Editorial Notices.

Articles, Correspondence, Reports, Items of News, on all matters of novelty and interest bearing upon the Textile Industries, home or foreign, are solicited. Correspondents should write as briefly as possible, on one side only of the paper, and in all cases give their names and addresses, not necessarily for publication, but as a guarantee of good faith. When payment is expected, an intimation to that effect should be sent with the contribution. The Editor will do his best to return ineligible MSS., if accompanied by the requisite postage stamps, but will not guarantee their safe return.

*** Readers at home and abroad are invited to avail themselves (gratis) of our columns, for the purpose of entering into communication with machine makers or others able to supply their wants, and for obtaining any other information on textile matters which they may desire. Their names will not be published unless requested.

All communications to the Editorial Department should reach the offices, 23, Strutt-street, Manchester, early in the week in order to receive attention in the next issue.

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The Textile Mercury.

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THE IMPERIAL BUDGET: REMARKABLE REVELATIONS.

In his Budget speech in the House of Commons, on Tuesday night, the Chancellor of the Exchequer made one or two remarkable statements, which are well calculated to shake the belief so deeply ingrained in the minds of south-country folk as to the amazing profitableness of textile manufacturing. In London and other non-textile districts, "cotton spinner" and "money spinner" are interchangeable terms; and when the trade presumes to resist extensions of harassing legislation, promoted by professional politicians with a keen eye to trades-unionists' votes, any impertinent nobody can raise a sympathetic laugh in the House of Commons by declaring that the cotton trade has always been on the point of ruin, to the best of *his* recollection; but that "cotton lords" are, nevertheless, still as plentiful as blackberries. The Income Tax Returns, however, tell an altogether different tale. "Take the cotton industry," said Mr. Goschen, in the course of his speech, "the cotton manufacturing and productive industry, including spinning and weaving. The total of the profits of those engaged in that vast industry—I am not speaking of wages but of profits,—the total profits of the cotton lords, if I may call them so in the broadest sense, and of cotton companies, is less than the aggregate profit made by the medical profession.—(A laugh.) Again, if I look at the profits of coal mines, notwithstanding the enormous fortunes made therein, the Committee may be surprised to learn that the total profit of coalowners is less than the profit of the legal profession.—(Loud laughter.) The lawyer in his quiet study and the physician in his sombre consulting room are rolling up taxable material almost at the same pace—in fact, at a faster pace—than those engaged in the great industries I have mentioned." Another fact on which Mr. Goschen commented—and a very significant one in view of the Railway Rates and Charges controversy—was that the profits arising from transport and distribution were twice the amount of those made by the producers and manufacturers of the goods thus handled. Taking the total of the latter industries, "including cotton, wool, silk, clothing, metals, and hardware of all kinds, ship-building, sugar refining, tanning, chemicals, brewing and distillation—in all these industries, which together cover a vast area, the profits only amount to half of the profits which fall under the head of distribution and transport. Those who distribute and transport the merchandise and industry make on the whole twice as much as the profits of the manufacturer and the producer." Mr. Goschen added: "I must remind the Committee and the public that I am not alluding to the wages. I am analysing schedule D."

TARIFF ARRANGEMENTS WITH SPAIN AND ELSEWHERE.

The Chancellor of the Exchequer, in suggesting some trifling modification of the wine duties, took occasion to sound a much-needed note of warning to Spain, with a hint to certain other countries that he had them also in mind. The House, he said, would remember the Spanish treaty made in 1886. The duty was then reduced in favour of the Spaniards, and with a result that had been very beneficial to both nations. Spain withdrew its tariff in favour of this country, and we reduced the duty on alcohol in favour of Spain. "Now the Spaniards," continued Mr. Goschen, "have renounced the treaty which we obtained by concessions which we made in 1886. All I wish to say upon the point is this: there must not be the impression, either in Spain or elsewhere, that if the satisfactory arrangements of 1886 should be withdrawn that it is certain they will retain the fiscal advantages that were given with regard to their issue in 1886. (Cheers.) There are strong fiscal reasons why we should put a greater duty on alcohol. I do not wish to propose it, because I do not wish to force the hand prematurely of our Spanish friends, or to put the wine trade into the excitement that would be occasioned. If we were to impose a scale now it would not come into force for some months, because we could not change our duty before the end of June. It is but right to say, in the most friendly spirit, that if concessions given for a certain *quid pro quo* are withdrawn, this country will have an open hand as regards granting similar advantages. (Cheers.) I sincerely hope these negotiations may come to a satisfactory result as regards both parties."

REDUCTION IN PATENT OFFICE FEES.

In further reference to the Budget, the only noteworthy change proposed to be made in the scheme of taxation is a reduction in the Patent Office fees. The primary fee of £4 for the first four years will remain, but at the end of that period and onwards certain reductions will be made. At present the fee after four years is £10 annually. It is proposed that this fee should be reduced to £5, £6, £7, and £8 per year for the second four years. For the fifth and sixth years the fee is now £15, which the Government propose to reduce to £9 and £10 respectively; and for the next four years, instead of £20, they propose £11, £12, £13, £14, a reduction which Mr. Goschen believes will be extremely satisfactory to a very large class, and which will ultimately involve a loss to the revenue of about £50,000 a year. This new scale is not to be brought into operation before the 20th September. In this connection Messrs. Wm. P. Thompson and Co., the well known patent agents, of Manchester and Liverpool, write us that in their opinion the only mistake that Mr. Goschen has made is that he has not gone far enough. The reduction should have been greater, and should have come into operation at once. The reduction only amounts to £55, extended over the life of a patent, leaving renewal fees of £95 still to be paid instead of £150. If he had reduced it by £4 per year more, making the renewal fees commence with £1 and giving a total of £55, he would have rendered signal service to Lancashire and Yorkshire and all manufacturing districts, without, Messrs. Thompson contend, reducing the total income derived from the fees, as on far the greater proportion of patents no renewal fees are ever paid at all. They know many instances of patents that have been allowed to lapse, not because they were worthless, but because the tax was too high. The number of patents upon which the renewal fee of £10 was paid during last year was about 8,000, whereas the number of patents that had been issued and on which if they had not lapsed the renewal fee would have been payable, was 37,319, and on this number the fees at £1, £2, £3, and £4 respectively for the fifth, sixth, seventh, and eighth years would have amounted to £93,926, or a greater revenue than £10 on 8,000. Two or three years would, of course, elapse before this was fully realised, as many patents have lapsed that would otherwise be now in force. Our correspondents think such matters should be brought before all members of Parliament who sit for manufacturing districts, and would advise all inventors and others interested in patents to write to and urge the member for their own district to use his influence to have these fees, which are now a tax upon industry, reduced as low as possible. Mr. Leng, M.P. for Dundee, will no doubt have a word or two to say on the matter when the Budget is under discussion.

MACHINE CLEANING DURING MEAL HOURS.

There is an anomaly in the relationship of employers and employed in the spinning division of the cotton trade, which is found in the fact that one class of workers in the mill are not employed by the owner, nor responsible to him for their actions. These are the piecers, who are engaged by the minders as helps, and are paid by them what they like—which, considered in relation to the services rendered in the performance of the work as compared with their own, is never very liberally. One of the vexed questions on which the trades-unions have aforetime been very loud in declaiming for purposes of their own, and which was really used to harass their

employers, was the question of cleaning during meal times, or after the stoppage of the engine on Saturdays. It will be remembered that a great outcry was made during the passage of the last Factory Bill through Parliament when it was demanded that the mill engines should be stopped an hour earlier, for cleaning purposes, on Saturdays—a demand, the improper character of which having been demonstrated, the House of Commons refused to sanction. Still, the loud outcry had been made, and the activity of the factory inspectors stimulated in order to ensure the prosecutions of the employers, as, singularly enough, the law holds the employers responsible for the proceedings of men who are not their servants, and over whom they have little or no control. The outcome of the cry has been that many employers have conceded the privilege of stopping the machinery during engine hours for cleaning, but of the advantages of this concession the piecers have been deprived by their employers, the minders, who previously were so loud in their demands for it when it was a weapon with which they could harass the master cotton spinners. But putting the concession in force meant a small reduction in their earnings, and therefore they suddenly became silent, as they made up their minds that they would deny it to the piecers, and compel them to clean, as before, during meal hours. But to this the piecers are determined not to submit, and an agitation is in progress in the Oldham district having for its object to compel the minders to stop the mules whilst the cleaning is performed. If refused, they are determined to strike. Thus the employer is placed between two fires: his interests have to be sacrificed between the quarrels of two classes of trades-unionists, the law holding him responsible for such breaches of the Factory Acts as they are quarrelling about. It is quite time that these points were taken into consideration by the associations of employers, and their position in relation thereto clearly defined. Employers who have conceded the liberty to clean machinery during what is termed engine time, would do well to put up in their mills a notice to that effect, and in it to disclaim all responsibility for infractions of the law arising from anyone intervening to set it aside. An inspector who prosecuted the employer under such circumstances would deserve a severe lesson, and no bench of magistrates, we are sure, would convict them of an offence under such circumstances. It is quite time too that the anomaly of which we have spoken should be terminated, and the employer become the employer of all persons in his establishment. This change, which ought to be made as soon as possible, would involve another reform of a very important and radical character. But all in good time: the new organisation of employers, we anticipate, will bear good fruit at an early date.

The Caraguata Fibre of Paraguay.

In a Consular report on the condition of Paraguay, just issued, it is stated that the textile plant called *caraguatá* abounds and grows naturally in every part of the Republic. In the year 1879 Messrs. Braulio Artecona and Luis L. Lenguas made experiments with machinery that they established in the department of Arroyos y Esterios, having obtained from the Government a concession for the working of this product freely for the space of 15 years in all fiscal lands, and to export the same free of duty when manufactured. The results were not satisfactory, owing to the inexperience of those in charge and the imperfection of the machinery. After several fruitless attempts they retired, and their concession lapsed. In 1889-90 Mr. Artecona again organised the same industry, with modern machinery, and took a contract from the company "Tejidona," of Buenos Ayres, for all he could remit. He remitted altogether 400 tons, and the result of the sale might have been remunerative if he had not committed the fault of employing inexpert hands, and spent his capital in useless experiments, and he again suspended operations. Attending to sundry requests from Europe, certain commercial men have lately remitted samples that arrived in perfect condition, from which a profitable result was obtained; but when they remitted large quantities in the year 1890 it fermented on the voyage, and arrived in Europe in an unacceptable condition. The *ibira* is a species of *caraguatá bromelia*, and its fibre is of a finer quality than that of its congener, but neither of them has obtained any importance in commerce, owing to the cost of cleaning and separating the fibre from the leaves. Several attempts, as above mentioned, have been made, but so far without any great success. From the interest which has been awakened in this product in European markets it would seem to deserve a more serious study, and in Paraguay the opinion is held that with improved machinery and more skilled administration more profitable results might be obtained. The flowers have been sent to Kew Gardens, with a view of determining their exact species, which is still undefined.

Bengal Limiteds.

From the stock quotations which appear weekly in *Capital*, a fair idea may be obtained of the position of the various mills in Bengal registered as joint stock companies. As far as the cotton mills in the list are concerned, the shares are generally quoted at a discount. Of nine firms, three paid no dividends last year. These are the Calcutta Mills, with capital and debentures together amounting to Rs.7,91,500; the Dunbar Mills, Rs.17,09,500; and the Muir Mills, Rs.21,50,000. The Muir has 42,000 spindles and 700 looms, and the others are spinning companies only, the Calcutta having 20,000, and the Dunbar 47,936 spindles. The former mill is Rs.40,913 to the bad, and the shares are practically unsaleable. The shares of the Dunbar (Rs.70 paid) are quoted at 33, and the Rs.200 shares of the Muir at 150. This mill is the largest in the province, and has hitherto paid good dividends, the figures being 14 per cent. for each of the years 1885-7; 5 per cent. for 1888; 8 per cent. for 1889; and 5 per cent. for 1890. With reference to the Bengal cotton industry, the *Pioneer* (Allahabad) remarks that the Bowreah Cotton Mills Company is about to consider a new reconstruction and extension scheme in lieu of the scheme previously rejected, and adds:—"The extension proposed of 20,000 spindles, really meaning a new additional mill complete, coming at a moment when the twist trade is not by any means at its best, tells against a perfectly fair consideration of the measure, yet there is no doubt it would be materially of advantage to the concern to have as a part of its plant something entirely new and efficient in every way, for notwithstanding renewals and alterations from time to time, Bowreah is the oldest cotton mill on this side of India, having first seen the light half a century ago." Particulars of some half-dozen Bengal cotton mills are given below:—

Paid-up Capital.	Debentures.	No. of Spindles.	No. of Looms.	Paid up per Share.	Closing Quotations.	NAMES.	Dividends per Cent. for Year. 1887.	1888.	1889.	1890.	1891.
Rs.	Rs.			Rs.	Rs.						
£120,000	Nil.	56,196	Nil.	£10	160	Bengal Mills	12½	10	10	10	5*h*
18,00 000	Nil.	45,212	Nil.	100	59	Bowreah Mills	6½	7	5	5	2½*i*
10,00.000	2,50,000	32,400	200	100	80	Cawnpore Mills	10	5	8	8	4
8,75 000	Nil.	32,250	Nil.	500	250	Empress India Mills	8	8	6½	2½	4
15,00 000	Nil.	42,198	Nil.	200	140	Goosery Mills.....	11	9	7½	6½	4½
4,53,110	1, ,000	12,160	127	100	90	Victoria Mills.....	2½	Nil.	10	10	10

h First half 1891. *i* Half-year ended 31st August, 1891.

The Bengal Mills alone figure favourably in the column headed "Closing Quotations," the figures in which refer to the prices when the last mail left. The shares of the other companies, it will be observed, are at a discount. The Bengal directors have at their command a reserve of £20,303, and the Empress of India Mills one of Rs.62,796. The Bengal Silk Co., with a capital of Rs.3,50,000, is another unfortunate. In 1887, 1888, and 1891 it paid no dividends. In 1885 it distributed funds at the rate of 2½ per cent., in 1886 7 per cent., in 1889 4 per cent., and in 1890, 12 per cent. The Cawnpore Woollen Mills (capital Rs.6,00,000, debentures Rs.2,00,000) paid 15 per cent. last year, and 10 per cent. in each of the years 1885-1890. The record in the case of jute mills is most varied. From 1884 to 1887 was a most disastrous period. Twelve firms, controlling 4,512 looms, paid no dividends in 1885. In 1887, however, better times set in, and the following figures represent the dividends for 1891:—

Managers.	Looms.		Dividend.
Gillanders and Co.	450	....	10
Ernsthausen and Co.	500	....	7 } 12 }
Jardine, Skinner and Co..	740	....	37½ } 7 }
Beer Brothers	63	....	..
Apcar and Co.	300	....	8
Bird and Co.	350	....	26⅔

It remains to be seen what will be the effect of the present jute crisis upon profits for the current year. Probably it will be found the figures for 1892 will not be so favourable as those referred to.

Yorkshire Inventions and Improvements in the Old Days.

Still following the career of the Akroyds, referred to in the notes on Halifax in these columns last week, one learns of much that helps to throw a light upon the history of the woollen trade in its early days. In 1825 James Akroyd and Son commenced the manufacture of damasks. Seven years previously an improved damask loom had been produced by Mr. James Akroyd, assisted by "Scotch Jemmy," a Paisley table-cover weaver, well acquainted with the "plash" loom. Bannister, a Stockport fancy weaver, assisted, and the loom, with the two weavers, was kept under lock and key. Secrecy was preserved until 1824, and the monopoly was retained. In that year, however, Mr. Jonas Robertshaw, of Ovenden, started a few looms, and others followed. The jacquard was soon applied to "Russell's" stout figured worsted satins. "Dobby" Dawson, originally a carpet weaver at Dean Clough, assisted in perfecting many inventions for the Akroyds. His speciality was the application of the jacquard to a two-lift engine, used for all descriptions of figured goods with plain grounds, such as figured Russells and figured Orleans. Some of these goods were wefted with mohair. An ingenious joiner named Dracup, of Great Horton, commenced making two-lift jacquard engines in 1829, and sold numbers of them. Norwich had already commenced to suffer from Yorkshire competition at this time. An ingenious hand-loom weaver of Shibden Dale, near Halifax, named Greenwood, successfully performed the difficult task of weaving Norwich crapes and bombazines. The transplanting of the industries of the Norfolk

capital was very difficult. In the case of camlets a peculiar knack was required on the part of the weaver in managing his treadles, so as to bring down the warp suddenly by the healds to curve round the weft. Trusty emissaries were sent to Norwich, in 1819, to acquire the required "knack" by personal observation, and they brought back the secret of weaving camlets, bombazines, and Norwich crapes. Robert Wood mastered the art of camlet weaving, and Greenwood that of bombazine and crape producing. Mr. Jonathan Akroyd made a lot of money out of the bombazine trade up to 1836, when Paramattas, with fine double-cotton warp, commenced to replace them, until they in turn were driven from the field by the modern Coburg, which has fine single cotton warp. Yarn dyed camlets in indigo blue, green, and other shades were largely used for waterproofs, until the macintosh cloth of James Akroyd, Jr., Old Lane, supplanted them. Messrs. Macintosh and Company, of Manchester, bought this cloth, which was a light worsted fabric, over sixty years ago. The cloth received a thin coating of india-rubber, the process being then a new one. Mr. James Akroyd made great advances in this trade, especially in the dyeing of unions.

Lord Masham on Fair Trade.

On Thursday of last week, as briefly recorded in our last issue, Lord Masham attempted to make a speech on the subject of Fair Trade at St. George's Hall, Bradford. We say "attempted," for as a matter of fact the remarks were only audible to the reporters during the greater part of the time, a large number of those present having evidently come to the meeting with the fixed purpose of annoying Lord Masham as much as possible. The conduct of those persons was not due to any feeling in regard to Fair Trade. It was evidently inspired by other considerations, and may be taken as an expression of the opinion entertained of his Lordship personally by a section of the working classes in Bradford. To suggest anything to the contrary would argue lack of personal knowledge of Bradford. "The Bogey Man," "Lah-di-dah," "Auld Lang Syne," "I've worked eight hours to-day," and other comic songs were sung freely at the meeting, which was a perfect farce from the beginning to the end of Lord Masham's speech. Amongst those on the platform were the Hon. S. Lister, Mr. H. Byron Reed, M.P., Mr. H. C. McCrea, Mr. Joseph Wright, of Macclesfield, Mr. José Reixach, Mr. William Watson, Mr. H. G. Tetley, Mr. B. T. Gibbins, Mr. Francis Willey, Mr. W. Greaves, and Mr. W. H. Mitchell. Amongst those in the stalls were Mr. E. P. Arnold-Forster, Mr. A. Mitchell, and Mr. John Lee. Lord Masham endeavoured by quotations from Mongredien to shew that this country was prosperous under protection. For between 20 and 30 years after our ports were thrown open to the world we received practically nothing either to injure our farmers or our manufacturers, with the exception of silk. This latter industry, employing, it was said, 120,000 people, was practically annihilated. He wished to point to two very remarkable facts: first, that we prospered for between 20 and 30 years because Free Trade was inoperative; it certainly did us no good, but much harm, especially to silk, and many other smaller industries; and secondly, that as long as we were prosperous, we paid more for food than we did before the repeal of the Corn Laws. After referring to the unanimity of other nations in favour of Protection, Lord Masham said that the real point to be considered in applying the principle of Protection on a particular case was whether the duty enhanced the price to the consumer in a greater ratio than the united gains of all the producers. If not, the nation must gain. Judicious Protection was, moreover, the wisest form of taxation, for while it enriched the Exchequer it stimulated and encouraged production. Referring to our enormous foreign trade, Lord Masham said that it looked very imposing, but was often a source of loss, weakness, and danger. Our vast foreign trade had been built on the ruins and at the cost of our agriculture. We imported about 150 millions of food, and if all trade was barter we exported 150 millions to pay for it; thus we had 300 millions of foreign trade. France could have the same foreign trade that England had if she liked to pay the price for it, and to import 150 millions of food, but she was far too wise. She put a duty on food and grew by far the greater part of what she required herself, which her farmers exchanged for home manufactures. So that France had 300 millions of home trade, every shilling of it French; whilst England had 300 millions of trade, only half of it being English. Our vast carrying trade was due not to Free Trade, but to the change from wood to iron and steel in shipbuilding and the use of steam as a motor. If instead of bringing manufactured goods across the Channel we shut them out and brought the raw materials from distant lands, it would give vastly more employment to our shipping. These arguments briefly express the character of the speaker's remarks. Most of those present, as we have said, could not possibly hear them, but full reports appeared in the local papers.

The Australian Wool Trade and its Conductors.

The wonderful development of the Australian wool trade has perhaps only a parallel in the development of the cultivation of cotton in the United States. Both of these offer remarkable illustrations of the value of well-directed and intelligent enterprise; and both of them also have been brought into existence and received the stimulus of their development from the genius and enterprise of Lancashire and Yorkshire manufacturers. In an issue recently to hand of the Melbourne *Argus*, in an article on the wool trade, the writer calls attention, amidst other interesting phases, to the growth of the business of the five largest firms importing wool into the London market—namely, the New Zealand Loan and Mercantile Agency Company, Limited; Dalgety and Co., Limited; the Australian Mortgage, Land, and Finance Company, Limited; Messrs. Sanderson, Murray, and Co.; and the Union Mortgage and Agency Company, Limited.

In 1878 these five firms (or their predecessors) imported 222,500 bales out of a total of 791,000 bales, their proportion then being 28 per cent. of the total. In 1888 they imported 403,000 bales, or 32 per cent., out of a total of 1,245,000 bales. In 1889 the percentage fell to 31 per cent., the same as in 1887. In 1890 they imported 412,000 bales, or 33 per cent., out of a total of 1,226,000 bales. Last year, however, these five firms imported 486,000 bales, or 35 per cent., out of a total of 1,381,000 bales. It is interesting to notice that, in spite of the rapid development of our local sales and the consequent distribution of very large quantities of wool through other channels, the five leading London wool-importing firms continue to steadily improve upon their position, not only as regards their actual quantity, but also their percentage of the total imports. Their growing power is, as we pointed out in reviewing the figures twelve months ago, due partly to their great monetary strength, which enables them to give financial aid to wool-growers, and especially to those who operate on a large scale in New South Wales and Queensland.

It would seem that in many respects changes of other kinds are occurring, all due to the rapid growth of the trade and its prospects of future extension. The leading Australasian banks, in consequence of their large advances on pastoral securities, are becoming very prominent as London wool importers. In 1878, five banks imported 47,000 bales, or about 6 per cent. of the total imports. In 1890, the banks importing wool had increased to eighteen, importing 164,000 bales, or 13 per cent. of the total. In 1891, however, the number of banks rose to nineteen, importing 219,000 bales, or nearly 16 per cent. of the total.

Action of Frost on Cotton.

At the last meeting of the Manchester Section of the Society of Chemical Industry a short communication by Mr. C. F. S. Rothwell, on "The action of Frost on Cotton," was read. The literature published on this subject, said the author, gave the idea that cotton was 'tendered' by frost. To quote Hummel's "Dyeing of Textile Fabrics," "the evidence on this point was conflicting, and it was quite conceivable that the crystallization might act injuriously in a mechanical way, and that the atmospheric ozone might also exercise some slight destructive influence." This uncertainty might be attributed to the fact that, until recently, no reliable machine for testing the strength of the cloth was available. To decide the question, two pieces of "madder-bleached" cloth, one of good and the other of very poor quality, were placed in water for ten minutes, withdrawn, and without squeezing were exposed to a temperature of 4° C. (28° F.). The cloth was quite stiff in three minutes, and, when the ice had evaporated, its strength was tested in Goodbrand's machine against some of the original cloth, when the breaking weights were found to be identical. The trials were repeated, the cloth being frozen for sixteen hours. In this case also the strengths were found to be identical. It was thus evident that cotton was not 'tendered' by the freezing of water within it, at any rate not when in the ordinary width. If the fibre were compressed to a greater or less extent, as would happen at the bottom of a waggon load, the cloth might probably be weakened mechanically by the crystallization of the water, but he had no proof of this. The prevailing opinion that cloth was weakened by frost had, no doubt, arisen from the fact that when the fibres were frozen stiff they were easily snapped, but any stiffening body, such as gum, would have the same effect, and this had obviously nothing to do with the actual strength of the fibre.

Textiles at the Tasmanian Exhibition.

Tasmania is having a little exhibition all to itself, although very little notice appears to have been taken of it in England. Mr. and Mrs. Stanley were amongst the distinguished visitors who inspected the exhibits recently. There is not a strong display of textiles, however, mineral and other products being naturally in much greater force. Messrs. Rylands and Sons, of Manchester, have a display, and there is a collection of wool samples from Mr. H. Maiden, F.L.S., curator of the Sydney Technological Museum. Mr. Maiden is collecting additional specimens, which, when complete, he will forward to the Chicago Fair. The collection is said to be the finest in the world, and the specimens of fleeces which constitute the exhibit under notice are both interesting and instructive. It displays all kinds of fleece—greasy, washed, and scoured—from the stud and flock sheep of various descriptions and ages. There are black, brown, and steel-grey wools, and also a magnificent sample of the fleece of a wild sheep; but the gem of the collection is undoubtedly the sample taken from the fleece of a ewe (18 months old) in Sir Samuel Wilson's Ercildoune flock. This exhibit, which took the first prize at the Melbourne Centennial Exhibition, shews the improvement effected in the wool produced in Australia since Captain John Macarthur and the Rev. Samuel Marsden introduced the merino sheep to Australia at the beginning of this century, and is accompanied

by an explanatory pamphlet, edited by Mr. Maiden. The exhibit of the Waverley Woollen Mills is interesting as being practically the first substantial collection of woollens made in Tasmania. Mr. H. M. Stanley and his wife spent a long time examining the goods displayed from these mills, upon the occasion of their visit, and (a local report says) were, like everyone else, surprised at the varied assortment and excellent manufacture. The exhibit includes tweeds, suitable for ladies' and gentlemen's wear, in endless designs and makes, and blankets, which now form an important feature in the business. During the last two years the Waverley blankets have been in constant demand all over the colony, and they are said to compare favourably with those made at Kaiapoi and Mosgiel in New Zealand. There is also a good display of flannels, varying in colour from snow white to deeper tints, both plain and twilled. Sanitary flannels are now a specialty, and of those exhibited the natural black or brown ones are made from wool grown in the colony, and purchased by the Waverley Mills. The men's, youths', and boys' clothing which is displayed is of strong material, in well-designed patterns, and for style, cut, and finish is an excellent illustration of what can be done in Tasmania. After all, the great merit of the exhibit is that it represents local enterprise and industry. There are also shewn a couple of dressed models—a lady and a little boy—which display the material in its made-up state. The mill itself is situated about three miles from Launceston, and many additions and improvements have been effected during the past few years. One set of carding machines are at work, and some twelve bales of wool are used per week. In the spinning department there are two large mules, each containing 350 spindles. A number of the looms work three widths of cloth and others two widths. The dye-house is detached, and contains two large dye vats and scouring and running troughs. The mill is illuminated with electric light, and during the winter season, or when night work is necessary, its great advantages are fully appreciated. These Waverley Mills are one of the sights of Launceston, and an enthusiastic writer in the *Tasmanian* says they mark the dawn of a new era in the island colony.

The Russian Flax Trade: Shrinkage of the Cultivated Area.

The report of Consul Wagstaff on the trade of the port of Riga possesses unusual interest, owing to the important position occupied by the town in relation to the flax export business of Russia. The prohibition of the export of wheat has had a serious effect upon the shipping trade generally, many British steamers being laid up owing to the short supply of homeward cargoes from Baltic and Black Sea ports. The most interesting portion of the Consul's remarks is that which refers to the area under flax. In England flax-growing has, practically speaking, disappeared, and it can scarcely be said to exist in Scotland. In Ireland also the shrinkage of the flax area causes great anxiety to those interested in the encouragement of this branch of agriculture, the successful prosecution of which is so important to the staple industry of Ulster. Russia has hitherto been the principal source for the supply of the fibre, but even in that country the acreage has diminished—a fact of profound importance to all connected with the dependent industry. The reason offered is the reduced market price of the staple compared with the former decennial period, entailing loss on the year's farming. There has also been a lighter yield per acre owing to the exhausted state of the soil. Flax is of course naturally an exhausting crop; but after the revelations made by Reuter's Special Commissioner as to the primitiveness of Russian agricultural methods and the ignorance that prevails amongst the peasantry regarding the use of fertilisers, the assumption may safely be hazarded that certain preventible causes have also had something to do with the result referred to. The quality of last year's crop did not come up to expectation, owing to variable weather. The summer was too dry, and the autumn rain laid the plants and prevented maturing, especially in Lithuania and Courland. Not only is the 1891 flax crop inferior in quality to previous years, but also in the manner it has been assorted. Dealers were aware that several firms with whom they had made contracts were urgently in want of flax, and, therefore, reduced the "brack" to a great extent, knowing that exporters would be obliged to accept what they could get to meet their engagements. Once a bad "brack" is established it generally continues throughout the season. Complaints continue to be made against unscrupulous dealers for wetting flax to give it greater weight. There was a falling-off in the quantity in the provinces of Livonia, Pskov, Kovno, and Tver, whereas the province of Smolensk last year shewed a large increase in the yield. In the 60 provinces of Russia the amount of flax produced in 1891 was 249,178 tons. The three preceding years yielded respectively 288,140 tons, 310,851 tons, and 266,022 tons. The province of Livonia takes the lead in flax with a total return of 23,960 tons, shewing a decrease of 1,720 tons under the preceding triennial average. Courland, however, gave a heavier crop last year, 4,707 tons, or 373 tons over the average for the three years preceding. The gradual reduction noticeable in the flax crop had had the effect of hardening prices. The average price, c.i.f., during the past year was, taking "K" as a basis, about £18 10s. per ton.

The Commerce of Texas.

A recent Consular report gives some interesting facts concerning Texas, and special reference is made to Galveston, the commercial capital of the State. The population of the city is not large—35,000 to 40,000—but as the chief port of a vast cotton-raising district its importance is much greater than is indicated by its size. Galveston in one respect resembles New York, inasmuch as it is situated on an island. The communication between the town and the shore is at present by means of a roughly constructed railway bridge, consisting of piles, with the accompanying supports, the intervals between the sleepers being open. This is obviously a most undesirable state of things for such a port as Galveston, and a scheme has been broached for the construction of a bridge for vehicular traffic. Galveston has in full work a cotton factory, with all the newest machinery, employing about 600 hands. The chief articles that it produces are sheetings, shirtings, and drillings, all in different qualities and widths, weighing from 2·50 yards to 5·30 yards per pound. There is also a rope and twine factory, producing annually about 4,680,000 lb. of rope and 300,000 lb. of twine, and a jute and bagging factory of 300 hands, which turns out about 500,000 yards of bagging and a large quantity of twine. The demand at present is more than the mill can meet. A lace curtain factory is also shortly to be built, about seven miles from the city. The corner-stone has been laid, and machinery is shortly expected from Nottingham, England, with skilled labour also. The present population of Texas is estimated at 2,500,000, but so large is the State that this number is scarcely noticeable, and there are many regions practically uninhabited. The cotton crop of 1891 and 1892 is the largest in Texas which has ever been known. It is estimated at about 2,200,000 bales, and the increase is calculated to be 10 per cent. over the official report of last year. In fact, already the cry is that there is too much cotton, and that prices have not been so low since the French Revolution of 1848. "Farmers are evidently seeing that growing cotton at present prices does not pay, and cannot pay. The bare or insufficient profit accruing to the grower under the present system had led to the formation of companies for the purpose of erecting cotton mills, water power being abundant in certain portions of this State; and as cotton can be manufactured where it is grown cheaper than in New England, calculating cost of freight on the raw produce, and of the manufactured article when brought back here, Texas is likely, with its increasing immigration, before many years, to be a formidable rival to New England manufactories; but to prevent this, the capitalists who are interested in New England mills may likewise advocate a reduction of tariffs, so as to prevent the southern trade from leaving them. It is an undoubted fact that though there is plenty of money in banks lying idle, traders from up country, who have come to obtain their usual supplies of groceries and dry goods in Galveston, or loans from the banks, on the security of the next cotton crop, have in many cases been refused any credit at all, and that if they wanted supplies for farmers they have been informed that on account of the low price of cotton they must pay in cash."

Density of Textiles.

An interesting discussion took place at a recent meeting of the Académie des Sciences between M. Leo Vignon and M. Chardonnet, on the question of the determination of the specific weight of textiles. The following are a few of the figures obtained by M. Leo Vignon by means of the hydrostatic balance, working in pure benzine:—For cotton, 1·50; for wool, 1·30; for raw silk, 1·32; for boiled-off silk, 1.34; for silk charged with tannin, 1·37. M. Chardonnet, on the other hand, has obtained higher figures by the method of floating in a solution of borotungstate of cadmium. M. Chardonnet argues that the difference between his results and those of M. Vignon is due to the fact that silk absorbs metallic salts in an aqueous solution. In reply to the objection that he had not taken sufficient account of the air in the textiles, M. Chardonnet observed that the density continued the same after three days of exposure in vacuum. We glean the above from our contemporary the *Moniteur des Fils*, and should like to ask what is the practical value of the experiments made, and how are they to be rendered useful in the textile industries. We can imagine one or two things that the experimenters may have been looking to, but would rather have their own statement of the objects they have in view.

The Lock-out.

As we write these lines (Thursday morning) intelligence is to hand from nearly every spinning centre shewing how determinedly and unanimously, according to engagements, the mills are being closed. A large number are closed already, many more close to-day, and some few work on until Saturday noon by mutual arrangement with the workers. These are mostly the cases that would otherwise have had to close on Monday or Tuesday. As to the offer of arbitration by the operatives, this has been made before and declined, and is hardly likely to be accepted now. There really is nothing to arbitrate about. At the commencement of the dispute the employers were all along willing to submit it in that manner, but the operatives refused everything except the concession of their demands. If the proposal be considered at all it

can only be so formally. Statements have been made that the weavers' unions in East Lancashire are going to hand over their funds to the spinners, but this is hardly likely, as the meeting of manufacturers early next week may possibly find them another use therefor. The mills in the various districts which combine spinning and weaving will mostly run to supply their own looms with yarns, paying heavy contributions to the funds of the Employers' Association according to the rules provided for such a contingency. These include many of the old firms in Cheshire and on the South Lancashire borders, some few in Oldham, and a number in Bury. Altogether, there is more unanimity than has ever before been seen in connection with any event of this kind, and confidence is strong that the lesson will do much to induce a more considerate behaviour on the part of the workpeople and their leaders.

THE LOCK-OUT IN THE COTTON TRADE.

The efflluxion of a few hours from the moment of our writing these lines will witness the general commencement of a lock-out of the operatives in the cotton trade by the employers, which indicates the extension over a very wide area of a dispute that ought never to have been heard of. It is superfluous to repeat that this is the strike at the Stalybridge Spinning Company's Mill, Stalybridge. This company was formed and registered in 1881. It issued 15,000 shares of £5 each, on which £2 has been called up, leaving a reserve of share capital of £45,000. Its mills are on the newest and most modern plan, boilers, engines, and gearing being all first class, while it has been equipped with machinery by Messrs. Asa Lees and Company, Limited, Oldham, and Messrs. Taylor, Lang, and Company, Limited, Stalybridge. The mills contain 75,420 mule spindles for spinning twist, and 36,000 for spinning weft. Altogether the establishment forms one of the finest in the country. Its fixed stock per last balance sheet was £62,373. It is this firm's mill that the leaders of the operatives, in pursuance of their policy of harassing the employers, brought to a stand, as stated in our comment upon the matter last week, on the 25th of September, that is, 29 weeks ago. The loss that has already accrued, taking that of both parties together, cannot have been less than £20,000; and instead of there being any prospect of a termination of this, there is only one of a rapid and enormous increase. Half the cotton trade of the country is to-day paralysed, and over 15,000,000 spindles and preparation machinery have been brought to a stand for an indefinite period, owing to the wicked obstinacy of the mischief-mongers who have instigated and prompted the continuance of this strike. This stoppage will mean a direct loss to the employers and employed of not less than £100,000 per week. It will imply a loss of the circulation in labour and trade channels of this sum four times told for every week that the dispute endures. This will mean impoverishment, distress, and destitution in a greater or less degree through all the ranks of the community; and its influence will not cease to be felt for many months, nay, even years will elapse before its effects altogether disappear, should it be continued for a few weeks.

The world will very properly ask—what is it all about? Absolutely a mere figment of the imagination. Some idle fellow amongst the minders in the employ of the Stalybridge Spinning Company goes to his club and says the work at his mill is "spinning bad." The officious committee give ear to his complaint, as they always do, because it gives them an opportunity of airing their own importance, and drinking-money was probably running low. It was held, therefore, to be a case for compensation, and after due consideration and a reference to the head-centre in Manchester, it was decided to make a claim upon the company for compensation for bad work, at the rate of 5 per cent. for and upon four weeks' wages of the minders. This would amount to about £30, and would have replenished the drinking exchequer of the Union very nicely had it been paid: but it was not. The claim, however, having been advanced, it was not consistent with trades-union principles or the dignity of secretaries and committeemen that it should be withdrawn, and therefore it must be enforced. The operatives gave in their notices, and the mill was "struck." Our readers will recognise the identity of the procedure in this case with that pursued subsequently in that of the Accrington Spinning Company, which is still being maintained. So much alike are the two cases that they afford a strong presumption of having been hatched in one brain-pan. That these endeavours to extort compensation on such allegations as have been made are simply gross attempts to levy blackmail upon the employers we sufficiently proved last week from the testimony of Mr. J. T. Fielding, the Bolton operatives' secretary. We may, however, just restate these figures in order that our remarks may be justified to any reader who did not peruse our comments last week. Messrs. C. T. Bradbury and S. Smethurst, representing the Employers' Association, and Mr. S. Sidebottom, the Stalybridge Operatives' secretary, with Mr. J. T. Fielding, the secretary of the Operatives' Association at Bolton, together examined the spinning on February 3rd, work having been re-commenced two days before in order to admit of this examination and of an attempt to settle the dispute being made. Now we specially desire attention to the report Mr. Fielding made in a letter to the local press upon the matter. He found that "5·12 ends broke on one side of a mule in 10 draws." The mules giving this result contain 990 spindles, and were spinning 36's twist. He does not say whether this was the long or the short side of the mule, but there could not be more than a few spindles difference. Let us, therefore, assume that this "side" contained 500 spindles: therefore the breakages were practically half an end per draw. As a minder or piecer has two sides to mind, and, roughly speaking, a mule makes four draws per minute, he has eight ends per minute to piece. Now we venture to affirm that a minder who could not easily piece up twice that number of ends is not worth his salt, and is either idle or incompetent. We ask any piecer or minder who has had any length of experience, and can recall the quality of the spinning and the number of breakages made per minute, say 15, 20, 25, or 30 years ago, whether or not spinning to-day not far away better than any that ever fell to his lot; and we affirm that if he will state the truth he will testify that the breakages at the times we speak of were five times as many. A little piecer who could not have pieced up five threads per draw in those days would have been turned out of the "jenny gate" by his minder as incompetent. On the weft mule, containing 1,200 spindles, a similar test produced, according to Mr. Fielding, a breakage of 7·1 ends. Of this he said: "In my judgment the percentage of broken threads was excessive, and constituted bad spinning." Thus the difference of ½ an end per draw makes the spinning good or bad. Of this weft spinning we repeat the affirmation we have made regarding the twist, and scout the notion that either of the cases affords the least shadow of justification of the proceedings that have been taken, and have resulted in this serious disaster to the trade and industry of the country. A little boy creeler of 20 years ago, let alone a piecer or a minder, would have felt himself insulted had any one told him he could not piece up three ends per draw. In the above statement as to what minders should do to-day ample allowance is made for increased speeds. To further shew the utter absurdity of the allegation that the spinning was bad, we need only adduce the average earnings made from the pairs of mules during the five weeks preceding the strike. These were for twist mules: gross, £3 5s.; net for minder, £1 19s.; for weft, gross £3 12s. 6d., net for minder, £2 4s. These facts incontestably demonstrate that the whole dispute, with all the sad consequences likely to result, has been sprung upon the country by a gross attempt to levy blackmail upon the employers as we have just stated.

Is it not time in view of these facts, and that this case is only typical of what is occurring every day, that the sensible and intelligent portion of the operatives in the cotton trade should resent the manner in which their interests are being sacrificed, and resume possession of their control? And we ask, further, whether, in view of the blind folly and obstinate self-conceitedness of the present leaders of the operatives, it is not high time for the employers themselves to refuse to hold intercourse with them, as being totally incapable of doing justice to their constituents, whilst at the same time they seriously imperil the interests of the employers. We think it is, and if this step were taken it would do much to liberate both parties from a position that threatens to become incalculably disastrous. Let those operatives who have not yet tumbled into the quagmire into which their leaders are doing all they can to drag them, pause while there is a chance, make their voices heard in disapprobation of the demented folly of their leaders, and if they cannot restrain them in their madness, let them open communications with their employers on their own behalf and of those who think with them, and by disavowing the mischief makers prepare the way for the restoration of harmony. It is only by some such proceeding that their best interests can be snatched from serious peril, if not absolute ruin.

Foreign Correspondence.

TEXTILE MATTERS IN THE UNITED STATES.

BOSTON, April 5th.

A CHANCE FOR TEXTILE MACHINISTS.

A large portion of the immense carpet mills of John Bromley and Sons, located at Lehigh Avenue, Fillmore and Somerset Streets, Philadelphia, has been destroyed by fire, causing a loss of over $300,000, and throwing several hundred hands out of employment. The amount of insurance on the three buildings burned is not known at present. They consisted of part of No. 1 mill, 65 by 300 feet, four storeys and basement, filled with carding and other machinery; No. 3 mill, two storeys high, 40 by 90 feet, located directly east of the main mill, in which the pickers and other preparing machinery were placed; and No. 7 mill, a one-storey dye-house, 190 by 60 feet, located at the rear of the large weaving sheds. The boiler house was also badly damaged; and the remainder of No. 1 mill not destroyed was protected by a 24in. brick fire wall which had been built in the centre of the main building when the entire plant was erected a few years ago. The carpet, lace curtain, and upholstery mills of John Bromley and Sons are the most imposing and extensive of all the buildings along that famous manufacturing thoroughfare, Lehigh Avenue.

DRY GOODS BUYERS FOR EUROPE.

J. H. Gill, the manager of the ribbon department of E. S. Jaffray and Co., New York, and one of the most successful buyers and distribu-

tors in the trade, sails for Europe on the 9th instant, by the French steamer, *La Champagne*. He purposes making his usual large selection of ribbons for the fall season.

Charles R. Shaw, New York, white goods and linen buyer for Tefft, Weller and Co., sails for the European markets to-morrow, per *Germanic*.

Mr. Brightson, head of the H. R. Claflin Co.'s notions, etc., department, has left for Europe. His assistant in fancies, Mr. Connell, left for Europe last Saturday week. His other assistants, Messrs. McEwen, buttons; Finlay, trimmings; and Peck, ribbons; will follow him shortly, and, with this combination of talent, he looks forward to securing extensive assortments for the holiday and fall business, superior to anything previously put on the market.

Mr. Hamilton, head of E. S. Jaffray and Co.'s linen department, will probably sail for Europe on Saturday, and Mr. Messenger, dress goods buyer, with the same firm, to-day.

A NEW THREAD MILL.

The William Clark Co., of Westerley, R.I., have just had completed a new mill for the manufacture of cotton thread. The mill is to contain 25,000 spindles for making thread, and the necessary machinery, includes 30 combers, 32 revolving top-flat cards of the new "Centenary Simplex" pattern of Dobson and Barlow, England (of whom Stoddard, Lovering and Co., Boston, are the agents), jack frames, etc. The Grinnell Automatic Sprinklers are used.

THE PROTECTIVE POLICY IN REGARD TO LINENS.

(FROM *The Haberdasher*, NEW YORK.)

"Oh, yes," said Mr. John R. Walker (head of the firm of Messrs. John R. Walker and Co., Chicago and Manchester), "the linen industry of Ireland is catching it right and left at the hands of Ireland's Continental customers. Russia's tariff is almost prohibitory. Germany has her handicap on. So have one or two of her neighbours; and now France has taken a hand in the protective game. This has increased the duties upon linen handkerchiefs fully 15 per cent. It is next door to prohibiting their importation entirely.

"When the Bill was up before the Chamber, the manufacturers of linen undergarments, shirts, etc., protested against any advance of duties upon bleached linens, and I am not sure just what disposition was made of the portion of the Bill applying to these. This was because they realised that the advance of value would work to the injury of their export trade, Germany being a very strong competitor. Strange to say, French linens were dearer under the old tariff than imported Irish goods, and wages are almost one-third lower in France than in Ireland.

"But when all has been said, these countries must have Irish linens and handkerchiefs, and though protective duties may diminish their consumption to some extent, all countries who have used them at any time must continue to do so. While places like France and Germany have their looms and factories where linens are manufactured, and where they turn out fair weight and quality, they fail when it comes to bleaching the cloth, and there's where Ireland will hold the supremacy."

Designing.

THE ANALYSIS OF PATTERN.—IX.

PILE FABRICS.

A lengthy consideration of the construction and analysis of these fabrics is hardly within the scope of these articles, so that all we propose doing is to touch very briefly upon the principal structures, and indicate in a general way the best system of analysis.

Formerly there was little difficulty in defining plushes; to-day there is such a multitude of specially constructed cloths, partaking more or less of the appearance of pile fabrics, that any rigid definition is impossible. The main feature of these cloths, viz., ends or loops standing straight out of the body of the cloth, however, renders at least the classification easy.

There are two distinct classes of pile fabrics, viz., those in which the pile is formed by the weft, and those in which the pile is formed by the warp, as instanced in *Diagrams* 20 and 21. Weft piles may be first considered.

WEFT PILE FABRICS.

The construction of these cloths is in reality very simple, since no pile is formed in the loom, the cloth being woven as an ordinary piece, as shewn in *Diagram* 20. After leaving the loom, all the picks which flush, for example *a*, are cut with a knife *k*; thus the two ends will stand straight up from the threads *c* and *d*. The point-paper plan for this is given in *Design* 27, in which there are four pile picks *a* to one ground pick *b*, and since the pile picks are only bound once in every 8, 10, or 12 ends, as the case may be, a large number of picks per inch are required to hold the pile firmly. A firmer binding is that shewn in *Design* 28, in which the pile weft interlaces for three threads with the warp. A corduroy type of effect is given by *Design* 29, and the reason is very apparent: if the bindings of the pile picks be examined, it will at once be seen that they all bind in a line up the piece; thus, when cut, they all project from one portion of the piece, forming a distinct rib.

The difficulties in analysing such cloths sink into oblivion when it is remembered that these cloths are *woven like ordinary pieces*. There is one point, however, which must not be overlooked, and that is, that in designs similar to *Nos.* 27, 28, and 29 the pile picks will not occupy so much space in the cloth as represented on paper. For example, in *Design* 27 the four pile picks *will altogether make one plain pick*, and may be regarded as such in the cloth. In determining the number of pile picks between each ground pick, then, this fact must be remembered.

A recent innovation in the manufacture of these goods provides for the cutting, *as required*, in the loom, by means of thin knives passing between the reeds in the going part. Quite elaborate figures may be woven thus, but under any circumstances the fabrics should be analysed as intimated above, since the pile is formed by the healds or harness giving the requisite float to the pile pick, the knives simply being worked to cut the flush.

Another type of weft pile is formed in the finishing process. A plan similar to *Design* 30 is employed with a cotton warp mohair *a* and wool *b* weft, the result being that shrinkage takes place weft way, resulting in the long float being thrown up as a curl. The analysis is, of course, effected in a manner similar to the previous examples.

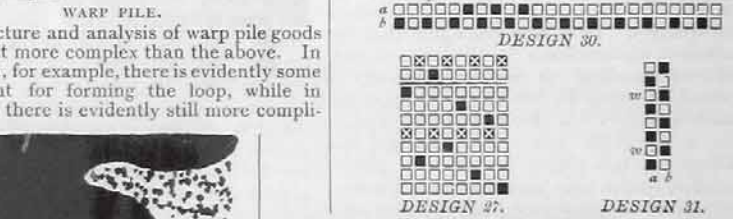
WARP PILE.

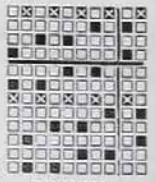
The structure and analysis of warp pile goods is somewhat more complex than the above. In *Diagram* 21, for example, there is evidently some arrangement for forming the loop, while in *Diagram* 23 there is evidently still more complication. These loops are usually produced by means of wires inserted in a shed specially provided for them, for it is evident that only the pile threads must pass over the wire. Thus, in designing for these fabrics, the point-paper must be classed into *ground and pile threads, and picks, and wires*. *Design* 31 is the point-paper plan for *Diagram* 21, the solid type representing the ordinary picks and the crosses the wires, while *a* are pile threads and *b* ground threads. With these particulars ordinary piles may readily be analysed, this being usually effected by examining the back of the fabric with a piece-glass; but the more intricately figured fabrics call for further explanation.

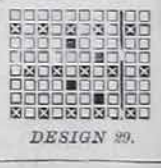
The simplest method of figuring these goods is by means of cut and uncut or looped pile, as illustrated in *Figure* 7 and *Diagram* 21, in this latter *d* being the looped and *c* the cut. The advantages of figuring in this manner are, firstly, that only one pile warp beam is required, each end taking up alike, while the figure produced is very distinct, as instanced in *Figure* 7, which exaggerates very little the variation between the looped *c* and the cut *d*. Another effective method of figuring is that illustrated in *Figure* 8 and *Diagram* 22, in which case the pile warp is composed of two colours, say red and tan, arranged end and end. Under these conditions either red or tan figures may be formed by bringing every other end over the wires as required, but should only one pile warp beam be used, every thread must be over the wires the same number of times. Should these conditions not be requisite, however, four distinct effects may be produced, viz., red pile, cut and uncut, tan pile, cut and uncut.

Another system of figuring with pile is by means of different heights of wires, as shewn in *Diagram* 23, in which, when the shed for *a* is formed, a broad wire is inserted, while at *b* a narrow wire is inserted. This system of figuring is often employed with a flat or sateen ground, as instanced in *Figure* 9, in which *a* is the sateen ground, *b* the short loop, and *c* the long loop or cut pile.

In analysing any figures similar to those given the figure must be ascertained by one of the systems already given, but, in sketching on design paper, the proportion of picks (not picks and wires) to threads must be carefully ascertained, and the design paper selected according







to this proportion. Should only ordinary design paper be at hand, the figure may be sketched out upon this and then may be put on to the cutting design sheet, missing picks for the wires as required. By this means, however, the figure will be considerably distorted.

A type of figured pile likely to be mistaken for the above is that known as "tapestry carpets," in which the figure is printed upon the warp in a considerably elongated form to allow for the take-up in weaving.

Another type, of much greater beauty, is the Axminster carpet, in which the pile is put in from bobbins in the front of the loom, the bobbins being arranged in the colours required to give the pattern, in many cases a large number of colours being employed with most telling effect.

NEW DESIGNS.

COTTON DRESS FABRICS.

There is a never-failing succession of novelties in cotton fabrics to tempt buyers: satin stripes in pale blue, pink, mauve, yellow, and light green—one of these colours alone, or two or three; and in some instances all together are in great request for evening dresses. The satin is a warp face, totally concealing the weft, in close-set reeds, giving all the possible brightness of colour beauty in these stripes. A great favourite for all-cotton coloured fabrics is Russian green; red merely appears in combination with green, navy blue, and black—the fashionable heliotrope is known commonly as cherry-pie; nominally it is a pale blue passing into white; one variety shades into a dark purple.

The colour scale for the spring season may be taken in orange, Nile green, olive, *écru*, gray, yellow, pink, and cream. These are well shewn in velvets; in fact, a delicate and refined taste seems to increase every season, and cotton fancy goods are fast becoming perfection in make, colours, and ornamentation.

Design A, which we submit, is on 4 shafts, 32 end draft, 32 to the round, forming a check in distinct squares, with one shuttle; warp, 24's twist, 30 dents per inch; weft, 24's, with 60 picks per inch; one black, one white, without twist in a heald, forming one dentful; weft, black and white, wound on the bobbin for the shuttle, without twist. Larger squares, two or three inches in size, are fancied; to obtain these the draft and round would have to be increased. When finished the width to be 30 inches.

Design B is another novelty for cotton dress goods, 35 ends, 35 to the round, 50 dents per inch of 30's twist for warp, 72 picks per inch of 30's weft. Warp all two in a heald, one heald per dent, orange and deep blue slightly twisted, say, four times in one inch; weft the same, but without any twist: one shuttle. The following varieties will give capital effects:—

Warp.	*Weft.*
Brown and white,	Green and red.
Blue and white,	Orange and purple.
Yellow and purple,	Green and white.
Brown and blue print,	White and red print.
Lilac and pink print,	White and brown print.
Cardinal and white print.	Black and white print.

It is evident from these variations that almost any other number can be formed at will; of course if heavier or lighter cloths are required the quantities, counts, and sett of reed may be increased or decreased if necessary.

Design C is constructed for a class of dress diagonals which is becoming very popular, in large plaid patterns, and which is likely to be a success, especially in white and all the delicate shades, for summer and autumn. We have given a little variety to the squares, which will entail the use of a small jacquard, 76 ends repeat, 52 to the round, the angle of diagonal always to the right; it may be reduced considerably so as to be brought within the compass of a dobby machine, 24 shafts. We may in a future issue give a few patterns suitable for dobbies. This design can be worked out from the following particulars:—Warp 2/60's, 40 dents per inch, two in a dent; weft 64 picks per inch of 24's cotton. If it should be considered necessary to preserve the squares exactly in form, then 30's weft, 80 picks per inch, would be required. The dots are weft to the face.

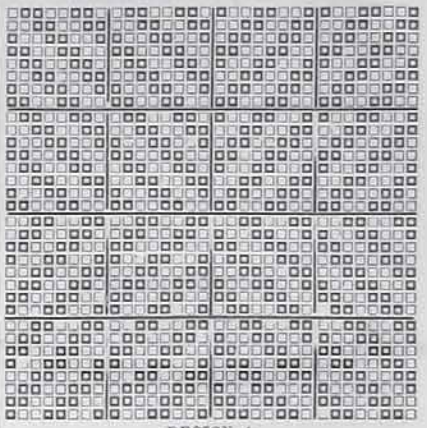
First pattern is a clan tartan, somewhat after the Stuart, 200 crimson or red, 12 royal blue, 24 dark brown, 4 straw, 4 black, 4 white, 24 dark brown, 8 crimson, 4 black, 4 crimson, 4 white, 4 crimson, 4 black, 8 crimson, 24 dark brown, 4 white, 4 black, 4 straw, 24 dark brown, 12 royal blue repeat from the "200 crimson." Weft pattern the same. One variation of this pattern may be made by substituting dark green for royal blue, or white for crimson, and crimson for the small portions of white.

Second pattern: 12 red, 12 chocolate, 12 red, 100 chocolate, 12 red, 12 chocolate, 12 red, 100 very light lavender, 12 red, 12 chocolate, 12 red, 100 light lavender; repeat from the first "12 red." Weft pattern the same. This combination will give a handsome pattern, with a good, bold effect. The diagonals break up the continuity of vertical and transverse lines, giving the fabric a very pleasing appearance in the making-up for dress goods.

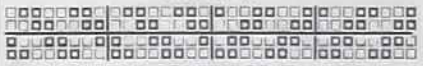
Third pattern: 48 mid-gas green, 12 scarlet, 48 mid-gas green, 24 dark brown, 24 light cream, 24 dark brown, 24 light cream, 24 dark brown, 24 light cream, 24 dark brown, and repeat from the first "48 of mid-gas green." Weft pattern, red for green and green for scarlet. All the other checking same as warp pattern.

Fourth pattern: Shepherd's plaid, 24 white, 24 black or blue. Weft pattern the same.

All these patterns will give satisfaction, and no doubt obtain success for home or export trade. Good finish is important; 50 inches wide out of the loom.

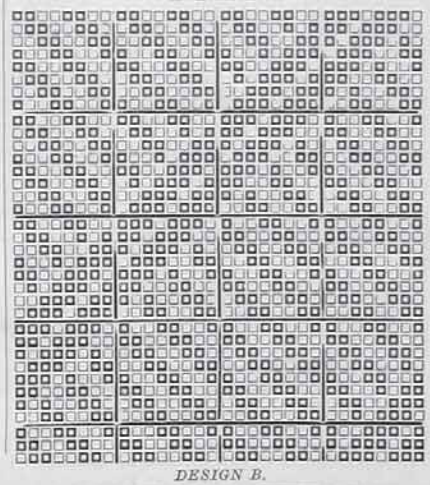


DESIGN A.



A: PEGGING PLAN.

A: DRAFT.



DESIGN B.

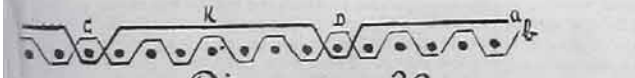


Diagram 20.

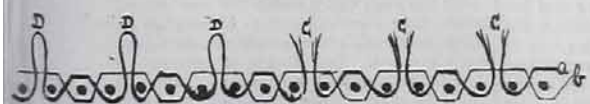


Diagram 21.

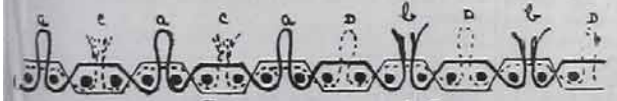


Diagram 22.

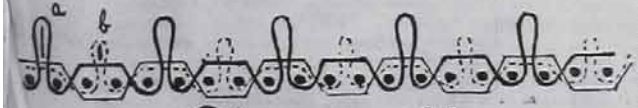
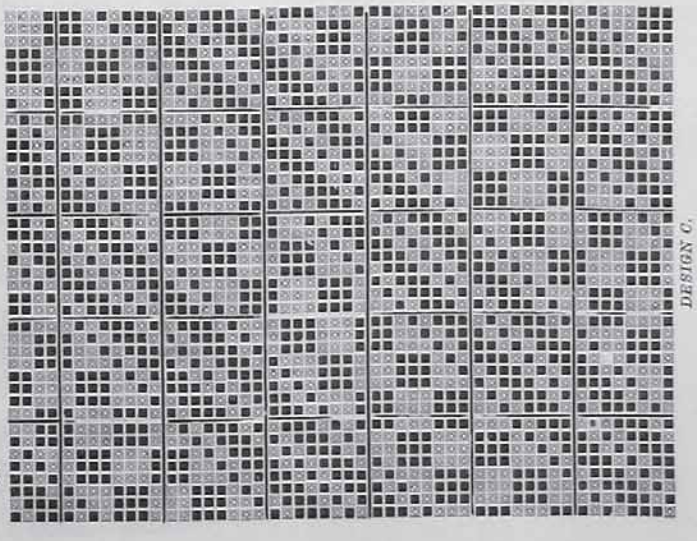


Diagram 23.



DESIGN C.

Machinery and Appliances.

ANOTHER NEW DIFFERENTIAL MOTION.

MAKERS: MESSRS. BROOKS AND DOXEY, (LATE SAML. BROOKS), WEST GORTON, MANCHESTER.

It is remarkable how much attention has been concentrated upon the "differential motion" of the frame series of machines in the cotton trade during the past ten years. For over half-a-century after its invention by Holdsworth, in 1826, it was severely let alone. Indeed it seems to have been regarded, for most of that time, as such a wonderful mechanical feat, that to attempt to improve it would be like laying sacrilegious hands upon a mechanical holy of holies, to touch which would bring down condign punishment upon the daring adventurer. To account for the existence of this sentiment is not difficult. From the earliest days of the new system of cotton manufacturing, and, indeed, previously thereto, the handling of the rove had not been an easy matter. Under the old hand-system the carded cotton had been lightly spun into rove and wound into large cops on the old hand-wheel, and this was taken, and by further attenuating in the fingers and twisting by the wheel, was transformed into yarn. When Arkwright and his co-inventors had produced the series of partially automatic machines, one of their chief remaining difficulties was how to deal with the rove as it came from the roving frame. Wind it upon bobbins they could not, as they had no "differential" driving arrangement; and in every attempt they made, and by every modification they introduced into the water frame for the purpose, they absolutely failed to prevent the rove being pulled down or so injured that it was useless. That they made such attempts is stated on good authority. It is well known to any student of the industry that Arkwright's water twist frame is the parent of the modern slubber, intermediate, and roving frames. It was, therefore, a sound inference of Mr. Richard Marsden, in his work upon "Cotton Spinning," to say that the solution of this problem "quite baffled the skill and ingenuity of Arkwright." To get over the difficulty, Arkwright devised a conical or cylindrical vessel, into which the rove should be received. This was made to revolve slowly upon a pivot, thus coiling the rove in the can, which was a reversion to the simple form of the drawing frame. These cans were fitted with a side door, by which, when the can had been filled, the rove was removed. From the construction of this can the machine received the name of the lantern or can roving frame, owing to the can being like the old-fashioned but then common lantern. When the rove had been removed, it had to be most carefully wound upon skewers or bobbins, which was done by a blocking machine, for use in the spinning frame. That it would suffer a great deal by breakage and elongation in this process, and so make very inferior yarn, will be obvious to anyone who knows anything of the matter.

With this arrangement and this process of winding the trade had to put up for a time, after which the Jack-in-the-box roving frame came to the front, the feature of which was the introduction of a bobbin arranged horizontally in the "lantern" can, and furnished with a traversing guide wire, the bobbin being actuated by a friction driving arrangement working in contact with its surface. The bobbin and fly frame was the next step, and was a return to the type of the water frame. As reintroduced, it was at first a very unsatisfactory machine, owing to the extreme difficulty of accurately making the many necessary changes and the proportionate adjustments of the speeds of the bobbin, which were found in practice "to be quite beyond the capacity of most overlookers of the preparation rooms of cotton mills, who seldom arrived at the correct difference till after an expensive and wasteful series of errors and alterations, whereby the quality of the work was more or less damaged, for several weeks, at each change of the twist or of the cotton staple." "The good yarn made before Holdsworth's invention," says the early writer from whom the above quotation has been taken, "required prodigious pains in the first adjustment of the machine, and its quality could not be altered to suit a new market without extraordinary exertions on the part of the mechanics, as well as the spinners, of a factory."

From all these troubles and difficulties Holdsworth's "differential" saved the trade, and we see, therefore, the origin of the loving regard it gained in the estimation of spinners. It needed the passing away of a couple of generations before anybody dare venture to look for an imperfection in its construction, or lay hands upon it to attempt its improvement. Inventors had improved, and almost perfected, everything else before venturing to look at it. Thus it was that not until about ten years ago were they able to give it attention. The long experience of its use had revealed several defects of an important kind. The first was that its driving consumed a great deal of the motive power; the second, that the wear and tear of cone belts was excessive; third, that these belts slipped a good deal, from which resulted irregular driving and imperfections in the work; and fourth, owing to the heavy driving there was a great wear of the teeth in the gearing, which had an increasingly bad effect as the wear progressed. This was in the then common arrangement, in which the flyer was the leader. Owing to this, at every start of the machine after a stop, the rove was stretched into a thin place, making uneven yarn as a result. This defect, however, was to a considerable degree obviated by a reversal of the arrangement in which the bobbin was made to lead. Still, even in this position the spindle would start first and injure the rove to a greater or less extent. These were the effects that it was desirable should be obviated, and that the skill of inventors was invoked to remedy. The result has been that a number of new arrangements have been devised to accomplish this result, as our readers are aware, and our columns have testified. And to-day it becomes our duty to bring another of these plans before the attention of our readers. The invention which we illustrate herewith is by Messrs. Brooks and Shaw, and the sole makers are Messrs. Brooks and Doxey, Union Ironworks, West Gorton, Manchester.

The chief object the inventors have had in view in the construction and arrangement of this new motion, upon which a great deal of careful study and labour have been expended, has been to transfer the labour and strain of driving the bobbins from the cone strap to the driving shaft, which has been very ingeniously accomplished. From this several advantages have accrued, and opportunity has been taken in the necessary remodelling of the arrangement to obtain several others. The new motion has been thoroughly tested in practice, as well

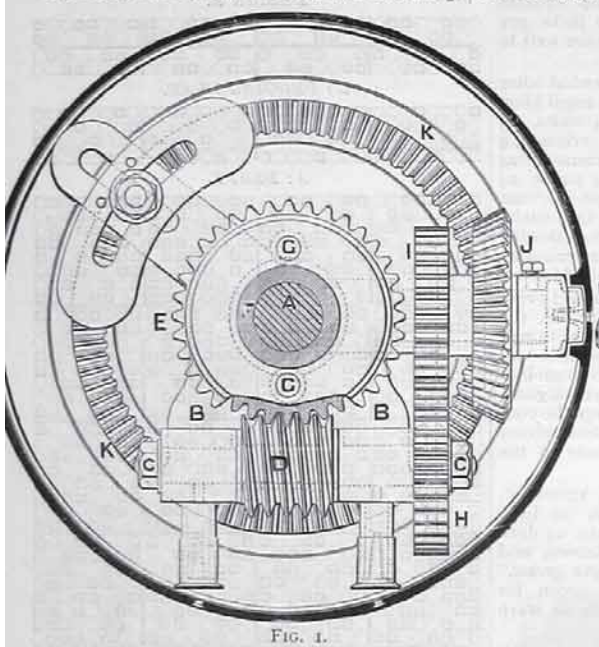


FIG. 1.

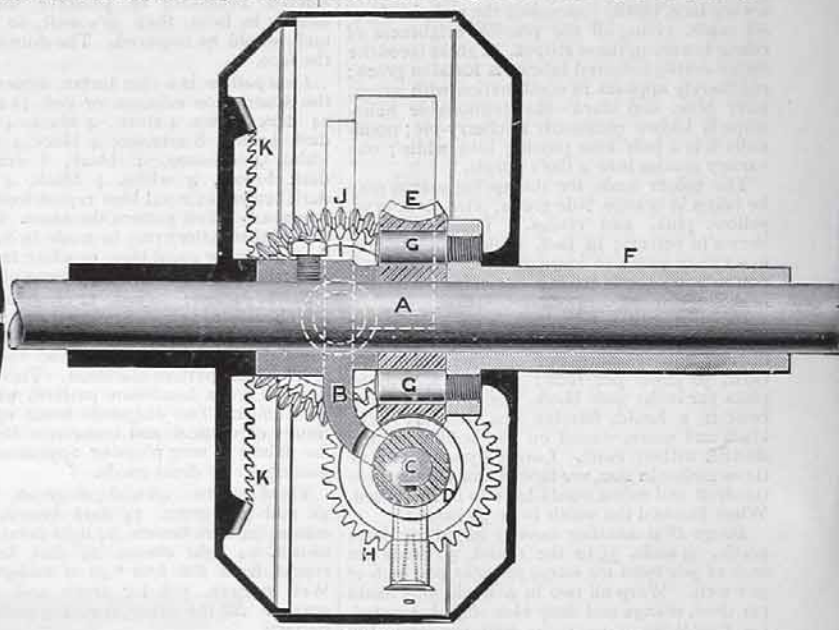
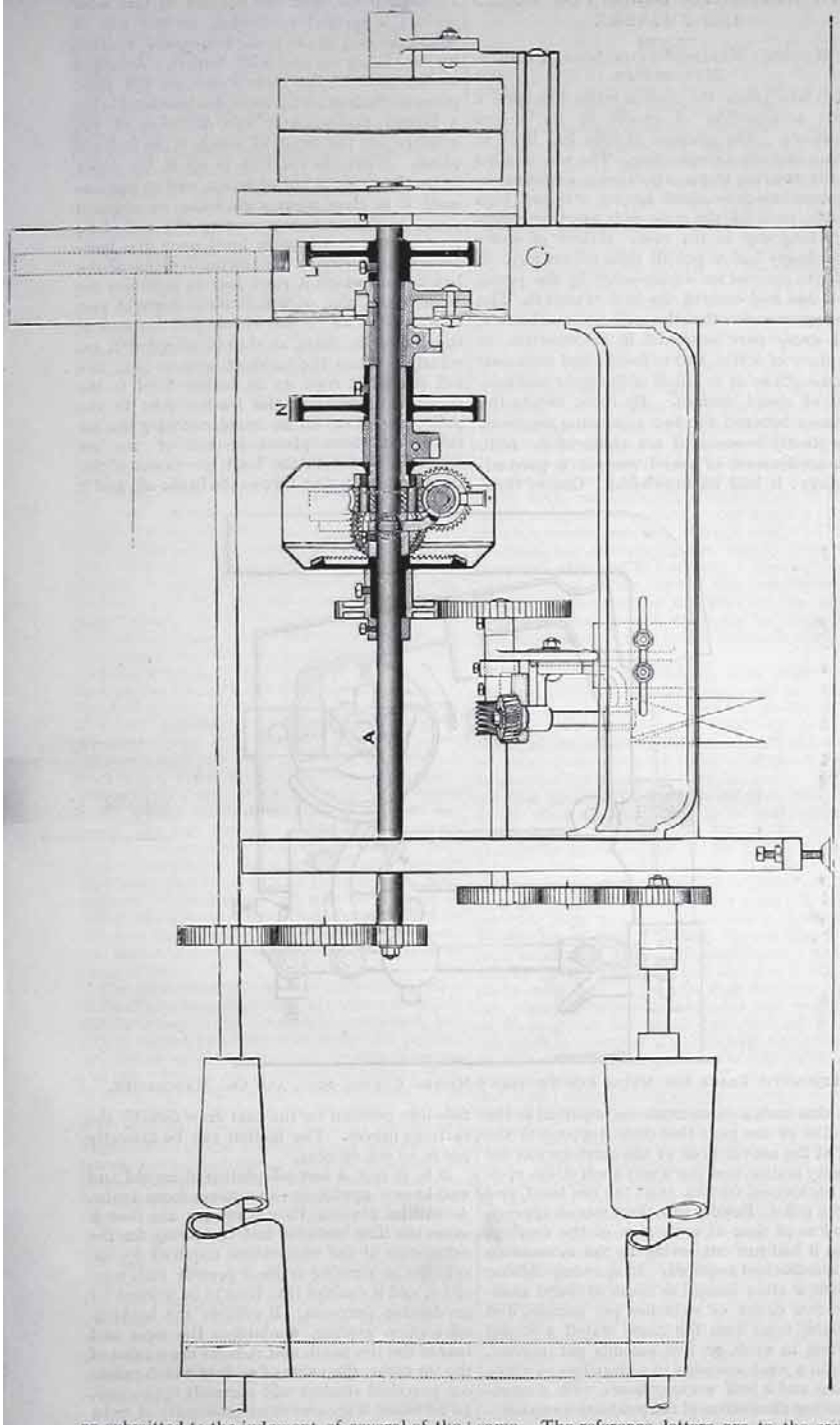


FIG. 2.

IMPROVED DIFFERENTIAL MOTION.—MESSRS. BROOKS AND DOXEY, MANCHESTER.



IMPROVED DIFFERENTIAL MOTION: FIG. 3.—MESSRS. BROOKS AND DOXEY, MANCHESTER.

as submitted to the judgment of several of the best practical experts, and in both respects has responded to the highest expectations, and has secured the most approving judgments. The following illustrations will enable the reader to follow our description: Fig. 1 shews a sectional elevation of the motion on a plane at right angles to the main driving shaft. Fig. 2 shews a sectional elevation on a plane parallel to and passing through the centre of the main driving shaft. Fig. 3 shews part of a back elevation of a roving frame, and a sectional elevation of the motion and parts immediately connected to same. The reference letters are to the same parts in each figure.

The shaft A is the primary shaft of the machine. Mounted upon this shaft, and firmly fixed thereon, so as to revolve with it, is a bracket B, upon which are cast bearings for the stud C. Keyed upon this stud is the worm D, free to revolve upon its own axis, and engaged with the worm wheel E. This wheel is loose upon the shaft A, but is connected to a sleeve F by the two studs G. Any movement, therefore, of the worm wheel E in either direction around the shaft A is necessarily transmitted to the sleeve F. Screwed upon this sleeve is the bobbin driver N, shewn in Fig. 3. Ignoring for a moment the existence of the gearing, H, I, J, K, it will be readily seen that a direct and positive drive is obtained from the shaft A to the bobbin driver N. If we suppose the shaft A to be turned in either direction, it will be seen that the thread of the worm D will press upon the teeth of and revolve the worm wheel E, which will carry with it the sleeve F at the same rate and the bobbin driver N upon its opposite end. Thus it will be seen that a positive drive for the bobbin is very ingeniously obtained. If no disturbing influence intervened, the two wheels N and L would revolve in the same direction and at the same rate as long as the shaft A continued in movement.

But at this point variation is required, and in order that the rove may be wound up exactly at the rate delivered by the front rollers of the frame, and without either slack or stretch, it requires that the variation shall be in exact proportion to the increase of the diameter of the bobbin caused by the deposition upon it of every fresh layer of rove; and also that the acceleration or retardation of the speed shall be made at the proper moment—namely, the commencement of each new layer. Of course it is retardation that usually takes place, as there are now very few instances at work of the flyer leading. This retardation or acceleration of the speed of the bobbin is effected by turning the worm D on its own axis a number of revolutions proportionate to the required variation of the wheel N; thus, if the shaft A and wheel L made 300 revolutions per minute and wheel N was required to make 305, then as bracket B carries the worm D and wheel E round at a speed of 300 revolutions, it follows that the speed imparted to the wheel N due to the revolutions of the worm D round its own axis equals 305—300 = 5 revolutions, that is equal to 1·6% of its total movement; and supposing that D is a double worm, and that the wheel E has 36 teeth, the worm D would have to make $\frac{36 \times 5}{2} = 90$ revolutions round its own axis. The worm D depends upon the cones only for its motion round its own axis. It therefore follows that in the above case the amount of work imparted to the wheel N by the cone belt equals only 1·6%, the remaining 98·4% required to drive this wheel being directly taken from the main driving shaft. The connection of the worm D with the cones, is by means of the spur wheels H and I and the bevels J and K; K is cast upon the inner face of the cover, as shewn and runs loose on the shaft A, and is driven, from the cones in a manner well understood, and as shewn by Fig. 3. The spur wheels I and the bevel wheels J are cast together, and revolve upon a stud cast to the bracket B.

In this invention the gearing can be so arranged that at the commencement of the bobbin the wheel N shall revolve faster than shaft A, and as the bobbin increases in diameter it shall decrease in speed, until at a point when the bobbin is about half filled the wheel N will run at the same speed as the shaft A, when there will be absolutely no movement of the worm and wheels inside the motion; and on the bobbin increasing in diameter the wheel N will begin to run slower than shaft A, and continue to decrease in speed until the bobbin is full, at which point the decreased speed of the wheel N will be less than the speed of the driving shaft A by the same number of revolutions as its maximum speed was greater: thus the maximum speed of the wheel N is, say, 310, the intermediate speed 300, and minimum speed 290, with a constant decrease of speed between 310 and 290. The motion can also be arranged so that the worm shall be practically stopped when the bobbin is empty. In this case the wheel N will run at the same speed as shaft A

at the commencement of the bobbin, and decrease in speed as the bobbin fills, as in the first-named case. The absence of any strain upon the cone belt, except the very slight one required to vary the speed of wheel S, converts the two cones into governors instead of drivers, and in consequence the winding becomes much more regular. This arrangement diminishes the power required for driving to almost nothing, and correspondingly reduces the strain upon the cone belt, obviating all the slipping that usually occurs, and the irregular driving and winding which is experienced in frames fitted with the Holdsworth motion, where the whole of the power required to drive the bobbin passes through the cone belt. This is the principal defect of the old Holdsworth motion, and one that has been very inadequately overcome by the improvements hitherto effected. Another improvement accomplished by the positive driving of the bobbins by the worm and worm-wheel is that the "back-lash" which is so noticeable in other existing frames (where the spindle advances from a ¼in. to ¾in. before the bobbin commences to revolve) is entirely obviated, and the bobbin starts exactly with the spindle, thus doing away with all the injury to the rove that has usually arisen from this source.

It will be gathered from what has already been stated that as the mechanism driving the bobbin revolves in the same direction as the driving shaft, there is a minimum amount of friction generated, and consequently greatly diminished wear and tear. On account of the slow speed the wear of the gearing inside the motion is practically *nil*. This has been proved by means of a motion which has been working on a slubbing frame continuously for about twelve months. The worm in this motion was made of hardened steel, and the wheel purposely of soft cast iron with cut teeth, so as to test the worm and wheel under the most adverse circumstances, and at the end of the period specified the soft wheel only presented a slight polish on the surface of the teeth. In order, however, to prevent any possible wear, these worms and wheels are all being made of steel and cut by special machinery, so that the teeth are exactly the correct shape; they are then hardened by a special process. Access to the motion has been specially studied, and the whole of the parts can be readily separated for cleaning purposes, inspection, or any other requirement.

Complete arrangements for oiling have been introduced, by means of which all the parts can be oiled from outside the cover, the receptacles inside the motions being arranged so that oil cannot be thrown off when revolving.

The advantages secured by this improved arrangement may be summarised as: the requirement of less power for driving; great reduction of wear and tear of cone belts, and gearing of the motion; more perfect driving of bobbin in relation to spindle; positive driving of bobbin, ensuring a simultaneous start of bobbin with spindle; and generally less wear and tear, greater durability, and better work than with the old arrangement. It well deserves the attention of the trade.

Messrs. Brooks and Doxey will be pleased to afford any other information that may be desired, and, by arrangement, will shew it at work.

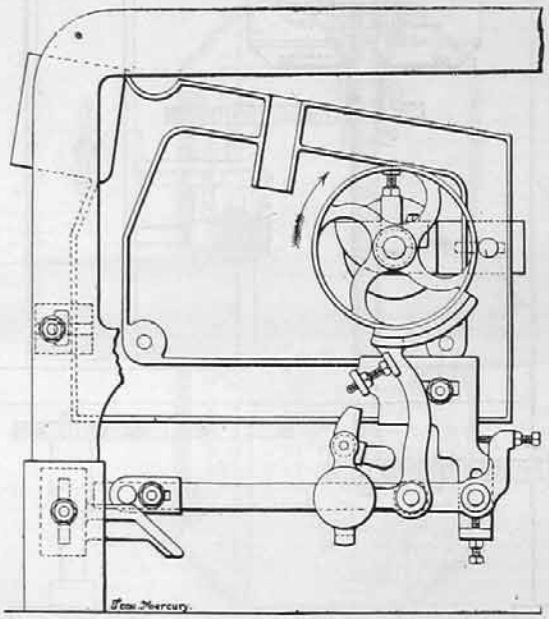
PICKING MOTION.—An invention for an improved picking motion in all kinds of looms, by Messrs. James and Abm. Moss, fustain manufacturers, of Hebden Bridge, has been brought under the notice of the Parisian Academy for Inventions, which has conferred upon the inventors the first-class diploma, and also awarded them the grand gold medal.

NEW AUTOMATIC BRAKE FOR MULES AND TWINERS.

MAKERS: MESSRS. CURTIS, SONS, & CO., MANCHESTER.

Of late years the cotton trade has seen a great acceleration of speeds in its various machines. The purpose of this has been to obtain increased production. The way was led by the new ring frame, which being a continuous spinning machine, and having attained high speeds, soon left the mule as it was then working a long way in the rear. Makers of mules accordingly had to put all their efforts forth in order to prevent its supersession by the young rival that had entered the field against it. The consequence was that the mule was overhauled, and every part improved in construction, in accuracy of action, and in finish; and increased in strength so as to admit of the great acceleration of speed desired. By these means the distance between the two competing machines was greatly lessened, if not obliterated. Still, this acceleration of speed was not a pure advantage: it had its drawbacks. One of these was that such a momentum was imparted to the spindles of the mule that their stoppage at the end of the outward run of the carriage was not an easy matter, and put a very great strain upon the backing-off friction gear, the rim band, and the tin roller. Besides this, there was an appreciable loss of time at each stop of the carriage when it had run out, owing to the momentum the spindles had acquired. In spinning Oldham counts, a mule makes, to speak in round numbers, five draws or stretches per minute, and probably loses from the cause stated a second of time in each, or five seconds per minute. This in a week amounts to a clear loss of three to four and a half working hours, with a corresponding diminution of the productive capacity.

We have the pleasure of drawing the attention of our readers to an ingenious little invention by Mr. J. R. Wain, of the mule department of Messrs. Curtis, Sons & Co., of this city, which is intended to prevent this loss, and to obviate the strain upon the working parts referred to above. It consists of a brake attached to the end of the mule carriage. As will be seen from our illustration, its parts consist of a bracket fixed to the end of the carriage near the back, from which, projecting towards the front, is a lever which has its fulcrum upon the bracket. From a point near the fulcrum of this lever springs a vertical projection, on the top of which the clog of the brake is mounted, as seen, its face being covered with leather. Attached to the front of the mule frame, on the same plane as the horizontal lever, is a bracket having a lateral projection in the direction of the carriage, on the front of which is an inclined plane. When the carriage is up at the roller beam the brake is out of action, and so remains until it is close upon completing its outward run. As the carriage is nearing the end of its journey, the anti-friction bowl upon the horizontal lever strikes the inclined plane of the bracket, up which it runs, and as it attains the summit, the clog of the brake is brought into contact with the brake wheel upon the end of the tin roller shaft, as shewn, stopping it instantly. When the carriage arrives near the full stretch it runs up an incline fixed to the frame end, pressing the leather part to the pulley, and draws on the brake, checking the tin rollers at three places instead of one as formerly, and with the least movement of the tin rollers reversing throws the brake off, and it falls into position for the next draw directly the carriage moves. The motion can be instantly put in or out of gear.



AUTOMATIC BRAKE FOR MULES AND TWINERS.—MESSRS. CURTIS, SONS, AND CO., MANCHESTER.

It is, in fact, a new adaptation of an old and well-known appliance—the power-loom brake. As will be obvious, its advantages are that it saves the time hitherto lost in waiting for the exhaustion of the momentum acquired by the spindles in running at their present high velocities, and it enables that time to be utilised for productive purposes. It relieves the backing-off friction gearing, diminishes the wear and tear of the rim band, and reduces the torsion of the tin roller, the value of each of which points our practical readers will correctly appreciate. In addition, it secures more uniformity of twist in the yarn, and imparts additional steadiness to the movement of the carriage.

It will be obvious that this device will prove of considerable value to spinners, being capable of application to all mules and twiners, and at little cost. Any further information may be obtained on application to the makers, as above.

THE Boston (Mass.) *Journal of Commerce* says:—"Many of the machine builders of the country are entering into a form of organization for the purpose of aiding the government

in the detection of frauds upon the customs revenues, relating to the importation of machinery, and for securing the reversal of the rulings of the board of appraisers affecting the importation of machinery when disconnected and separately packed. The organization is apparently under the auspices of the Manufacturers' Club, Philadelphia. Quite a number of the textile machine builders are enrolled as members. There is a strong feeling in some quarters that much of the machinery that comes into our ports is undervalued."

Bleaching, Dyeing, Printing, etc.

METHODS OF SILK DYEING: THEIR PRINCIPLES AND PRACTICE.—II.

(Continued from page 258.)

All dye-stuffs, whether of natural or artificial origin, are divisible into two distinct classes or groups, which, following the nomenclature of Bancroft, are called substantive and adjective dye-stuffs. The colours of the substantive group are characterised by having a direct affinity for the silk fibre, and will dye the latter without the aid of a mordant; further than that, they only dye one colour in many tints or shades, no matter how the dyeing process may be modified. The adjective dye-stuffs have no direct affinity for the silk fibre, but require the intervention of a second substance, not only to fix them on the fibre, but to develop the colour, and the latter is, as a rule, dependent on two factors, the dye-stuff and the mordant, the same dye-stuff giving or forming different colours with different mordants. To take an example, alizarine gives with alumina a scarlet, with chrome a dark red, and with iron mordants a dark violet. These dye-stuffs are few in number, although they are increasing at a fairly rapid rate. There is no sharp line of division between the two groups: among the numerous coal-tar colours are a few which will not only dye unmordanted fibres, but will also dye on mordants, and these will be increased as time goes on. Now it is obvious that the method of dyeing the adjective colouring matters must be different from that of the substantive colours, and these differences will be pointed out in their proper places.

The substantive colours are capable of being divided into several groups, according partly to the difference in the chemical composition, but chiefly on the principle underlying the process or method which is required to dye them on the silk. It may be remarked in passing that, in these papers, no reference will be made to the differences which have to be made in the dyeing of silk according as yarn or pieces are being dyed; these differences are almost of a purely mechanical nature, and it is desired at present to develop the purely chemical side of the operations of silk dyeing, leaving the treatment of yarn and piece dyeing to a future time.

The substantive dye-stuffs may be divided into at least three sub-groups, which may be termed the direct, basic, and acid colouring matters. The first two comprise dye-stuffs which can be used for dyeing cotton either with or without a mordant, while the last are only applicable in wool and silk dyeing. As there are three sub-groups, there must necessarily be three methods of dyeing the substantive colours on silk.

The first method is used for the application of the direct-dyeing colours. These comprise a few natural dye-stuffs, such as annatto and turmeric, while there are many artificial dye-stuffs—Congo red, chrysamine, Titan yellow, sterosine grey, chrysamine, Clayton yellow, cotton brown, benzoazurine, sulfon azurine, Diamine scarlet, Titan brown, Titan scarlet, Delta purpurine, and all members of the so-called Congo or Benzidine series of coal-tar colours. The usual method of dyeing with this class of colours is to prepare a bath with the required quantity of dye-stuffs, about 2% of soap and 15% of salt, Glauber's salt, or phosphate of soda. There are some differences in the behaviour of the various members of this class in dyeing, especially in regard to the condition of the dye-baths: some, such as annatto, all the Congo reds, and the diamine reds, require a slightly alkaline bath, hence the use of soap, with the addition of phosphate of soda or borax, which have alkaline properties. The use of soap is not absolutely essential, but in most cases it appears to be a relic of old times in the silk dyeing trade; the writer considers that it may be often omitted with advantage. The Titan series of dye-stuffs, chrysamine, and most of the direct blues, are best dyed in a bath of salt or sulphate of soda; it is not necessary to add soap, nor is it desirable, as some of the dye-stuffs are slightly affected by the alkalinity of the soap which is used. It is desirable to work at the boil, the best method being to enter the silk into the bath when it is at a temperature of about 120° to 150° F., and then to slowly raise the temperature to the boil, and keep the bath at that heat for an hour; this serves to develop and fix the colouring matter upon the fibre. Some dyers enter the material into the bath at the boil, and then keep the silk immersed in it until the bath has cooled down. This, however, is scarcely so good a method as the one described above, as the colour is not so firmly fixed, and is therefore more likely to lose colour or bleed on washing. No doubt a combination occurs between the dye-stuff and the silk fibre, and necessarily the affinity between these two will vary in intensity. The object in dyeing is to bring about this combination between the colour and the fibre in the most perfect manner, which can only be done by allowing sufficient time in the dye-bath to effect this object.

This class of dye-stuff is most useful on account of the property that its members possess of dyeing silk and cotton from the same bath—of almost the same shade or tint of colour in the great majority of colours, although in some cases (such as benzoazurines, Congo blues, etc.) the shade is very different. Mixed silk and wool fabrics can also be dyed with the direct colours, giving very level and uniform shades; the dye-bath can be made up in exactly the same manner as for plain silk dyeing.

The second method is that adopted in the dyeing of silk with the so-called basic colouring matters, such as magenta, safranine, auramine, thioflavine, Bismarck brown, chrysoidine, brilliant green, etc. These dye-stuffs have a strong affinity for the silk fibre, and will dye it from a plain water bath. Unfortunately for even dyeing, especially when light shades are required or piece goods are being dyed, this affinity is too great to permit of a simple bath being used. In such cases the first portions of silk which are entered into the dye-bath will absorb all the dye-stuff: thus uneven dyeing is produced, the gradation of colour going from dark shades to sometimes no colour at all. To remedy this trouble it is usual to add to the bath substances which have a retarding influence: the most commonly used is either soap or old boiled-off; of these the former is the best, and should be used in preference as being cleaner, but when only half-boiled-off silks are being dyed it is necessary to use old boiled-off in order to prevent the dye-bath from taking more gum off the silk—a proceeding that the silk-dyer does not desire, and that may lead to defective dyeing. The best substance to use, however, is Glauber's salt, which is simple and easy to work with, and for fully boiled-off silks it should be used in preference to soap, as giving a cleaner dye-bath.

The dyeing is done at the boil, or may even in fact be better done below the boil. The best plan of working is to enter the silk into the bath while the latter is cold, at which temperature the affinity of the dye for the fibre is small; and after working a short time to slowly heat up the bath. When the latter is completely exhausted, the operation is ended, and it only remains to wash the silk, brightening, if required, by means of a very weak acetic or tartaric acid bath, and to dry. It is almost unnecessary to point out that any of the dye-stuffs of this group may be mixed together to produce a variety of compound shades.

(To be continued.)

AFFINITIES OF DYES FOR SILK AND WOOL.

The following tables will be found useful by dyers of textile fabrics made from wool and silk, in indicating the best dyes and the best ways of dyeing for the production of certain shades:

1. DYEING THE SILK AND WOOL EVENLY.—Orchil, turmeric, safranine, rhodamine, auramine, quinoline yellow, azoflavine, alkali blue, Victoria blue, Bismarck brown.

2. HAVING GREATER AFFINITY FOR THE WOOL, AND THEREFORE DYEING IT DEEPER.—Eosine, erythrosine, roccelline, xylidine scarlet, orange, fast yellow, chrysamine, Bordeaux, sulpho green, naphthol black. With these dye-stuffs the dyeing should be done below the boil to ensure uniformity of shade.

3. DYES HAVING GREATER AFFINITY FOR THE SILK, AND DYEING IT DEEPER.—Magenta, Magdala red, rubine, rosolane, mauveine, Paris violet, aniline blue, methylene blue, iodine green, malachite green, nigrosine.

4. DYEING THE WOOL ONLY AT THE BOIL.—Indigo extract, cochineal, acid magenta, naphtho' scarlet, picric acid, naphthol, yellow, tartrazine. This property may be taken advantage of to dye the fabric in two different shades: thus, by using a bath of xylidine scarlet and tartrazine, the wool will be dyed orange and the silk scarlet.

DYEING OF ALL-SILK AND MIXED SILK TISSUES.

For a number of years past the dyeing of silk goods in the piece has been much practised in Lyons and the vicinity. According to the usual system pursued in the manufacture of silk goods, when an order is to be executed the silk yarns required for the warp and weft are selected, boiled-off, and dyed. The warp yarn is wound on bobbins, and the weft on spools, which operations unavoidably cause a certain amount of waste; finally the wound material is passed on to the weaver. During the work, and until it is finished, the stuff is exposed to all kinds of accidents, causing the parties interested to run great risks. The long delay which this work requires is not less dangerous for the customer than for the manufacturer. In fact it may happen that the merchant, disappointed in his speculations, is obliged to keep in his store fabrics which are neglected by his customers, and which are apt to undergo, by keeping, changes of colour.

The system of dyeing in the piece presents enormous advantages over the common method. The manufacturer can keep raw stuffs ready-made on hand, which are woven more easily and without so much waste. As soon as he receives an order he can have the articles dyed and the goods ready in a short space of time. The dealer, in his turn, need not any longer lay in a large stock, being sure of obtaining rapidly from the manufactory all the pieces he needs, and in the colours that are selling best.

Up to 1870, foulards, satins, and linings almost exclusively were dyed in the piece, made from raw silk warp and schappe or fancy weft; then china crapes and all silk foulards were taken up—all fabrics whose texture allowed an easy boiling-off and dyeing. At present much more varied tissues, of closer weave, are successfully dyed in the piece.

A very interesting branch of dyeing, which has attained great development, is that of tissues of silk mixed with wool and cotton. This problem presented serious difficulties regarding the different properties of the constituent fibres. At the present time it is well known how to produce plain colours upon wool-and-silk mixed tissues, after scouring the second fibre without altering the first. As there exists but a small number of dye-stuffs that at the same time dye the two fibres with the same intensity—because some have more affinity for the wool, others for the silk—it is necessary to classify these dye-stuffs, and often to have recourse to peculiar mixtures, or to particular rule-of-thumb, taught by practice.

In general, when the object is to obtain by one single bath a plain dye on both fibres, it is

done in two operations: first the bath is heated to the boiling point, so as to rapidly saturate the wool; then the material is taken out and only re-entered when a lower temperature has been attained, to saturate the silk. Sometimes the inverse order is followed: that is, the bath is heated to a moderate temperature to make the silk take the dye, and when it has attained the required shade the heat is rapidly raised to the boil to dye the wool in its turn. This plan is not so good as the first, for it may happen that owing to the boiling the silk may lose some of the colour it formerly took up.

When it is the object to produce different shades on the wool and on the silk instead of a self-colour, dye-stuffs must be selected that have different affinities for the two fibres, besides bearing in mind the effects of the temperature of the bath. Thus, for instance, red and green shades, yellow and violet shades, etc., may be obtained.

The following table gives some information relative to the affinity of wool and silk at 100°C. (212°F.) for different dye-stuffs:—

DYE-STUFFS.

Dyeing wool and silk evenly.	*Having greater affinity for the wool.*
Archil	Eosine
Turmeric	Erythrosine
Safranine	Roccelline
Rhodamine	Xylidine scarlet
Auramine	Oranges
Quinoline yellow	Fast yellow
Azoflavine	Chrysamine
Alkali blue	Grenat
Victoria blue	Bordeaux
Bismarck brown	Sulphogreen
	Naphthol black
Having greater affinity for the silk.	*Dyeing the wool only at 100° C.*
Magenta	Indigo extract
Naphthaline rose	Cochineal
Rubine	Acid magenta
Rosolane	Naphthol scarlet
Paris violet	Picric acid
Aniline blue	Naphthol yellow
Methylene blue	Tartrazine
Iodine green	
Malachite green	
Nigrosine	

In the case of silk and cotton tissues the conditions of the problem are different. This style of dyeing has made very great progress, and has been greatly developed of late in the Lyons district. The boiling-off of such tissues is effected in machines in which the pieces are automatically wound from one roller to another, the direction being reversed at intervals, the pieces passing through a tub of soap liquor. The dyeing may be done on a similar machine.

Besides annatto, turmeric, safflower, and all the azo compounds of the Congo red class, there are no dye-stuffs that will at the same time dye the silk and the cotton without the use of a mordant. To fix many coal-tar colours on the mixed tissue recourse must be had to mordanting. Ordinarily the process takes place in two operations: first the silk is dyed as if the fabric were composed only of that material, but stopping when the silk has been dyed a shade lighter than is required; then the piece is manipulated in a cold tannin bath for six hours. Next the piece is dried, washed, and passed through a tartar emetic bath, then it is rinsed. The dyeing is done at as low a temperature as possible, best in the cold, in a bath of the dye-stuff. In this way magenta, safranine, Paris violet, methylene blue, Bismarck brown, chrysoidine, and most basic colours can be dyed. The silk has lost its power of absorbing colour, and becomes but slightly more coloured by its second immersion in the dye-bath, doubtless because its pores have been obstructed by the tannin lake which has been formed. This property is utilised for the production upon the same piece of different colours.

The introduction of the Congo class of dye-stuffs has afforded considerable facilities in the plain dyeing of these cotton-silk tissues; these products, which are applied in an alkaline bath without any mordant, fix themselves at the same time upon cotton and silk, and much more so on the former, which is an advantage, as the cotton in such goods is always required of a deeper shade than the silk. By their aid the dyer is enabled in a direct way to obtain a large portion of the colours and shades desired. Blacks can be obtained with aniline black, or a light bottom of this and topping with logwood and copperas. Bleaching of mixed silk fabrics is best done by hydrogen peroxide.—Jules Garcon in *Textile Colorist.*

Finishing size for twill cloths, 15-16 to 20-20. First time: 150 lb. white starch, 90 lb. farina, and 4 lb. tallow, boiled in 250 gallons water. Second time: 90 lb. white starch, 60 lb. farina, and 4 lb. tallow, in 200 gallons water.

Titan Scarlet C is one of the best direct-dyeing cotton reds. It is rather brighter and bluer than benzopurpurine 4B, and is faster to acids and light. On the other hand, it is scarcely so fast to soaping, although it will stand a moderate amount at a low temperature.

A French patent has been granted for a process of preparing a colour for printing on cloth. This colour is made by taking 1 part, by weight, of gum arabic, and dissolving in 102 parts, by weight, of water. To this is then added 15-20 parts, by weight, of egg albumen solution, prepared by dissolving 1 part of egg albumen in 4—6 parts of water. To this is then added 15 to 20 parts of gelatine. When properly prepared, the aniline colour is added to the mixture; the printing colour is now made, and is used in the usual way. It is rather doubtful whether the results will be satisfactory.

Oxygen from Air: Cheap Bleaching.—At the last meeting of the Manchester Section of the Society of Chemical Industry Dr. Bowman and Mr. F. Fanta gave a description of the latter's patent process for the production of oxygen from the air. Dr. Bowman stated that if oxygen could be produced cheaply it would effect a complete revolution in bleaching. If peroxide of hydrogen could be made cheaply he believed it would supersede every other bleaching material in the course of time, because it did not injure the fabrics, and it was besides one of the most powerful bleaching agents we possessed. There were many other uses to which cheap oxygen could be put. Mr. Fanta then proceeded to describe his process, and made some of the gas in a working model he had on the table. The chemical principles of the process, viz., the alternate oxidation and deoxidation of sodium manganate, were not new, but he had by various alterations, especially in the mechanical parts of the plant, succeeded in making the process really successful on a large scale. Oxygen could be produced at prices ranging from 5s. 10d. to 2s. 1d. per thousand cubic feet, according to whether it was sold in a compressed state in small quantities or was made direct at some manufactory by the aid of waste heat.

News in Brief.

ENGLAND.

Ashton-under-Lyne.

The Rock Spinning Co., Limited, have made a call of 5s. per share, making 10s. per share called up, due on May 2nd. The second storey of their mill has just been commenced. The machinery will be supplied by Messrs. Asa Lees and Co., Limited, Oldham.

Blackburn.

The first meeting of the year of the council of the Technical School was held in the Town Hall, on Monday evening. After the officers had been elected, an arrangement by which Professor Beaumont, of the Yorkshire College, will deliver two lectures on textile manufacturing, was sanctioned.

On Tuesday, in the County Court, before his Honour Judge Coventry, Alice O'Hara, weaver, sued the Wellington Mill Co., Great Harwood, for 15s. 8d. Mr. Withers represented the plaintiff and Mr. Higginson defended. The plaintiff, who was a married woman, was engaged at defendant company's mill about seven months, and was paid by piecework. On March 13th she was told she would be fined 2d. for a certain flaw in her work. Rather than put up with the fine the plaintiff left her work, and the money due to her for wages was forfeited in lieu of notice. Mr. Higginson contended that under the Married Women's Property Act of 1882, it was competent for a woman to enter into a contract to the extent of her separate estate, and that the contract was just as binding as a similar contract by a man would be. The effect of the Married Women's Property Act was to over-ride the Employers' and Workmen's Act of 1875. Women wanted to have an equal footing with the men under the Married Women's Property Act, and now that they were on an equal footing they wanted something more. His Honour said he could not agree with Mr. Higginson's argument. Under an Act passed in 1875, it was provided that no abatement should be made in a woman's wages in respect of her work, without defining whether she was married or single, except actual damage in business was proved. In this case there had been no damage proved, and the plaintiff was entitled to the wages earned. In his opinion the Act of 1882 meant to give women certain rights of making certain contracts, and did not in the slightest degree alter the Act of 1875. The plaintiff was entitled to the privileges given under that Act, and he would give a verdict for the plaintiff for the full amount.

Bacup.

The students of the weaving class in connection with the Bacup Mechanics' Institute, accompanied by their teacher (Mr. Atkinson), on Saturday visited the works of Messrs. Butterworth and Dickinson, Burnley. They were conducted over the works by Mr. Tattersall, the manager, who described the various operations through which the yarn passed from the cop to the woven fabric. The winding, beaming, and sizing machinery which this firm make were in operation, being run for the purpose of shewing the students the various motions. Besides plain looms, there were also shewn the firm's various check looms and dobbies.

Bolton.

The three mills of Messrs. T. Barnes and Co., Ltd., which have been running short time for many months past, commenced working full time on Monday.

Burnley.

An important demonstration of weavers was held on Tuesday night to condemn what is called the "driving system" in weaving sheds. Mr. David Holmes, Mr. Joshua Barrows, and others spoke to a crowded audience in the Mechanics' Hall. The system was described as one of the most cruel forms of slavery that ever existed. It sought by undue influence to make the weaker weaver, under unfavourable conditions, produce as much work as his stronger brother with better material to weave. It was stated that this system was in operation at three-fourths of the mills in Burnley. The following resolution was unanimously adopted, amid cheers:—"That the Committee of the Weavers' Association be instructed to take such measures in regard to each firm as they deem necessary, and that this meeting pledges itself to support all weavers who may be called upon to strike, in order to put an end to the cruelty and tyranny now practised in Burnley under what is known as the 'driving system.'"

Bury.

Messrs. Fox and Williams, Manchester, have received an order from Messrs. Robert Peers and Sons, Brooksmouth Mill, to repair, strengthen, and solidify the steam engine foundations with their patent fusible metallic cement. The work will be done during the holidays.

On Wednesday morning Messrs. J. K. Schofield and Co., Limited, Springfield Mill, Bury, were fined 1s. and costs in each of five cases for employing two women and three young persons during breakfast time, on Saturday, March 26th. A large number of the work-people were cleaning their looms in the weaving shed, so that they could get away earlier at noon. Mr. Pearson prosecuted.

We are authoritatively informed that the master spinners of Bury have decided not to take part in the general lock-out which has been decided upon—at all events at present. With few exceptions the mills are connected with weaving sheds, and the employers prefer going on and paying the forfeit provided by the rules of the Federation, to being compelled to stop the sheds as well as the mills.

Bradford.

A serious strike has occurred in one of the dyeing establishments at Bradford. On Thursday week the notices given by the men employed by Messrs. George Armitage and Sons, for an advance of wages, expired, and as their demands were not granted, they struck work. The advance asked for averaged from 5 to 7 per cent., but, in addition, the men stipulated that on any man leaving employment, the person engaged in his place should receive the same rate of wages. The other employers in the town and district are prepared to support the attitude of Messrs. Armitage by a general lock-out; and in that case probably 5,000 persons would be thrown out of employment. The number of men on strike is about 600. On Monday the Bradford Board of Conciliation, at a private meeting, resolved to take some action with a view to avert the threatened lock-out. The men have formed a committee for the purpose of ascertaining the exact wages which have been received by the men and boys who are now on strike. A friendly conference between masters and men concerned in the strike was held on

Wednesday, upon the invitation of the Bradford Board of Conciliation. Various recommendations were agreed to on behalf of both parties, which, if adopted, as there is reason to believe they will be, will have the effect of speedily and satisfactorily settling the dispute.

Chorley.

An interesting lecture on "Russian mills and mill workers" has been delivered by Mr. J. Hesford, in the Congregational School, Adlington. In giving an account of cotton mills in Russia, the lecturer said the system differed in many respects from what we were accustomed to in England. The wages paid in Russia were very low, and the operatives were compelled to work an excessive number of hours in order to get the barest sustenance. The lecturer also gave some graphic pictures of the housing and the manners of eating peculiar to the Russian. Mr. Hesford also related his experience in visiting the exhibition at Moscow, in 1888, and observed that he, with many other Englishmen, was surprised at the efficiency shewn in many branches of industry by the native exhibitors.

Church.

The workpeople of Messrs. Steiner and Co. will present a service of punch bowls to Mr. F. Hartmann, on the occasion of his approaching marriage to Miss Lister. The largest has a holding capacity of three gallons. On it is the monogram, "F.H.," and the inscription, "Presented to Frederick Hartmann, Esq., by the employés of F. Steiner and Co., on the occasion of his marriage. 20th April, 1892." All the bowls are richly chased and fluted, and are fitted with massive side handles, connected to the bowls by finely modelled representations of lions' heads. They each bear the monogram "F.H."

Clitheroe.

A serious accident occurred last week at the Salford Bridge Mills. The large fly wheel and also the spur wheel smashed, and the broken wheels in flying off broke some of the machinery. A weaver had a narrow escape. The accident will cause the whole of the mill, containing near 1,000 looms, to be stopped for nearly three months, and will be a serious loss to the town, the wage list amounting to near £400 weekly.

Dewsbury.

The weavers in the employ of Messrs. Theckrah and Co., woollen manufacturers, Ravensthorpe and Dewsbury, are on strike.

Dukinfield.

The Park Road Spinning Co., Limited, have made a call of 5s. per share, making 10s. per share called up. The foundations of the mill have now been got in, and building operations are going on rapidly.

Haslingden.

Messrs. Thos. Warburton and Bros., Flash Mills, have just had their engine-house wall, etc., materially strengthened by Messrs. Fox and Williams, Manchester, by means of that firm's well-known fusible cement.

The dispute at Hazel Mill may now be considered as completely ended, all the machinery being at full work again, with the exception of the mules, which are not for the present to be worked. Those operatives who voluntarily served their notices and left work at the request of the Operatives' Federation are unfortunately unemployed, their places having been taken by fresh operatives, and it is understood that the directors will not employ any of these operatives again.

Heywood.

The crisis in the cotton trade in Heywood is causing no little concern. If the notices posted last week are to be acted upon this week, no fewer than 2,500 operatives will be thrown out of employment. The masters so far seem determined to act up to the notices and teach the operatives a lesson in manners, whilst the operatives boast that their association will be equal to the strain which will undoubtedly be put upon it—a statement we very much doubt, else why so much concern on their part? One effect of the threatened lock-out has been to cause a general flocking of operatives to the associations fruitlessly seeking shelter from the coming storm. It is said that the stocks of the manufacturers are pretty large, so that unless the lock-out continues for some length of time, the weaving trade will not be much affected.

Horwich.

The new Beehive Weaving Shed, which is expected to find employment for nearly 500 persons, has been built by Messrs. J. Kippax and Co., of which Mr. J. B. Crompton is one of the shareholders and also acts as secretary.

Leeds.

The weavers' dispute at the woollen mill of Messrs. Hargreaves and Nussey, of Farnley, has not been settled. The dispute now hinges on the price-list. Some of the weavers have returned to work, and believe that the employers will not act unjustly towards them.

On Friday of last week the dyers employed by Messrs. Reffitt and Sons, Kirkstall-road, received a week's notice to leave their employment. The firm belong to the Bradford and District Stuff Dyers' Association, and are therefore bound to act in accordance with a resolution passed recently by that body to the effect that unless the dyers employed by Messrs. Armitage, of Bradford, withdraw their demand that all the new men shall receive the same remuneration as those they succeed, the 13 firms in the association will close their works. Mr. Joseph Reffitt states that unless matters are settled at Bradford, upwards of 300 of his workpeople will be thrown out of employment. He points out that his dyers having nothing whatever to complain of, their wages having on two occasions recently been advanced. The masters decline, he says, to have their businesses managed by their workpeople.

London.

The manufacturers of the "Grinnell" sprinkler, Messrs. Dowson, Taylor and Co., Ltd., have changed their London address from 19 and 21, Queen Victoria-street, E.C., to 14, Victoria-street, Westminster, S.W.

Manchester.

Messrs. Fox and Williams, of this city, have just executed an order for bedding a steam engine with their fusible metallic cement for the North Lincolnshire Ironworks. This is the second order from the same firm.

Mr. Gustav Behrens, of the firm of Sir Jacob Behrens and Sons, of this city, and a director of the Manchester Chamber of Commerce, has been appointed by the President of the Board of Trade a member of the Trade and Treaties Committee.

On Tuesday evening a fire broke out in the offices of Messrs. George Belcher and Co., cotton merchants, India-buildings, Cross-street, and rapidly spread among a quantity of stored samples of cotton. The fire brigade found rooms in three upper storeys of the five-storeyed building alight, but they soon brought the flames under control.

Very few indications of a desire on the part of local firms to exhibit at Chicago have been noticeable this week. It is understood that a well-known concern of fancy cotton manufacturers, whose productions include such goods as damasks, quilts, and Turkish towels, has decided to shew at the World's Fair, but their business is of an exceptional character.

Nelson.

It is proposed to erect a new shed here, to hold 500 looms. With the shed of the Springbank Room and Power Co., there is now in preparation in Nelson accommodation for about 2,400 looms.

Nottingham.

The monthly meeting of the Chamber of Commerce was held on Monday, when the Secretary reported as to certain interviews he had had with the Clerk to the Magistrates (Mr. W. T. Cartwright) with reference to the new regulations which had been made by the borough magistrates as to certificates of origin of goods for Spain, and that a new form of declaration was being prepared, which would in future have to be made before the magistrates granted their certificate.

Oldham.

It is reported that there are stocks of cotton at Oldham railway stations which are fifteen months old.

Mr. J. H. Barlow has been appointed as the representative of the King-street Ropery Co., Limited, in place of Mr. John Greenwood, deceased.

It is stated that the first manager of the Pine Mill Co. will be Mr. Benjamin Moores, who for several years was the manager of the North Moor Spinning Co.

Considerable progress is being made with the erection of machinery at the mill of the Holly Mill Co., Royton. The engines, we understand, are really waiting for the machinery.

We understand that Messrs. Healey Bros., Limited, rope and twine manufacturers, Oldham, intend to make considerable additions to their premises at Heywood in the course of a few months.

At the meeting of the Executive Council of the Amalgamated Association of Operative Cotton Spinners, held at Manchester on Saturday, Mr. James Smethurst, who was injured a few months ago whilst following his employment as a minder at the mill of the Shaw Spinning Co., received the accident grant of £100.

The spinners and card-room operatives in the Oldham district are making every preparation for the lock-out. Arrangements have now been completed for the payments for the stoppage out of the funds of the union. The loom workers have also held a meeting this week, and resolved to pay extra levies in order to strengthen the financial position of their association. It is reported that there has been some little difficulty in obtaining the workpeople's consent to work the mills until Saturday. In many instances this is being done, while in others it is not. It is reported that the piecers at one mill in the town on Wednesday noon struck work for the simple reason that they had not had a voice in, nor been consulted about working until the week end, and it was said that similar action would be taken at other concerns. The operatives yet incline to the opinion that the lock-out will not be of long duration, although they admit the stoppage will very much depend upon the state of trade. It is rumoured that owing to contracts a few spinning firms will work, and in these instances they will have to pay the levy to the Employers' Association of ¼d. per spindle, the card-room operatives having also to contribute an increased levy to their organisation.

Preston.

On Monday a meeting was held of Messrs. John Liver and Co.'s weavers, Kent-street Mill. A deputation had waited upon their employers to see if they could come to some arrangement as to the prices paid for crimps. Mr. Luke Park and the deputation reported that for crimps there was no recognised list, but that Mr. Liver said he would pay the average of the town, and would not reduce any of the prices paid for crimps. Mr. Park read a list of prices that would be paid until the average prices paid in the town could be ascertained. He said that the best plan would be to draw up a list price that would be recognised throughout the town, and if they would put their shoulders to the wheel they would win. It was ultimately unanimously decided to accept the temporary arrangement with regard to the prices to be paid for crimps.

Radcliffe.

Patrick Hawes, who was admitted on Friday of last week to the Bury Infirmary suffering from severe scalds sustained by falling into a vat of liquid ash at Messrs. Bealey and Co.'s Works, Radcliffe, succumbed to his injuries on Monday morning.

Ramsbottom.

The strike of labourers at the Stubbins Printworks, belonging to Messrs. Rumney and Co., continues, at the time of writing, with little prospect of immediate settlement. The cotton mills of the same firm which manufacture the prints have also been stopped, as the firm go through the whole process of spinning, manufacturing, and printing themselves. A large number of workpeople are thus thrown out of employment for the sake of a few labourers.

Rossendale.

The students of the Bacup, Rawtenstall, and Shawforth Cotton Classes on Saturday visited the works of Messrs. Brooks and Doxey, at West Gorton and Miles Platting, Manchester, where the various processes were explained by the managers and foremen. On leaving the works each student was presented with a free ticket to Belle Vue, where the firm also generously provided them with a substantial tea. Afterwards Mr. Blakey presided over a social meeting, and short addresses were given by Messrs. Brooks, Butterworth, Spencer (Oldham), Clegg, and others.

Shaw.

On Saturday afternoon the members of the Crompton Mutual Cotton Class visited the extensive works of Messrs. Brooks and Doxey, West Gorton, Manchester. After a thorough inspection of the machines they were entertained by the firm to a substantial repast.

Stalybridge.

At the Police Court, on Monday, Alfred Walker, a non-union minder, in the employ of the Stalybridge Spinning Co., at whose mill the great dispute is now in progress, was charged with assaulting William Brooks, a former minder at the mill. The latter is one of the pickets on duty near the mill premises, and as the defendant was returning to the mill on Sunday night he resented the attention of the pickets by throwing a strap awl at complainant, who was struck, but not injured. The magistrates fined the defendant 10s. and costs.

Stockport.

The congregation of Hanover Chapel are desirous of erecting a tablet in that chapel as a memorial to the late Colonel John McClure, J.P., for many years head of the firm of Messrs. David McClure and Sons, cotton spinners, who died recently.

Considerable attention is being paid to the half-time question by the factory operatives in the Stockport district, and a deputation representing the local textile trades has been appointed to wait upon the School Attendance Committee of the Stockport Corporation to complain of the exclusion of half-time children from certain schools receiving the Government grant.

Westhoughton.

The business of the late Mr. John Chadwick has been purchased by Messrs. Dunkerley, of Glasgow and Macclesfield. The silk mills will be continued as usual, perhaps on a more extended scale.

SCOTLAND.

Dumfries.

A fire occurred on Tuesday night at the Nithsdale Mills, the property of Messrs. Walter Scott and Sons, woollen and worsted manufacturers. Flames were seen breaking through the roof of the wool store, in which was kept the whole of the wool for the supply of the factory, and a large quantity of valuable furniture belonging to a member of the firm, which had been stored there. The materials were so inflammable that

in a few minutes the whole store was in flames and was soon consumed. The damage to the mill, which is estimated at £10,000, is covered by insurance.

IRELAND.

Belfast.

The weekly payment of wages is proposed to be made compulsory in Ireland by a Bill introduced by Mr. Sexton, M.P. "Servants in husbandry" are excluded from the operation of the Bill. But where any other workman works for wages calculated by time, the period of the payment of the wages is directed to be weekly, unless under the custom or contract of employment the payment is made after the expiration of less than a week. If any employer or his agent refuses at the end of a week of employment to pay to the workman the wages due in respect of that week, he is to be guilty of an offence against the Truck Act of 1887.

The circular of the Flax Supply Association shews that the imports of *flax* for March are about equal in quantity to March, 1891, but there is a decrease in value of 30·9 per cent. This, of course, indicates that during the month a lower-class flax has been imported, and this the following figures bear out:—Decrease from Belgium 82·3 per cent., increase from Russia 41·6 per cent., and the general imports for the three months point in the same direction; increase in quantity 39·3 per cent., and increase in value only 22·6 per cent.—*Yarns* exhibit a falling-off of 24·7 per cent, and 25·1 per cent. in quantity and value respectively, comparing March just ended with the same month last year. Amongst the decreases are—France with 40·8 per cent., Belgium 38·4 per cent., Holland 36·3 per cent., and United States 20·7 per cent.: embracing the three months the decrease is only 2·5 per cent. and 1·3 per cent.; this is owing to January having ranked as an increase.—*Linen thread* exports in the three expired months of the year shew an increase of 5·3 per cent. in quantity and 2·9 per cent. in value.—The exports of *linen piece goods* mark a moderate improvement in March. Standing high are the British East Indies, increase 64·8 per cent., Italy 61·6 per cent., British North America 40·3 per cent., and Mexico 31·3 per cent. Amongst the decreases are—France 59·0 per cent., Brazil 40·8 per cent., and Spain and Canaries 26·4 per cent., all in quantity. The totals for the month are increases, the quantity being 13·0 per cent. and the value 6·1 per cent. higher than March, 1891. The unenumerated articles given in values only are decreased for the month 13·2 per cent., and for the three months 7·5 per cent.

Letters from our Readers.

ASHWORTH versus LAW.

(To the Editor of *The Textile Mercury.*)

Sir,—Owing to numerous enquiries, and very considerable misapprehensions, concerning the true issues involved in this case, your readers may be interested in having briefly put before them, in common justice to both parties concerned, one or two observations with regard to the recent decision of deputy Vice-Chancellor Taylor.

1.—It is well known to the card clothing trade that prior to 1880 there was no practical method of grinding deep down the sides of fine wire cards, *i.e.*, no efficient means had been discovered of removing what was commonly known as "end surface" that did not leave something considerable to be desired, until the appearance in that year of the Ashworth patent specification.

2.—It is equally well known that prior to 1880 various methods for pointing or sharpening the teeth of wire cards had been devised, such as Martin's, Allen and Johnson's, Walton's, Wilkinson's, and others; but in no case were they as perfectly successful as their inventors would have wished, nor did the trade accept them as such, mainly for the reason that the extreme carding points of card teeth were sought to be sharpened by these processes, and these, after a few surface grindings, left the teeth blunt and deficient in the desired carding power.

3.—It is clear, therefore, from these two broad facts alone—and on which no evidence has yet been forthcoming in refutation—that had the position taken up by the Ashworth patent of 1880 been assailable, evidence could not have been adduced in open Court, such as an almost general acceptance of it by the trade, an estimated sale of over £800,000 worth of this clothing by the inventors and their licensees; and, further, that no contention at law could possibly hope to succeed against such a patent, and the overwhelming evidence in favour of the originality and value of plough pointing over all known methods of wire sharpening.

4.—The defendants, Messrs. Law & Sons, could not, nor did they, attack the special plough pointing method of Messrs. Ashworth. They contended that their method of sharpening the teeth of wire cards was altogether unlike that of the plaintiffs—so far as grinding deep down the sides of the teeth by the aid of a plough—and was instead substantially that of Mr. Eli Wilkinson, in which view they were supported by the deputy Vice-Chancellor.

It is here where the confusion as to prior use has arisen. The Wilkinson patent of 1878 did not claim the prior use of deep side grinding; it simply claimed the grinding of the extreme points of wires by means of a "V" shaped emery disc, and since the defendants had purchased the machine originally used by Wilkinson, and were said to have adopted substantially a similar method, the plaintiffs were nonsuited on that ground, and that only. Charles J. Hall.

Manchester, April 12th, 1892.

News from the Calcutta jute district states that some rain has fallen and has facilitated sowing. The jute crop will be a late one in any case, but the prospects look much better than they did some weeks ago.

The British Government have agreed to increase the grant to the British Commissioners for the World's Fair from £25,000 to £60,000. This will enable the Commissioners to offer space to British exhibitors free of charge.

The Bill applying the *minimum* tariff to certain American products by way of reciprocity has been unanimously approved by the Committee of the French Legislature, after explanations by M. Jules Roche, Minister of Commerce.

The Secretaryship of the Engineers.—The voting for the position of secretary of the Amalgamated Society of Engineers has resulted as follows:—Anderson, 18,102; Mann, 17,152; Glennie, 738; giving Mr Anderson a majority of 212 over the combined totals of his two opponents.

The balance-sheet of the F. Bayer and Co. Dye Manufacturing Company, of Elberfeld, for 1891, shews a gross profit of £112,500, as against £123,886 for 1890. A dividend at the rate of 18 per cent. for the year is proposed, as against 17 per cent. for 1890, the appropriations to the several accounts being considerably less for 1891 than for 1890.

A motion brought forward in the Dominion House of Commons by the Hon. David Mills, a leading member of the Opposition, affirming the principle of Canada's right to make her own commercial treaties was defeated by a majority of 44 votes. The Hon. G. E. Foster, Minister of Finance, strongly opposed the motion as being a step in the direction of independence or annexation.

Argentine Wool.—The Buenos Ayres correspondent of the *Economist* says: Very large quantities of wool and wheat were being kept back by farmers, the motive being the hope of gaining higher prices through an advance in the gold premium. The movement has, however, been in the other direction, and it seems likely that the 225,000 bales of wool reported to be held in the country, besides abundant supplies of wheat, maize, and hides, will be forced on the market at no distant date, adding greatly to the exports, and tending, of course, to keep up the demand for imports of manufactures in return.

Specifications of Patents.—Some correspondence has taken place between Mr. Leng, M.P. for Dundee, and the Board of Trade on the delay in the publication of abridgments of specifications of patents. Mr. Leng pointed out that, in round numbers, there were 40 classes which were more than a quarter of a century behind, and 50 which were between 30 and 40 years in arrears. In reply the President of the Board of Trade stated that specifications of patents applied for since 1884 are set out in the *Illustrated Journal of Patents*, and, so far as regards each individual specification, it is possible for applicants to consult it. As regards the old series of unillustrated abridgments previous to 1883, the Board of Trade have determined to recast and reissue the old volumes (100 of which have been published) upon improved lines, with, so far as regards the period since 1852, illustrations, and in accordance with the key to the classification, which, after very considerable labour, was finally completed last year. Meanwhile the specifications for the patents applied for between 1877 and 1883 are now being printed upon the same lines as the abridgments published in the official journal since 1884, and time has been devoted to this period, because it seems more important that applicants should be able to consult specifications of patents applied for then than that they should be delayed for the earlier specifications. The question, however, of proceeding more rapidly with the publication of illustrated abridgments has recently been specially under the attention of Sir Michael Hicks-Beach, and he trusts that arrangements will be possible for proceeding more rapidly with the work, and thereby more fully complying with what he believes to be the legitimate demands of the public.

Textile Markets.

*** Owing to the approaching Easter holidays, we have had to go to press earlier than usual: consequently some news and late reports are held over until next week.

COTTON.

Manchester, Thursday, April 14.

Our market this week has been considerably perturbed by the advent of one or two factors not always present. The one of by far the greatest importance is the resolution already announced of a general stoppage in the spinning section of the trade, induced by the exaggerated demands and harassing conduct of the operatives and their leaders. Immediately previous to writing this a wide enquiry amongst the leading members of the trade and joint-stock companies affected shewed that there is not the slightest sign of weakness or of retreating from the position assumed. There is a general concensus of opinion that the conduct of the operatives is simply unendurable, and can no longer be submitted to. It is therefore clear that, as has been frequently pointed out in these columns, the workpeople, by entrusting their interests to the men who have them in charge, have been led into a quagmire. Their want of wisdom is deeply to be regretted, as the impending and now inevitable contest cannot be carried on for any length of time without seriously injuring the contending parties and also many interests quite external to but dependent upon them for their prosperity. There appears to be a considerable amount of apprehension in the ranks of the operatives' leaders about the pass to which they have brought matters, and already they have offered arbitration; but as a fact there is really nothing about which to arbitrate. Their allegations have been over and over again proved to be entirely groundless, and even according to the admissions of their own leaders there has not been the slightest shadow of a justification for their proceedings in connection with the strike at Stalybridge, upon which they have already wasted on their own and their employers' account over £20,000. The employers have now very largely perfected their organisation, and, confident in their strength, they are determined to put an end to the mischievous and irritating attacks that have been continued for such an abnormal length of time.

The effect upon the cotton market has been somewhat different from what superficial observation might lead one to expect, and with a stoppage of spindles on a large scale immediately in front, cotton has decidedly hardened and advanced in value. This may possibly have arisen from a greater or less anticipation on the part of operators in Liverpool that spinners who clear their stocks will reinvest in the raw material the capital so set at liberty. This they may have done to some extent, and by so doing have given a needed stimulus to the market, which operators have not failed to utilize. Whether, however, the trade generally speaking will adopt a course so contrary to their true interests remains to be seen. After the bitter experience they have had this year it might be thought they would be more cautious. They need not fear that while their spindles are stopped any other people will step in and clear the Liverpool warehouses; the cotton will be there when they want it, and the holders will be all the more eager to sell. There is no logical reason whatever why cotton should have advanced ⅛d. this week, and if spinners will constitute themselves weather vanes for the advantage of cotton dealers they may know what to expect as a reward.

Cotton.—For the raw material there has been only a very quiet demand. The exceptional condition of the trade, however, has placed spinners in such a position that to a greater or less extent they have been assisting operators in Liverpool to propel prices upwards. Transferring stocks of yarn, as has been done during the past fortnight owing to manufacturers increasing their takings of yarn in order to tide over the impending stoppage, has enabled spinners to re-invest their liberated capital in the raw material, and their purchases of futures have enabled operators to start the market upwards. On Saturday, and again on Monday, Americans were advanced 1/32d., making an improvement of ⅛d. on last report. Futures in the meantime, under the stimulus previously referred to, ran up 6 to 8 points, but lost 1 to 2 of this amount on Tuesday, when the market went quieter, and prices eased off fully 3/32d. Other growths were unchanged. Yesterday there was little change in the aspect of cotton, the upward movement having made practically no further progress. Yesterday the market regained the tone it had lost on Tuesday, and after some little fluctuation in the early part of the day, closed steady and firm with spot, whilst futures recorded a gain on the day of 2 to 2½ points. Brazilian was in rather better request and steadier in price. For Egyptian there was a good demand, which imparted much

steadiness to prices, and the market was over ⅛d. per lb. worse to buy in over the irregular rates of last week.

The following particulars of the business of the week are from the official report issued by the Liverpool Cotton Association :—

	Import.	Forward.	Sales.	Stock.	Actual Export.
American	57,801..	36,157	31,970	1,457,010..	4,641
Brazilian ..	487..	314..	600..	51,680..	—
Egyptian ..	4,209..	4,367..	6,260	116,800..	623
West Indian	734..	574..	370..	28,970..	214
East Indian	2,832..	1,548..	930 .	35,730..	866
Total ..	66,063..	42,960..	40,130	1,690,190..	6,338

The following are the official quotations of the Liverpool Cotton Association :—

	G.O.	L.M.	Md.	G.M.	M.F.
American.....	3⅜ ..	3 9/16 ..	3¾	3 15/16 ..	4 9/16
			M.F.	Fair.	G.F.
Pernam.....			3 13/16 ..	4⅛ ..	4½
Ceara			3 13/16 ..	4⅛ ..	4 5/16
Paraiba			3 13/16 ..	4 1/16 ..	4 5/16
Maranham			3 13/16 ..	4⅛ ..	4⅜
			Fr. G.F.	F.G.F.	Gd.
Egyptian			4 1/16	4 5/16	4 7/16 4¾
Ditto white			4½*	4⅜*	— 5*
	Fr.	F.F.G.F.	F.G.F.	Gd.	F.G.Fine.
M.G. Broach ..	—	—	—	3 5/16	3 5/16 3 9/16
Dhollerah	2 5/16	2¾	2 7/8	3 1/16	3 1/4 3 7/16*
Oomra	2 11/16*	2 13/16	2 15/16	3 1/16	3 5/16 3 5/16*
Bengal	—	—	2 5/16*	2 7/8	3 1/16 3¼*
Tinnivelly	3⅛*	—	3 5/16 3½	3⅜*	— —

* Nominal.

The following are the values of futures at mid-day on each day of the week—American deliveries—any port ; bases of middling : low middling clause ; (the fractions are in 64ths of a penny) :—

PRICES OF FUTURES AT 1.30 P.M. EACH DAY.

	Saturday.	Monday.	Tuesday.	Wednesday.	Thursday*	Friday
April	3·42 43	3·46 v	3·44 45	3·48 49	3·51	
April-May	3·42 43	3·46 v	3·44 45	3·48 49	3·52	
May-June.	3·44 v	3·47 48	3·46 b	3·49 50	3·54	
June-July..	3·46 47	3·50 51	3·49 s	3·52 53	3·57 58	
July-Aug. .	3·49 50	3·53 54	3·52 s	3·55 56	3·59 60	
Aug.-Sept.	3·52 53	3·56 57	—	3·58 b	3·63	
September.	3·55 s	3·59 s	3·54 55	3·61 b	4·1	
Sept.-Oct..	3·55 s	3·59 s	3·57 58	3·61 b	4·3	
Oct.-Nov..	3·57 58	3·61 62	3·57 58	3·63 4·0	—	Holiday.
Nov.-Dec.	3·59 60	4·0 s	3·60 b	4·2 b	—	
Dec.-Jan..	—	4·2	3·63 s	—	—	
Feb.-Mar..	—	—	—	—	—	
Price of Mid. American.	3 11-16	3¾	3¾	3¾	3¾	
Estimated Sales including Spec. and Export.	5,000 500	8,000 500	7,000 500	8,000 1,000	7,000 1,000	

* 11-45 a.m. report.

YARNS.—There has again been a fair amount of activity in yarns, and manufacturers have continued to purchase stock lots with considerable freedom. Sellers have demanded and have obtained from 1/16d. to 1/8d. advance, the latter, however, only in rare cases. The impending stoppage of spindles has disturbed the minds of manufacturers very greatly, and it is not unlikely, if no organised movement be possible to stop looms to a corresponding extent, that an extensive stoppage on private initiative will take place wherever engagements will allow. Unless this be done, manufacturers are fully cognisant that they will have to provide for the better margin obtained by spinners out of their attenuated and miserably small profits. So far the crisis has done little or nothing in stimulating the export division of the market into any increase of activity. Hence bundles have not moved with the freedom that has characterised cops. Yesterday it became apparent that manufacturers had nearly completed the provision they thought it necessary to make in view of the chances of the future. Yesterday cop yarns for the home trade were again strong and worse to buy, whilst for distant delivery spinners have to a great extent withdrawn from the market. For export account there is not the slightest improvement. Bolton yarns are steadier than of late.

CLOTH.—As yet the dispute has not had the slightest effect in stimulating a demand for cloth. All markets are sending very poor reports and few orders, and these are hardly worth acceptance when they come to hand. Matters all round are very bad, and almost without a redeeming feature. Throughout the week the enquiry for cloth was on every side of a most unsatisfactory character, and has so continued without material change. In this department no improvement can be discovered. A moderate trade continues with South America, but the great Eastern markets are all exceedingly dull. Business will be practically suspended in this market until Tuesday.

To-day the market opens very quietly, with merely a holiday sort of attendance up to one o'clock. No change in the positions.

WOOLLENS AND WORSTEDS.

BRADFORD.—Wool is unchanged. Yarns are dull, and spinners are not well provided with orders. The orders sent in by shippers are not large, although fairly numerous. Prices are low, and profits are said to be down to the vanishing point. There is a good deal of machinery idle Piece goods are not bought freely. The shipping trade is quiet.

LEEDS.—New effects in coatings and serges have been in active request amongst home-trade buyers, Tweeds and prints are steady. Mantlings move off freely, but low makes generally are dull. The American demand for worsteds is a little better. Leeds producers of unions are fairly busy. Morley makers of them and of meltons are doing a considerable export trade. Most of the Yeadon and Guiseley mills are running full time, due to some extent to a demand from South America, orders having come in more satisfactorily from Brazil. The blanket trade is dull. Orders are to hand from Japan for rugs.

ROCHDALE.—Merchants continue to place orders, and those who are usually late are now more disposed to make arrangements for next season. The actual business settled before Easter will be on a much larger scale than is usual. Manufacturers expect a much better trade, and it is almost certain that if the present price of wool is maintained they will be compelled to insist upon higher prices for flannel. The upward movement in the price of wool at the London sales has had the effect of causing merchants to complete their arrangements.

GLASGOW.—Messrs. Ramsey and Company, wool brokers, in their report, dated 12th April, say :—*Wool* : The wool market continues in much the same condition as last week. The spurt at the London sales, and consequent advance in prices of Colonial wool, have had practically no effect on this market as yet, nor on home wools generally. A little more enquiry has been experienced, but there is no increase of business. Prices are, however, for the moment steadier, and holders are less inclined to make any concession. *Sheep skins* : Much fuller supplies, and qualities very prime. White-faced were somewhat neglected, but black-faced were keenly competed for at firm rates.

FLAX AND JUTE.

DUNDEE, TUESDAY.—The trade here does not improve. Calcutta wires that the young jute plants suffer from want of rain, and that the later sowings are delayed from the same cause. New York telegraphs a drooping market for jute manufactures. The home trade is unsettled by strikes, and the English holidays interfere with business. On the spot there is a retail trade doing in *jute*, to enable spinners to keep up assortments. Values are unchanged, although in some cases holders, to secure profit and to avert the cost of warehousing, take five shillings less on the quay. Jute yarn is worth rather less than it was ten days ago. For 8 lb. common cop 1s. 7½d. is got, while some still hold for 1s. 8d. Warps fetch 1s. 9½d. to 1s. 10d., and heavies 1 lea, 1¼d., for good quality. Hessians are difficult to sell at last quotations, and 2⅛d. is the price for ordinary 10½ oz. 40 in goods. It is important to bear in mind that these prices (generally quoted) do not represent the price of the largest and best makers' goods. For best 8 lb warps 3¼d. per pound is the price, and for good Hessian 2 3/8d. ; for extra standard make wide widths the basis is 2¾d. per yard for 10½ oz 40 in., under which it is not possible to buy forward the finest Hessians. *Flax* is quiet There is indeed no quotable change in list prices, but sellers are disposed to give way a trifle to secure sales. Flax yarns are firm, especially the best warps. Tows of superior spin and of best warp quality are firm. For other kinds the price is somewhat irregular. Dundee fancy jute goods are still dull ; only the very best makers are fully engaged. Linens at the moment are less enquired for, as the English holidays stop demand, still both in Fife and in Forfarshire the linen looms are all fairly engaged. Arbroath only continues exceptionally dull, and many of the heavy canvas looms run short time.

BELFAST.—The demand for yarns and cloth is a hand-to-mouth one. Coarse setts of brown linens are quiet, and prices are wavering. Hand loom goods are in a similar position. Unions are in fair request, but other bleached goods are dull.

DRY GOODS.

MANCHESTER.—The week, as far as it has gone, may be regarded as having been satisfactory, except for two adverse factors in the situation. These are the Durham strike and the threatened lock-out in the cotton spinning trade. Under the influence of the cotton dispute buyers have assumed a cautious attitude, and retailers in the districts to be affected do not care to buy season goods largely. The silk departments are not doing much, but those devoted to lace have been more active. Mantle cloths move off steadily. For carpets there is a fair enquiry, some good shipping orders having come to hand.

HOSIERY AND LACE.

LEICESTER.—There is a firmer tone in the wool market. Yarns have been quiet, although there is more doing than was the case a week ago. Cashmere and fine yarns are firm. The home demand for hosiery has been good. Steady makes have sold well.

NOTTINGHAM.—There has been a brisker trade this week in anticipation of the holidays. Some grades of cotton laces are selling well. Mob caps, fancy aprons, and other made-up goods sell more freely. Curtains and window blinds are in fair demand at unchanged prices. Bobbin nets are fair. Paris and Paisley nets are quiet. Silk lace is dull. In hosiery there is not much doing.

Joint Stock and Financial News.

NEW COMPANY.

MANCHESTER COTTON WASTE PACKING COMPANY, LIMITED.

Capital, £4,000, in £5 shares. Object, to carry into effect an agreement made between W. J. Hall and this company, for the acquisition of the undertaking of a cotton waste packer now carried on at Rock Mill, Cheetham, Manchester, by W. J. Hall, and to carry on and extend the said business. Registered without articles of association.

Gazette News.

PARTNERSHIPS DISSOLVED.

J. Bennett and J. Parker, Rochdale and Castleton, cotton band manufacturers and coal merchants ; as regards J. Bennett, deceased.

E. Lockwood, M. R. Dickinson, and A. Shaw, Kirkburton, Yorkshire, woollen and worsted manufacturers ; as regards A. Shaw.

J. and C. H. Severs, Ripon, rug manufacturers and wool merchants ; as regards J. Severs.

Patents.

NOTICE OF REMOVAL AND CHANGE OF FIRM.

E. K. DUTTON & CO.

(Late DUTTON & FULTON),

CHARTERED PATENT AGENTS,

Removed from 1, ST. JAMES'S SQUARE, to QUEEN'S CHAMBERS, 5, John Dalton St., MANCHESTER.

SPECIFICATIONS PUBLISHED.

Each of the following Specifications may be purchased at the Sale Branch, 38, Cursitor-street, London, for the price of 8d., or may be ordered on the Postal Request, price 8d., which is now on sale at all the principal Post Offices in the United Kingdom.

1891.

4,892 LAMB. Jacquard looms.

4,928 YOUNG AND CRIPPIN. Treating fibrous materials in the raw state.

5,136 WILSON AND MIDDLETON. Card-setting machines.

6,101 BRADBURY and others. Loom shuttle-guards.

8,330 SAVILLE AND HULME. Spinning, etc., fibrous materials.

8,595 PEARSON and others. Figured terry cloth.

11,577 PUGH. Oil cloth.

13,025 LUDWIG. Winding yarn.

13,546 TALBOT. Producing woven fabric.

20,225 KELLNER. Treating short fibres.

21,652 BOULT (*Klein and another*). Stitching and tying threads.

1892.

960 BANG (*Dahl*). Azo dye-stuffs.

2,222 PARIKH AND MULCHAND. Yarn-warping machinery.

2,939 OPHOVEN. Colouring pictures on textiles.

3,027 INGERSOLL. Warp threads.

3,033 GEB. Carding engines.

3,190 BOARDMAN AND BURR. Plush fabrics.

3,196 Mewburn (*Haumart Frères.*) Dressing fabrics.

AMENDED SPECIFICATION.

18,849 (1890) Cohen. Sectional warps.

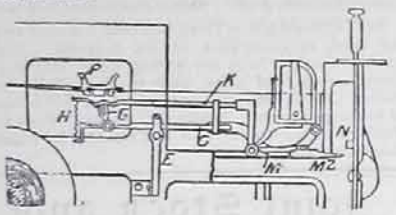
SECOND EDITIONS.

15,680 (1890) John Brinton and Co., Ltd., and Greenwood. Looms.

7,258 (1891) Johnson (*Badische Anilin und Soda Fabrik*). Dyes.

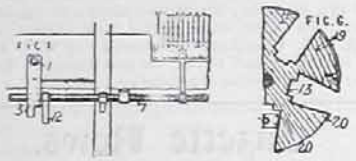
ABSTRACTS OF SPECIFICATIONS.

16,587. Oct. 18, 1890. **Looms.** E. Smith, 3, Brook-street, Bradford.



Stop motion.—For stopping looms, when a warp thread breaks, a series of detector plates P are employed, two warp threads being passed respectively through slots in each end thereof. When either thread breaks the other alone supports the plate, which then falls one way or the other on to a rod or bar G pivoted on two bars C, which are hinged to the lay and reciprocate on supports E. A rod K is indented in order to hold the bar G up ordinarily, but the latter is knocked over by the fall of a detector plate, whereupon the spring H acts to raise the end M2, which, upon the beat up, acts on a block N on the knock-off handle and stops the loom.

16,642. Oct. 20, 1890. **Looms.** A. Sowden, Springfield House, Baildon, Yorks.



Loose-reed motions.—When the reed is thrown out, the partial rotation of the stop-rod 7 (Fig. 1), permits a finger 12 on the latter to be caught by a notched spring-piece 3, pivoted at 1, whereby the reed flats are held clear of the reed until the parts are replaced by the operator. The device may be modified.

Shuttle-boxes.—Rotary boxes are provided with metal linings, which may be made in parts to fit the bottoms and sides of the cells 13 (Fig. 6), and which may be extended, as at 19, over the outside of the box, or may be simply turned over the corners, as at 20.

16,709. Oct. 21, 1890. **Spinning.** A. F. Whitin, Whitinsville, Massachusetts, U.S.A.

Ring and traveller spindles.—A clearer for the traveller is mounted by means of a spring hoop, or otherwise, on the ring, and extends upwards and forwards in the direction of motion of the traveller, so that the fibre caught in the clearer is removed by the traveller. *Drawings.*

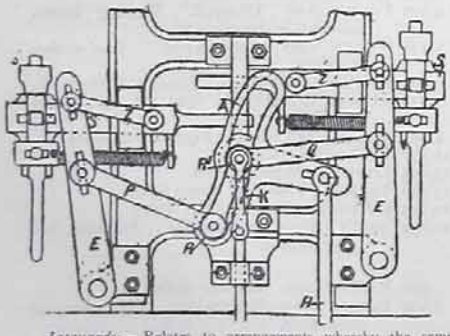
16,732. Oct. 21, 1890. **Drying fabrics.** A. Whowell, 388, Manchester road, Great Lever, Bolton, and A. A. Whitley, Park View, Walmersley-road, Bury.

The fabric is passed from a roller over a number of drying cylinders, and thence over rollers, which support it loosely. It is now taken up in folds by rods, which are forced by travelling chains up inclined ways and on to horizontal travelling chains. The rods are here only short distances apart, the fabric hanging in folds between them, and are transferred by means of a turn-table and travelling chain to similar chains, parallel with the former, on leaving which the fabric passes over stretching rods and over other drying cylinders to another roller. Suitable heating pipes may be arranged beneath the hanging folds of fabric. *Drawings.*

16,801. Oct. 21, 1890. **Sacks and bags.** P. B. Hollick, 5, Miles-lane, London, E.C.

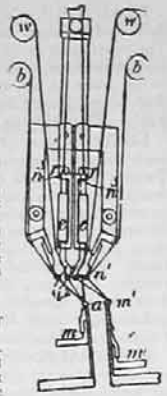
Jute sacking or bagging is woven with certain of the warp or weft threads made heavier and stouter than the remainder, such threads being of jute, flax, leather, wire, hemp, etc. Additional strength is thus obtained. The sacks or bags made from these fabrics may be employed for holding cement, lime, plaster, potatoes, coal, coke, corn, manure, etc.

16,822. Oct. 22, 1890. **Looms.** J. Watson, Belfast Machine Works, Limited Leeson-street, Belfast.



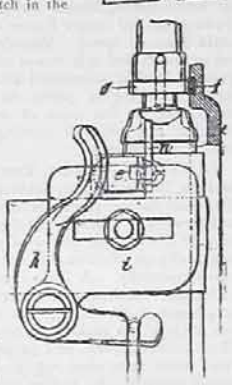
Jacquards.—Relates to arrangements whereby the same machine can be worked either as a double action single cylinder machine, as a double action double cylinder machine, or as a cross bordering machine, one cylinder working the repeat and the other the border in the last case. The cylinder slide brackets S are connected by links Z, P, Q and levers E with rollers R, R1 which are linked together and work in a slotted lever A rocked by a rod H from a crank, etc. By means of a link K and rod (worked by hand or automatically), the rollers R, R1 are moved to one end or to the centre of the lever A, and are thus put in or out of action. Both links P, Q may be connected to one of the rollers to produce a double action double cylinder machine.

16,870. Oct. 22, 1890. **Knitting pile fabrics.** E. Sauer, 29, Carlstrasse, Limbach, Saxony.



Warp machines.—Figured double pile fabrics are made by two sets of latch needles n^1, operated in guides a by bars m. Each of these sets of needles is fed by a set of thread-guides n^2 to form the ground work, and both by two sets of thread-guides n^3, which are selected by a jacquard and rocked from side to side to lay the pile threads on the two sets alternately. The thread-guides n^2 are held in guide-bars n^3 by a series of short dovetailed slides r, and are loaded with weights s. The guides n^1 are fed from beams h, and the guides n^2 from a series of spools or bobbins, the threads from which pass over a series of tension rods and rollers w.

16,880. Oct. 22, 1890. **Spinning.** J. D., A. M., and H. Ryo, all of Roubaix (Nord), France.



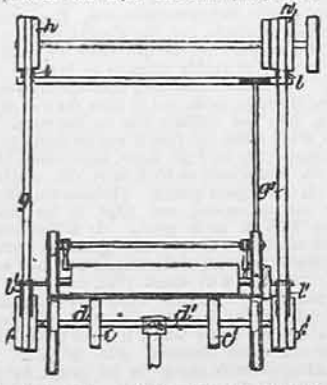
Spindles and their appurtenances.—The spindle is mounted on a pivoted lever c capable of moving to a slight extent horizontally in a notch in the adjustable plate i and continuously pressed towards the right by a weighted lever h. It is driven by the friction between a metal collar g on the spindle and a friction ring f on a rotary disc e. The spindle is stopped for piecing, etc., by moving the lever c horizontally, when the parts g and f are separated and are held apart by a latch n which drops into the notch in the plate i between the lever c and the side of the notch.

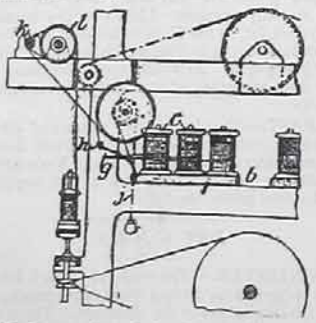
17,015. Oct. 24, 1890. **Knitting.** W. J. Billings and T. Starbuck, Stockwell Head-street, Hinckley.

Circular bearded-needle machines: splicing.—A splicing thread is inserted into hosiery by an extra thread carrier, pivoted to (or sliding in) a standard, and put in and out of action by a spring and a cam respectively. The Provisional Specification describes also means for cutting off the thread after each splice and holding the end ready for the next splice. *Drawings.*

16,959. Oct. 24, 1890. **Stretching fabrics.** J. Welsh, Bowden Bridge, Hayfield, Derbyshire.

Relates to machines in which the fabric is stretched between chains provided with clips. The chain pulleys c, $c1$ are on separate spindles d, $d1$ provided with cone pulleys f, $f1$ which are driven from cone pulleys h, $h1$ by belts g, $g1$. The belts are moved by four forks f, f, $f1$, $f1$ which are operated simultaneously by a hand-wheel. By turning the hand-wheel the movement of one or other of the selvages of the fabric can be accelerated.

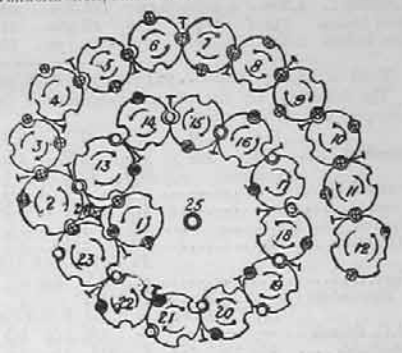




16,967. Oct. 24, 1890. **Spinning.** A. Nicholson and J. Hall, Leek, Staffordshire.

Throwing silk.—The doubled silk is first spun and re-wound in the ordinary manner, and then groups of three, etc., of these threads are doubled and thrown in a machine of the following construction. The groups of bobbins c are mounted on a rail b, and the threads from each group pass in their passage to the spindles under a rod or wire g, through a guide eye h, round a tension pulley i provided with a brake appliance such as a weighted cord j, and round a grooved shaft k and a grooved roller l, which are driven at the same surface speed by suitable gearing.

17,058. Oct. 25, 1890. **Trimmings.** W. J. Adams, Whitworth-street, Manchester.

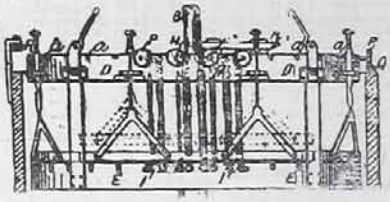


Trimmings, composed of plaited cords with braided selvages, are made upon a combined cord and braid machine, arranged in the manner shewn, 1 to 12 being the braid heads and 13 to 23 the cord heads. The spindles are guided by the governor 24, and the core for the plaited cord is fed through the tube 25.

17,085. Oct. 25, 1890. **Spinning.** J. Wood, 18, Boggs, Allerton, near Bradford.

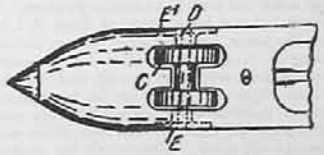
Roving and thread guides.—The guide eye A on the top board is formed of metal, is provided with a flange a, and its lower inside edge c is faced with brass.

17,137. Oct. 27, 1890. **Scouring, dyeing, and drying.** H. Lister, Ashbrow Mills, Huddersfield.



Relates to machines for scouring, dyeing, and drying hanks of yarn. The hanks are carried on rollers H, mounted in slots a, formed in two concentric rings D, supported by a shaft B, rotated by worm gearing. They are kept extended by a second series of rollers I, which may be similarly mounted on two concentric rings E. The rollers H are caused to rotate by providing them with pinions P, which gear with racks Q and R, attached to the side of the tank.

17,193. Oct. 28, 1890. **Looms.** J. Stead, 112, Thornton-road, Bradford.



Shuttles.—The wheels C of heavy shuttles are of metal which is reduced in diameter at the middle part. They are mounted on arbors D, screwed at one end into a block E1, and held freely at its other end in a block E. The arbors may be reduced in diameter in the centre to facilitate lubrication. The wheels may be recessed on their outer faces.

17,195. Oct. 28, 1890. **Dyes.** D. Dawson, Hoffmann-street, Milnsbridge, near Huddersfield.

Relates to the production of blue colouring matters by the condensation of a salt of dimethylaniline with diphenylamine, benzyl-diphenylamine, methyldiphenylamine, or ethyldiphenylamine or with a mixture of these compounds. Consists, for example, in heating on a water bath a mixture of dimethylaniline hydrochlorate and two equivalents of diphenylamine, together with sufficient phenol to render the latter more fluid, and then adding common salt and sulphate of copper or red prussiate of potash, and stirring until the mass becomes thick. Or the dimethylaniline salt may be chlorinated or brominated, and heated with diphenylamine alone. The product, when purified, may be used in the same manner as spirit blue, from rosaniline, or it may be sulphonated by the ordinary methods.