strive to emulate
Some fair design, which the controlling Will
Hath given them forth to pattern and fulfil.
But there are others, who, disconsolate,
Their textures weave with foolish fears and sighs—
Like thriftless, thankless craftsmen, who deride
Their labor, with its fate dissatisfied—
While to and fro Time's subtle shuttle flies.
O men, O toilers, let us blithesome be,
And weave brave garments for Eternity!"

INDIA'S COTTON TEXTILES.

The Frankfort Commercial Gazette states that efforts of the cotton-producing countries to establish factories for manufacturing raw cotton simultaneously with its cultivation have led to a great increase of the cotton-textile industry in India. In 1883 there were in operation 62 factories, with 1,554,000 spindles, and 15,000 looms; in 1903 the numbers had increased to 201 factories, with 5,164,000 spindles and nearly 44,000 looms. Of these factories 113 were for spinning exclusively, four for weaving only, and 84 for spinning and weaving. Seventy per cent. of the spindles and 75 per cent. of the looms are situated in the Bombay district. The capital invested in these establishments is estimated at $60,000,000, and the number of workmen at 178,500. Aside from those employed in cotton factories, large numbers are engaged in the cotton hose industry, so that in both about 1,000,000 persons are employed. The production of yarns during the last year was 559,000 pounds and shows a small decrease over the previous year; in the finer grades, however, especially in Nos. 21 to 30, the increase was considerable. The export of yarns has caused much loss to the factories in the Bombay region and in consequence they are now restricting themselves more to the home demand. With reference to the number of spindles, India occupies the sixth place, and to the number of looms the eighth among the countries of the world. The exports are principally to East Africa and Turkey.

* * *

WOOL MERCERIZATION.

Many experiments have been made in the attempt to obtain useful results by mercerizing wool. They have simply proved that various strengths of caustic soda lye have very little effect on the lustre, and rapidly rob the fibre of strength. A. Karge, of Mulhouse, has discovered a composition, however, that can be used very successfully with a lye of from 38 deg. to 42 deg. B. This solution acts in the proportion of one-tenth of the lye. This proportion of glycerine, etc., would be quite useless. The yarn is treated in the hank as in ordinary mercerization, but with the difference that the wool does not require the enormous tension applied to cotton. It is washed with slightly soured water at a temperature of from 62 to 65 deg. C. The effect on the strength of the wool is interesting. Wool which before treatment breaks with a load of from 550 to 560 grammes, breaks after treatment, the caustic soda lye having been of 38 deg. B. strength, with 750 grammes; with 790 grammes if the lye has been 40 deg. B., and with 840 grammes if its strength has been 42 deg. B. If the soured water used for washing the wool is too cold or too hot the increase in strength is not so great, as shown by breaking loads in the following table:

Lye Used.	Temperature of Wash Water.	Breaking Load, Grammes.
38 deg. B.	55 deg. C.	700
38 "	70 "	690
40 "	55 "	740
40 "	70 "	690
42 "	55 "	720
42 "	70 "	710

Of still greater importance than keeping the washing water at 62-65 deg. C. is a proper drying after mercerization and rinsing. The drying has great influence on the structure, lustre, and softness of the wool. The duration of the mercerization must be about two and one-half minutes, and the same for the rinsing, so that the processes can only be carried out with machinery entirely automatic. The lustre is the result of the joint action of the ingredients of the mercerization bath and not of the caustic soda alone. It is true that the microscope has not revealed any change in the anatomical structure of the fibre due to the treatment, but it shows an alteration in the surface of it, which consists in making that surface much smoother and more lustrous. The brightness of the lustre depends on the strength of the wool and the temperature of the mercerization bath. This must not exceed 16 deg. C. Experiments with a mercerizing bath cooled to zero C. gave purely negative results, and at certain stages the strength of the fibre is gravely imperiled. To get a really good result the caustic soda lye should show about 40 deg. B. before the other ingredients are added, and a temperature of about 12 deg. C. Wool mercerizing, as above, shows no special features. After drying it is hardly likely that the wool could show any increasing affinity for dye. The tests of successful mercerization are that the wool should show a beautiful silky lustre and that its strength should be very distinctly increased.—Dyer and Calico Printer.

* * *

WEAVING IMPROVEMENTS OF LAST YEAR.

BY T. W. FOX, TEXTILE DEPARTMENT, MANCHESTER MUNICIPAL SCHOOL OF TECHNOLOGY.

During the latter half of the nineteenth century, the productiveness of the power-loom was repeatedly increased by the simple expedient of enlarging the circumference of the driving drum and reducing that of the loom pulley. With higher speeds certain modifications were made in the details of the machine, and the shuttle received its share of attention, especially with regard to enlarging its weft-carrying capacity. But it came to be recognized that much higher speeds or larger shuttles were impracticable, and that future efforts would have to be directed towards the construction of a new type of loom. Some means for automatically supplying a loom with weft appeared to offer a possible solution of the problem, as this might result in increasing the productiveness of each loom, or, failing that, the cost of production could be reduced by allotting a larger number of looms to each weaver without materially adding to his or her labor.

After the first serious attempt had been made in this direction, an almost feverish energy was manifested to attain success upon similar lines. The contagion has spread so rapidly that it is now almost impossible to find a loom-maker who has not at least one self-feeding loom upon the market or in his experimental room, and it is jocularly said that every overlooker and mechanic who has the misfortune to be without regular employment devotes his enforced leisure to the inventing of an automatic loom. Be that as it may, the great efforts made during the last five years to perfect a new weaving machine are certain to be exceeded during the ensuing five years. Old inventions which failed chiefly because they were introduced long before other conditions were favorable to success, have been reintroduced, but more or less modified in detail. New devices have been, in many instances, hastily put upon the market before they were capable of fulfilling commercial conditions. In short, the methods by which inventors are now attacking the loom problem are so many and varied that even to tabulate them is no easy task. By resorting to classification, however, and ignoring chronological sequence, some idea may be formed of the extent and variety of the schemes launched or about

to be launched upon the market. These include automatic spool or cop changers, automatic shuttle changers, weft-carriers with means for supplying a loom with sufficient weft for many hours' continuous running, the use of two or more shuttles that move continuously, and many labor-saving attachments to ordinary and special looms.

Of spool or cop changers the Northrop loom is the most notable example, and is more extensively adopted than all other self-feeding looms put together. It contains parts which automatically eject an exhausted spool or cop, insert a full one, and draw a thread into a shuttle-eye while the loom is working at its normal speed. A warp-stop motion is also provided. It may be affirmed of the parts that eject and insert spools or cops that neither acts with appreciably greater certainty or at a higher speed than those of certain other so-called automatic looms. But the self-threading contrivance is the most original, and probably the most valuable, part of the invention. By its aid time and labor are economized to an extent impossible of attainment by the ordinary method of shuttle-threading. This is so generally recognized that, in the event of no satisfactory automatic or semi-automatic shuttle-threaders being previously developed, it is safe to assume that on the expiry of the Northrop patent rights a shuttle more or less modelled upon the original will be promptly adopted. The Crossley No. 2 loom also contains parts which change a cop or spool while the loom is running at full speed. The scheme reintroduces an old principle of enclosing weft in a metal case and inserting the case into and ejecting it from a shuttle automatically. But the method of accomplishing this appears to be original, and, so far as can be ascertained from the working of one loom is likely to attract its full share of attention. Threading a tube, however, makes as great a demand upon time and labor as threading a shuttle. Much has been said regarding the relative merits of cop or pirn versus shuttle changing, and although there can be no doubt that it is an easier matter to cause a loom to run satisfactorily with one shuttle than with a dozen shuttles, the final word has not been spoken upon the subject.

Shuttle-changers are built upon most diverse lines. There are those which stop to discharge an empty shuttle and, after replacing it with a full one, restart. The Harriman and the Hattersley looms are typical examples. The Blackburn automatic loom effects its changes while the loom is moving at a greatly reduced speed. Others eject a spent shuttle and insert a full one without any reduction of speed. These include the Crossley No. 1, the Ross, the Baker-Kip, the Cowburn, the Walker, the Gregson and Monk, the Harling and Todd, the Manchester automatic, and many other looms. In the above-named inventions devices are to be found for ejecting a spent shuttle behind, in front of, beneath, and above the shuttle-box, also for feeding-in a shuttle at one end of a loom and ejecting it at the other end. The Ross and the Walker looms are each provided with a hopper from which shuttles are fed into chambers of revolving boxes, and on the failure of a weft thread the boxes make a partial revolution and move another shuttle into working position. The empty one is next ejected from its chamber and a full one takes its place. In a Walker loom if a weft thread breaks, the loom stops. In order to prevent broken picks in the cloth, the Northrop, the Baker-Kip, and the Manchester automatic looms have mechanical or electrical feeders to put the change mechanism in action shortly before a cop or spool is spent. In the Walker loom the same object is attained by ejecting a cop or spool as soon as a predetermined length of weft has been drawn away, and substituting for it a full one. The Howarth pick-counting motion is also attached to some self-feeding looms to effect a change of shuttle on the completion of a definite number of picks, and the loom stops when the weft breaks. This same pick-counter may be fitted upon ordinary looms, but its action is then to warn the weaver that only a few picks remain upon the cop, and upon their completion the loom will stop.

It is quite possible that in bestowing so much attention upon the weft supply of a loom other things of equal importance may be overlooked. The question of how best to prevent warp-breakages, for instance, requires attention, because far more time is needed to repair a broken warp thread than to replace a spent shuttle; further, if a broken thread is not repaired at once it becomes entangled amongst adjoining threads and breaks them also, which entails further and greater loss of time. Such mechanical and electrical warp stop motions as are attached to the Northrop, the Baker-Kip, and other looms may prevent a broken thread from breaking others, but they add something to the strain which the warp must resist. Large shuttles and deep sheds, however, are more fruitful causes of breakages, and a tendency unduly to enlarge the shuttle is one sign of the times.

It must not be assumed that the attention of inventors has been entirely engrossed in devising cop and shuttle-changing mechanism, for that would imply a lack of imagination and initiative on their part which would be altogether unwarranted. The loom problems have been attacked simultaneously from many sides, and upon no side with more ingenuity than that of removing the shuttle and replacing it with a carrier which draws from a large supply of weft a sufficient length for one pick or two picks. Of these schemes the Seaton loom and the Smith feeder are the best known examples. In the former a store of uniform or multi-colored wefts, sufficient to last for many hours' working, is placed upon the floor at each end of the loom and led through small tubes to the shuttle-boxes. A thin metal carrier, provided at each end with a pair of nippers, enters a shuttle-box, and the outer jaws of the nippers close upon the end of a thread presented by one of the guide tubes. In passing through the warp the carrier draws in enough weft for one pick. A similar sequence of movements occurs at the opposite end of the loom with the other nippers and with another weft thread. Meanwhile parts at each side of the loom measure are cut off the exact lengths of weft required for following picks. This loom is now in the works of the Anderston Foundry Company, of Glasgow. Smith's feeder is merely an attachment to an ordinary loom, and consists of a cone composed of several pounds' weight of weft, a carrier, and a catch-thread. Weft from the store is passed through an eye into the carrier, and as the latter is driven through the warp two weft threads are left behind it, the catch-thread passes between them, and when the carrier returns to the starting end both picks are left in the same shed.

It is well known that a shuttle only performs useful work for one-quarter of every pick, and is moving into, or out of, or remaining idle in a shuttle-box for the remaining three-quarters of each pick. If a shuttle could be kept constantly moving through the warp a great economy would obviously be effected. At least one scheme for attaining this end is being worked out at present. The chief features of the scheme consist in sectional shedding, sectional beating-up, and constantly moving shuttles. The threads of four warps are led vertically upward and distributed uniformly around a large circle, except for a small gap between warp and warp. A series of short reeds forms a horizontal, circular platform, upon which two or four shuttles constantly travel by reason of contact with rotating arms from a central vertical shaft.

The warp threads are divided in advance of and closed behind each shuttle, and the short lengths of reed move upward in rotation to beat home the weft. Cutters are placed in the centre of each gap between the warps, and as soon as a shuttle has passed the weft bridging the gap is cut, and feelers fold back the short lengths into the respective warps to form selvedges.

Whether or no any of the looms referred to in this article will ever supersede the present power-loom, it is impossible to say; but it is safe to predict that a more productive, as well as a more perfect, weaving machine will be forthcoming. It cannot be conceived that all the ability, energy, and money now being bestowed upon the solution of this problem will be unproductive.

* * *

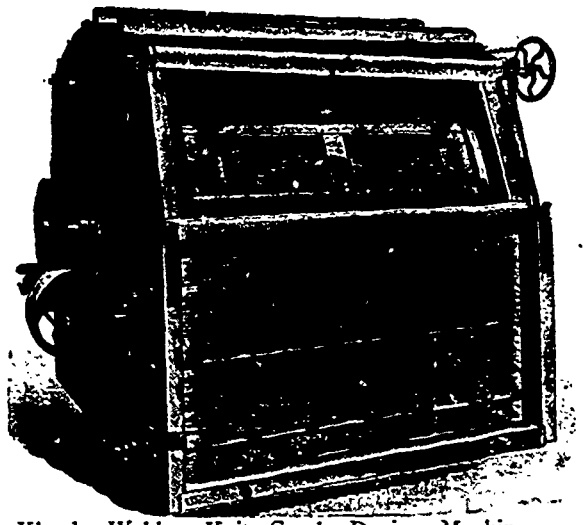
DYEING UNDERWEAR.

BY ROGER WILLIAMS, IN THE TEXTILE WORLD RECORD.

The dyeing of underwear is done by four methods; in the raw stock; in the skein; in the garment partly made up but not finished; in the roll just as it leaves the knitting machine.

The goods for dyeing in the garment are first knit into rolls, then cut and made up, but not finished; they are then counted into dozens, tied with strings and sent to the dyehouse. After coming to the dyehouse they are first boiled out, either in open kiers or vats, and after boiling are dyed in a cylindrical machine having six compartments.

This machine rotates through the dye, keeping the goods in motion and contributing to evenness of the color. These machines dye from 150 to 400 pounds in a batch so that case lots can be dyed in one batch. Care must be taken, however, not to run the machines at too great a speed and cause the goods to roll and knot up, as this will cause uneven dyeing and seconds will result.



The Klauder-Weldon Knit Goods Dyeing Machine.

After boiling out, the goods are washed in running water and then extracted; after extracting they are counted so that each compartment will have about an equal share of the batch and then the dyeing is begun. For light shades the goods are generally entered at 140 and run one-half hour, the salt or Glauber's salt added and the dyeing continued for one-half hour longer, when it is completed.

The accompanying illustration shows the well-known Klauder-Weldon garment dyeing machine, which is one of the best types of machines in use for this purpose.

The Klauder-Weldon machine has been in general use throughout the country for many years and most of our readers are familiar with its construction and operation. Among its advantages are the uniform application of the color, the large production, small amount of labor required, economy of steam and dyestuff, and simplicity of construction. The goods are placed in the six different compartments of the cylinder which revolves in liquor in the tub. The goods are thus alternately brought into the liquor and then carried around with the cylinder. During this passage the goods fall from one side of the compartment to the other, and thus are in a different position when entering the liquor from that during the preceding immersion. In this way all parts of the material are exposed to the action of the dye in the same degree.

The compartments are separated from each other by partitions of round wooden slats which allow the free passage of the liquor. Perforated doors in the outside of the cylinder permit the liquor to pass from the tub into the cylinder, thus maintaining a free circulation.

The machine is easily loaded and unloaded. When in operation its action is entirely automatic and requires attention only for the regulation of the steam and the application of dyestuff. As the liquor is practically protected from exposure to the atmosphere, very little steam is required to keep it at a boil. The volume of liquor is reduced to a minimum, as compared with the amount of material being dyed; this results in using the dyestuff to the best advantage. The construction is simple and in some cases the cylinder is driven by pinions on a shaft located across the back of machine. The gears on this shaft connect with bronze gear racks that extend around the periphery of the ends of the cylinder. From 150 to 400 pounds of goods can be colored at one time, and, if properly prepared for the dyeing process, will come out uniform in shade.

The Klauder-Weldon machine is built for raw stock and yarn, as well as knit goods, and gives equally good results on either of these materials. We lately saw one of the first of these machines to be built running side by side with one of the latest machines, and both were giving excellent results.

After being extracted the goods are sent to the boarding room to be shaped and dried. This is done by putting the garments on wooden forms called boards when they are wet and allowing them to dry in this stretched condition. The goods are dried by the well known hot air principle; they are first placed on a movable truck, put into the dryer and left there until dry. The garments are next removed from the boards to be finished, that is, to have the bands and buttons sewed on and to be pressed and boxed. They are pressed between cardboard or leather papers under pressure of hot plates.

The system of dyeing knit goods in the roll is now coming into general use and is carried out as follows: The goods are sent to the dyehouse in the form of rolls just as they come from the knitting machines. These rolls are usually boiled out in an open kier, then put through a washing machine and extracted. After extracting they are dyed in kettles specially constructed for this purpose.

These kettles have a roll over which the pieces are passed, the ends being sewed together to make an endless piece, so that they are continually passing through the liquor until the dyeing is complete. The length of these pieces should be as nearly equal as possible, so they will all get the

same circulation in the same time. If one piece is, say, 100 yards long and another 200 yards in length, both travelling at the same rate over the reel, one would pass through the liquor twice as many times as the other. This is likely to cause different shades in the same dyeing.

The dyeing of knit goods, whether in the roll or in the garment, requires care and experience. The dyes used are nearly all of the "direct" type, that is, colors which require no previous mordant. For light shades the goods are generally boiled for one-half hour in the dye before adding salt or Glauber's salt, and then the dyeing continued for one-half hour longer in order to complete the dyeing and thoroughly exhaust the dyebath. The dyes chosen for this work are those which are fast to washing and hot pressing, and those which are easily soluble and go on evenly. For very light shades the goods are bleached before dyeing, but in most cases this is omitted and the dyeing is done in the gray. Whether the goods are dyed by one method or the other every care should be taken by the dyer to get the very best results; his batches should weigh as nearly alike as possible; in weighing out dyestuffs he should see that his weighings are correct and insist on having thoroughly reliable scales. A color can be thrown off shade very easily by an error in weighing either the goods or dyestuff, especially when 100 pounds of goods are dyed with one-half ounce of dyestuff or even less. Managers should provide their dyer with enough machines or kettles to dye the different ranges of shades, so that the dyer should not have to dye, say, pinks, browns, and blues in the same machine, losing time and money, cleaning out and changing from one shade to another.

The ventilation should be good, the steam should be carried out to prevent condensation on roof or ceiling of the dyehouse, thus preventing drops of dirty water from falling from the ceiling and staining light colors.

No matter how good the dyer is he cannot do the best work without the best machinery and under the best conditions, and if the mill management desire the best results at the lowest cost, they should place their dyer in a position to get them and then insist on their being produced.

* * *

ON THE ORIGIN OF MILDEW IN WOOL GOODS.

Under the term "mildew" a disease of the wool fibre is understood which is generally attributed to micro-organisms either of fungus or mould growth. It is frequently met with, and in dyed goods usually appears as light patches. The microscopic appearance of mildewed wool, described by V. Georgievis and Schimke, differs materially from that of wool attacked by acids or alkalies. In its initial stage it is considered by some to be curable, whereas by others the contrary is maintained. The author set out to isolate the micro-organism with the idea of being able by its study to indicate how to combat it. He found it impracticable to make cultures from pieces showing mildew since such goods, by the time they were examined, had passed through several processes which had effected the extinction of the micro-organism, though its effects remained. He succeeded in producing characteristic mildew spots in perfect cloth by rolling it up after thoroughly wetting with a piece of rotten wood, and then keeping in a moist chamber at 41 deg. C. In three days mildew could be detected under the microscope, and from fibres taken from the infected parts pure cultures of the micro-organism of which it consists were easily produced. With these cultures a series of experiments on cloth were carried out

A piece of white cloth previously boiled for one hour in water was inoculated with a pure culture of the bacteria, and placed along with a second piece not inoculated in a moist chamber, in which the temperature was maintained at 40 deg. C. In three days the inoculated places showed the characteristic appearance of mildew, made easily apparent to the naked eye by dyeing both samples with acid green. The uninoculated piece dyed perfectly level, whilst the other one showed light patches on the inoculated places. This experiment was repeated a number of times, but always with the same results. For a further experiment two pieces of cloth were dyed with acid green, in one case with acetic, in the other with sulphuric acid, and together with an undyed piece previously boiled in water, were inoculated and tested, as above described. In four days the undyed piece was mildewed, whilst the dyed ones were not.

In order, then, to determine whether the dyestuff or the acid had prevented the bacteria developing, two pieces of white cloth were taken and boiled, one in sulphuric, the other in acetic acid, corresponding in strength to the dyebaths previously used; rinsed, inoculated, and treated as before. In four days it was found that a sample which had not been treated with acid had become mildewed, whilst the acid treated ones were quite free from it, proving that the acid prevents the development of the bacteria. Similar experiments on indigo-dyed cloth first boiled one hour in water showed that it was attacked much more rapidly than undyed cloth, as the inoculated places showed mildew in twenty-one hours. This fact is well known to practical men, and may be owing to the dyestuff or the slightly alkaline state of the cloth. In view of the preservative action of acids demonstrated by the previous experiments, the author tried their effect in this instance. He boiled a piece of indigo-dyed cloth in N 20 sulphuric acid, and afterwards inoculated it. After eight days' treatment no trace of mildew could be detected under the microscope.

The author afterwards learned from a practical man that it was his custom in summer to pass indigo pieces through acid if they could not be finished without delay, to prevent their mildewing. Further experiments showed that indigo cloth dyed in a fermentation vat was more liable to mildew than when dyed in an alkaline hydro-sulphate vat, whilst when dyed in a slightly acid hydrosulphite vat no mildew could be detected after eight days' treatment. Seeing that indigo apparently favors the development of mildew, the behavior of other dyestuffs in this respect was tried. Cloth samples were dyed with the colors named, after which they were boiled one hour in water, and afterwards inoculated with the following results: From previous results it was to be expected that the slightly acid patterns would not develop mildew, but from the fact of a piece in an alkaline state like that dyed with methylene blue not developing mildew, it may be concluded that some colors act as antiseptics. The author's finding was confirmed from a practical source that pieces dyed in an acid bath never become mildewed, and if such show mildew it has been present before the pieces have been dyed.

According to an experiment made by the author, it appeared at first sight as though cochineal scarlet covers mildew, as shown by the following experiment: A piece of cloth upon which mildew had been developed by inoculation and cultivation was dyed by him with cochineal scarlet. The color was quite even, and no mildew visible to the eye. In a few days, however, after the cloth had been frequently rubbed, the mildew places became visible. An attempt to develop mildew on cochineal-dyed cloth, even after sixteen days' cultivation, gave negative results under the microscope on the inoculated parts. The author is of opinion that all mordant colors are like cochineal in apparently covering mildew. He dyed two mildewed samples one with Chrome black, the

other with Alizarin Bordeaux on a Chrome mordant. In both cases no signs of the mildew were apparent after dyeing, but after drying light place showed themselves. The conclusions the author arrives at are the following:

1. Mildew is the effect of a form of bacteria. 2. The mildew bacteria is very susceptible to dilute acids either inorganic or organic. 3. Pieces dyed in acid baths will not mildew before the acid is washed out. 4. Pieces dyed in an acid bath, which show mildew spots after dyeing, were mildewed before dyeing. 5. Mildew is most rapidly developed on indigo-dyed pieces which are slightly alkaline. 6. Indigo is actually destroyed by the bacteria of mildew, and the light patches in mildewed indigo pieces are due in part if not entirely to this. 7. Many dyestuffs, such as Methylene blue, act as antiseptics to mildew, so that goods even in an alkaline condition, if dyed with such colors, do not develop mildew.

In a supplementary article, the author gives results of experiments made with Methylene Blue, Methyl Violet, Magenta, Safranine, Malachite Green, and Auramine, showing that Methylene Blue, Malachite Green, and Safranine entirely prevent mildew, which cannot consequently be developed upon goods dyed with these colors. On material dyed with Methyl Violet a very slight development of mildew took place, whilst on material dyed with Magenta or Auramine the mildew was strongly developed, and its ravages on the fibre easily visible to the eye, the Magenta being almost decolorized on the parts infected, whilst the shade of the Auramine was unaffected.—W. Kalmann, in Hosiery Trade Journal.

THE TEXTILE TRADE OF ALMONTE.

The Almonte Gazette publishes an interesting report on the manufactures and trade of the town, from which the following extracts are taken: Our townspeople have also been well employed, and the output of our mills has been large and profitable with one exception. The product of the Rosamond Woolen Co. is this year below the average, which the management claim to be due to the competition of British woolens admitted under the preferential tariff.

Last year there were shipped over the C.P.R. from Almonte 1,335,000 yards woolen and worsted cloths and flannels, valued at $427,000, and knitted goods to the value of $262,560.

The output of the several factories is as follows:

Jas. H. Wylie, Limited:	
450,000 yards of flannel, valued at	$ 82,000 00
Wm. Thoburn:	
385,000 yards flannel	70,000 00
Rosamond Woolen Co., Limited:	
500,000 yards woolen and worsted cloth	275,000 00
Almonte Knitting Co., Limited:	
Underwear, sweaters, etc.	130,000 00
Anchor Knitting Co., Limited:	
Underwear, hosiery, etc.	132,500 00
Total	$689,500 00

—A great deal of cotton machinery is idle in New England cotton manufacturing towns, such as Fall River, Biddeford, Holyoke, Burlington. The cause is not altogether due to scarcity of cotton, but in some cases owing to the war between Japan and Russia, some of these mills being devoted to cloth for the Chinese and Japanese markets, which may be temporarily closed by hostilities.

Textile Design

DESIGNS IN FANCY TWEEDS.

Fancy Tweeds.—These still remain very rich in coloring and simple in weave. The novelty consists either in the mixture yarns used, or in the methods of warping or wefting. The style illustrated, Fig. A, is suggestive of the lines of pattern being developed in these textures.

Fig. A.

Warp.

1	thread of orange.
2	threads " black.
1	thread " green and white twist.
3	threads " black.
1	thread " green and white twist.
2	3 threads " dark green.
	1 thread " white.
1	thread " orange.
2	threads " black.
1	thread " green and white twist.
3	threads " black.
1	thread " green and white twist.
	3 threads " dark green.
	1 thread " white.
	3 threads " dark green.
	1 thread " white.
2	3 threads " black.
	1 thread " green and white twist.
	3 threads " black.
	1 thread " green and white twist.
2	3 threads " dark green.
	1 thread " white.
2	threads " red.
1	thread " black.
1	thread " green and white twist.
3	threads " black.
	1 thread " green and white twist.
	3 threads " dark green.
	1 thread " white.
2	3 threads " dark green.
	1 thread " white.
	3 threads " black.
	1 thread " green and white twist.

3 threads " black.
2 { 1 thread " green and white twist.
  { 3 threads " dark green.
1 thread " white.

8's reed, 4's.

Weft.

7 threads of dark brown.
3 threads " black and white twist.
1 thread " dark brown.
3 threads " black and white twist.
6 { 9 threads " dark brown.
  { 3 threads " black and white twist.
  { 1 thread " dark brown.
  { 3 threads " black and white twist.
2 threads " red.

30 picks per inch.

All 2/32's skeins yarn.

Stripe and Suiting Patterns.—Some examples in single-weave textures are given in Figs. B to E. They are not only useful as suggestions for these styles in woolen or worsted yarns, but being of a typical character, are of special value to

Fig. B.

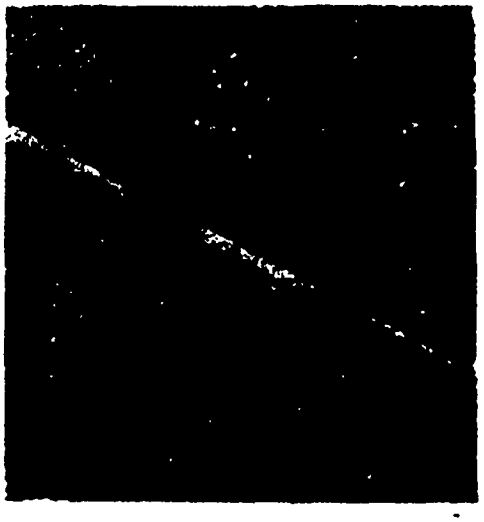


Fig. C.

the student of woven design. They show, in the first place, the effect of weave structure and of compounds of weaves, and in the second, they give an illustration of how a variation in weave changes the effect due to a simple order of coloring. Taking the weave contrast first, and referring to Fig. B, the novelty here or freshness of pattern is due to the knops in the worsted yarns, which are almost white in color, and crossed with a black weft. The weave itself is a simple

64

Design 1757.

angled twill (Design 1757), the counts of the warp yarn being 10 skeins, and of the weft 16 skeins, with 28 threads and picks per inch in the loom.

Fig C is a simple derivative of the $\frac{2}{2}$ twill (Design 1758), and therefore weavable on four shafts. The warp

Design 1758.

yarn is 2/36 skeins, and the weft 15 skeins, with 32 threads and 36 picks per inch on the loom. This is an excellent weave for over-checking or for striping. As seen in Fig. C, it makes a tweed of a suiting class.

Figs D and E are also stripe compounds of derivatives of the $\frac{2}{2}$ twill, a form of pattern which may be varied to an unlimited extent, both in respect to the relative dimen-

Fig. D.

Fig. E.

sions of the stripings, and to the methods of applying color. The examples emphasize the weave contrast, the warp being light and the weft dark shade.

Fig. E is in worsted yarns, and hence the clearness of weave detail, but weave compounds are equally successful in Cheviot, as well as Saxony.

The warping for Fig. D (Design 1759) is:

1 thread of 2/30 skeins.
2 threads of 20 skeins,

the weft being all 20 skeins, with threads and 46 picks per inch.

60 60

Design 1759.

Fig. E is a $\frac{2}{2}$ twill, cut in 2's angled, with 92 threads and 64 picks per inch. The comparatively small number of picks per inch gives the elongated characteristic to the weave.—Roberts Beaumont, Professor of Textile Industries, Yorkshire College, in the Textile Recorder, Manchester.

* * *

M. Dupont, a manufacturing hosier, of Paris, France, whose stockings, colored with black aniline dye, caused blood-poisoning to one of the wearers, has just been condemned to a fortnight's imprisonment and to pay a fine of $20 and $20 damages.

TREATMENT OF RAGS FOR RE-MANUFACTURE.

H. SCHIRP, UNTER-BARMEN, GERMANY, IN THE TEXTILE JOURNAL.

The manufacture of goods in this and other countries from old rags, remnants and the like, has assumed considerable proportions during the last quarter century; and, although the use of shoddy goods may not be the highest form of economy, there is no doubt whatever as to the great demand on the part of the poorer classes of people for them. The chief centre for the manufacture of goods from old materials, which are broken up and afterwards spun into coarse yarn for the making of cloth, is, so far as Great Britain is concerned, in the districts of Dewsbury and Batley; whilst there is a great deal of this class of manufacture carried on on the Continent, in Germany, Belgium, Austria, and Italy, in addition to Russia, Norway and Sweden, and some other countries which also carry on the manufacture in a fairly extensive way.

The rags and other remnants are generally collected by wholesale rag merchants, who roughly sort them into colors and qualities, bale them, and deliver them to the carbonizing mills, whose special object is to thoroughly sort the rags, clean them, and break them up ready for delivery in a state suitable for use in the cloth mills, where the rough fibres are spun into coarse yarns and woven into cloth. Sorting is carried on by women, who spread out the rags on sorting tables and put the different colors and qualities in skips. After this operation has been performed, it is necessary that the rags be thoroughly carbonized. This process may be carried out either by the wet or dry process. In the former the

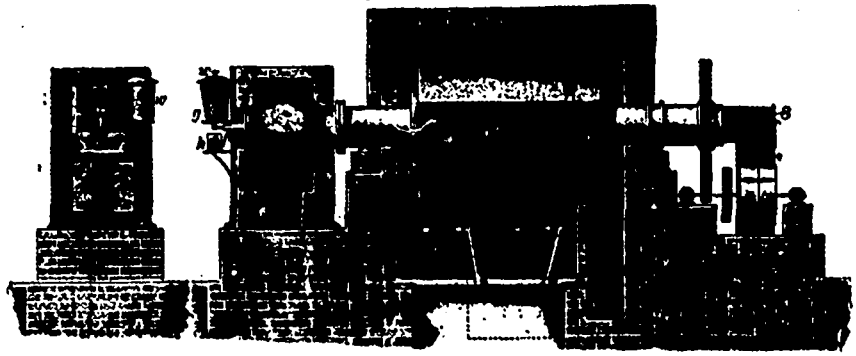


Fig. 1.

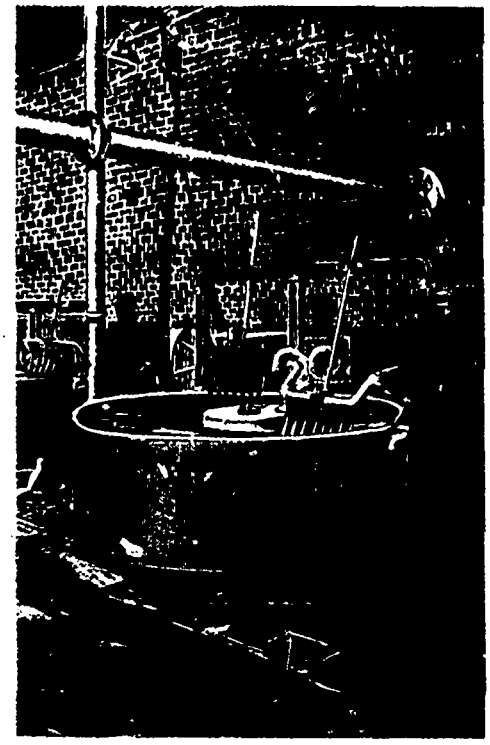


Fig. 2.

rags are dipped in a reservoir filled with diluted sulphuric acid, in which they remain till thoroughly impregnated. They are then shaken, and taken to the carbonization or drying room, which consists generally of a rectangular building, in which there is a platform of strong wire mesh arranged a little distance from the floor, on which the rags are laid. On one side of the space covered by this wire is a heating apparatus, designed either to force or induce a current of hot air through the goods to be carbonized. The wet process, is an old-fashioned arrangement, and had a great deal of vogue up to a few years ago; but it is also a costly one, and, what is more, a great deal of space was necessary in order to accomplish even a comparatively small amount of work. Consequently, this process has given way to various systems of mechanical carbonization, of which the treatment of the rags with hydrochloric acid vapor in a closed cylinder is considered to be the best, both on account of its simplicity and cheapness. Figure 1 is an exterior view of the retort chamber, and Figure 2 a longitudinal section through the chamber in which the rotary carbonizing cylinder is placed. From these latter views, it will be seen that A is the cylinder in which the rags to be carbonized are placed, and B is the retort in which the hydrochloric acid is vaporized on its way to the former. The retort B is combined with a hollow axis i of the cylinder A, and consequently rotates with same; d is the furnace below the retort, and is designed to enable the heat to thoroughly circulate round B; w is a tank, arranged at the exterior of the retort chamber, containing a supply of acid, which is discharged therefrom into a semi-circular vessel, arranged below the axis of the retort. The outer end of the retort has secured to it a pipe f, which can revolve with it. The end of this pipe is fitted with a scoop g, which, at each revolution of the retort, picks up a definite quantity of acid from the semi-circular vessel h, and transfers it to the retort B, wherein it is vaporized. The scoop g has an automatic closing arrangement which locks in the acid immediately it has been lifted up, thereby preventing any escape of vapor from the retort. As the acid is vaporized, it passes directly through the axis i into the carbonizing cylinder A, with the result that no vapor is lost, and there is a great saving of acid over other known methods. It will, of course, be understood that, prior to the passing of vapor into the cylinder A, the rags therein have been thoroughly dried. This drying is carried out by means of a battery of pipes below the cylinder A. The latter, we should say, is pentagonal in cross section, is provided with a hinged door, and is fitted internally with hooks, which lift up the rags during the rotation of the cylinder, and retain them for a time, thus preventing the formation of balls. The cylinder is rotated by the pulleys, shown at the right of Fig. 2, which transmit motion to the train or gear wheels indicated. As the rags continually rise and fall, the acid vapor enters into every fibre, whilst the dust from rags can escape from the perforations q into the pit 4 which is separated from the chamber containing the battery of pipes by the partition 3. A careful provision is made for discharging any gaseous fumes direct to the flues connected with the mill

Fig. 3.

chimney. By means of the apparatus we have just described, the whole of the carbonizing process, including drying, packing, and unpacking, occupies about three and one-half

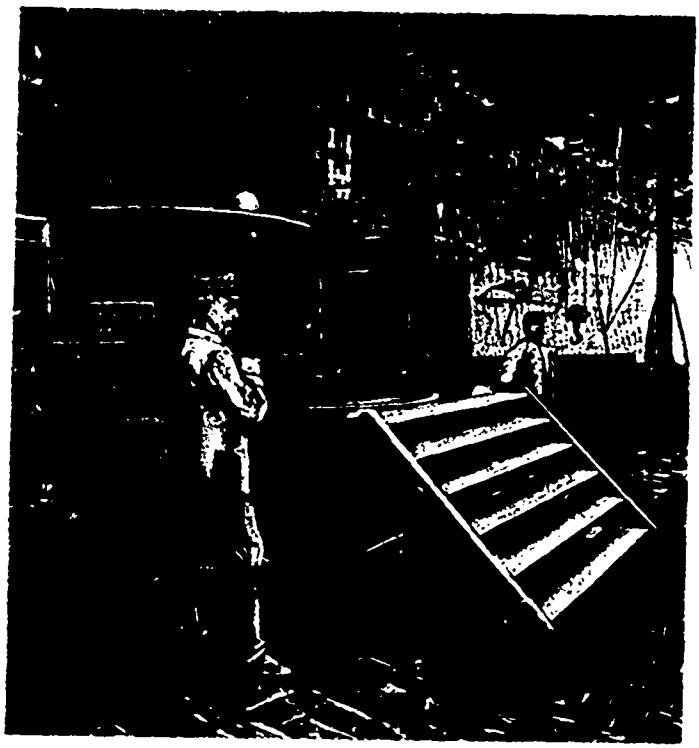


Fig. 4.

hours, and in twelve hours, according to the size of the apparatus, 500 to 1,000 kilogrammes of rags are carbonized, and the quality and color thoroughly retained. The size of the machine also determines whether one or two men are necessary to its operation. The saving effected over the old wet process comes out at about 50 per cent.

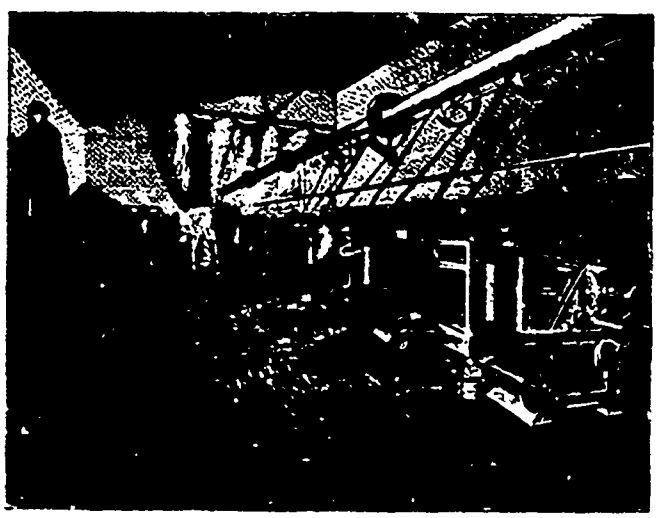


Fig. 5.

After the rags have been carbonized, they are placed in a rotary dusting cylinder, and then taken to be washed. The washing room is indicated in Fig. 3. Each washing machine consists of a rotary tank, provided with a false perforated bottom, and so arranged that the dirty water does not flow directly on to the ground, but first rises through a central upright chamber, and then flows away. This arrangement prevents any loss of the rags. The circulation of the rags in each tank is carried out by a pair of rising and falling forks, arranged and operated in a very similar manner to the old type of forks used in ordinary wool-washing machines. If the rags are required to be dyed, they are transferred to the dyeing room, indicated in Fig. 4. The dyeing apparatus consists of three tanks, as illustrated. The dye liquor is contained in the bottom central tank, and from thence can be lifted, by means of a central pipe and a circulating pump, into one or other of the dyebaths arranged above the tank. The central pipe is fitted with a swivelling curved end, so that it can be readily turned from one tank to the other. Whilst dyeing is taking place in one tank, the other is being charged with rags. The liquor is in continuous circulation through the dyebaths, each of which is furnished with valves and delivery cocks, by means of which the goods can be rinsed after dying. The dyeing apparatus is exceedingly simple, and requires very little attendance.

The next process is to dry the rags, and this is carried out out in a very similar manner to the carbonizing process except that no retort is used. The drying cylinder is provided with perforated sides, and in place of the revolving retort, there is arranged a coke fire air heating apparatus. Two similarly arranged chambers bring air to the fire, and their inlets can be controlled as desired. The heated air is led through both ends of the axis to the interior of the drying cylinder. After being thoroughly dried, the rags are transferred to the tearing or breaking-room; and passed through the willows, a number of which are indicated in Fig. 5. The rags are placed upon endless lattices, sprinkled with oil, and fed through rollers into the interior of the machine, where they are broken up by the revolving spiked cylinder and stationary spiked surface of the machine. After the breaking up the material is baled for transference to the mills manufacturing shoddy goods.

—The Argentine Republic has passed a law granting exemption from import duties in regard to machinery for spinning cotton and for combing wool, or for spinning combed wool, and on the accessries and materials necessary for the installation of such machinery, to all companies or individuals who shall have established, or shall seek within three years to establish, factories for such purpose. The law further exempts such factories from payment of all national taxes for a period of ten years. The executive is empowered to limit in each case the amount of duty to be remitted.

BRITISH WOOL AND TEXTILE MARKETS.

(Correspondence of Canadian Journal of Fabrics.)

Since our last report, the London sales have come and gone, and on the whole left raw material considerably harder than was expected, although the volume of trade transacted is not above the average for the time of the year. The advances made at London have not only established themselves on the Bradford and Continental markets, but the values have even advanced since the close of the sales. Our reports from Continental centres fully confirm this hardening tendency which has already affected not only wools but also noils, wastes and shoddies.

In a report, which we received from Roubaix a few days ago, we were informed that at the recent auctions, both wool and noils had shown an advance of 10 per cent. on December prices. The manufacturers around that centre report that their travellers are booking good orders in corkscrews and cheviots; stripes seem to be well in favor in different combinations and in various descriptions. Our reports from Germany report the same advances in raw material there. Manufacturers report that in wools dark colors are being sold most readily. In Germany also striped goods appear to be in great demand. From Mazemet we are informed that all descriptions of wools are selling well, especially crossbreds.

In England business cannot be said to be in a satisfactory condition, especially in merinos. Spinners, who wish to buy are obliged to pay higher prices, and cannot get corresponding advances for their yarns. It was expected in many quarters that the outbreak of war would entail a general lowering of prices, and a depression in trade, but such has not been the case, although we have heard of several local stuff and wool merchants, who have had their orders from China and Japan cancelled.

From the Argentine we have been informed that the clip this year is estimated at 10,000 tons, against 11,000 tons last year, and 13,000 tons two years ago. A considerable business is said to have been done there and the stocks practically cleared.

The exports from the British Isles for last month, in wool, show a considerable decrease from that of the same month of last year, especially those to the United States, which show a decrease on the month of over 800,000 lbs. The exports of yarns and wastes are practically the same,

(Markets continued on page 6.)

CHEMICALS AND DYESTUFFS.

There has been a marked improvement in trade during the last two weeks; buyers of heavy chemicals are placing their orders for spring delivery. Prices remain firm on all lines.

Bleaching powder	$ 1 60 to	$ 1 80
Bicarb. soda	1 75 to	2 00
Sal. soda	0 80 to	1 00
Carbolic acid, 1 lb. bottles	0 35 to	0 40
Caustic soda, 60°	2 10 to	2 25
Caustic soda, 70°	2 35 to	2 50
Chlorate of potash	0 09 to	0 10
Alum	1 35 to	1 50
Copperas	0 65 to	0 75
Sulphur flour	1 60 to	1 70
Sulphur rock	1 75 to	1 80
Sulphate of copper	0 06 to	0 06½
White sugar of lead	0 07 to	0 08
Sumac, Sicily, per ton	57 50 to	58 00
Bich. potash	0 7½ to	0 08½
Soda ash, 487° to 587°	1 25 to	1 35
Chip logwood	1 50 to	1 75
Castor oil	0 07 to	0 08
Cocoanut oil	0 07 to	0 08

(British Wool Markets Continued).

whereas worsted tissues and blankets show a decrease. The exports of carpets, on the other hand, amount to about double the amount of the corresponding month last year.

The wools, which are the most difficult of sale, are the finest qualities, and we have heard of merino tops being sold at slightly lower prices than we realized a month ago. On the other hand, crossbreds and low wools and wastes in corresponding qualities seem more difficult to buy every day.

Bradford, February 17th, 1904.

D. H. Ross, Dominion Government agent at Melbourne, Australia, reports that the wool exports of the Commonwealth, for the six months ending December, were 107,000 bales. Some 100 bales went forward from Melbourne to Boston by the December sailing of the Vancouver steamer. If shipments can be sent to the principal American wool market by this route, Mr. Ross asks why cannot Canadian buyers operate in Australia for their requirements, and thus save intermediate profits, by which means the cost of their productions is lowered.

The second series of the 1904 auction sales of wool opened in London on the 8th inst. There was a large attendance. The offerings numbered 13,082 bales, including a large supply of crossbreds. Competition was brisk. Yorkshire buyers were keen bidders for crossbreds. German and French buyers competed for merinos, the offerings for which were light. Scoureds sold readily. The offerings of Cape of Good Hope and Natal were principally greasies, and they declined 5 per cent. American purchasers included a few combing greasy, ad also some neck wools and pieces.

Gustav Ebell & Co.'s annual report of the wool trade of Germany for 1903 shows that German imports of South African wools continue to increase. In 1894 the Cape wools imported by Germany were estimated at 97,000 bales, and these figures were increased year by year till 1899 when the import reached 155,000 bales. The next year the import fell to 80,000 bales, but it has regularly increased since then, and stands at 150,000 bales, in 1903, a significantly large total. Messrs. Ebell & Co. predict a growing demand for merino wools due to the tendency of fashion for goods of fine texture.

* * *

WOOL MARKETS.

Toronto. Market quiet. Enquiry from domestic mills moderately active. Little or no enquiry for fleece, stocks of which have been pretty well cleared up. Prices quoted are. Fleece, combing, 17½c.; clothing, 19c.; unwashed, fine, 11c.; unwashed, coarse, 10c.; pulled, super, 19 to 21c.; extra, 22 to 24c.

Montreal.—Fine and medium crossbreds unchanged; coarse, 5 per cent. higher than closing prices last month.

* * *

The Appleton Mills closed down on February 29th owing to scarcity of water.

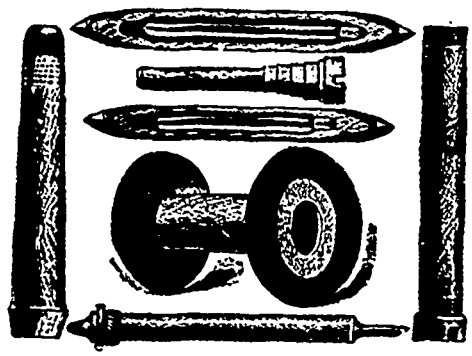
An order-in-council has been passed by the Dominion Government, extending the trade preference of 33 1-3 per cent. to New Zealand, in return for the preference granted to Canada by that colony. South Africa received the Canadian preference some time ago.

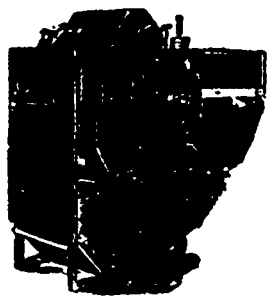
—The census bulletin for 1901, dealing with New Brunswick, shows a total of 182,524 sheep, in 1901, compared with 182,941 in 1891. The product of wool shows that 68,009 lbs. of fine wool was produced in 1891, and 351,250 in 1901, whereas the coarse wool produced in 1891 was 624,889 lbs., against only 358,566 in 1901. Either the census figures are incorrect, or the ten years has developed a noteworthy increase in the average yield of wool per head.

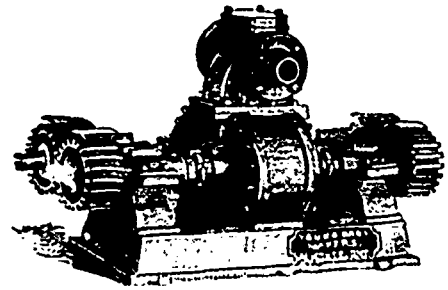
—Over a ton of cotton seed has been distributed from the Grove Station, in the island of Montserrat, West Indies, to 63 persons. About 700 acres have been planted, and despite the ravages of the cotton worm and the leaf blister-mite, preparations are already being made to increase the area next season. It is estimated that there are about 10,000 acres of land suited to the growing of Sea Island cotton in Montserrat, and with a three years' rotation this would enable planters to have over 3,300 acres annually in cotton.

A woolen manufactury is proposed at Vancouver, B.C. The owner of a large Australian sheep ranch came to Canada recently to look into the question. He was invited here by a well-known citizen, who believed there was an opening for such a factory. The C.P.R. steamship line are anxious to carry freight from Australia ,and the rates quoted on wool are very low. It is stated that the first cost of laying the wool down in Vancouver for the manufacture of garments, would enable the wool to be manufactured and quoted in British Columbia, Manitoba and the North-West, so far under Ontario prices, as to make those markets sure. The scheme can be easily financed, and it is probable the factory will be built at an early date.

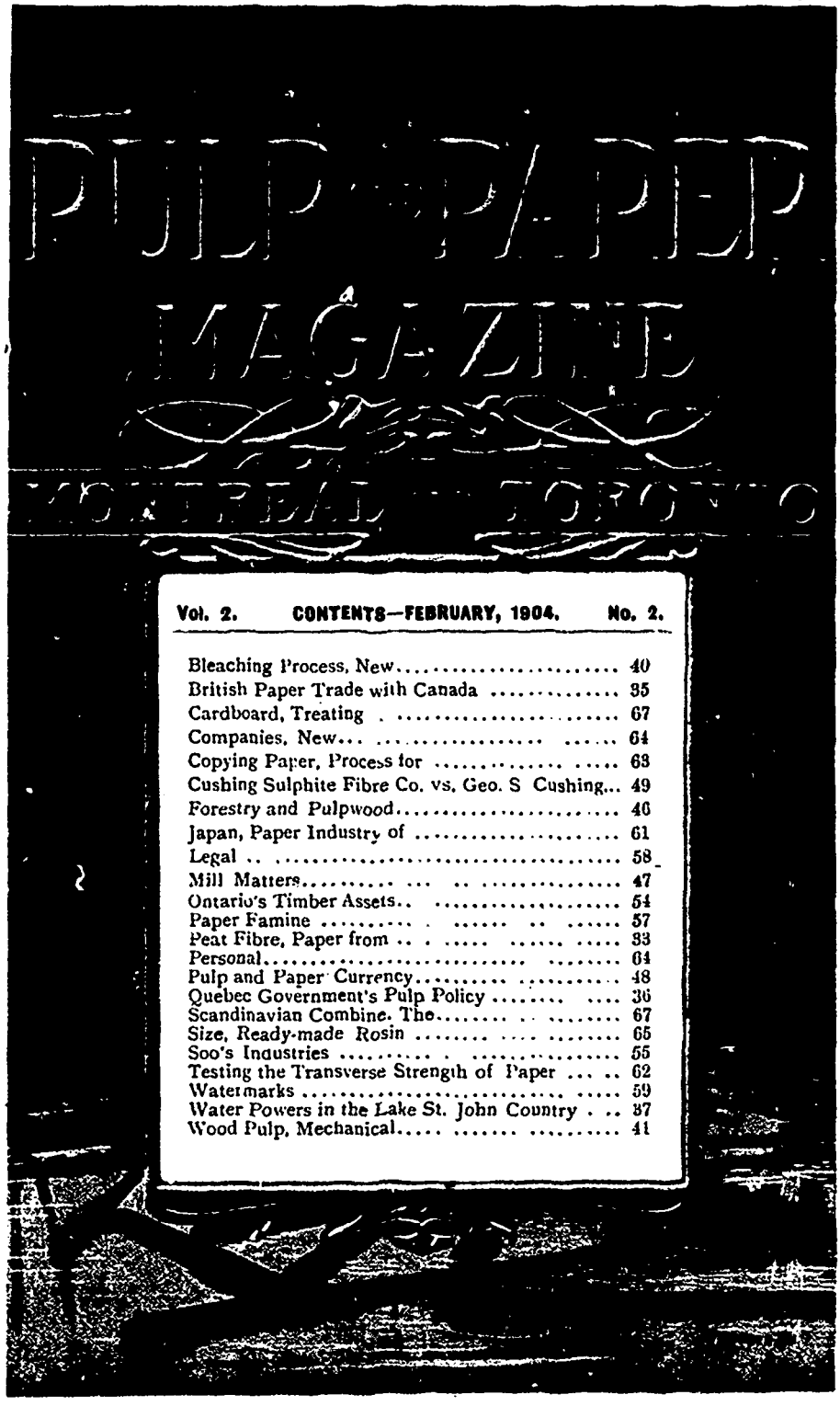
INDEX TO ADVERTISEMENTS







CONTENTS OF FEBRUARY NUMBER.



NEW COMPANIES.

Dominion.—The Elite Costume Co., Limited, Montreal. Capital, $40,000. To carry on the business of dealers in, and manufactures of, ladies' skirts and outer garments, etc. Harris Wener, Samuel Wener, Zelig Wener, Allan R. Oughtred and E. Tobias, of Montreal.

Ontario.—The Ideal Women's Wear, Limited, Toronto. Capital, $40,000. To manufacture, sell and deal in women's and children's wear of every description, and to acquire the business of the "McKay Manufacturing Company." John Tanner, F. F. Allison, Catharine L. Woodruff, T. H. Barton, and A. C. McMaster, of Toronto.——E. Van Allen & Co., Limited, Hamilton. Capital, $100,000. To manufacture and deal in textile fabrics, particularly shirts, collars, cuffs and other clothing, and to acquire the business of E. Van Allen & Co. Eli Van Allen, W. Southam, C. S. Scott, G. Lynch Staunton, and Clara Van Allen, of Hamilton.——The Brantford Hosiery Co., Limited, Brantford. Capital, $75,000. To manufacture, buy, sell and deal both at wholesale and retail in knitted hosiery and underwear. Frank Cockshutt, R. J. Strauss, Nora V. Cockshutt, J. H. Hines, and E. Sweet, of Brantford.——The Ontario Government have issued a license to the Geigy Aniline and Extract Co., of New York, to manufacture, import and sell anilines, dyestuffs, colors and chemicals. Capital, $40,000. T. D. Wardlow, Toronto, is appointed attorney.

* * *

The annual meeting of the Paton Manufacturing Company, of Sherbrooke, was held on February 24th in Montreal. The reports and statements presented were satisfactory, and the following board was elected: Lord Strathcona, Hon. Robert Mackay, D. Forbes Angus, Robert Brodie, Jonathan Hodgson, George Hyde, George M. Loy, M.P.; Robert Reford and John Turnbull. At a subsequent meeting, John Turnbull was elected president and managing director, and the Hon. Robert Mackay, vice-president.

* * *

The leading manufacturers of cloth, silk and cotton goods in Venice, Italy, some of whose places of business were opened all Sunday, have undertaken to close their works, warehouses, shops, and offices from Saturday night till Monday morning, and so to observe in its entirety the Day of Rest. Some time ago resolutions were passed by the Sunday Closing Societies urging upon Parliament the immediate passing of the Sunday Closing Acts. All over Italy an agitation in favor of the observance of Sunday is being systematically carried on, and with good results.

* * *

Henry A. Moore, of Worcester, Mass., has made a proposition to the Sherbrooke city council, to acquire the plant of the defunct Dominion Carpet Co. This company is prepared to purchase the property, to instal new machinery, and to agree to run the business for five years, paying $20,000 a year in wages. The company would also enter into a bond for $10,000, subject to a reduction of $2,000, for each $20,000 paid in wages. The city is asked for exemption from all taxes, except school taxes, for ten years, such exemption to be extended for a further ten years, if the pay roll is doubled; also a bonus of 2½ per cent. on the wages paid. The city council have decided to accept this offer subject to the following amendments: That not less than $25,000 per annum be paid in wages, and that the taxes due by the old company, about $2,000, together with the costs of litigation in the matter, be paid.