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THE CANADIAN JOURNAL OF Fabrics

THE JOURNAL OF THE
Textile Trades of Canada.

Vol. XVIII.

TORONTO AND MONTREAL, AUGUST, 1901.


No. 8.

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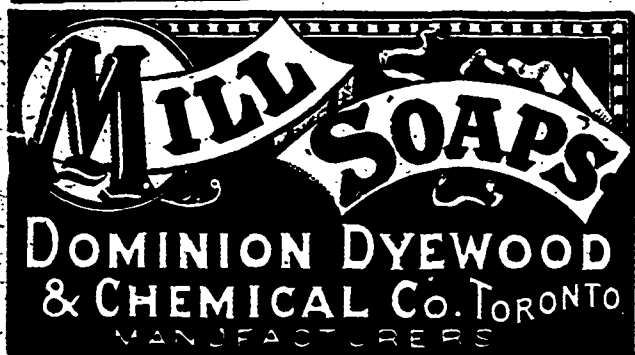
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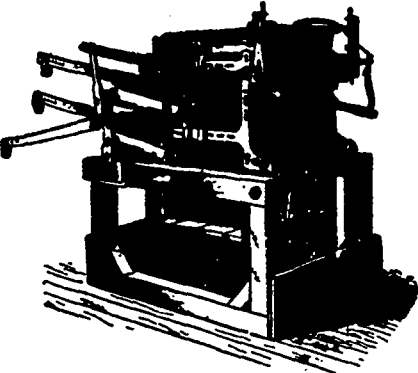
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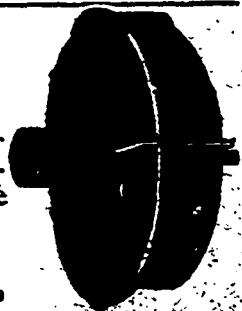
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Canadian Journal of Fabrics

THE JOURNAL OF THE
Textile Trades of Canada.

Vol. XVIII.

TORONTO AND MONTREAL, AUGUST, 1901.

No. 8

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THE CANADIAN TEXTILE DIRECTORY

A Handbook of all the Cotton, Woolen and other Textile manufactures of Canada, with lists of manufacturers' agents and the wholesale and retail dry goods and kindred trades of the Dominion, to which is appended a vast amount of valuable statistics relating to these trades. Fourth edition Price, \$3.00

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REFORM IN ENGLISH WORSTED CLOTHS.

Some time ago we referred to the sensation caused in the British textile trade by the exposure of the practice that has been obtaining in Yorkshire lately of weighting worsteds by means of chemicals. An association was then formed with the object of forcing the manufacturer to abolish the practice. The experience of the association is thus set down by the Textile Manufacturer.

"The way of transformers, like that of transgressors, is hard—in fact, very much harder as a rule—and the newly-formed Yorkshire Worsted Association has not been long in finding this out. The association was only formed a short time ago, with the aim of exterminating the growing practice of adulterating worsted cloths by chemical weighting, and since its formation has probably lost the little faith it had in the average manufacturer. That is, of course, looking at the case from its own standpoint, although we are inclined to think that

it has been too stringent in its regulations. It is well known that pure worsted coatings are preferable to the weighted article, but it has yet to be proved that a large number of consumers are not willing, even anxious, to have weighted goods if they can get them cheaper. Coatings are not worn next to the skin, and any chemical disadvantages would not affect the wearer, so that an adulteration which does not affect the appearance to an appreciable extent, yet adds weight and warmth, is really a boon to many in these days of extra taxation. It would be quite sufficient to have a registered mark to distinguish the genuine from the adulterated article, and reformation should take these lines, at any rate in its early stages. The introduction of margarine was welcomed by the poorer classes and is allowable so long as it is not sold as butter, and in a similar manner loaded coatings might be recognized so long as they had a different name or mark to the genuine article. It is also high time that some such definite means was introduced for distinguishing cotton and adulterated flannels and the heavily-sized cottons which are so prevalent. Returning, however, to the Yorkshire Worsted Association, these gentlemen decided on a special trade-mark, and made arrangements for being registered as an incorporated body. Unfortunately, it appears, the members of the association are bound by a promise not to weight any worsted coatings, which fact converts them into a trade union, and as such unable to be registered under the Companies' Acts. Of course there is nothing to prevent them remaining as they are, and using an unregistered trade mark, but such will be a great disadvantage. Then, another trouble has cropped up; the Association of Leeds Dyers and Finishers, after having given the case a fair trial, have found it impossible to longer refuse to fill goods, such is the demand made by their other customers. This bears out what we have said above, and much more benefit would be derived if the association directed their energies towards securing a recognized legal mark whereby pure coatings, whether made by members of the association or not, could be definitely distinguished from the loaded article. This once done, and the usual test case made upon the first infringement, would seem the most practical way of settling the difficulty.

ELECTRIC POWER EQUIPMENT FOR DOMINION COTTON MILLS COMPANY.

In the fall of 1898, the Dominion Cotton Mills Co. took up vigorously the question of improved power for driving the Hochelaga and St. Ann's mills, in Montreal. They found themselves in possession of a steam plant, most of which had been in operation for about twenty years, and one of the three engines in Hochelaga mill having done good service for about twenty-eight years. The engine in St. Ann's mill was in fair condition, and was capable of good service for a considerable length of time, but new machinery was being installed to increase the output, and as more machinery was being placed in the mill, another engine would have to be added, for which there was no available space in a convenient location. There was but one of



Cut 2.

the Hochelaga engines in good condition, and even this engine needed something in the way of repairs to put her into efficient working conditions. Besides this, the capacity of this mill was also being increased by the addition of new and more modern machinery, and an entire rearrangement of the equipment, making possible a considerable increase in the output of the mill.

The power problem was an important one, and meant either an entire new equipment of steam plant or an installation of electric motors supplied by power from one of the large water-power companies who were

at this time prepared to transmit into Montreal and furnish power at very reasonable figures.

Under the old conditions the different departments of the mill were so connected to the engines that it would have been practically impossible to instal a new steam plant without shutting down the whole mill for at least two months.

A second consideration was to try and eliminate the long transmission lines of shafting to the different departments which absorbed considerable power in friction.

A third object was to try and dispose of the large driving belts from the engines passing up through several floors of the mill, which caused an additional element of risk from an insurance point of view, as the mill was an old one and did not have belt wells.

Figures were made, first for an entire equipment of steam power with rope drives and shaft transmission throughout the mill. The figures were also made for an installation, part of which was to drive directly on to jack shafts near the engine house, and engines direct connected with two dynamos, which would supply power to the mill machinery at more distant points. Finally, however, after carefully considering all the conditions, a contract was made with the Royal Electric Company for electric power, to be transmitted from Chambly, seventeen miles outside the city of Montreal, under conditions of service which would not interfere with the Royal Electric Company's lighting customers, thus making the power which was sold to the Cotton Mills available for use during the hours for lighting and obtaining a double revenue for the Royal Electric Company, which admitted of their making a specially low figure to the Cotton Mills for power purposes. The conditions which the Cotton Mills had to meet in order to avail themselves of this low price for power, made it necessary to shut down the mills at 4 o'clock p.m., during the six winter months, but power was available at all times, except during these six months, between the hours of 4 and 7 p.m.

In considering the adoption of the electric power the following points were discussed: With large steam units to which power was connected to a single prime mover, so that in case of accident to any of the machinery, it became necessary to shut down one of these large units, throwing into temporary idleness a large number of operators. With the electric system, motors of much smaller capacity in each unit made the sub-division of power such that much of the above difficulty was overcome. Furthermore, with the large steam engine units, when it was necessary to run overtime to make up for delays that might have been occasioned by accident to some of the machinery, it was necessary to run a very large unit under uneconomical conditions, whereas with the motors these conditions could be made much more economical, and in the case of any one

department getting behind another the electric motors could be run overtime or a unit stopped, together with the machines driven by it, until the production in the various departments was evened up.

People outside of the cotton milling business will probably not appreciate the importance of this until they realize that the manufacture of cotton is like an endless chain, if a link is broken the whole system is interrupted until the link is repaired, it being practically impossible to keep stock ahead in sufficient quantities to bridge over any considerable period of time, the movement of cotton being almost continuous as it undergoes the various operations in travelling from the bale of raw cotton to the point where the finished cloth is ready to pack for shipment.

Another consideration in favor of the electrical equipment was the ground space that was saved and made available for the addition of cotton manufacturing machinery. The motors were, with a few exceptions, placed in two towers which occupied very little ground space, making available the large space that was occupied by the engine and boiler rooms for other purposes. Besides the actual space occupied by the engines and boilers, the runways for belts inside the building were done away with, making the floor space thus formerly occupied available for the installation of new machinery. The boilers now remaining in the mills are sufficient only for bleaching and dyeing purposes, and for heating the mill during the winter months.

The division of power into small electric units permitted the removal of many tons of large transmission shaft, hangers and pulleys, saving a great deal of power formerly lost in transmission from point to point in the mill. Incidentally considerable advantage resulted from the decrease of smoke and dirt and space for coal storage and the heat, which, in the summer time, was unpleasantly noticeable while the steam plant was in operation. At the time arrangements were made for electric power provision was also made for electric light throughout the mill, taking the place of gas formerly used and the small electric light plant formerly operated from the mill engines. The substitution of electric light of course reduces the fire risk and does not vitiate the atmosphere, which is usually done none too good in large manufacturing institutions.

Having decided upon electric equipment the next matter of importance was the selection of the type of motor to be used. For the purpose of maintaining a high power factor the Company supplying power urged the use of a synchronous motor, and arrangements were made with them for the installation of a trial plant to demonstrate the feasibility of their use for the purpose. A 180 k.w., S.K.C. synchronous motor was installed with its necessary equipment of starting motor, exciter, friction clutches, etc., and operated for a considerable length of time. The clutch on the counter

shaft, which was driven by the motor and from which the rest of the machinery in the department was belted, picked up the load, after the synchronous motor had been speeded up and gotten into step. In starting the load from point of rest, considerable heating occurred in the clutch, often reaching a point where sparks were emitted. This, considering the quantities of cotton fluff and light flyings constantly accumulating at every point where lodgment can be found, makes a fire risk which cannot be overlooked. Furthermore, the synchronous motor was very complicated and required more or less attention and adjustment, particularly if any variation in the load occurred.

It was finally determined that this type of motor was not suitable for the general mill equipment, and



Cut 5.

orders were placed for a few of the Westinghouse, type "C" induction motors. The company supplying power objected very seriously to their use and still continued to urge the adoption of the synchronous motor, objecting to the large starting current which the induction motors were reputed to require. The induction motor being so simple and requiring no starting device, having no brushes or moving wire—the only revolving part consisting of a spider supported on the shaft carrying short circuited bars of copper imbedded in its periphery—the high potential circuit being connected directly to the stationary windings on the motor, which have no connection with, but on the contrary are carefully insulated from the secondary or moving parts, appealed

most convincingly to the sentiment in favor of simplicity, durability and absence of repairs.

To remove any possible objection in regard to the starting current, which ordinarily would be equal to the full load current, and under some conditions of load slightly in excess, a special starting device was provided for the larger size motors, ranging from 50 h.p. to 300 h.p. capacity. These devices had a number of steps so that the voltage increments were gradual and resulted in an increase of not more than 10 amperes per step of the starter, which made the load at the central station increase very gradually instead of by jumps of from 50 to 300 h.p. at a crack.

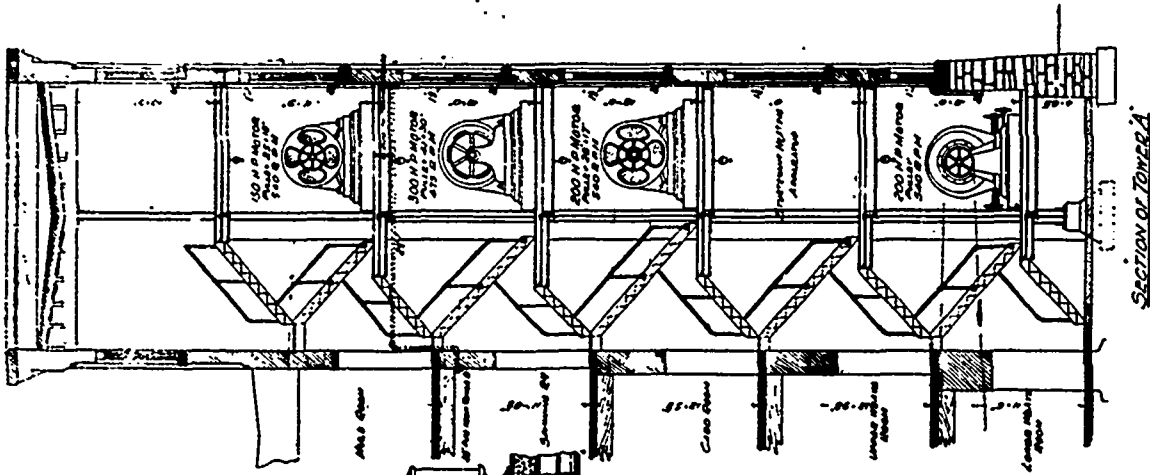
The operation of starting consists only in closing the switch or circuit-breaker, and moving the handle of the starter from step to step until the motor was started and full voltage applied to the terminals. With the small motors, on account of the lesser quantities of current absorbed, the ordinary auto-starter was used, which is operated in two motions to start the motors. A low voltage depending upon the amount of load to be started, being first applied, the switch being reversed into a position where full line voltage was applied to the terminals after the motor had gathered speed. To provide a space for the motors, so as not to encroach upon the floor space in the mill, which would interfere with the placing of machinery, towers were designed and erected at the rear of the mill at most convenient locations for transmitting the power to the shafting in the mills. These towers were constructed with a steel framework, and brick curtain walls with concrete floors and iron stairs, provision being made in one corner for an elevator well. The illustration on opposite page shows the general arrangement and construction of these towers.

It will be noticed that the floor levels in the towers do not correspond with the floor levels in the mill; this arrangement being adopted so as to bring the motors to a sufficient elevation to allow the belts to pass into the mill at sufficient height to give ample head room below the galvanized-iron ducts which enclose the belts in their course from the point where they pass through the aperture between the tower and the mill to the pulley on the jack shaft, the pulley itself being entirely within the box and only a sufficient space being left through which the shaft can freely pass without rubbing on the sides of the casing. The belts thus encased leave no opening whereby drafts of air could carry flame from one floor through the tower and into the next floor above, and serves as a fire cut-off as well as to prevent the flyings from the mill coming into and accumulating on the machinery in the motor tower. As these towers are all steel, brick and concrete, and nothing inside of a combustible nature, the sprinkler system, which is installed throughout the balance of the mill, was omitted as it was considered that the water risk was

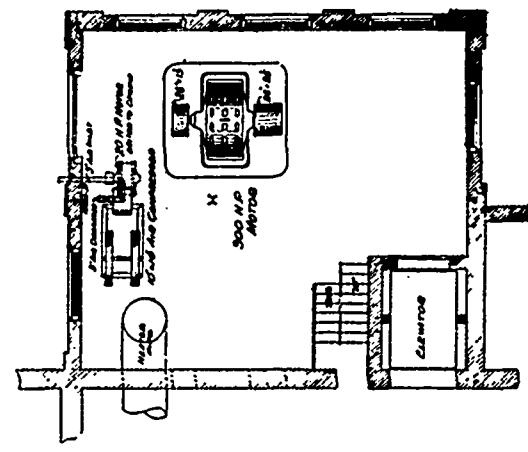
a greater hazard than the possibilities of fire damage.

By reference to the cuts, the general arrangement will be noted. The section of tower "A" shows the only synchronous motor now remaining in the installation located on the lower floor. The floor above this is occupied by a Sturtevant heater, which heats the No. 3 mill, the arrangement of the apparatus being very similar to that shown in the section of tower "B," except that it is smaller. The story above the heater is occupied by a 200 h.p. induction motor and a 300 h.p. three-bearing induction motor is located in the story above this, and for driving the mule room a 150 h.p. induction motor is installed; the upper floor being occupied by the switchboards for the power service, the elevator machinery and motor driving it and storage room for a few electric supplies. The fourth floor of each of the electric towers has an equipment of 4-60 k. w. transformers for reducing the voltage from 2200 volts to 550 or 110 volts, the transformer secondaries being split into five coils, which reduces the drop on inductive load, at the same time making the transformers interchangeable for either lighting or power work. These transformers supply current to motors of 100 h.p. and under, located at various points about the mills where it was inconvenient to drive the power from either of the two towers.

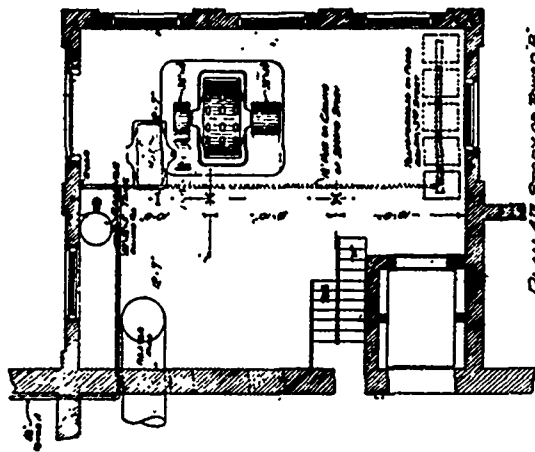
The plan of the fourth story of tower "A" shows the location of the motors and transformers, the elevator and the iron stairs leading from the motor tower to the mill and to other floors of the tower. Double swing doors are provided between the elevator shaft and the tower, besides which there are automatic fire doors between the elevator shaft and mill and the entrance to motor tower and mill. The section of tower "B" shows practically the same arrangement as in tower "A", with the exception that the entire equipment in this tower is of induction motors—one of 200 h.p., 3 of 300 h.p., a 5 h.p. on the top floor immediately over the elevator well for driving the hoist, and a 20 h.p. motor on the ceiling of the floor below which is belted to the air compressor which supplies a system of piping in both towers, a hose connection being provided on each floor so that a connection can be made with a small jet for blowing air into the motors, remove dust and for general cleaning purposes. The air compressor system is also tapped with connections under the transformers so that when running at heavy load a small quantity of air can be supplied to the transformers, which as it expands reduces the temperature and helps to cool them. The galvanized iron piping for the Sturtevant system is carried up in a convenient location in the tower so that no space in the mill is occupied by these risers. The horizontal pipes, of course, are carried through the mill just below the beams and outlets provided with dampers to control the quantity of hot air supplied to each room or to various parts of the same room.



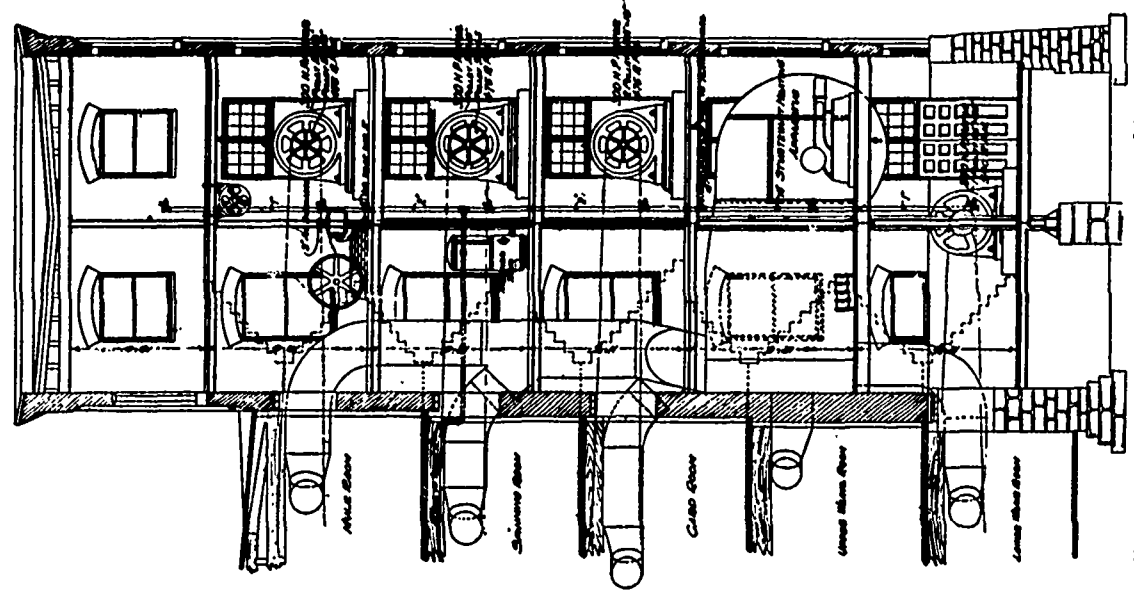
SECTION OF TOWER A



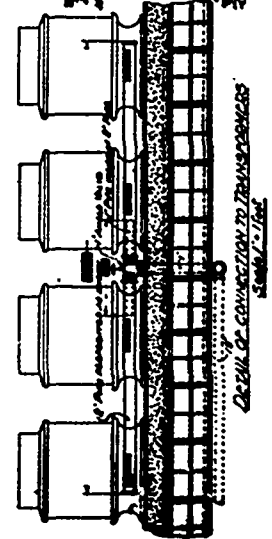
PLAN 3rd STORY OF TOWER B



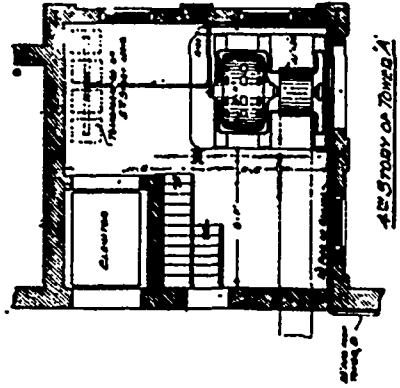
PLAN 4th STORY OF TOWER B



SECTION TOWER B



DETAIL OF CONNECTION TO TRANSFORMERS
Scale 1/2" = 1'-0"



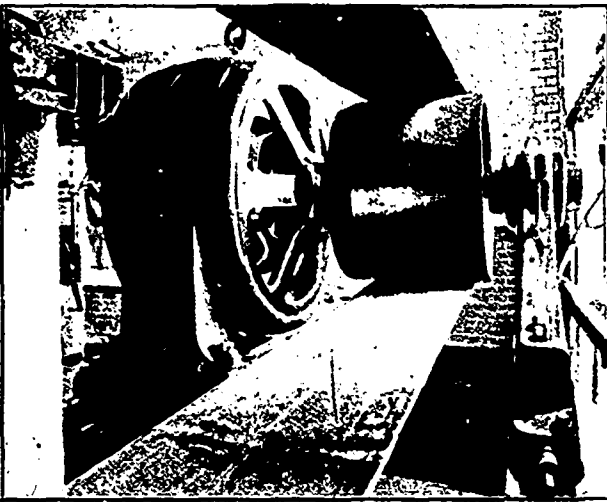
4th STORY OF TOWER A

DOMINION COTTON MILLS CO
HOCHBLEGEL MILL

ARRANGEMENT OF MOTORS & AIR COMPRESSOR
IN ELECTRIC TOWERS A & B
Scale 3/16" = 1'-0"
Nov. 18, 1900.

In tower "B" there is a double throw switch, which, on being reversed, changes the connections in the secondary of the spare transformer from 500 volts to 110 volts, so that in case of breakdown of a transformer on either voltage the switch can be thrown so as to supply the proper voltage and a double throw switch then connects the spare transformer so as to supply the necessary current in place of the one to which an accident may have occurred.

As the mill has to pay for the leakage current or core loss in lighting transformers it is essential to obtain apparatus of very high efficiency and the specifications were accordingly made to provide for about one per cent. core loss. The type "L" transformers, furnished by the Packard Electric Co., have a remarkably low core loss and a regulation of about one per cent.



Cut 4.

All of the large motors are directly connected to the 2200 volt main line pressure. The main switchboard in the top floor of each tower controls all of the motors, as well as the feeders coming into the tower. The small motors are supplied from 550 volt circuits and these are also controlled from the towers, an ammeter being provided in one phase so as to indicate how the motors are starting and permits of their operation from a central point. Emergency switches are, however, placed at the more distant motors so that in case of accident the circuit can be opened at the motors. These switches are seldom used, however, and all motors are usually started by the attendants in the towers. Each of the large motors being operated directly at line pressure of 2200 volts has a circuit breaker in one side of each phase so that in case of any sudden overload the motor opens its individual circuit without blowing the fuses on the feeders coming into the main switchboard or those which protect the various lines in the towers.

The lines supplying the Hochelaga and St. Ann's mills come by three distinct routes, on separate pole lines most of the way, no part of the lines having less than two pole lines. This provides a means of feeding

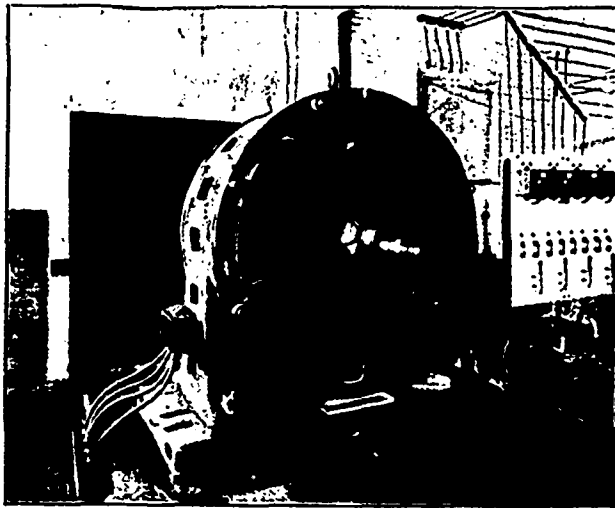
either of the towers from the other tower in case of fire or other interruption to the lines by means of bridge circuits between the towers; the switches controlling which are usually closed, connect all the buss bars in multiple. As the motors in tower "B" drive two sections of the mill these have, with one exception, pulleys on both ends of the motor shafts belting through separate openings into the mill and drive onto the end of two shafts, each extending in opposite directions so as to drive the machinery in the two sections of the mill, each about 200 feet in length. The motors in tower "A" have a pulley on one end of the motor shaft only and belt through the opening in the wall between the tower and the mill to the centre of the shaft in number 3 mill about 200 feet long. This would be the most advantageous drive, as it admits of tapering the shaft in both directions from the center, saving considerable weight of shafting and friction, besides reducing the torsion of the shafts, which often produces unpleasant speed conditions in long shafts, particularly where mule spinning is driven, the end of the long shaft sometimes making several turns faster or slower than the head shaft—that is, winding up and unwinding like the spring on a watch escapement. This method of driving would have been pursued in the other sections of the mill except for the increased cost of the additional tower that would have been required and for lack of available space for its erection.

The small motors scattered about the different departments away from the main mill, are some of them located on platforms above the floor, some on angle iron brackets bolted to the side walls, and some inverted and suspended from the ceiling, depending upon the location, the work to be driven and conditions to be overcome. In ordering the motors careful tests were made to determine the sizes of motors to drive the different departments, and in every case the motors were loaded as nearly as possible to full load in order to take advantage of the increased efficiency and better power factor obtained under these conditions. Any of the motors will stand a considerable overload for several hours, without excessive heating, and as the power factor increases with the load it is advantageous to run motors overloaded rather than with underload, where load conditions are variable, but the load being so constant in a cotton mill it is impracticable to figure on operating under overload conditions, except in a few instances.

The arrangement of the motors in St. Ann's mill is practically the same as in the Hochelaga mill, except that the tower is located at one end of the main mill which is about 200 feet long, and instead of belting as in the case of Hochelaga, the motor shafts were extended through small openings in the wall between the motor tower and the mill and the line shafts driven from this shaft extension, a complete cut-off between the motor tower and mill being obtained by small self-closing doors, operating on practically the same principle as the auto-

matic fire doors which close the openings between the tower and the mill.

To keep up the output of these mills to nearly normal conditions, while changes in motor power were being made, new lines of shafting erected, location of machinery changed and new floors laid throughout the mill involved an immense amount of careful forethought and development of plans so as not to interfere with the operation of the mills. This involved getting everything ready for the change and doing as much as could possibly be accomplished between shutting down time Saturday noon and starting up Monday morning, as at such periods most of the important changes were made, though much work was done between shutting down time at night and the next morning throughout the week. As a result of these changes the worn out machinery throughout the mills has been replaced with new and



Cut 3.

up-to-date cotton manufacturing machinery, utilizing the floor space to better advantage and with the same buildings increasing the output from 30 to 40 per cent. The large induction motors in this plant were manufactured by the Westinghouse Electric Co., of Pittsburg, Pa., who also furnished some of the smaller motors, though most of the smaller sizes were manufactured by the Ampere Electric Mfg. Co., of Montreal, who supply a motor on much the same lines as the Westinghouse Company. The one synchronous motor installed was furnished by the Royal Electric Company and is of the S.K.C. type.

All of the motors have operated in a most satisfactory manner, with the exception of the friction clutch on the synchronous motor, which runs at 66 R.P.M. and picks up the number 3 weave room load from a point of rest and runs it up to speed; little or no depreciation has taken place. The clutch above referred to, however, has to be occasionally adjusted and wearing surfaces replaced. This is usually done in advance of the time when an interruption might ensue, so that the

mill does not suffer loss of time. The speeds on all of the machinery have been slightly increased and owing to the steadiness of this type of motor power, there is very little breakage of ends and the spinning and weaving are most satisfactory.

For protecting the apparatus in the various towers from lightning discharges, cabinets are built at the terminal pole from which the line is connected into the towers which serve as a housing to protect the choke coils and lightning arrestors on the various feeders. There are also placed in these cabinets 4-pole switches capable of opening the circuit at the pole so that in case of fire or other accident, making it necessary to disconnect the lines from any one of the towers, it can be accomplished by sending a man up the poles, which are stepped, and opening the proper switches. The motors throughout the towers and mills are located on heavy timber bases which serve the double purpose of distributing the load over a large floor area, and at the same time checking any tendency for the lightning to discharge through the motors to the ground.

Illustration number 2 shows the starter for the large sized motors of 150 h.p. and upwards. In starting up the automatic circuit breakers at the top are closed with the stick shown leaning against the left hand side of the starter; the knife switches mounted on the same panel with the circuit breakers are then closed, after which the operator increases the voltage step by step by moving the handle shown just below the upper panel which operates the traveling head on the various contacts step by step; the carbon contacts breaking from point to point serve as a preventor resistance, so that the various coils of the auto-starter connected with the contacts are not short circuited. In opening the circuit for the purpose of shutting down the motors the circuit breakers are tripped by the wooden rod running down from the latch of the circuit breaker along the left hand side of the panel.

Number 3 illustrates a 200 h.p., type "C," Westinghouse, induction motor, mounted on the wooden base in tower "A" at Hochelaga mill. The double doors beyond the motor open outward so that the machine can be hoisted or lowered from its position in the tower by means of the overhead trolley on the ceiling of each floor, and a tackle made fast to the iron cat head on the top floor of the tower which projects at outside over these openings. The transom light and bars over the door can be removed by sliding back the bolts. This motor belts back of the meter board shown through the arched opening into the mill.

Figure 4 shows a Westinghouse, type "C," 300 h.p. 3-bearing motor belting into the spinning room in number 3 mill from tower "A." At the left of the motor part of the starter may be seen and it will be noted that the barriers entirely enclose the circuit breakers instead of as shown in plate 2.

Plate 5 illustrates a 2-bearing, type "C," Westinghouse, induction motor, and shows the wooden base on which the machine rests. It will be noted that this machine has a pulley on each end of the shaft for driving machinery, part of which is in number 1 mill and part in number 2 mill. The steel column near the motor has been enclosed in a wooden casing to prevent accidental contact in case of leak in the machine through an attendant who might carelessly have hold of the iron column.

The work above outlined was planned by T. Pringle & Son, Montreal, and carried out under the supervision of their electrical engineer, F. H. Leonard, Jr.

SOLUBLE INDIGO PASTE.

The various kinds of indigo paste at present on the market contain either a relatively small percentage of indigo white or are very much charged with a fixed alkali, chiefly sodium hydrate, or they require for dissolving and preparing the indigo vat such vast quantities of caustic alkali that the subsequent dyeing process of the fiber is greatly interfered with. Fixed alkalies attack textile fabrics very strongly, and the presence of large quantities of caustic alkalies in the vat also prevents the fixation of indigo on the fiber. For that reason, it is a matter of great difficulty to dye dark shades even if great quantities of reducing agents—hydrosulphites, for instance—are added to the vat, and the light and medium shades show a lack in brilliancy of color. The shades obtained are rather dull and grayish-blue, and do not adhere fast to the fiber after all. To avoid all these drawbacks, a Cologne firm have introduced a preparation of indigo paste which contains no fixed alkali at all, and shows a large percentage in effective indigo white.

The process depends on the reduction of indigotine by metals in a state of fine division in the presence of concentrated ammonia. The metals employed for the reduction may be zinc, tin or iron, although tin and iron do not act so energetically as zinc, and should therefore not be used unless zinc dust be not available. Since the reduction of indigo by means of zinc dust and ammonia proceeds very quickly and energetically, the ammonia is preferably added very gradually to the intimate mixture of indigo and zinc dust. The process is carried out thus: In a covered pot, provided with an agitator, 10 kilos. of indigo, pure B.A.S.F., or equal quantity of natural indigo, are intimately mixed with from four to five kilos. of zinc dust. After the mixture has become uniform and homogeneous from 10 to 12 litres of 25 per cent. ammonia liquor are added very gradually and slowly, the agitating being continued all the while. When all the ammonia has been added, the agitator is worked for some time longer, say, one hour or so. The process of reduction is then finished. The pot is opened and the product of reaction quickly pressed, in order to free it from the adhering liquor. If all has been carefully done, and pure indigo B. A. S. F. has been employed to start with, the paste obtained will contain somewhat like 75 per cent. of indigo white. As previously mentioned, the zinc dust may be replaced by tin or iron in a finely-divided state. But in that case, equal weights of tin or iron and indigo should be taken, and the quantity of concentrated ammonia liquor required will have to be greatly increased to somewhat like four times the weight of the indigo employed. As a consequence, the paste obtained is not so rich in indigo white.

An indigo paste prepared in the manner described is not only suitable for the preparation of an indigo vat, but may also be used for printing purposes in combination with the

usual thickening. The indigo vat needs no addition of fixed alkalies, whereby any injury to the textile fabrics to be dyed is avoided, as a matter of course. Furthermore, owing to the absence of fixed alkalies, the indigo adheres much faster to the fiber, and there is no difficulty in producing dark shades by color by one single draw through the vat. There is, therefore, not only a great saving in time, but also in dye-stuff. An indigo vat prepared with a paste made according to the manner stated is also suitable for the dyeing of silk, which is altogether out of the question when fixed alkalies are present in the vat. The colors and shades obtained in dyeing silk show a great brilliancy and adhere fast to the fiber. Such indigo paste may also be employed in combination with other dye-stuffs. Galloxyanine BS and RS produce with indigo paste, red shades, both in dyeing and in printing.—Textile Manufacturer.

GETTING DOWN TO SENSE.

The following article, from the Textile Record of America (Philadelphia), on the relative position of the United States and Great Britain in the manufacturing world, is so refreshing a variation from the usual notes of exultation from across the border, that it is worth reproducing:

Readers of American newspapers, who have no other sources of information might very naturally obtain from some of the recent utterances of these journals the impression that British industry is on the short road to destruction, while American industry will within a few years dominate the world. Maybe it will, at some time in the remote future, but it has a long way to go to reach its final victory. There can be no doubt that this nation, within half a century, under a protective tariff, has risen from the fifth or sixth place to the first place among the manufacturing nations of the world. The development of industrial power and of the capacity to supply our own wants has been wonderful; but there has been also, within the same period, a very great increase of the industrial power of Great Britain. We have grown faster as a manufacturing country, but Great Britain has not grown slowly; and much of what she has gained she holds, and holds with a firm hand. Perhaps we shall compel her to relax her grasp some day or other, but we shall do better not to brag about it until the feat has been performed.

We are proud of the showing we are making in our exports of manufactures; but a truth, during the fiscal year just now ended, we exported less by nearly 29 million dollars than we did in the preceding year. The total for the fiscal year ended June 30th was but 205 million dollars. Great Britain, in 1900, exported in cotton goods alone—a mere fraction of her foreign business—nearly 260 million dollars. The total sales of manufactured articles are so far beyond ours that we are hardly in the game at all.

We have made much advance in cotton manufacture, and we are steadily pushing ahead; but, still, Great Britain has 45½ million spindles, against 19 million in our mills. We may catch up to our rival, and nobody doubts that we shall catch up, but not before the next Presidential election; not by 1925 or 1935, unless Englishmen are all going to sleep, or are going to be scared into a condition of paralysis by American newspapers, which is not likely. If the tariff-wall were taken down, as some Americans want it to be, there are British manufacturers who are so far from being paralyzed that they would give to their American rivals a tough battle for mere existence in this American market. Instead of dominating the earth, many valuable American industries are not yet strong enough to enter a free fight in the open. We have reciprocity with Brazil, and there would seem to be all kinds

of inducements to Brazil to buy our stuff; and yet Brazil prefers to buy in the British Islands. So it is, not only in other parts of South America, but in many other parts of the world. The doom of British trade no doubt is written in the book of fate, and no doubt Americans will be on top when the day of disaster befalls it; but, unless all indications are misleading the babies born in 1901 will be veterans long before the crack of doom is heard.

This country, with its vast and swiftly-growing population, its amazing and unequalled natural resources and its venturesome people, has every equipment to win in the race for industrial supremacy, and the nation would be stupid if it did not win; but England has enormous wealth, the advantage of present supremacy, and the further advantage that her people are not by nature laggards when the industrial race becomes strenuous. We shall win, but there will be no walk-over. In the meantime, we shall do ourselves more credit if we stop bragging, and if, while we are attending to important commercial business, we also attend a good deal more faithfully to the far more important business of removing the corruption which is fast making American politics a stench in the nostrils of honest men everywhere. Before conquering the commerce of the world we shall do well to learn how to govern ourselves decently.

Foreign Textile Centres

MANCHESTER.—An important judgment has been delivered by the House of Lords, which will greatly affect the relationships of employers with the trade unions of the country. It establishes once for all the liability of the unions as organizations for the actions of their officials—the very opposite of a view which has been assiduously cultivated. Cotton crop news from the principal fields of cultivation continues very good. Rain has been reported from the American States as having fallen to such an extent as will do much to allay anxiety about mischief from drought. The old crop bids fair to total over 10,250,000 bales. There is good news also from Egypt. The Nile is contributing this season far more water to the country's requirements than it has done for a season or two past, which means a good cotton crop. India, too, is doing well in the same line. The trade may therefore look with equanimity upon its immediate future so far as its raw material is concerned. In other respects the prospects are not below the average; there should therefore be a period of rather better than average prosperity before us. In the yarn market, shipping yarns continued difficult to move. Bolton yarns, both combed and carded, were little enquired for. The demand from home consumers was very slow in both American and Egyptian yarns. A little more enquiry was heard of for export and a few more transactions were got through, but the aggregate continued small. There is little change in the cloth demand, which was of about late dimensions, and fairly evenly distributed. Values, however, continued too low to permit of acceptance by producers on anything but a small scale. For the eastern markets there are few new enquiries heard of.

ROUEN.—Principally owing to the hot weather the flannel market is quiet. The very marked advance at the London sales might have stimulated the flannel trade, but it has failed to do so. Manufacturers, however, are content to wait, as they expect to gain a stronger position, and there is no pressure to sell, while the mills are turning out a full production.

LEEDS.—As a result of negotiations which have been going on between the Leeds and District Worsted Dyers and Finishers' Association, Ltd., and the Piece Merchants' Section of the Bradford Chamber of Commerce, the following is a copy of a

letter which has been received by the secretary of the Leeds Association from the secretary of the Bradford Chamber of Commerce. "I have laid your letter, dated the 6th inst., before the Piece Merchants' Section of this chamber, and am desired to thank the dyers for accepting our committee's suggestion that for the future the lengths of worsted coatings shall not exceed 65 yards (of 36 inches) in the finished state, it being understood that the dyers will accept longer lengths up to the end of the year at a proportionately increased charge from 1st August next. We have recommended our merchants and manufacturers to fall in with this arrangement, and we trust that by the end of the year the dyers will have no cause for complaint." The attendance on 'Change is small, and the feeling anything but buoyant. Summer fabrics are being sold from stock in considerable quantities, but otherwise the trade lacks vigor. There is an entire absence of speculation on the part of buyers of piece-goods, either for the home market or the shipping branch, and for the most part orders are strictly limited to requirements. The grades of wool from which the finer classes of worsted coatings are produced having become dearer, such goods are in better request and have improved somewhat, though prices have not advanced. Mixture worsteds are also selling fairly well, and for flannel tweeds in stripes the rather brisk demand occasioned by the hot weather continues. Makers of the lower class of woollens are complaining very much of a lack of orders, and production is being severely reduced, stocks being too heavy with little prospect of an early clearance even at a concession. This is largely owing to the depression in the export trade. Ready-mades for summer wear are selling well in most of the industrial centres, and the clothing factories are maintaining their usual output. At this season business in the local wool market is sluggish, and manufacturers are limiting their purchases to present needs.—Textile Mercury.

KINDERMINSTER.—Business in carpets is quiet, and the output is curtailed a good deal by short time or by stopping part of the machinery. There is no lack of confidence in the trade; business is likely to be quiet for a month or six weeks, but there are reasons for thinking that next season's trade will be busier than last. The yarn trade is better.

NOTTINGHAM.—Ordinary goods in fancy millinery laces are slow of sale, and as this is not a propitious season for the introduction of novelties, and manufacturers are not inclined to make for stock, many machines are standing idle. Those engaged in the production of best goods are more favorably situated, a large business being done in the better qualities of Valenciennes, Torchons and fancy novelties in laces, galoons, insertions and allover nets. Moderate quantities of assortments of Maltese, Bretonne and Brabant laces are selling, but there is not a full average request for warp laces and Irish crocheted trimmings.

BELFAST.—This linen market is still quiet, but there is a fairly hopeful tone with more disposition on the part of buyers to do business. Firm prices, however, prevent much increase in volume. The spinning branch is steady, there being rather more enquiry for tow yarns, which have reached, it is believed, the lowest prices. Line welts in range are quoted 3s. 10' 3d., but there is no briskness in demand. The manufacturing end is without change; production is kept in narrow bounds, and stocks are easily controlled; prices are firm. Housekeeping goods and damasks are in fair request. Shipments to Canada have improved. Another report on the linen trade in general states: The linen sections are only poorly engaged, and the sales for the west, although above the average as far as the United States market is concerned, are unsatisfactory, the demand being insufficient to keep mills engaged. The sales are not enough to keep the mills in the neighborhood of Bel-

fast fully engaged, and in the east of Scotland the mills are not well employed. The supply of orders for the Fifeshire looms has been quite inadequate for the requirements of local looms. In many branches of the trade it is impossible to work at a profit, and thousands of spindles are stopped all over the country. The position of flax is so irregular that it is difficult to fix quotations definitely, and the reason is to be sought, not only in the difference between the classes of buying performed in Europe, but in the impossibility of fixing a standard price on the British and Irish side owing to the irregularity in quotations. One may wander aimlessly throughout the quotations shown by the leading British authorities and find no guiding line with reference to flax quotations, such as exists in the case of the cotton trade.

SOUTH OF SCOTLAND.—Business in the tweed districts is only moderately good. As compared with previous years at this time, the production is below the average. What keeps some of the mills in full swing is the Government work placed some weeks ago. So far, orders for next season are not numerous, but as yet it is too early to speak with confidence regarding next season's prospects. Very few transactions in wool are reported.

DUNDEE.—The transactions now being carried through on the Dundee market are restricted to immediate wants. On the whole, quietness prevails in all departments. The reports concerning the new flax crop continue very good, and this will have the effect of preventing spinners buying a ton more than they can help of old stuff. The jute market is slow. In old crop little or nothing is doing, but values remain unchanged.

THE SOAPING MACHINE.

The manufacturer who has never used a modern soaping machine for soaping the goods for fulling, will most likely tell you that he has no use for it; while the one who has used one to the best advantage, and noted all its good points, will say he would not do without it. This implies that the machine possesses merits that are not generally known, which is emphatically true, and is a sufficient apology if any is needed, for taking a subject which to many would seem to be of little interest. The mere soaping of the cloth is not the only advantage of the machine, which we shall attempt to show from facts gathered from a thorough and careful test. The writer, like many another, had his prejudice against the machine, because it looked as though its use was to some extent a waste of time and expense, as well as of space in a mill.

Having had in charge the equipment of a woollen mill with ample funds, and a desire to secure the latest and best, we were induced to try the soaping machine, which resulted in discovering advantages which only appear to the one who is willing to act on the principle that "the proof of the pudding is in the eating." The modern soaping machine is arranged so that the cloth passes through the soap, and then through rollers with adjustable pressure, by which the desired moisture can be obtained, and the surplus soap retained in the tank. In its use, it is best to have a good supply of soap in the tank, and to add after soaping each set of pieces sufficient fresh soap to keep the tank filled to a uniform depth all the time. By this means the soap is kept at a uniform strength, while if it were not replenished regularly, and allowed to run low, it would also tend to run weak by having its original strength exhausted. By a careful test and adjustment of the pressure rolls, it can be easily determined what pressure will be required, and after once secured there is seldom any need of a change, unless the character and weight of the goods should vary. The first, and perhaps the most important advantage of the machine is the uniform moisture obtained. Every fin-

isher of experience knows how important it is to have just the right moisture for fulling, and how impossible it is to secure it by soaping in the fulling mills when there is a constant variation in the length of the pieces. With the soaping machine, the amount of soap per yard is always the same, and whether the cloth be 30 or 40 yards, it always gets just the required amount of soap. By this means the cloth is always in the best possible condition for fulling and the risk of having imperfect work from either a lack or excess of moisture is entirely done away with.

The second advantage of the machine is the saving of time, and this is of more importance than is at first apparent. When the cloth goes to the fulling mills, it is evenly wet, and by the pressure of the rolls, the grease has been loosened up, and the cloth is in a condition to at once begin to full; while in case the cloth is soaped in the mill, it ordinarily requires from 10 to 15 minutes for the soap to become evenly distributed and the grease to get well started, causing a delay in the work to just that extent.

Another important feature in the saving of time is the fact that while one set of cloth is being fulling, another can be soaped in readiness for the fulling, so that the fullest possible benefit of the fulling mills is obtained by securing as nearly as possible their continuous service. Another advantage of the machine is its promotion of cleanliness in the fulling room. When the cloth is soaped in the fulling mills, it is thrown into all parts of the mills, coating the sides and being absorbed by the flocks and flyings in the mills until it is noticeable that a large percentage of the soap is wasted by its never having served the purpose for which it was put into the mill. By the use of the soaping machine, the only soap used goes with the cloth, and by a correct moisture there is never any surplus to go where it is of no use, and the inside of the mills, as well as around and about them, is kept free from the excess of soap, which so often destroys the lasting qualities of the fulling mills by its tendency to cause decay to the wood, and constant corrosion to the bolts and screws that are used in the machine.

This is a point I wish to emphasize, for I found that by the use of the soaping machine, the saving in the condition and consequent service of the fulling mill, by its freedom from excessive moisture in and around its parts, was a most desirable attainment in connection with other advantages, and having started with new machinery, it was plainly evident, as the newness seemed to be retained by the cleanliness maintained. It is useless to speak of the advantage of the saving of soap, as nothing more can be said than that every drop of soap used counts for good service.

Another feature which I found more noticeable on goods that did not run long in the fulling, was that they uniformly washed easier. The pressure of the rolls started the dirt and grease, and where the fulling was not sufficiently long to insure a thorough loosening up of all the dirt, the soaping machine aided very much. Upon some dress goods that did not require any fulling, I found it worth while to use the soaping machine before entering the goods to the washer.

Some very heavy goods that did not get thoroughly saturated by one run in the machine, I found it worth while to run a second time before fulling. The uniformity of the soaping, the promptness with which the fulling begins in every part of the cloth at once, and the freedom from over or under soaping, are points that are of great importance in assuring good work, and making it absolutely impossible for the appearance of cockles caused in fulling, providing the strength of the soap is right, and taken altogether, it will certainly be found, by a fair test, that the modern soaping machine will soon pay for itself in the quantity and quality of work it renders possible

in the fulling department, and cause a saving in soap and profanity that the old fashioned method cannot assure.

PRIZES FOR GOOD SHOOTING.

The J. Stevens Arms & Tool Company, of Chicopee Falls, Mass., are offering to distribute the sum of \$500, to be divided between the 60 young persons sending them before October 1 the 60 best targets made with Stevens rifles. The prizes range from \$50 to \$5. Send them 10 cents in stamps, and state the calibre of your rifle, and they will mail 12 official targets and conditions of the contest.

THE MANAGEMENT OF TEASELS IN GIGGING.

The process of gigging in the finishing of woolen goods often varies, according to the kind of goods to be treated, but, generally speaking, the end to be attained is either to raise a heavy nap, a part of which is to remain upon the cloth as a part of the face finish, or else the principal point is to clear up the felt upon the face of the cloth, so as to bring out clearly the coloring and pattern, and give the cloth a soft and agreeable "feel."

The former is the method employed upon face finished, or as sometimes termed, steam finished goods, such as broadcloths, beavers, kerseys, etc., while the latter applies to goods which have a close or thread finish, such as cassimeres and the like. While the same general rule would apply to all the goods requiring a steam finish would call for more work; and the work upon cassimeres, etc., would depend largely upon the amount of felt the cloth had received, which must be raised in gigging sufficiently to render the shearing to be properly done, so as to bring out the pattern clear and distinct; and it is often the case that heavy felted cassimeres require nearly as much work as the face finished goods, while others would require less, ranging down to such as would clear up with very little gigging or perhaps with only a good, stiff brushing. So in writing, we will at present confine ourselves to such work as would apply to a good quality of close felted cassimere. Before proceeding, however, we will say something in reference to the machines and teasels used. The old-fashioned up-and-down gig is not very generally in use now for raising the nap, but is employed somewhat in wet gigging, which is a finishing process after the nap has been made, and previous to steaming. When these machines were in more general use for nap raising they did very good service, but like all old methods, were too slow for modern ideas. We now have in more general use the single and double cylinder rotary machines, all of which do the work upon the same general principles, the double cylinder machine, of course, doing it more rapidly on account of the increased number of contacts of the cloth to the working cylinders or teasels at one run of the cloth.

One advantage of the double cylinder machine, is the possibility of running the cylinders in opposite directions when desired, which is sometimes desirable upon heavy felted goods. Whatever the style of machine used, the general directions regarding the change and care of the teasel slats which we may give will be applicable.

Regarding the teasels, which play so important a part in the work, there is sometimes an ignorance or carelessness in the selection and care of them which is expensive to the manufacturer in more ways than one, and a little study of their peculiarities may not be out of place.

First, we will say that it seems as though nature intended the teasel for the specific purpose of the use it is put to in the finishing of woolens, because nothing has ever been dis-

covered or invented which was so admirably adapted for raising a nap upon woolens, and there has never yet been found any other use for it. The fine and evenly constructed points of the teasel, together with the tough surface from which it grows, and its connection with the interior pith which gives to the points their peculiar elasticity, or tendency to hold and return to their original position when in use, render them perfect beyond the skill of man to invent, for the use to which they are put, and a little study of their construction and the possibilities that are in them when properly used and cared for, will be worth consideration in the selection of teasels for use. It should be borne in mind that the best are always the cheapest, and they can generally be distinguished by their bright, greenish shade. Those that are dull in shade, and tending to the brownish cast, are likely to be either over-ripe or else have been impaired by an excess of moisture, either in their growing season, or after they have been harvested. If they are over-ripe, the tendency will be for the points to break off in use, and if they have been injured from any cause, it can be discovered by breaking them open, when a part of their pith will be brownish or of a dull shade, instead of bright and light, as when perfect. Teasels thus injured lose the elasticity above referred to, and soon become useless. So it will be seen that it is very important that the quality of the teasel be all right from the start.

The cultivation of the teasel is said to be very uncertain in its results owing to the danger attending the extremes of weather, more especially of the injury caused by a wet spell at a certain period of its growth, rendering the teasel of less value in consequence. Sometimes the manufacturer makes the mistake of storing his teasels where they will absorb moisture, which, reaching the centre, will soon injure their usefulness to some extent. They should always be kept in a perfectly dry place. Having secured a good, serviceable teasel, the next matter of importance is the setting of them in the slats for use. The closer they are set, the more even will be the surface, and the less likely will they be to cause stripes in gigging. The large "King teasels," so-called, are useless except for coarse blanket work, and the small "button" teasel is only suitable for goods that require a little more than a good brushing to clear them up. A medium sized teasel of sufficient length so that two of the average length will fill the slat crosswise by lapping a half inch, should be all right. The teasels set next to the cross irons of the slats should be of a soft, bushy kind, and by being pressed firmly against the iron on either side, will very nearly cover it, thus avoiding a continuous open space around the cylinder where these occur, and a consequent danger of gig marks by a deficiency of gigging at these points.

This is a seemingly small matter, but will count for much in the perfection of the work if acted upon. There are two methods of teasel setting. One may be called the dry, and the other the wet method, the latter of which is by far the best provided certain precautions are taken. By having the teasels wet, they can be much more closely set, making even work, as well as being much more easily handled in setting. The precautions to be observed are on account of the danger following the moisture remaining in the teasel for any considerable length of time. For this reason we would advise only wetting a few at a time, say enough for three or four hours' setting, and then drying them as soon as possible, as each slat is filled, in which case the moisture will not be in them long enough to cause serious results. The best way to wet them is to use a basket or some vessel with openings in the bottom, in which to place the teasels, then throw over them one or two pails of boiling hot water, and cover up immediately with a cloth. The water runs directly off, which with the steam held in for a few minutes by the cloth, will render them soft and

pliable, without retaining a dangerous amount of water. Set them quickly and dry promptly, and they will be "as good as new." But no teasels should be left wet over night, or be subjected to the wetting process the second time. By the wet method of setting, the teasels can be pressed firmly together, giving a much smoother surface with a larger number of points to the square inch than by the dry method, which counts for considerable in the excellence and rapidity of the gigging.—Cassimere in Wool and Cotton Reporter.

SHUTTLES FLYING OUT.

A shuttle never flies out of a loom without cause, but sometimes it is extremely hard for the fixer to locate the trouble, and if he be a man of limited experience, he will spend many a weary hour in fruitless search, and finally have to call on a more experienced man for assistance. The causes of shuttles flying out are numerous, and at times their actions are so irregular that to the uninitiated it does not appear reasonable to assert that a single cause is responsible. At times, a shuttle will fly out of the shed repeatedly, and then it will run for hours before it will again leave the loom. A broken thread in the shed will often throw the shuttle, but as this can be easily located by the weaver, and remedied, nothing need be said about it. Sometimes the picker spindle is not exactly parallel, so that the picker does not give the shuttle a straight blow, but one that deflects the shuttle, causing it either to fly out or the loom to bang off. Sometimes the hole into which the taper end of the spindle fits is a little large, and as the picker moves back and forth on the spindle, the spindle moves also, imparting an uneven blow to the shuttle, that will cause it to fly out.

By packing the hole with thin leather, the taper end of the spindle will remain firm, and the spindle will not vibrate as the picker moves back and forth. If the spindle hole of the picker is not reamed out true, the shuttle may be thrown out. The sweep of the strap also has an influence on the movement of the shuttle. If the strap is made so short that the blow of the picker ball is immediately communicated to the picker stick the movement of the shuttle will be jerky and the probabilities are that it will be occasionally thrown out. The slash or sweep of the strap should be sufficient to impart the blow of the picking ball gradually to the picker stick. The slack of the strap is first taken up by the blow, and then the force is imparted to the picker stick, with the result that the blow of the stick on the picker and shuttle is free of jerkiness.

If the picker stick is not true and square where it fits into the picker, it may impart an uneven blow or movement to the picker, thereby causing the shuttle to move out of a straight line. Anything which has a tendency to throw the shuttle out of a straight line while it is moving from box to box, will cause the shuttle to fly out. The reed forms the back guide, and the raceboard the bottom guide for the shuttle in its passage across the warp, leaving the top front and both ends open for the shuttle to leave the loom if its course is diverted by a broken thread or knot in the shed or by an uneven blow of the picker.

If the hole in the picker head is uneven, it will cause the shuttle to fly out by imparting a crooked motion, but it may not do so every time, as the deflecting motion may be imparted only at intervals, or instead of throwing the shuttle out of its shed, the tip may be raised, so that it will break the warp threads. With the picking motion properly working, which will include picker, strap, spindle and picker stick, there is not much liability of the shuttle being thrown out unless there is a defect in the raceboard or reed.

It is not a difficult matter for the skilled fixer to detect

the causes of shuttle throwing when they arise from badly adjusted pickers, too much power, defective pickers, spindles or when the drop boxes on fancy cotton looms are too high or too low, and he can quickly remedy them. If the reed does not form a perfectly straight line with the back of the boxes, the shuttle will be deflected from a straight line and thrown out of the shed. A straight edge laid from box to box will always tell whether the reed is out of true or not. A bent dent in the reed will deflect the shuttle from a straight course, and cause it to leave the shed. It is the hidden or unusual defect that causes the fixer the most trouble, and these are generally found in looms provided with an iron raceway. Sometimes they are plainly visible, but they appear so insignificant that only the fixer of long experience recognizes their importance. A shuttle may get caught between the batten of the lay and breast beam, causing the batten to spring, which in turn affects the iron raceway, and the result is the same as when a bent dent exists in the reed. Sometimes the raise in the raceway is only a small spot that would escape detection unless tried for with a straight edge. In such cases the fixer will be sorely puzzled to locate the trouble.

The loom may run for several hours, and the shuttle may not fly out, and then for a number of picks in succession the shuttle will strike the defect in the raceboard in such a manner that it will be thrown out every time. A worn raceway, whether of wood or iron, will cause trouble by occasionally throwing the shuttle. Whether the raceboard is dented, sprung or worn, the only cure for it is to take it out of the loom and have it planed down true.—American Wool and Cotton Reporter.

DEFECTIVE DYEING OF WOOLEN TISSUES.

The following (says a writer in the *Leipziger Farb- und Zeugzeitung*) are the chief causes of defective dyeing in the case of woollen tissues: 1. Imperfect scouring. 2. Incomplete saturation of the tissue with water before entering it into the mordanting bath. 3. Defective mordanting, due to the process being commenced at a high temperature. 4. Dark-colored lists are produced by the continued action on the wool of the mordanting liquor retained by it after its withdrawal from the bath. Their formation may be avoided by passing the tissue through a cold water rinsing bath as it leaves the mordanting bath. 5. Exposure to light in the interval between mordanting and dyeing.

In dyeing with coloring matters of the alizarine class from one to one and a half pounds ammonium acetate should be added to the bath for each piece of 50 pounds in weight dyed. The temperature of the bath should not at the beginning exceed from 70 to 80 degrees F., and should be gradually raised to the boil. Completion of the dyeing is accomplished by an addition of acetic acid. If the shade obtained be too pale and requires to be further dyed, the bath must be allowed to cool before any addition of dyestuff is made to it, and must be again heated gradually. It is usually advisable, however, in such a case to employ a non-mordant dyestuff in the second dyeing operation, on account of the difficulty of obtaining the desired shade of color with dyestuffs of the alizarine group after the operation of dyeing with them has once been interrupted. The proportion of alkaline bichromate employed in mordanting should be regulated by the intensity of the color subsequently to be dyed.

The new dyehouse, finishing room and warehouse of the Golerich Knitting Co., are now finished and equipped. The mill reports a very busy season.

IMMEDIAL BLACK AND IMMEDIAL BLUE.

W. J. Matheson & Co., Montreal and New York, send the following description of the above colors, which are made by Leopold Cassella & Co., and which have acquired importance for cotton dyeing, because they may be dyed cold. Owing to this property they are important for dye works which have no steam boiler, and therefore cannot work according to ordinary methods of dyeing.

The dyestuffs are dissolved in wooden or earthen vessels. The dyestuff is mixed with the quantities of sodium sulphide stated in the recipes mentioned, and boiling hot water poured over the mixture, which is then well stirred until it is completely dissolved. (By sodium sulphide here mentioned is always understood the ordinary crystallized sodium sulphide of commerce. Of the concentrated sodium sulphide, which is sold in the shape of irregular lumps only one-half of the quantities stated for the crystallized product is needed).

Immedial Black.—The dyeing of piece goods may be carried out in any earthen, wooden or iron vessel, etc., which must, however, contain no parts made of copper or brass. It is essential that the goods immediately after being dyed, i.e., directly when coming from the dye vat, are well squeezed off at full width by means of a pair of squeezing rollers, and then at once very well rinsed. In dyeing the brands FF extra, V extra and G extra, prepare the bath with about 20 times as much water as the goods weigh and 20 to 25% Immedial Black calculated on the weight of the goods, in addition to 9½ oz. sodium sulphide, 1 lb. 3 oz. dextrine (yellow), 1 lb. 8 oz. common salt, 8 oz. Turkey red oil, per 10 gallons liquor.

When dyeing in the standing bath add for each subsequent lot, 9 to 11% Immedial Black, 3 to 4% sodium sulphide, 1 to 2% dextrine, 1 to 2% common salt, 1 to 2% Turkey red oil, calculated on the weight of the dry goods.

When using the brands "NB" and "NG," prepare the dye bath with about 20 times as much water as the goods weigh and 20 to 25% Immedial Black calculated on the weight of the goods, as well as 14½ oz. sodium sulphide, 1 lb. 3 oz. dextrine (yellow), 1 lb. 8 oz. common salt, 8 oz. Turkey red oil per 10 gallons liquor.

When dyeing in the standing bath add for each subsequent lot 9 to 11% Immedial Black, 6 to 8% sodium sulphide, 1 to 2% dextrine, 1 to 2% common salt, 1 to 2% Turkey red oil, calculated on the weight of the dry goods.

The dyestuff is dissolved as stated before and added to the bath. The other ingredients which have been previously dissolved are then added, and after the whole has been well stirred, the well wetted goods are entered. The goods are left for about 1½ to 2 hours in the dye bath at the ordinary temperature and turned during this time only three to four times. Care should be taken that during the dyeing operation the goods remain covered by the liquor as much as possible and are only brought into contact with the air during the turning. The dyed goods are squeezed off at full width as stated before by means of the squeezing rollers fixed on the vat, immediately thoroughly washed in a second vat containing fresh water, and then aftertreated.

The aftertreatment may be done at ordinary temperature the same as the dyeing. For bluish blacks use 3% bichrome, 3% acetic acid, calculated on the weight of the dry goods. For deep shades use 2% chromic alum, 2% bichrome, 3% acetic acid, calculated on the weight of the dry goods.

It is not necessary to aftertreat dyeings done with the brands NB and NG, but it improves their shade somewhat. The goods are left for about ¾ to 1 hour at the ordinary temperature in the baths prepared as described in the foregoing, turned twice or three times during this time, and then washed. To the last rinsing bath 3 to 5 oz. acetate of soda per 10 gal-

lons of liquor are added and the goods dried without being rinsed again.

Cotton yarn may be dyed in a manner exactly analogous to that employed for the dyeing of piece goods, in any vat or other vessel, free from brass or copper, and the quantities of dyestuff as well as all other additions for the first bath and for subsequent lots remains the same as indicated for the dyeing of piece goods.

Previous to dyeing the yarn is well wetted, suspended as usual on sticks and then entered at the ordinary temperature into the dye bath prepared as stated before. The duration of the dyeing operation is the same as for piece goods, viz., about 1½ to 2 hours, during which time the yarn is turned five to six times. The dyeing is either conducted on bent sticks or iron pipes as described in our pamphlet, the yarn remaining in this manner always covered by the liquor, or on straight sticks placed slantwise into the liquor, the yarn thus being also below the surface of the same. The dyed yarn is either quickly and evenly wrung off over the vat, to avoid any loss of dyestuff, or it is squeezed off by means of squeezing rollers fixed on the vat. In both cases this operation must be followed immediately by a thorough rinsing in fresh water in a vat kept at hand for this purpose. After rinsing the yarn is aftertreated exactly as indicated for piece goods.

Immedial Blue.—The dyeing of Immedial Blue on pieces is carried out in exactly the same manner as stated for Immedial Black, with the only difference that the goods after being dyed are simply squeezed, but not rinsed. The starting bath is prepared with about 20 times as much water as the goods weigh, 12 to 20% Immedial Blue C calculated on the weight of the dry goods and 9½ oz. sodium sulphide, 1 lb. common salt, 8 oz. caustic soda lye, 75° Tw. 8 oz. Turkey red oil per 10 gallons of liquor. When dyeing in the standing bath the same is replenished for each lot with 6 to 15% Immedial Blue C, 3 to 4% sodium sulphide, 1 to 2% common salt, 1 to 2% caustic soda lye, 75° Tw., 2% Turkey red oil calculated on the weight of the dry goods. The goods are dyed for about 1½ to 2 hours at the ordinary temperature, squeezed off, as in the case of black, but not rinsed, and then the bluish-black shade is developed to blue.

In addition to the developing methods described the following may also be employed: The pieces after having been dyed and evenly squeezed off, but not rinsed, are laid in folds and simply placed into a room heated to 140 to 160° F. (60 to 70° C.) for five to six hours, after which time the blue will be developed. In order to prevent the goods from drying during this time they are wrapped into a cloth steeped into the dye liquor and slightly wrung off. After the developing a very thorough washing is essential or even soaping if necessary, in order to remove any particles of dyestuff that may still adhere to the fiber.

Yarn is dyed with Immedial Blue C in the same manner as indicated for Immedial Black, with the exception only that the yarn is not rinsed but very well wrung off or squeezed off by being passed through the squeezing rollers and then well wrung off again. The yarn is then developed in the same manner as stated for piece goods. The preparing of the starting bath and the dyeing in the standing bath is carried out exactly as stated for piece goods.

IMPERIAL TRADE NOTES.

The following were among recent enquiries at the office of the Canadian High Commissioner in London regarding trade. Addresses of these firms can be given on application at the office of The Journal of Fabrics:

Enquiry is made for the name of a Canadian firm supplying a form of rubber cloth prepared for taking blue prints. A

Manchester firm asks for addresses of printers of cotton goods in Canada. A firm of manufacturers' agents at Vancouver are prepared to open up correspondence with English houses desiring to do business with British Columbia and the Yukon territory. A gentleman recently from Canada, well acquainted with the requirements of the country, would like to recommend a very well established agent there to handle draperies, etc. A correspondent asks for addresses of cotton, wool, hemp, tow, jute and silk manufacturers in Canada, who may utilize steel pins in the first stages of manufacture. A commission agent in London desires to correspond with a Canadian firm requiring someone to look after their interests, and to push the sale of goods on this market. Several British and foreign firms are also desirous of entering into negotiations with Canadian paper and pulp manufacturers to sell these products abroad.

FINISHING HOSIERY.

When it is desired to produce a silk or lisle finish on hosiery, it is necessary to remove the nap or lint from its surface. These can be removed most effectually if, in the case of a cotton stocking, the article is stretched or distended, so as to spread the threads well apart. In this way the flames or other singeing medium employed can reach every fiber that forms this nap or lint, it being apparent that when the stocking is in its normal or unstretched state the flame cannot reach all of these fibers forming the nap or lint. The stocking thus stretched is passed through the singeing machine and the fibers forming the nap or lint are removed by the singeing operation. To more effectually perform this operation, the stocking is first saturated, while in its white or normal condition, in a solution consisting of the following ingredients, namely—chloride of soda or chloride of potash, 1 lb.; bluestone, $\frac{1}{2}$ lb.; aniline salt or aniline oil, from 4 to 5 lbs.; this solution being known as an aniline-black solution, and being the first step in the process of dyeing goods fast black.

After thorough saturation, the goods are dried in the atmosphere, and are then in an oxidized state. It is while they are in this oxidized state that their threads are distended or pulled apart by being stretched upon the board or former and passed through the singeing machine to remove the nap or lint, it being noticed that the board acts as a backing for temporarily and conveniently handling a stocking while being subjected to the singeing action. After the stockings are thus singed they are finished, the finishing agent being, for instance, chrome of soda or chrome of potash, this being the concluding step in a process of dyeing goods fast black.

The nap or lint which detracts from the appearance or finish of the stocking consists of the fiber ends or fibers that project from the thread and which are almost imperceptible. But the knitted fabric brings these fine ends or fibers together and forms a nap or lint, and the effect of their close congregation becomes apparent on the exterior surface of a stocking by reason of the fact that they prevent the threads from standing out clear as in a lisle thread or silk stocking, or in other words these fibers on the thread, which by themselves are practically imperceptible, deaden the appearance of the stocking and obscure the fine lines of the thread in the knitted fabric. As it is only to improve the appearance of a stocking that the nap or lint is removed from its exterior surface, it is obvious that it is unobjectionable on the interior surface; and it is not only unobjectionable, but it is not desired to remove this nap or lint from the interior surface as it makes the surface of the stocking smooth and soft and enhances rather than detracts from its wearing qualities. It is

best then to singe only the exterior face or surface so as to remove every portion of this nap or lint projecting outwardly from the thread composing the stocking. This leaves the exposed sides of the thread clean and smooth, without affecting other portions, and consequently gives to the stocking a smooth finish and fine surface and luster resembling a silk or lisle finish, for, as mentioned before, fine lines of the thread are not observed. When this latter process is resorted to, the singeing process can be most effectually accomplished by treating the hosiery before singeing so that the nap or lint can be more effectually removed when the stocking is singed for instance, by first saturating the stockings when white or in their natural condition in the solution given above, and by treating the knitted fabric on the same lines.—Textile Manufacturer.

THE COMING CONFLICT.

It is the opinion of more than one leading thinker in the United States that the forces of capital and labor are marshalling themselves for a great conflict, which, if it does not actually involve Canada will at least profoundly affect the relations of those two forces here. The Hon. Wayne MacVeagh, in an address the other day at Cambridge, Mass., declared himself in these terms: "Our electorate is already beginning to be divided, and must, in obedience to the law of social evolution, continue more and more to be divided, by that cleavage which separates those who are contented with their lot from those who are discontented with their lot. Under whatever disguises, called by whatever names, inheriting or seizing whatever partisan organizations, the alignment of the two great political divisions of American voters, who will sooner or later struggle against each other for the possession of the government, will inevitably be upon the basis I have named. . . . The one party will be, under whatever name, the party of capital, and the other party will be the party of labor."

Thus, says The American Wool and Cotton Reporter, is stating the case very strongly, but not more so than the situation warrants. That human society is being more sharply differentiated than previously into two classes has long been our opinion. Of course, it is possible to view the manner of life led by the mass of mankind to-day in comparison with that led a century ago, and get up a pretty good argument in favor of the theory that human conditions are on the upgrade. But the argument is after all more specious than sound. In the last century and a quarter the race has, on the whole, progressed to quite a noteworthy extent from an abject condition to one of tolerable independence. That fact cannot be denied. But the fact now to be feared is that it will, in greater or less measure, revert to the conditions from which it was evolved.

What was it that principally caused the great improvement in the condition of mankind witnessed in the last century? It was the wonderful discoveries and inventions in mechanics of the eighteenth century. These so enormously increased the facilities for supplying the race with the comforts of life, at the same time affording such a marvelous opportunity for the larger utilization of the labor of the world that a great advance in the material prosperity of the race was inevitable, which in turn was bound to produce a higher average of intelligence. But it could not have been safely postulated at the beginning of the new period that the changed situation would go on working to the end of time in the interests of the entire race. The best of things when carried too far are apt to be converted into their opposites, and it may be questioned if that very result is not in danger of being soon witnessed in connection with our industrial and social development. Improved industrial facilities have vastly increased the wealth of the

world, and up to the present time the distribution of this increase has been along tolerably equitable lines; that is, we may admit that for the sake of argument. But that portion of the increase received by labor has not been effective for much beyond satisfying immediate and pressing wants, whereas that portion received by capital has gone in very considerable measure towards the creation of a vast accumulation of resources, which can now be used for the purpose of fixing more grinding conditions on labor. That is the point of the whole situation to-day as regards labor and capital.

NAVAJO BLANKET PATTERNS.

Navajo blankets are made by the Navajo Indians in Arizona and New Mexico. These people are nomadic, following their flocks of sheep, and building their hut or hogan in the most out-of-the-way places. They have vast herds of sheep, spin and dye the yarn, and upon the crudest sort of looms weave these curious and interesting blankets.



FIG. 1.

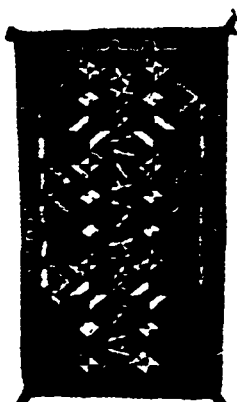


FIG. 2.

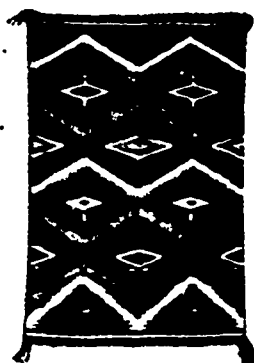


FIG. 3.

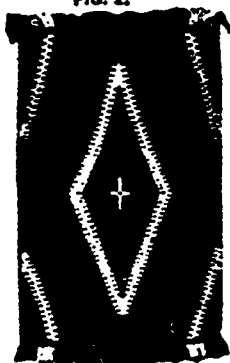


FIG. 4.

The patterns are usually bold and striking, and with their brilliant reds, blues, whites, etc., a blaze of color is obtained that is startling and effective. Many designs, however are quite intricate, and occasionally a blanket is found that is a perfect symphony of color and a marvel of the designer's skill. There is a certain effect in the finer specimens that makes them not only greatly sought after for the finer decorative qualities, but also for their close resemblance to some of the rugs from the Orient. The cuts presented herewith give a fair idea of the character of the designs, but of course no black and white reproductions of the mere design can convey the full effect of the pattern.

Figure 1 is notable for the strong resemblance to an Oriental rug pattern. Fig. 2 is a more intricate design, and is regarded as an example of the highest type of Navajo work. Figs. 3 and 4 represent favorite motives in the Indian weavers' patterns. Fig. 3 is well suited for a wall hanging.—Carpet and Upholstery Trade Review.

Textile Design

From the Textile Record, Philadelphia:—

WORSTED CHEVIOT SUITING.



Complete Weave.
Repeat 8 x 4.

Warp:—2,820 ends, 8-harness strait draw all yarn, 2/26's worsted.
Reed:—11 x 4.

Dress:—
4 ends, light gray and green-gray twist, } x 10 = 80 ends,
4 ends, dark gray, } = 4 ends,
4 ends, light gray and green-gray twist, }
1 end, dark gray, }
1 end, brown, }
2 ends, dark gray, } x 3 = 48 ends,
4 ends, light gray and green-gray twist, }
4 ends, dark gray, }
4 ends, light gray and green-gray twist, }
1 end, dark gray, } = 1 end,
1 end, brown, } = 1 end,
2 ends, dark gray, } = 2 ends,

Repeat of pattern, 136 ends.

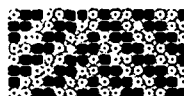
Filling:—48 picks per inch, all 2/26's worsted. Arrangement of colors.

4 picks, light gray and green-gray twist, } x 12 = 96 picks,
4 picks, dark grey, } = 4 picks,
4 picks, light gray and green-gray twist, }
1 pick, dark gray, }
1 pick, brown, } x 3 = 48 picks,
2 picks, dark gray, }
4 picks, light grey and green-gray twist, }
4 picks, dark gray, }
4 picks, light gray and green-gray twist, }
1 pick, dark gray, } = 1 pick,
1 pick, brown, } = 1 pick,
2 picks, dark grey, } = 2 picks

Repeat of pattern, 152 picks.

Finish:—Cheviot finish, scour, shear: 55 inches finished width.

FANCY CASSIMERE.



Complete Weave.
Repeat 16 x 4.

Warp:—2,680 ends, 8-harness fancy draw, all 4 run woolen yarn.
Reed:—10½ x 4.

Dress:—
4 ends, dark gray, } x 8 = 64 ends,
4 ends, medium gray, }
2 ends, dark gray, } x 16 = 64 ends,
2 ends, medium gray, }

Repeat of pattern, = 128 ends.

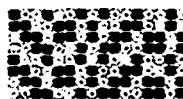
Filling:—40 picks per inch, all 3½ run woolen yarn, arranged thus:—

4 picks, black, } x 8 = 64 picks,
4 picks, dark gray, }
2 picks, black, } x 20 = 80 picks,
2 picks, gray, }

Repeat pattern, 144 picks.

Finish:—Fancy Cassimere finish, don't shear too close; 55 inches finished width.

FANCY UNION SUITING.



Complete Weave.
Repeat 16 x 4.

Warp:—3,960 ends, 8-harness fancy drawer, or 16-harness straight draw, all 2/36's worsted yarn.

Reed:—15 x 4.

Dress:—
4 ends, navy blue, or color No. 1,
1 end, black and gold, or color No. 2,
1 end, black and brown, or color No. 3,
2 ends, blue-gray, or color No. 4,

4 ends, navy blue, or color No. 1,
1 end, black and gold, or color No. 2,
1 end, navy blue, or color No. 1,
2 ends, blue-gray, or color No. 4.

16 ends in repeat of pattern.

Filling:—60 picks per inch, all $3\frac{1}{4}$ run woolen yarn, navy blue or color No. 1.

Finish:—Worsted finish, don't shear too close; 56 inches finished width.

NEW AUTOMATIC SHUTTLE CHANGING LOOM.

The Textile Mercury gives a description of a new automatic shuttle changing loom, of which it writes in glowing terms.

In 1784, says our contemporary, a party of gentlemen assembled at the dinner table of an hotel at Matlock, Bath, and very naturally, soon commenced to discuss the wonderful inventions for cotton spinning then at work in the new cotton mill at Cromford, about a mile and a half away. This was the mill of Arkwright & Strutt, equipped with the machinery invented by Richard Arkwright. A matter that no doubt gave interest

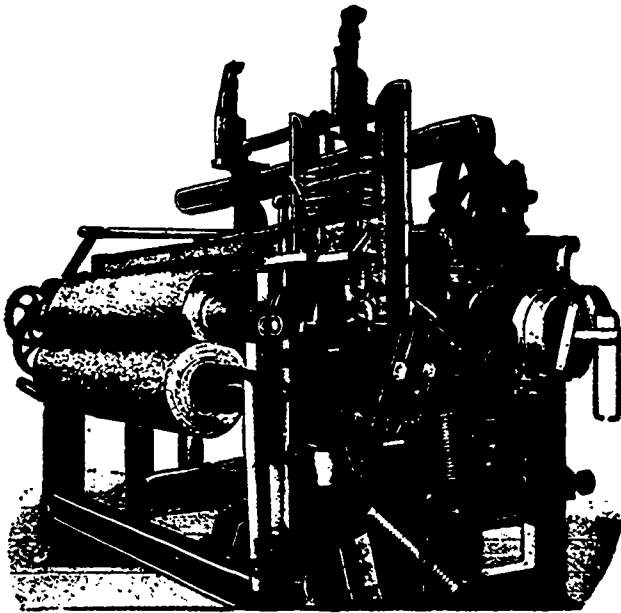


Fig 1.—Crossley Automatic Shuttle-Changing Loom.

to the discussion was the prospect of a heavy law suit, for which preparations were being made, whereby the validity of Arkwright's patents was to be attacked—and before which, indeed, they fell in the following year. It was the possibility of the Cromford inventions thus being thrown open to the public, and the prospective glut of yarn that would follow when everybody was free to use the new machinery that formed the point of the discussion. The Rev. Dr. Cartwright, a clergyman of the Church of England, was one of the party, and suggested that "as we had made machines to spin yarn, we must also make machines to weave it." This was the first expression of an epoch-making idea; it was the complementary thought which perfected the grand inventions of Hargreaves and Arkwright, and followed theirs in the natural order of succession. The suggestion, however, was not received with much favor. Several gentlemen from Manchester, who were there, and who might have been expected to endorse the thought, declared a power-loom to be an impossibility. The doctor failed to convince his fellow-guests, but he did what was perhaps far better, he convinced himself. We

need go no farther; the story is well known—Dr. Cartwright invented the power-loom. He afterwards invented many other things, including the first wool combing machine. A tardy recognition has been made of his great merits as an inventor. Lord Masham (better known yet perhaps in textile trade circles as Samuel Lister), of Manningham, himself an inventor, has founded and is now erecting in Bradford a grand institution in Cartwright's memory, to be called after his name. Towards this we believe Lord Masham has contributed £40,000. What a pity Lancashire and Yorkshire have not joined in this movement, and built an institution which should have been in memory of and done honor to the textile inventors of both counties!

Cartwright's loom was not a commercial success for some time, though improved in its details by several successive inventions during the following twenty years. The great difficulty encountered was in the sizing process, which was not then separated from the work done in the loom; the plan of the handloom weaver—who sized a length of his warp from his healds to his beam, wove this down, and then sized another length—was retained. For several reasons this proved unsatisfactory in the power-loom, as it greatly limited its productive capacity. A Stockport manufacturer, Mr. Radcliffe, saw this disadvantage, and suggested to Thomas Johnson, an ingenious mechanic in his employ, the separation of the process, and the invention of a new machine for the sizing process. Radcliffe stood the cost of these experiments, and after some time the invention of the "dressing machine" was the result. This was a new departure of extreme importance and great value. Numerous other inventors made improvements in details upon Cartwright's original conception, all tending to carry it forward towards the comparative perfection it has attained. The next decided advance was the invention of the over-pick or Blackburn loom in 1828, by William Dickinson, subsequently founder of the firm of William Dickinson & Sons, loom makers, of Blackburn. The next improvements were the weft fork, the automatic stopping arrangement, and the loose reed, all during the following twenty years. These were the inventions of the late James Bullough. These, with several minor improvements, brought the loom in principle very nearly to the position it occupies to-day. The further improvements made have been mainly in the way of adjuncts to do special work, and of improvements in the details of construction. Save these, the loom has stood still, or nearly so, since near the middle of the 19th century. This, however, has not been from want of effort to carry it further, as numerous ingenious men have tried, but though their efforts have been highly creditable, these have not eventuated in commercial success. The pause has been a long one, but we believe it has come to an end, and that there is now ready to be placed upon the market another invention, which in importance will surpass many and be equal to most of those made before.

One reason for the long pause in the development of the loom was undoubtedly the general conviction that it had been carried to a point approximating to perfection. It had become a perfect weaving instrument; that is to say, it performed every motion formerly dependent upon the personal energy of the weaver, and did this with a regularity, precision, continuity, and perfection far transcending that of the human operative. Obviously, so far as the average perception of observers went, there was little or nothing further required to be done. The only thing that seemed to tempt the ingenuity of inventors was to produce an automatic motion for stopping the loom on the breakage of the warp threads. This soon engaged attention, and it was solved in several ways; but its doubtful commercial advantage has all along prevented its adoption on any extensive scale. A quarter of a century ago, however, it was seen that the bulk of the weaver's labor then remaining

was that of keeping the looms supplied with shuttles when the weft was exhausted or broken; and it was also recognized that it would be a considerable achievement to make the loom do this work itself. The first attempt we have heard of to realize this conception was made by the late James Bullough, the well-known inventor of Blackburn, who, after Dr. Cartwright, is probably entitled to more credit than any other man for his improvements of the loom. A few years after removing to Accrington, he attempted to solve this problem, but ultimately relegated it to future times and other men. Little further was heard of the matter for over twenty years. It then seemed to engage attention again, and in two or three years it was solved. Different minds were simultaneously working at the matter, and the solution was reached by different ways. Naturally these methods differ in both their mechanical and their commercial merits. We have already described several in these columns, and now have pleasure in bringing before our readers one more, and one that we think will distinguish itself by proving to be possessed of every merit.

The invention to which we refer is the work of Bernard Crossley, of Burnley. As before stated, the problem is to remove the shuttle automatically from the loom, when the weft is exhausted or breaks, and to substitute another, so that the loom may continue its work without intermission and the weaver be relieved of the attention and labor of it. The inventor accomplishes his object in the manner we shall now briefly

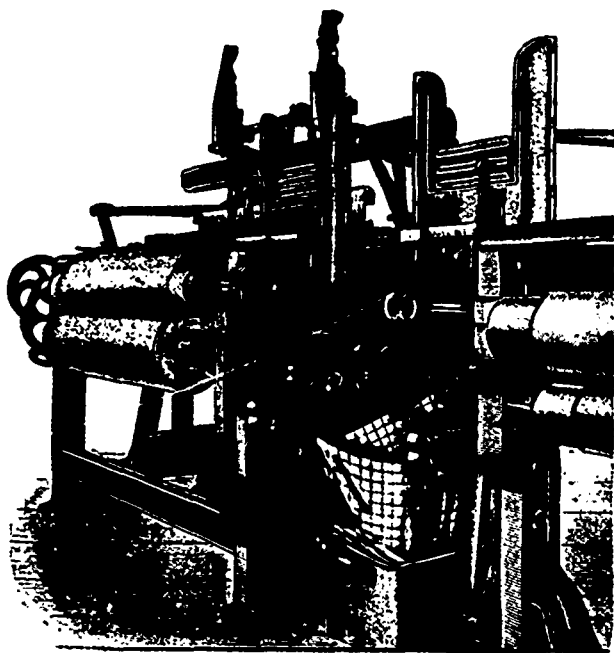


Fig 2.—Two Looms, with Shuttle-Changing Device, arranged Side by Side.

describe. He takes the ordinary single-box over-pick or Blackburn loom, as it exists. As five or six shuttles are required for each loom he provides a hopper or magazine for their reception, which is shown in our several illustrations. But it must not be assumed that this is the limit to the number of shuttles that may be used. Any number which may be found most satisfactory may be employed. In Figs 1 and 2, in which the looms are exhibited as when at work, the hoppers are shown supplied with the shuttles, the ends of the weft from them being twisted round a pin projecting from the frame for the purpose. The shuttles are placed in the ordinary position, one upon the other, and descend by gravitation to the bottom. Here they are received in succession upon a carriage, which by suitable means is made to carry them to a position under

the shuttle-box at a point beneath the box when the slay crank is on the top centre. In Fig. 2, a shuttle is shown in this position. Here it waits until the moment arrives when it is required to enter the box. The exhaustion of the weft, or its breakage, brings the fork motion into action exactly as at present, but instead of stopping the loom, it simply actuates the mechanism of the invention, and the waiting shuttle is instantaneously lifted upwards through the bottom into the shuttle-box, simultaneously ejecting the empty one over the side. In order to accomplish this, the shuttle-box bottom-plate is constructed in two parts, the division being in a longitudinal direction. These are hinged on their exterior sides, and on pressure from below they open like the two leaves of a trap door. The entering shuttle, as already observed, ejects the empty one. In Fig 1 a shuttle is shown just leaving the box, from which it descends into a basket, as seen in Fig. 2, or any other suitable receptacle that may be placed to receive it. Fig. 2 shows the arrangement of the looms side by side.

We may now glance at the important results likely to follow the application of this invention, and the great advantages that will be obtained. Working looms are supplied with weft in the form of cops or on hobbins, which are contained in shuttles. The loom sends these through the warp at the rate of from 180 to 250 picks per minute, according to its width and the speed at which it may be desirable to work. The stoppage of the loom when the weft breaks or is exhausted, is in present conditions a necessity, and it is, of course, effected automatically. A cop of weft of average counts, say 50's, will be used up in $6\frac{1}{2}$ minutes. Reckoned out for a week of $56\frac{1}{2}$ hours, the legal time, these stoppages will amount to 565; and to this number should be added 200 stoppages for breakages of the weft. In using finer counts, the stoppages may be less; with coarser they must be more. It is well known to everybody having any practical acquaintance with weaving that, when a loom stops, the weaver is not always there to restart it; and this entails additional loss of time. A careful estimate of the time lost in these weft stoppages, under various conditions, has been made, with the result that they are found to amount to from 10 to 25 per cent. of the working hours, of which a low average would be $12\frac{1}{2}$ per cent. This means a loss of production from each loom, a waste of the motive power, and a waste of all the standing expenses inseparable from the conduct of a manufacturing establishment, each to the same extent. In large establishments of 500 to 2,500 looms, it will be obvious that if this hitherto inevitable loss can be prevented, a great gain will accrue. With the adoption of this invention, such loss is obviated; for the loom is self-fed, when the weft is exhausted, or when it breaks with a full shuttle, and the empty one is ejected without the stoppage of the loom. The change is so quickly and so perfectly effected that it requires a sharp eye to detect the moment of its occurrence; in fact, with a loom running at 200 picks per minute, it is accomplished in the one-fourth part of a minute, all being accomplished in half a revolution of the first shaft. Thus the whole of the time hitherto inevitably lost by the necessity of changing shuttles can be saved for productive purposes by its adoption. The insertion of two picks only is lost in making a change of the shuttle, but this makes no fault in the fabric, as, by the use of a slip catch, which is brought into operation, the warp taking-up motion is arrested for two picks. These numerous stoppages have hitherto been the cause of many imperfections in the cloth being made, termed "thick" and "thin" places, when too much or too little weft is put into the warp by the weaver on restarting the loom. This invention perfectly obviates such defects, thus considerably enhancing the commercial value of the cloth—an achievement which will no doubt be a strong inducement to manufacturers to adopt the invention.

The introduction of this invention will also be welcomed by the operatives, because it will relieve them of one-half to three-fourths of the present labor of their occupation, which arises from the changing of shuttles and the restarting of the loom. As weavers superintend from three to four looms each, these stoppages and necessary restartings amount to from 2,500 to 2,800 per week, and involve the weavers running from one loom to another to perform them. At a low estimate, 50 to 75 per cent. of the weavers' present labor will therefore be saved to them. This is a most important matter, as weavers will thus be able to superintend at least 100 per cent. more looms than at present, and to make proportionately larger earnings; or, if the increase be divided between them and their employers, they will still be greatly advantaged, and the employers will share in the economy from this source.

One of the great recommendations of the invention is that it accepts everything in the loom and its equipment, and in the preparatory stages of its work, as it already exists, and it can thus be applied at comparatively small cost. It entails absolutely no change in the details of the weaver's work beyond relieving him of the amount of labor stated. The invention is applicable to all single-box looms, and of the 865,000 looms now in the United Kingdom a careful estimate justifies the statement that it will be applicable and can with great advantage be applied to 700,000. This will prove the potential value of the invention for the English textile trades; indeed, to preserve their hold of neutral markets, its early adoption is a necessity. Competition is becoming increasingly felt on every hand, because competitors are everywhere adopting labor-saving appliances and other means of cheapening production. It is announced by the makers of a self-shuttling loom in America that they have within the past two or three years sold 75,000 looms in the United States, and that the sale is rapidly increasing. These, it should be observed, are mainly of the under-pick type for which this loom has been constructed. It affords a good augury for the future of one for an over-pick loom. The English trades cannot withstand competition of this kind with their now antiquated arrangements; but by the application of this invention (which can be effected at the cost of a very few pounds per loom), old looms will have far more than their original value restored to them, and will begin a new career of usefulness, while without it the newest looms will not be able to make a profit in competition with the renovated ones.

The Mercury says several large English loom manufacturing firms have already adopted the device to attach to their looms.

FABRIC ITEMS.

A dissolution of the Canadian Wrapper Mfg. Co., Montreal, has been registered.

The Arlington Embroidery Mfg. Co., Montreal, has been registered by Clodomire Forest.

Geo. Stewart, of the Corticelli Silk Co., St. John's, Que., has returned from Sydney, N.S.W., where the company has an agency, and reports that the company has established a good trade in Australia.

Alex. Shearer has registered as proprietor of the dry goods commission business of John S. Shearer & Co., Montreal. Mr. Shearer succeeds the late John S. Shearer, whose death was recently announced.

The business of the Preston glove factory, which was recently burnt, is being reorganized by a new company, under the management of Henry Osgood, one of the proprietors of the old works. Application will be made for a charter.

Incorporation has been granted to W. H. Wyman, A. Mercer, H. A. Beatty and R. D. Chipp, of Montreal, and Robert Neill, of Peterboro, as the Semi-Ready Clothing Co., with headquarters at Montreal, and a capital of \$200,000.

Georgetown, Ont., will submit a by-law to lend \$10,000 to H. T. Arnold, of Acton, on condition that he establishes a glove factory there and employs 40 hands. The money is to be repaid in 16 years without interest, and borrower undertakes to pay out not less than \$7,000 per year in wages.

J. Taplitzsky, proprietor of the Dominion silk waist factory of St. Roch's, left Quebec suddenly on the 2nd inst. for parts unknown, leaving a great number of creditors, and nothing in his establishment worth seizing for their benefit. He has been running the business only a short time alone.

The stock, valued at \$3,650, and book debts, amounting to \$1,446, of the insolvent National Corset Manufacturing Company, were sold by auction at Quebec on the 24th ult., to the Dominion Corset Company for 70 cents and 43 cents on the dollar respectively. The machinery, valued at \$3,446, was bought by Israel Bedard for 65 cents on the dollar.

The incorporators of the Strathcona Rubber Company, of Montreal, referred to last month, are: Eleazer L. Rosenthal, manufacturer; Aristide M. Juncas, clerk; Joshua Rosenthal, clerk; James Crankshaw, advocate, and William Campbell, manufacturer, all of the city of Montreal. The capital is \$50,000, and the company will manufacture rubber clothing, and deal in rubber goods.

For some time past the big thread combine in the Old Country has been making Canadian customers pay for a fight it has been waging with European competitors. Prices have now been reduced in Canada not out of any consideration for Canadians, but because there was such a tremendous difference in the prices charged there and here that the combine's own customers in England could easily undersell it in the Canadian market. It is a pity an independent thread manufacturing company cannot be started in this country.

If any reader of this journal had been told ten years ago that a cotton mill away down in Mississippi would be sending colored shirtings and other fine lines of colored cottons to Canada in competition with British and Canadian goods he would have smiled broadly. But that is just what is being done to-day by the Meridian Cotton Mills of Meridian, Miss., through their Canadian agent, G. B. Fraser, Toronto. Our representative was shown samples of these goods, which are really fine, and we are not surprised that Mr. Fraser is taking good orders for them.

A correspondent of The Toronto Globe in the county of Essex, Ont., reports a curious experience in experiments on the raising of silk-worms. Usually, in this country, the silkworm hatches from the egg in May, feeds for a month or so, spins its cocoon, comes out as the moth about two weeks later, and lays its eggs, which remain eggs till the following May; but this year, for some reason that has not yet been explained, some of the eggs laid in June hatched out in the early part of July, and the worms from these eggs are being fed and appear to be doing well. No explanation of this curious occurrence has so far been offered by entomologists, but a professor in Cornell University reports a like experience this year in the United States.

Alexander Smith & Sons Carpet Company, Yonkers, N.Y., the largest carpet manufacturers in America, are going to sell their products direct to the trade. Paul Huebner, at present manager of the wholesale department of W. & J. Sloane, through whom the Smith goods are sold, is to be the company's selling agent. The announcement is a surprise to the trade. A prominent agent in the U.S. carpet

trade speaking of the matter said: "I think the change will be an excellent thing for the Smith Company. There has always been more or less friction and complaint by the jobbing and retail trade of dealing with a house that was in a great many instances a stern competitor, combining as the Sloanes do wholesale and retail departments. On contracts W. & J. Sloane have always figured in the reckoning and many have expressed their preference for dealing with the manufacturer direct."

An investigation into the sweat shops of Hull, Que., referred to in these columns, has been held by James Brown, Ontario factory inspector, with his colleague, Miss Carlyle. Mr. Brown gives *The Globe* the following account of the sweating system as operated in connection with the manufacture of clothing at Hull and Ottawa: The Ontario inspectors were working in conjunction with the Quebec inspector, as 90 per cent. of the clothing sold in Ottawa is manufactured in Hull under the worst form of "sweating." As an illustration, Mr. Brown states, whereas the price for making pants in Ottawa is from \$1 to \$3 per dozen, in Hull it is only 60c. to \$1 per dozen. Another injustice to which the workers in Hull are subjected is that when they work for Ottawa dealers they are compelled to accept orders or "bons" in payment instead of cash. About 150 or 175 of the Hull seamstresses are using machines supplied by the manufacturers for whom they work and are charged \$55 for the machine, upon which they have to pay at the rate of \$2 per month. But when they go to their employer and tender him his own bon or order for \$2 he refuses to accept it at par and makes the unfortunate employee give him his own bons for \$2.50 in payment of a debt of \$2. One family in Hull whose home was visited by Mr. Brown and Miss Carlyle consisted of a widow and her three daughters. They were making coats at 25 cents each, and informed the inspector that it took a week for one person to finish a dozen coats, working from 7 o'clock in the morning until 9 at night. One of the family had to devote her time to the housework, and the other three were able by their united effort to make \$3 in wages. There is a difficulty in dealing with the case, owing to the fact that Hull is in the Province of Quebec, and the work is done for a firm in Ontario, but it is quite probable that the laws of the two provinces may be made uniform in order to remove the evil. In the meantime some check may be obtained by compelling the dealers or manufacturers to comply with the Ontario law requiring each article to be labelled, showing where and by whom each article was made. The factory inspector for Quebec co-operated most heartily with Mr. Brown and Miss Carlyle in their investigations.

Among the Mills

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

John Greenwood, formerly boss carder at the Magog, Que., cotton mills, is now carder at the Aiken Manufacturing Co., Bath, S.C.

Mr. Layden, formerly boss finisher with the Perth woolen mills, is now in the same position at the Richelieu woolen mills, Chambly, Que.

We regret to learn of the death, last month, of William Whiteley, of the well-known firm of Wm. Whiteley & Sons, Ltd., makers of textile machinery, Huddersfield, Eng. Mr. Whiteley died at the comparatively early age of 51.

New carding machinery is being installed in the cotton mill at Milltown, N.B.

The charge of fraud preferred against S. V. Willson, former proprietor of the Union Woolen Mills, Vienna, Ont., has been dismissed.

An English company has a representative in St. John looking for a site in New Brunswick for a paper mill of a capacity of 200 tons per day.

Wm. MacCallum, late superintendent of the engraving department of Magog print works, was presented with a smoking outfit on the occasion of his leaving.

R. Campbell has been succeeded by F. Young as boss spinner at the Anchor Knitting Co., Almonte, Ont. John Davis, boss carder at the same mill, has resigned.

We understand the Baden woolen mills were not closed last winter as stated in our June number. They were running 8-hour days during the winter and full time since spring.

The cotton mills, the woolen mills and the paper mill at Cornwall had to close down the other day, when the water in the canal had to be shut off, owing to the break in lock 17.

James Rolston, J. W. Slingsby, W. F. Haskins, T. F. Haskins and others, of Dunnville, Ont., have been incorporated as the Imperial Knitting Company, Ltd., with a capital of \$40,000.

The by-law to grant a loan of \$7,000 to Wm. McGregor, of Guelph, representing the Standard Carpet Co., to establish a carpet factory at Forest, was carried at that town on the 2nd inst. by a large majority.

There is a big crop of wild clover in Canada this year. This plant yields a fiber of considerable strength, which several experts have pronounced suitable for binder twine. Samples of twine made from it were sent to this journal a couple of years ago, and a description of the plant appeared at the time. We would suggest to our binder twine manufacturers to cut and treat say half a ton experimentally this year, and put the matter to a test.

One indication of confidence in the stability of British control in South Africa is the rapid increase in the exports of wool to Great Britain after the stagnation in this trade that marked the beginning of the war. In the first six months of this year, compared with the same period last year, South African wool merchants have shipped to England 35,987,910 lbs. of wool against 17,411,966 lbs., a gain of 18,875,944 lbs., equal in value to £405,522; and 2,782,600 lbs. of mohair, against 644,262 lbs. last year.

H. H. Burrows, of the Royal Carpet Co., Guelph, Ont., is seeking an opening for business in Galt. He asks that town to provide a three-storied factory and basement, dyehouse, engine and boiler house, bleach-house, and a loan of \$12,000, with free water and exemption from taxation for some years. In return he will employ 40 hands, and pay about \$10,000 yearly wages. Mr. Burrows is too modest. He should have asked for the town's charter, its public revenues, the water privileges on both sides of the Grand River, and the right to use the park as a yarn drying yard.

Adam L. Grindrod, who founded the Magog woolen mills at Sherbrooke in 1868, died on the 7th inst., in his 69th year. He had been in failing health for some time, and retired from business three years ago. He took an interest in the volunteer movement in the 60's, and was out in 1866 and 1870 to repel the Fenians who were threatening to invade Canada. He belonged to Victoria Lodge, A.F. & A.M., and other fraternal societies. He leaves a widow and one daughter. The late Mr. Grindrod came to Sherbrooke from Bury, Lancashire, England, in 1851.

Alfred Hawksworth, superintendent of the Merchants' Cotton Co.'s mills, St. Henri, Que., sailed with his family last month from Boston on a trip to Europe.

The James MacLaren Co., of Buckingham, Que., are to start building a large pulp and paper mill. A mechanical pulp mill will first be finished, and the paper mill will be built later on.

The Van Egmond woolen mill at Seaforth is still closed. The property is owned by a Mr. Gowanlock, but W. D. Van Egmond still has hopes of being able to obtain control of the mill and re-open.

Charles Turnbull, of the C. Turnbull Co., of Galt, on his return from his trip to the Old Country, was greeted by the employees of the knitting factory with an address accompanied by an oak desk and a lady's rocking chair for Mrs. Turnbull.

The autumn meeting of the New England Cotton Manufacturers' Association will be held at Niagara Falls, Sept. 25-26. Sessions will be held at the International Hotel. The opening address will be delivered by Dr. Robert H. Thurston, Dean of Sibley College, Cornell University. Special trains and cars will be run from Boston, New York and Philadelphia. The secretary is C. J. H. Woodbury, Boston, Mass.

The Brompton Falls, Que., paper and pulp mills have been organized with a capital of \$50,000. The mills will be completed and running next spring. George B. Bearce, of Lewiston, Me., is the president, and James Munro, of Auburn, is secretary and treasurer. The directors are: E. W. Tobin, M.P., Brompton Falls; E. P. Lindsay, Boston; C. C. Wilson, Auburn; W. N. Munroe, Auburn; C. M. C. Twitchell, Milan, N.H., and N. S. Milliken, New York.

J. E. Molleur, whose claim against the town council of St. John's, Que., was alluded to last month, has through his lawyers, Bisailon & Brassard, of Montreal, sent another letter, in which it is stated that the loss of the latter by the recent fire which destroyed his knitting mill was \$43,400.54, and that their client holds the corporation and the proprietors of the waterworks responsible for the loss over and above the amount of his insurance (some \$10,000). A settlement was asked for within eight days. The demand was made in consequence of lack of pressure at the time of the fire. The council disclaim all responsibility in the matter.

The Dewsbury, Eng., correspondent of the Textile Manufacturers' Journal writes: In rags and shoddies only a moderate business is being done in the export branch. Canada only requires a few lines, such stock as merinos in the carbonized state, fancies and light shades and a few black or blue worsted serge rags and white stock, of which there is but a small supply in that country. In fact this year a very large amount of stock has been imported from there, especially in new stock, such as tailors' clippings at about 6½ cents, and satinets at prices varying from 2 to 3 cents, according to color, etc. Russia at the present time is by far the best customer for shoddies and rags.

The Stevens Mill Corporation, manufacturers of linen goods at Fall River, Mass., have obtained control of a patented machine for the treatment of flax straw that they think will make American flax practicable for the manufacture of goods in the making of which imported jute is now used exclusively. The company has, through its representative, an experienced linen manufacturer of Dublin, Ireland, contracted for 50,000 tons of flax to be delivered in Fort Scott, Kan., this season, and threshed and threaded with the machinery. The machinery will extract the lint from the straw and prepare it for the factory. Since the duty was taken off jute and foreign fiber, American straw has not been able to compete with that from Ireland. A general price of \$8 per ton has been offered to the

farmers for flax in the straw. This is regarded as a high price. If the experiment here proves successful, a great industry will, the Carpet and Upholstery Review thinks, be opened to American farmers and American manufacturers. If there is anything in it for United States flax men there will be an equally good opening for Canadians; but we must remember that so-called "revolutionary" inventions are continually coming up in the flax industry, but when put to the test they do not revolutionize.

The case of the Consumers' Cordage Company, Ltd., vs. Conolly and Another was before the Imperial Privy Council with the following result as reported in English papers: This was a petition for special leave to appeal from a judgment of the Supreme Court of Canada. The petitioning company are, according to their petition, binder-twine manufacturers, and till recently they had practically the complete control of that trade in Canada. Some time before September, 1895, the Government of Ontario introduced into the Central Prison at Toronto, a plant for the manufacture of binder-twine with the object of competing by means of prison labor against the petitioners, and after making it for a short time, advertised for tenders with a view of putting the business in the hands of contractors. In September, 1895, P. L. Connor, whose tender had been accepted, entered into a contract with the Inspector of Prisons and Public Charities, by which he secured the right to work the plant in the prison for five years subject to certain conditions, one of which provided that the contractor should not assign or sub-let the business without the assent of the Lieut.-Governor of Ontario in Council. In February, 1896, the petitioners and the respondents entered into an agreement, whereby the respondents agreed to transfer to the petitioners the right to manufacture binder-twine in the Central Prison for the full term of the Government contract and to furnish the capital during the twine season of 1896, the petitioners undertaking to repay the respondents the sums which had been invested by them in the business and in addition \$7,350 within a stated period. In December, 1896, the respondents brought the action, in which the present proceedings arose, against the petitioners, claiming \$54,054 under the contract. The petitioners disputed the claim and alleged that the respondents had not procured the assent of the Lieut.-Governor-in-Council to assign the prison contract. They further claimed \$75,000 for breach of the contract. The respondents replied that Mr. Connor acted throughout as *procurator* of the petitioners, and secured the contract and worked the prison plant in their behalf, and that the sole right the respondents had ever had in connection with the business consisted in their option to advance the necessary capital at interest. Justice Tellier, who tried the suit, delivered judgment for the respondents, and gave them a decree for \$22,324 interest. The Superior Court of the Province, on appeal, upheld that decision. The Supreme Court of Canada, on an appeal by the petitioners, held that the evidence disclosed an illegal combination affecting injuriously the public interests by unreasonably raising the price of an article of commerce and unduly restricting its production, but that, notwithstanding that element of illegality, the respondents were entitled to \$18,000. Justice Gwynne dissented from his colleagues in the Supreme Court, holding that in the circumstances stated, the court should do nothing to assist either party. From the judgment of the majority of the Supreme Court, the petitioners now applied for special leave to appeal to His Majesty in Council, on the ground that important questions of law arose, especially as to the application of the Criminal Code to trusts, the establishment of which was proceeding with great rapidity in Canada. After hearing the arguments on both sides, their Lordships declined to accord special leave to appeal and dismissed the petition with costs.

THE WOOL MARKETS.

The July series of Colonial wool sales in London closed with prices somewhat irregular, leaving Australian wools in about the same position as at the close of the May sales. There had been a decline of 5 per cent on merinos at the opening, but these recovered to par. Of the available total of 326,000 bales, 126,000 went to the home trade, 120,000 to the continent, 12,000 to America and 48,000 were carried over.

As regards the Toronto and Hamilton markets scarcely any movement is to be recorded during the month. Large dealers are not inclined to buy except at prices which country dealers will not accept, and there is a lot of wool stored throughout the province awaiting developments. There appears to be little demand from the United States. Prices are nominally 7½ to 8 cents for unwashed and 13 cents for washed fleece.

Manitoba wool is quoted in Winnipeg at 7 to 7¼ cents.

Our Montreal report is to this effect: Foreign fine wool firm, but slow of sale. Manufacturers are buying very sparingly. Medium and coarse is lower; no sale of any importance; prices may be quoted for Cape, 13½c. to 15½c.; Canadian, unwashed, 9c. to 10c.; washed, 13½c. to 15c., as to quality and condition; fine merino B.A., 30c. to 35c.; crossbreds, 20c. to 27½c. We hear of a few car loads of Northwest having been bought at about 9c., f.o.b.

TEXTILE EXPORTS OF GREAT BRITAIN TO CANADA.

The following are the values in sterling money of the exports from Great Britain to Canada for June, and for the six months ending June, 1901, compared with the same periods last year:

	Month of June.		Six months ending June.	
	1900	1901	1900	1901
	£	£	£	£
Raw Wool.....	862	2,048	24,089	14,687
Cotton Piece-Goods.....	41,776	37,214	349,279	326,161
Jute Piece-Goods.....	14,772	9,976	79,623	72,017
Linen Piece-Goods.....	10,858	15,589	99,536	88,845
Silk, Lace.....	174	—	8,869	1,673
Articles partly of..	2,814	2,544	26,167	27,324
Woolen Fabrics.....	27,163	28,877	197,996	207,771
Worsted Fabrics ..	25,022	49,877	278,226	321,416
Carpets.....	8,229	8,631	150,334	133,622
Apparel and Slops.....	12,436	17,530	133,346	130,279
Haberdashery.....	8,326	5,972	80,987	65,496

TEXTILE PATENTS.

The following are recent patents and trade marks and industrial designs granted in Canada of interest to the textile trades:

No. 71,191.—Combination garment and hammock for hunting; J. Conley, Mound City, Missouri.

No. 71,290.—Wood fiber producing machine; H. M. Hoover, Perrysburg, O.; a combination of rotating saws and travelers.

No. 71,319.—Overall gussets; I. Sachs, Roanoke, Va.

No. 71,499.—Garment supporter; W. H. Cornell, Brookings, South Dakota.

No. 71,544.—Collar and cuff fastenings with buttons; J. Carter, Belfast, Ireland.

TRADE MARKS AND DESIGNS.

Nos. 7,833-4.—Dominion Cotton Mills Co., Ltd., Montreal, Quebec; cottons,

No. 7,840.—S. Greenshields, Son & Co., Montreal, Que.:

certain named dress furnishings for men and women.

Nos. 7,845-6.—Imperial Cotton Co., Ltd., Hamilton, Ont.; cotton duck.

No. 7,852.—S. Greenshields, Son & Co., Montreal, Que.; dry goods, such as wool rugs, umbrellas and parasols.

No. 7,857.—The Yarmouth Duck and Yarn Co., Ltd., Yarmouth N.S.; cotton, cotton duck, twine, prints, etc.

No. 7,866.—F. Reddaway & Co., Ltd., Manchester, Eng.; driving and carrying belts and aprons for machinery.

No. 7,867.—The Winter Cotton Book Cloth Co., Ltd., Manchester, Eng.

LITERARY NOTES.

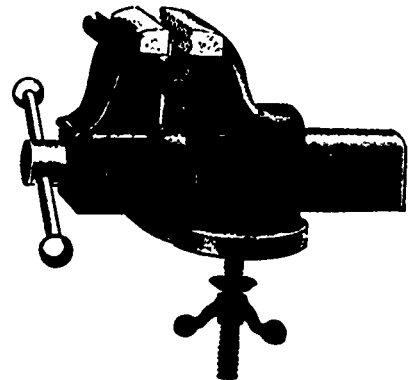
We have received the 1901 edition of the "Blue Book," the Davison Publishing Co.'s textile directory of the United States and Canada, also the Textile World's Directory of the United States for the current year. A further notice will appear in next issue, but we may mention that the former is published at 401 Broadway; office edition, \$3; traveler's edition, \$2.50; and the latter by Guild & Lerd, 620 Atlantic avenue, Boston; office edition, \$2.50; traveler's edition \$2.

There are over 30 contributors to the August number of the Ladies Home Journal, which is specially devoted to holiday subjects.

This is a great age. The August Century Magazine has a most interesting article describing how photographs have been taken by the light of Venus, with illustrations made from the actual photographs.

KEYSTONE COMBINATION ROLLER PIPE VISE.

The Hollands Mfg. Company, Erie, Pa., are putting on the market the combination pipe vise shown herewith. For holding pipe, roller jaws are used instead of the old style V, the rollers having from 25 to 40 flutes, according to the size of the vise. The rollers rest on round corners in the body of the vise, and not on the pins, which simply keep the roller from dropping out. A slight pressure of the screw, it is explained.



Keystone Combination Roller Pipe Vise.

makes the purchase so great that it is impossible for the roller or pipe to turn. It is remarked that the rollers will not mar the pipe; that they will never wear out; that the roller jaws do not interfere when doing machine work, and that the vise is adapted not only to the use of machinists, but also to plumbers', gas fitters' and steam fitters' use. The vise is referred to as high grade throughout.

SPINNER—Wanted situation by first-class mule spinner, aged 30 and single. At present employed. First-class references. Address

BOX 7, CANADIAN JOURNAL OF FABRICS, Toronto

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TEXTILE PUBLICATIONS.

In order to accommodate readers of The Canadian Journal of Fabrics, the publishers will be pleased to mail any book in the following list on receipt of the publisher's price, duty free. Books on technical and practical subjects, not in this list, can be obtained and mailed at publisher's prices. In ordering, please give full address, written plainly:

- Loom Fixing; a handbook for loom fixers working on plain and fancy worsteds and woollens; containing chapters on shuttles and bobbins, and their management; head motion; putting in warps; filling; adjusting and starting new looms; chain building, etc.; 104 pages, by Albert Ainley\$1 00
- Technology of Textile Design; explains the designing for all kinds of fabrics executed on the harness loom, by E. A. Posselt 5 00
- Structure of Fibers, Yarns and Fabrics, the most important work on the structure of cotton, wool, silk, flax, carding, combing, drawing and spinning, as well as calculations for the manufacture of textile fabrics, by E. A. Posselt 5 00
- Textile Machinery Relating to Weaving, the first work of consequence ever published on the construction of modern power looms, by E. A. Posselt..... 3 00
- The Jacquard Machine Analyzed and Explained; explains the various Jacquard machines in use, the tying up of Jacquard harness, card stamping and lacing, and how to make Jacquard designs, by E. A. Posselt..... 3 00
- Textile Calculations; a complete guide to calculations relating to the construction of all kinds of yarns and fabrics, the analysis of cloth, etc., by E. A. Posselt... 2 00
- Wool Dyeing; an up-to-date book on the subject, by E. A. Posselt 2 00
- Worrall's Directory of Cotton Spinners, Manufacturers, Dyers, Calico-printers and Bleachers of Lancashire, giving the mills of the British cotton district, with number of looms and spindles, products of the mills, cable addresses, etc\$2 00

- Worrall's Directory of the Textile Trades of Yorkshire, comprising the woolen, worsted, cotton, silk, linen, hemp, carpet, and all other textile mills, giving looms and spindles, and the various lines of goods manufactured, etc\$2 00
- Worrall's Textile Directory of the Manufacturing Districts of Ireland, Scotland, Wales, and the counties of Chester, Derby, Gloucester, Leicester, Nottingham, Worcester, and other centres not included in preceding works, with capacity, products of mills, cable addresses 2 00
- The Wool Carder's Vade-Mecum, by Bramwell; third edition, revised and enlarged; illustrated; 12mo. 2 50

CHEMICALS AND DYESTUFFS.

Nothing new to report; market remains firm; demand for chemicals and dyestuff is small.

Bleaching powder	\$ 2 75	to	\$ 3 00
Bicarb. soda	2 00	to	2 05
Sal soda	0 75	to	0 80
Carbolic acid, 1 lb. bottles.....	0 50	to	0 60
Caustic soda, 60°	2 35	to	2 60
Caustic soda, 70°	2 60	to	2 85
Chlorate of potash	0 13	to	0 15
Alum	1 35	to	1 50
Copperas	0 65	to	0 70
Sulphur flour	2 00	to	2 50
Sulphur roll	2 00	to	3 00
Sulphate of copper	6 00	to	6 25
White sugar of lead	0 08	to	0 08
Rich. potash	0 11	to	0 12
Sumac, Sicily, per ton	75 00	to	80 00
Soda ash, 48° to 58°	1 30	to	1 40
Chip logwood	1 90	to	2 00
Castor oil	0 09	to	0 10
Cocunut oil	0 10	to	0 11

NEW BLACK FOR COTTON



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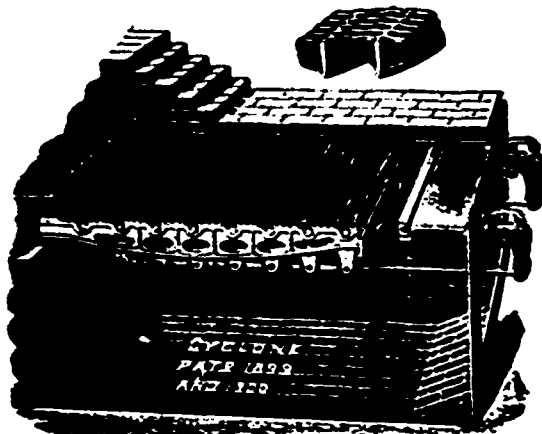
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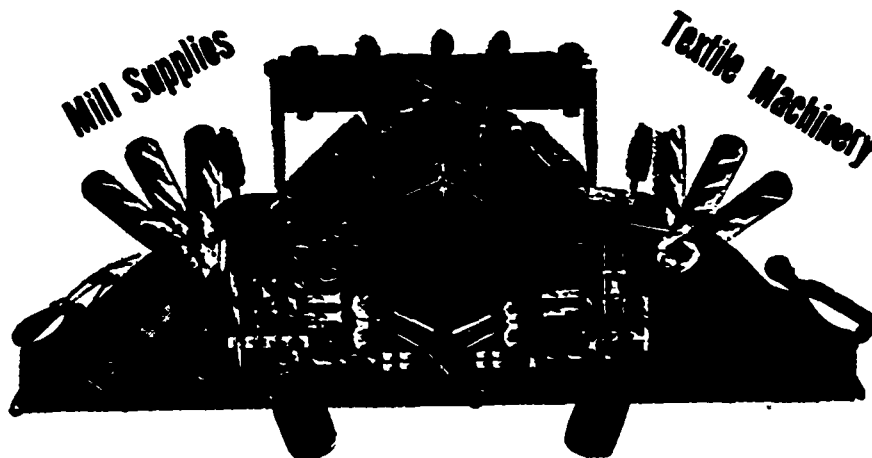
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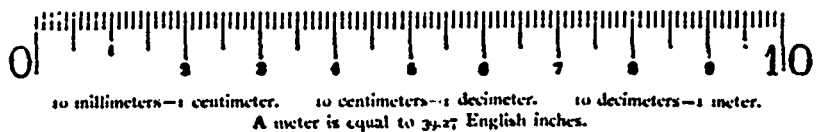
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BIGGAR, SAMUEL & CO., 62 Church St., Toronto, or Fraser Building, Montreal

Opinions of the Press

CHART OF THE METRIC SYSTEM.

The publishers have received many letters complimenting them on the issue of the popular Chart of the Metric System of weights and measures. The following are a few sample opinions:

I have very much pleasure in seeing you step to the aid of those pressing the Metric System to the front. I shall be glad to call the attention of teachers to your chart. The Metric System has for a number of years—since I came into office—been taught in all the schools of the province; and the metric measures are those called for in the returns from all our high schools—dimensions of school rooms, etc. I have much pleasure in sending you a few copies of my brochure on the "Three Great Reforms," in which it will be seen that for a number of years I had been an advocate of the system—even in the conservative city of Toronto. Wishing you much success.—A. H. Mackay, Superintendent of Education, Nova Scotia.

I am in receipt of your favor of the 7th ult., together with a copy of The Canadian Engineer for June, and a specimen of the Chart of the Metric System prepared by your firm. I am very pleased to read your article, but I wish particularly to compliment you on the chart. It is, I believe, the best I have seen for explaining briefly the principles of the Metric System. It will afford my committee much pleasure to hear of this awakening interest in Canada. Australia too is showing a growing disposition to adopt Decimal Coinage and Metric Weights and Measures, and here we keep gaining a step month by month.—E. Johnson, Secretary Decimal Association, London, Eng.

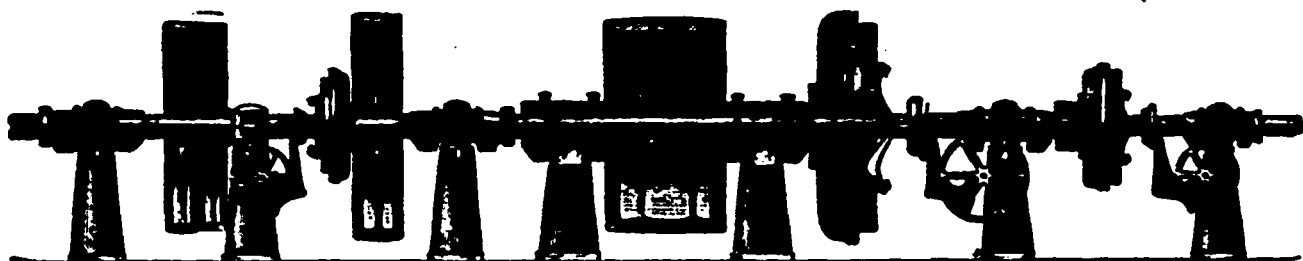
We see that you, too, advocate the general adoption of the Metric System of weights and measures, and we believe that as much as possible everywhere the same means should be employed to accomplish the desired aim. The widest possible distribution of your chart would no doubt be a good step forward. We request you therefore to forward to us two copies

for our office and for the library of the American Society of Dyers.—L. M. Carriat, Philadelphia.

The Monetary Times has a review of your Chart of the Metric System. I notice the price is stated at ten cents per copy, but if you have any other more expensive editions printed, I should be glad to receive a copy or two; as it is my intention to frame a copy (if possible), and present it to the library of the society of which I am an associate, viz., the Incorporated Accountants (Eng.). It is high time that British traders and accountants awoke to the necessity of adopting decimal coinage and measures. Enclosed please find \$1 (Canadian), to cover your expenses for as many copies as the remittance will pay for. Trusting you will be able to assist our efforts on this side to foster "intercolonial and home-country" trade, and lessen the tide of German competition, which is a danger to all the English-speaking countries, if Germany gets the upper hand (both politically and socially), and assuring you of the awakening of the British to their surrounding dangers of subsidized continental competition.—E. Woodroffe, 121 Stapleton Hall Road, Stroud Green, London, England.

Please accept my thanks for the Metric System Charts. The adoption of the Metric System must shortly take place, as everything is to be said for it and next to nothing against it. As to the chart, I consider it is a valuable one, and one which every progressive citizen ought to have in his home. The mass of information, which it explains, is handled in such a simple manner that anybody can understand it without becoming in the least confused as to the use of the different terms, which is the only drawback, that I know of, to the Metric System. There is no doubt though that, if the system were adopted, the terms would be abbreviated to suit the rapid business methods this side of the Atlantic. I expect that a number of people, to whom I have shown the chart, will be calling upon you for copies of it ere long, as they have already expressed intentions of doing so.—Dermot McEvoy, Mechanical Engineer.

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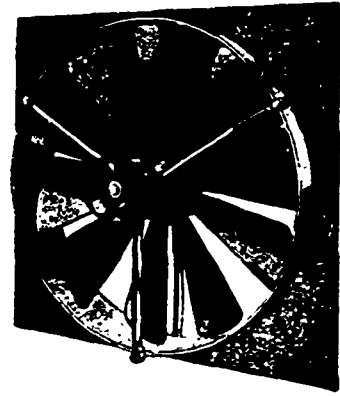
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THE METRIC SYSTEM.

With a view to popularizing the metric system, The Canadian Engineer, of Toronto and Montreal, Canada, has issued a chart or poster upon which a meter is laid out in full, with its ten divisions, each a decimeter, and each of these is divided into centimeters and millimeters. The measures of length are also enumerated in a table, after which follows the table of the measures of area. The measures of volume are graphically represented by a cubic decimeter and its equivalent, the liter, which resembles a quart mug. The measures of weight come next, with the kilogram represented graphically. Then follows a table with the English equivalents for the meter, the square meter, the hectare, the cubic meter, the liter, the gram and the kilogram. The publishers, Biggar, Samuel & Co., of 62 Church street, Toronto, will send this poster to anyone on receipt of 10 cents.—*Railroad Digest*, New York.

The gunny trade has for some time back been slowly undergoing a transition process, and this (remarks Capital), is being felt in Calcutta at the present moment in the slackness of demand for heavy sacking goods, produce which formerly used to be handled in sacks being now transported in hessian bags. There are some purposes for which heavy gunnies will always be wanted, but the tendency is more and more towards the lighter material where it can be conveniently used. For the handling of wheat, for example, American customers find the light central hessian bag infinitely more convenient than a heavy sack, and symptoms are not

wanting to show that the Australasian Colonies will ere long follow the San Francisco example, and then the corn sack will become a thing of the past.

The Aberdeen woolen mill, Lanark, is now recovered from its fire and is again running.

The flax crop of Manitoba is reported to be short. Flax growing districts in Ontario so far heard from, report a fair crop.

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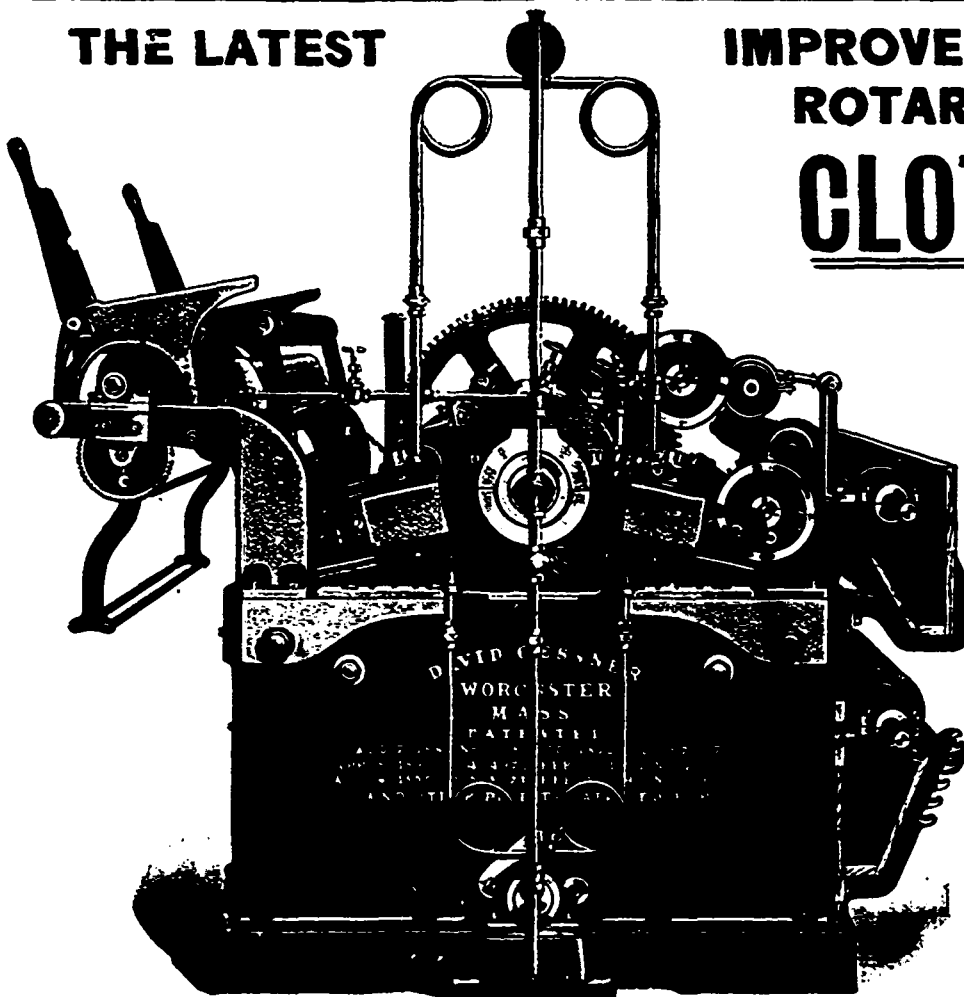
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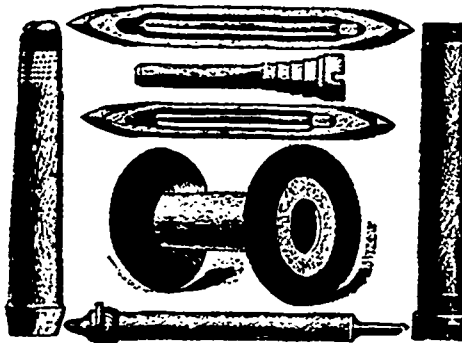
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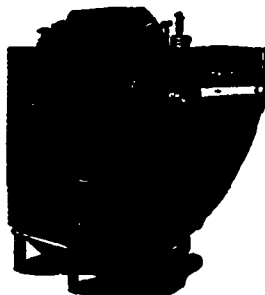
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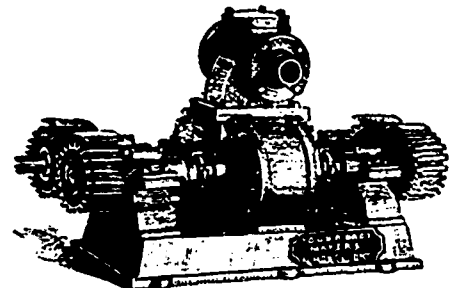
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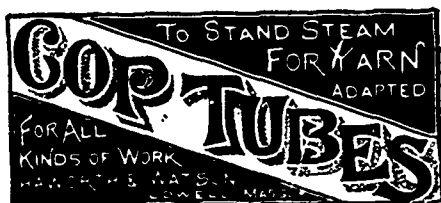
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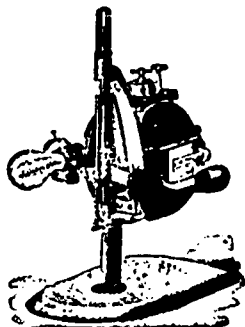
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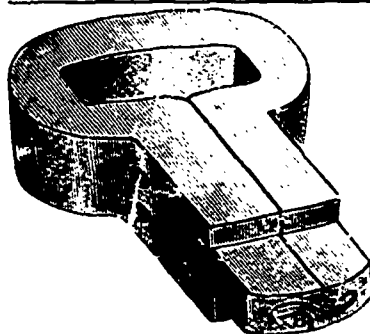
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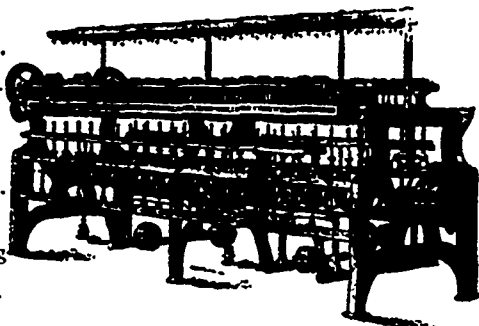
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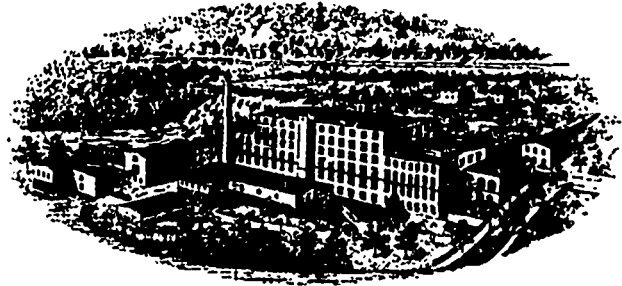
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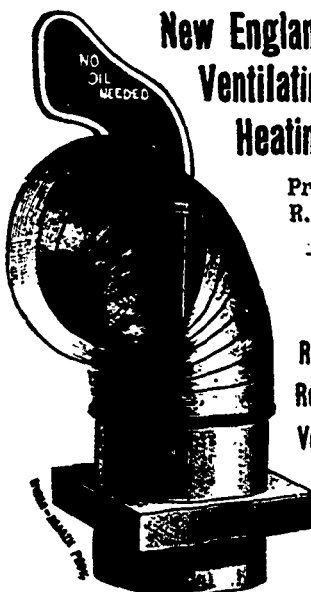
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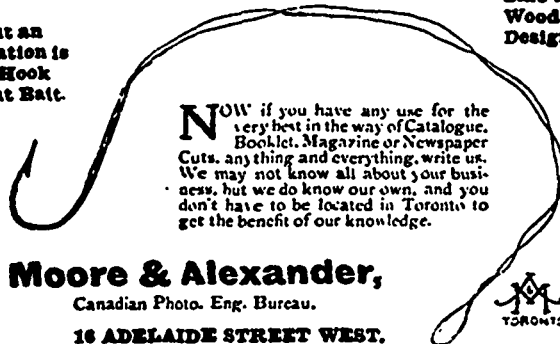
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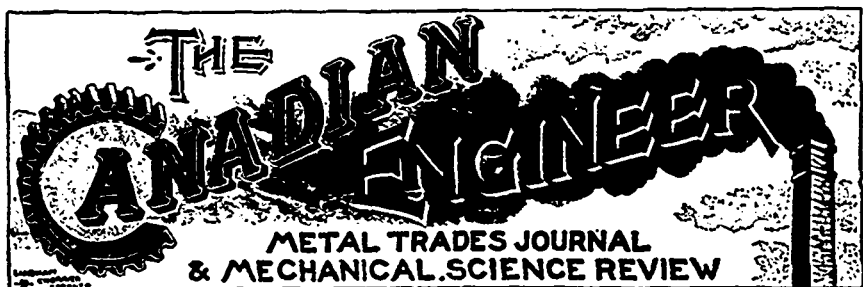
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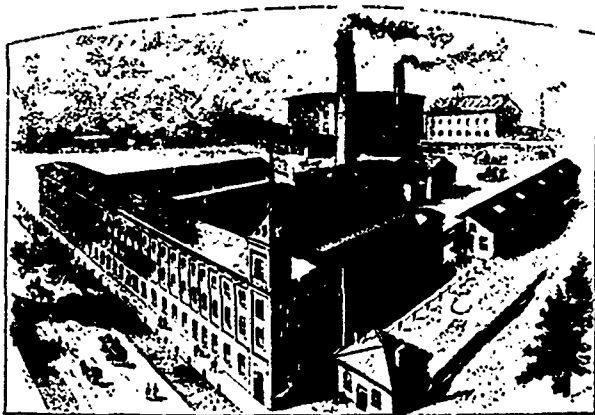
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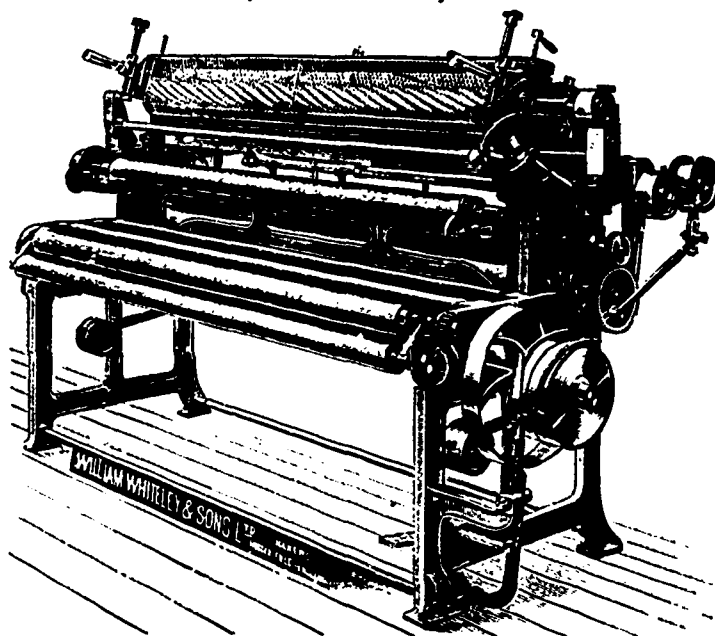
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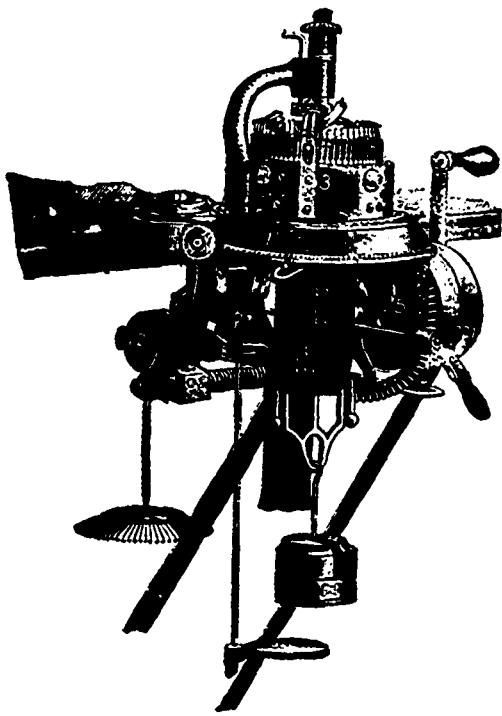
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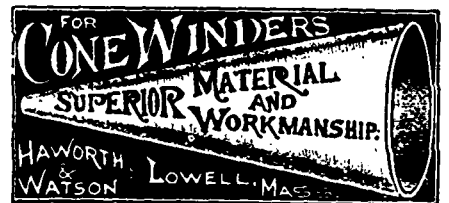
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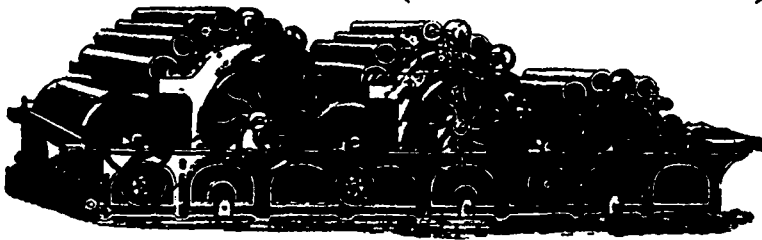
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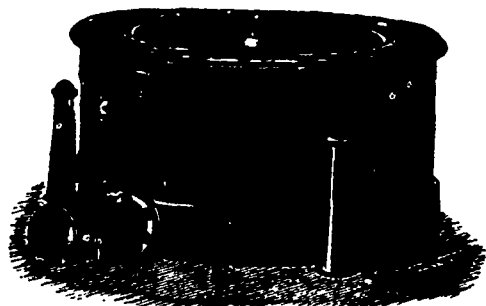
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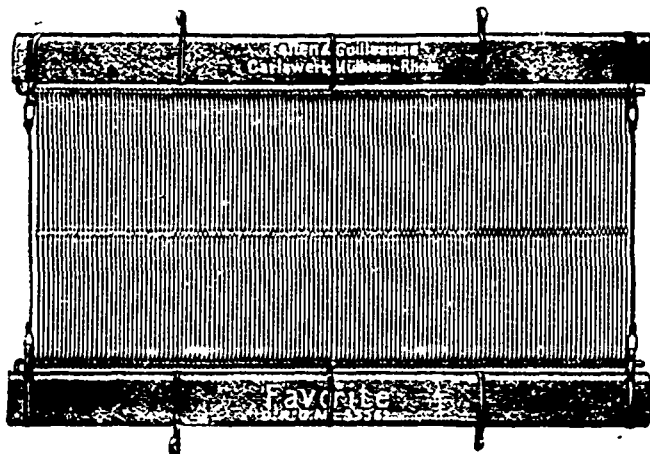
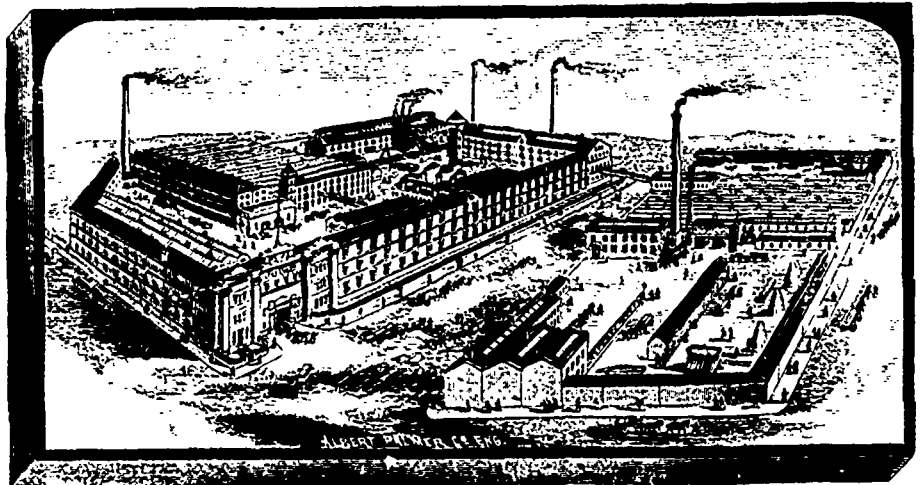
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