

Technical and Bibliographic Notes / Notes techniques et bibliographiques

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

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

Coloured covers/  
Couverture de couleur

Coloured pages/  
Pages de couleur

Covers damaged/  
Couverture endommagée

Pages damaged/  
Pages endommagées

Covers restored and/or laminated/  
Couverture restaurée et/ou pelliculée

Pages restored and/or laminated/  
Pages restaurées et/ou pelliculées

Cover title missing/  
Le titre de couverture manque

Pages discoloured, stained or foxed/  
Pages décolorées, tachetées ou piquées

Coloured maps/  
Cartes géographiques en couleur

Pages detached/  
Pages détachées

Coloured ink (i.e. other than blue or black)/  
Encre de couleur (i.e. autre que bleue ou noire)

Showthrough/  
Transparence

Coloured plates and/or illustrations/  
Planches et/ou illustrations en couleur

Quality of print varies/  
Qualité inégale de l'impression

Bound with other material/  
Relié avec d'autres documents

Continuous pagination/  
Pagination continue

Tight binding may cause shadows or distortion along interior margin/  
La reliure serrée peut causer de l'ombre ou de la distorsion le long de la marge intérieure

Includes index(es)/  
Comprend un (des) index

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

Blank leaves added during restoration may appear within the text. Whenever possible, these have been omitted from filming/  
Il se peut que certaines pages blanches ajoutées lors d'une restauration apparaissent dans le texte, mais, lorsque cela était possible, ces pages n'ont pas été filmées.

Title page of issue/  
Page de titre de la livraison

Caption of issue/  
Titre de départ de la livraison

Masthead/  
Générique (périodiques) de la livraison

Additional comments:/  
Commentaires supplémentaires:

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

10X	12X	14X	16X	18X	20X	22X	24X	26X	28X	30X	32X
								<input checked="" type="checkbox"/>			

# THE CANADIAN MANUFACTURER AND INDUSTRIAL WORLD

DEVOTED TO HOME INDUSTRIES, COMMERCE, FINANCE, INSURANCE, RAILWAYS & MINING.

Vol. 2.

TORONTO, MARCH 9, 1883.

No. 6.

## THE BOILER INSPECTION AND INSURANCE CO'Y OF CANADA.

(Incorporated by Act of Dominion Parliament),

**ALSO CONSULTING ENGINEERS,**

late THE CANADIAN STEAM USERS' INSURANCE ASSOCIATION.

Authorized Capital - - - - - \$500,000.

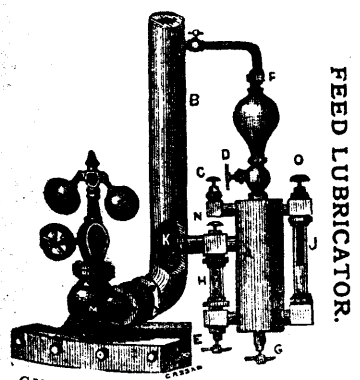
Boilers periodically inspected, and Insurance granted against explosion, covering Boilers, Buildings, and Machinery.  
General Consulting Engineers for all kinds of Mechanical, Civil, and Mining Engineering Work.

HEAD OFFICE - - - - - MECHANICS' INSTITUTE, TORONTO.

SIR ALEX. CAMPBELL, Minister of Justice, *President.*  
JOHN GALT, C.E. & M.E.,  
*General Manager.*

HON. JOHN McMURRICH, President Western Assurance Co., *Vice-President.*  
GEO. C. ROBB, *Chief Engineer.*  
A. FRASER, *Secretary-Treasurer.*

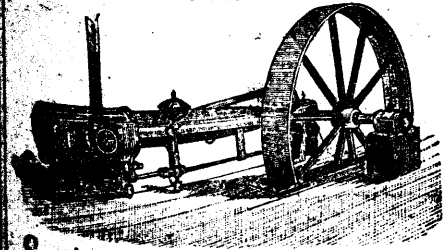
**MONTREAL BRASS WORKS.**  
**ROBERT MITCHELL & CO.,**  
MANUFACTURERS OF ENGINEERS' AND  
PLUMBERS' SUPPLIES



THE CONTINUOUS

FEED LUBRICATOR.

CIRCULARS ON APPLICATION.  
MONTREAL.



**Smith-Elkins**  
**Manufacturing Co'y,**  
**MACHINISTS,**  
**IRON & BRASS FOUNDERS.**

Engines and Boilers of the best materials and latest designs a specialty.  
Board Mills,  
Shingle and Clapboard Machines,  
Waterwheels, Plows, Cultivators,  
Furnaces, Registers,  
Mill Gearing of every description.

**MONTREAL, - - QUE.**

## LEATHER BELTING.

**ROBIN & SADLER,**

MANUFACTURERS OF

Leather Belting,  
Fire Engine Hose,  
& Lace Leather.

All kinds of MILL SUPPLIES.

ROBIN & SADLER make a specialty of Double Driving Belts for mills, and in this class of belting specially—for quality of leather, smoothness of running on the pulleys, and durability, they are unsurpassed on the Continent of America.

BELTING FACTORY:

594, 596 & 598

St. Joseph Street,  
MONTREAL.

## Imperial Bank of Canada.

Head Office - Toronto.

H. S. HOWLAND, *President.* T. R. MERRITT, *Vice-President.*  
D. R. WILKIE, *Cashier.*

Capital Paid-Up - \$1,500,000  
Rest - - - - - \$503,000

Purchases Municipal Debentures.  
Issues Drafts on its Branches and Agencies in the North-West.  
Transfers Monies by Telegram to Winnipeg and Brandon.  
Agents in London,  
MESSRS. BOSANQUET, SALT & CO.,  
73 LOMBARD STREET,  
with whom monies for transmission from Great Britain to Ontario and the North-West may be deposited.

A general Banking Business transacted.

## McKechnie & Bertram, CANADA TOOL WORKS!

Dundas, Ont.

Supply complete outfits of Machinery for Railway Machine Shops, Locomotive Builders, Car Builders, Implement Manufacturers, Planing Factories, etc. CONTRACTS taken and fulfilled at shortest notice. Tenders given, and Price Lists and Catalogues furnished on application.

## PATENTS

Secured in Canada, United States, Great Britain and all Foreign Countries.

Trade Marks & Industrial Designs Registered.

Searches made. Transfers and Contracts Drawn, and all Patent Business carefully prosecuted. 13 Years' Experience.

**R. A. KELLOND,**  
Solicitor and Expert.

St James Street, Montreal.

**WM. CRABB & CO.,**  
Manufacturers of all kinds of  
**STEEL + PINS**  
AND PICKER TEETH.  
ALSO  
**Hackles, Combs and Gills,**  
AND MILL SUPPLIES.  
**NEWARK**

Fire Bricks, Fire Clay,  
Portland, Roman, and Canada  
Cements,  
Drain Pipes, Plaster,  
Tiles, Flue Covers,  
Furnace Blocks,  
&c., &c., &c.  
**W. McNALLY & CO.,**  
Importers,  
**MONTREAL.**



THE LARGEST MANUFACTURERS OF  
STEEL AND BRASS STAMPS IN THE CONTINENT.  
**RICHTARD & MINARD**  
**ENGRAVERS**  
TO THE DOMINION P.O. DEPT. & C.  
**OTTAWA.**  
STEEL, BRASS, AND RUBBER STAMPS.  
STENCIL PLATES, SEALS, &c. &c.

**PILLOW, HERSEY & CO.,**  
Manufacturers of  
Cut Nails, Horse Shoes,  
Railway and Pressed Spikes,  
Tacks, Brads, and small Nails  
of every variety.  
Carrriage, Tire, Plow, and other Bolts. Hot  
Pressed and Forged Nuts, &c.  
Office and Warehouse:  
**91. ST. PETER ST. - - MONTREAL.**



**KNITTING MACHINES,**  
2 1/2, 3 1/2, 4 1/2 in. diameter  
for  
**FACTORY USE.**  
which make  
**FULL FASHIONED SEAMLESS HOSIERY,**  
also,  
**PLAIN FAMILY KNITTING AND RIBBING MACHINES**  
**COTTON, YARNS, MIXES & COLORS, &c**  
**CREELMAN BROS., MANUFACTURERS**  
**BRIDGE TOWN, ONT.**

**McARTHUR,**  
**CORNEILLE & Co.,**  
310 to 316 St. Paul Street,  
and  
147 to 151 Commissioners Street,  
**MONTREAL,**  
offer at closest prices

**PURE OLIVE OIL,**  
**WINTER-PRESSED LARD OIL,**  
**EXTRA FINE SPINDLE OIL,**  
and a full assortment of other  
**LUBRICATING OILS.**  
Also  
**CHEMICALS,**  
**DYESTUFFS,**  
**DYEWOODS,**  
**EXTRACTS,**  
&c. &c. &c.

Are Sole Agents in Canada for  
**SOCIETE ANONYME**  
DES  
MATERES COLORANTES ET  
PRODUITS CHIMIQUES,  
DE ST. DENIS,

Successors to  
**A. POIRRIER AND G. DALSACE,**  
**PARIS,**  
Manufacturers of  
**ANILINE DYES,**  
**ARCHIL,**  
**CUDBEAR,**  
&c. &c. &c.

Prize Medal, London Universal Exhibition,  
1862.  
Gold Medal, Paris Universal Exhibition,  
1867.  
Grand Diploma of Honor, Vienna Universal  
Exhibition, 1873.  
Medal and Diploma, with Highest Com-  
mendations, Philadelphia Centennial Ex-  
hibition, 1876.

Maintain large stock, replete with all the  
new and improved colors. Will be pleased  
to furnish quotations with samples and  
directions for use.

**Exchange Bank of Canada**  
Capital Paid up, \$500,000 | Rest, \$500,000  
**HEAD OFFICE, MONTREAL**  
Directors.  
M. H. GAULT, M.P., President  
Hon. A. W. OGILVIE, Vice-President  
E. K. Greene, Alexander B. ...  
**THOMAS CRAIG, Managing Director**  
Branches.  
Hamilton, Ont. .... C. M. Counsell, Manager  
Aylmer, Ont. .... J. G. Billett,  
Bedford, P.Q. .... E. W. Morgan  
Sterling American Exchange bought and  
sold. Interest allowed on Deposits.  
Collections made promptly and remitted at  
rent rates.

**MILLER BROS. & MITCHELL,**  
**Machinists & Millwrights,**  
Manufacturers of  
**IMPROVED HOISTING MACHINERY.**  
Sole Licensees for Dominion for  
Gray's Patent Noiseless Roller Mills  
—AND—  
Gradual Reduction Machines.  
**110, 112, 114 & 116 KING ST.,**  
**MONTREAL Que.**

**New York Dyewood, Extract**  
**and Chemical Co.**  
**161 FRONT ST., N.Y.**  
All kinds of  
**DYE STUFFS.**  
Dye Woods, Extracts, Cutch,  
Indigo, Gambler, Cudbear, Coch-  
ineal, Sumac, and Liquid  
Extracts of Dyewoods.

**ROYAL NAVY**  
**TOBACCO WORKS,**  
**PARIS, - - - ONT.**  
**N. P. BENNING**  
MANUFACTURER OF  
**Royal Navy Plug Tobacco**  
AND  
**FINE CIGARS.**

**THURBER'S**  
**BABBIT METAL,**  
**Nos. 1, 2, 3.**  
Acknowledged superior to any made  
Canadian Metal is far cheaper and better than  
ordinary Babbit.  
Philadelphia Metal, Nos. 1 and 2, is a very fine  
metal at the price.  
**JAMES ROBERTSON & CO**  
**TORONTO.**

# THE CANADIAN MANUFACTURER AND INDUSTRIAL WORLD.

DEVOTED TO HOME INDUSTRIES, COMMERCE, FINANCE, INSURANCE, RAILWAYS & MINING.

VOL. II.

TORONTO, ONT., MARCH 9, 1883.

No. 6.

## PRISON LABOR.

The amended tariff just passed in Washington is so large and complicated a piece of legislative work that it is not easy to say, off-hand, whether it reduces to any serious extent the protection afforded by the old tariff. But employers engaged in the iron trades, or some of them, who presumably are well posted on details, are saying already that, in order to keep American iron works going, sweeping reductions in wages will be necessary. If such reductions are made as a consequence of the change, the question of prison labor, which has for some time back been greatly agitating the minds of working men, will very soon become a burning question of the day.

In some of the neighboring States the competition of prison labor with that of honest workers outside of prison walls has attained large proportions. From a recent official report to the Legislature of the State of New York it appears that Perry & Co. regularly employ 900 men in Sing Sing prison in the manufacture of stoves and hollow ware, at 56 cents a day for each, and that another concern has 210 men regularly employed in Auburn prison in the manufacture of hollow ware at the contract price of 55 cents a day for each. When, in connection with this price, we consider the fact that all the work prisoners are capable of doing is exacted from them, also that the contractors have no shop rent or taxes to pay, it will be observed that competition of outside free labor is not at all to be feared. The contractors who thus employ 1,110 moulders at 55 and 56 cents a day are secure from all competition in the stove and hollow ware line. When trade gets a little dull they can cut prices so as to secure orders for all their production, and when it becomes very dull they can drive some manufacturers, who employ free labor, out of business and compel the cutting down of wages to the lowest possible ebb.

On this the *American Machinist* remarks:—

"It requires no argument to show that the contractors hold this power over honest industries that are unsupported by the State Treasury. A glance at the prices of labor, as officially given, will convince any intelligent observer. In order to secure this advantage beyond the power of disturbance for a prolonged term the stove contract has been extended to Feb. 28, 1887, and the hollow ware contract to Dec. 31, 1884. The official who had the letting of prison contracts, as well as the few who are favored with their benefits, evidently anticipated legislative action looking to the excision of the prison contracts from our industrial system, in the near future, and therefore hastened to bind the State government to a continuance of

special contracts as long ahead as they dare fix the time for expiration. The stove manufacturers and their workmen are, however, by no means the only parties injured by prison contracts. Many other industries are disturbed both directly and indirectly by prison contract competition.

"Where, for instance, in this country, can machinists be employed at 55 cents a day? Yet in Auburn prison, 265 men are regularly employed in making waggon axles at the contract price of 55 cents a day, and the labor of that number has been pledged to the contractor until Feb. 28, 1885. Every machinist working in an axle factory must compete directly with the labor of these Auburn convicts, and when business is dull and wages low in stove foundries and axle factories the depressing influence must be felt in other factories and shops."

While honest labor is thus injured, the criminals themselves are treated with a cruelty wholly unauthorized by the sentences under which they suffer. A recent investigation of prison management in New York reveals some facts disgraceful to the Empire State. One witness, George Lewis, had spent eighteen months at Sing Sing. He had been "paddled" twelve times, and when he said he could not finish his task, ironing shirts, he was told he would be "paddled" until he could. Becoming desperate, he jumped from the stoop, for which he was again "paddled" and confined for twenty days in the dark cell. When released he had to make up for lost time. "If ever I had a paddle," he concluded, "I would give them a dose of their own medicine." James Murphy testified that he had been an inmate of the Clinton prison for seven years. He had worked on hats, and had been "paddled" for doing bad work. A convict named Buckman, he stated, had been chained to the floor of the dark cell for 170 days. He never came out alive for "they murdered him." For trying to escape one Creswell was chained in the dark cell for ten months and died. Of three others who attempted to escape with him, O'Neill was shot, one went crazy, and the third is in prison. The convicts feared the dark cell, but dreaded "paddling" more. He knew of men maiming themselves to escape their tasks, and he also knew of men being kept fourteen months over their time for trifling offences. James T. Cooper and Michael Conner, keepers in the Kings County Penitentiary, testified as to the working of that institution without the use of the "paddle" or rawhide. The labor of the convicts is contracted for by the Bay State Shoe and Leather Company, the county receiving on an average fifty cents per day for each man. Robert V. Powers, alias Robert Green, testified that he had been "paddled" at Sing Sing, and confined in the cooler four times. When his foot was burned in

the foundry he was obliged to work some days before he was allowed to go to the hospital. "Under Bowes," he said, "there was a reign of terror." Charles Young testified that when at Sing Sing he got along nicely in the shoe shop until Keeper Bowes assumed charge. Then his tasks were raised, and to save himself from "paddling" he cut off the end of one of his fingers. Another convict, Nelson by name, dreading another "paddling," after having received two, cut off three of his fingers.

In the system of prison labor there are three parties concerned—the prisoners, the contractors, and the public. It is easy to see that it works to the detriment of both the first and the last, while the contractor—the middleman, or party of the middle part—is the only one who profits by it. This is not as it should be. The public interest lies in two directions—the punishment of criminals, along with their reformation to the extent practicable, and the protection of honest labor. Under the present system, in the State of New York at all events, only the interests of the contractors are served.

The prison labor system of most of the Southern States is, however, far worse than anything known in the north. Georgia has its "chain-gang" system, the horrors of which almost match what we have read of Siberia. The prisons in Alabama are farmed out to contractors, as they are in most of the Southern States. Georgia abuses are repeated in Alabama, and others are added which make the picture even blacker than the Georgia one is. A large proportion of the Alabama convicts are let out to contractors for work in coal-mines, and on railways. The contractors have full authority over them, flog them without restraint and without mercy, and lodge them like pigs. The average number of convicts between September 30, 1880, and September 30, 1882, was 531. Of that number 61 died. Here is a death rate of over 11 per cent. But an analysis of the division of labor shows more appalling figures than these. About half the convicts were employed on farms, and of that half only ten died, or less than 4 per cent. Of the other half, employed in mines and on railways, fifty-one died, or more than 20 per cent. This, says a New York paper, is murder, pure and simple.

The recent investigation into prison abuses in New York had a good motive, but the first effect was bad. The prisoners got it into their heads that they had Albany legislators on their side, and a dangerous revolt followed, which was not subdued for several days.

In Canada we have made a beginning with the prison labor system—let us take care that it does not grow upon us. We had better, before it gets too strongly rooted and established, set our wits to work to devise some plan for abolishing it altogether.

#### THE ONTARIO ELECTIONS.

Since our last issue the event of a general election has come off in the Province of Ontario. The result must have been a surprise to most people, judging by the prevailing talk just before. As usual, success was all but a certainty for both sides, according to their respective organs, but the general expectation was that Mr. Mowat would come back with at least a good working majority. His majority is now stated by one

side at about thirteen or fourteen, and by the other at about six or seven, while observers who claim to be impartial put it at nine or ten, in a House of eighty-eight members.

Seeing that he had in the last Assembly a majority of about twenty-eight or thirty, the result is unquestionably a serious "come-down" for the Provincial Premier. He had in his favor all the prestige of a "strong Government," and of success for a number of years continued with the support of an overwhelming numerical majority in the House. His command of patronage, too, was very extensive in the Province. Far more so, we venture to say, than is generally supposed. The simple fact that, with all this in his favor, his majority was so greatly reduced notwithstanding, is what chiefly marks the importance of the event.

Trying to account for what has happened would lead us far into the field of party politics, which we wish not to enter. The legislation and the government with which the CANADIAN MANUFACTURER most concerns itself belong almost wholly to the Dominion, and only in small part to the Provinces. It is not the business of the latter to regulate trade and tariff, manufactures and commerce—matters industrial, which come within our sphere. And a Provincial election, as every one in form admits, should not turn upon the tariff question, or any other not belonging to Provincial public business. Yet we cannot help thinking, and saying it too, that in the elections of February 27th the tariff issue did considerably affect the result, after all. Beyond all doubt many votes were affected by the belief that a very strong and unchecked Reform Government in Ontario—the leading Province of the Dominion—was a standing menace to the National Policy. On the sustaining of that policy our manufactures depend for being themselves sustained; and there is no wisdom in blinking the fact that this is well understood throughout the country. As these manufactures keep growing every year, the strength of the interests connected with them, those of employers and employed together, grows also and increases. Nor is it the interests of those only who are directly employed in manufactures that have to be considered. The number of those indirectly interested, but still in the same thing, is every year increasing, and must tell, even in Provincial elections.

However, no matter what the motives in men's minds may have been, leading to so considerable a change in the representation, one thing is tolerably certain. Every man having money to invest in manufactures, or looking for employment therein, must feel that the *continued* protection of home industry against foreign competition is safer and surer now than it appeared to be before. Any lingering hope on the part of opponents of the National Policy that Ontario might be induced to declare against it must now be abandoned. And that, we fancy, is a result of no little importance to the country.

#### THE STOPPAGE IN THE RUBBER TRADE.

A remarkable event in the history of manufactures is the recent stoppage of all, or nearly all, the large American factories producing rubber shoes. Factories making other kinds of rubber goods continue in operation, but those running on shoes have mostly stopped. The extraordinary advance in the price of

rubber last year is given as the cause. It appears that some time ago arrangements were made by which a syndicate, composed of Jews belonging to London, Paris, and New York respectively, managed to get all the rubber production of South America into their hands, or under their control. Having thus "cornered" the article, they advanced the price, bringing it at last up to a figure which the manufacturers could not pay for it and live.

For several years past the prices of rubber have been advancing. These high prices are said to be due largely to the operations of cliques which are working towards speculative ends. The opportunities for controlling the rubber market, it is stated, offer an excellent chance for speculators so long as the supply nearly equals the demand. For several years the prices have been advancing. This has been due to the effects of two cliques, one composed of Portuguese merchants, whose headquarters are at Lisbon, and the other composed of Jews whose headquarters are at London and Liverpool. These cliques, backed by capitalists and operators in the United States, have succeeded in monopolizing the products of the Amazon. But the advance in price of the raw material, great as it has been, was by no means the sole reason for the stoppage of the rubber shoe factories. Another, and a most potent cause, is acknowledged in the plain and significant fact of over-production. It was stated, on the occasion of a manufacturers' meeting held not long ago in New York, that if only one half of the existing rubber machinery were kept going it would amply suffice to meet the demand. In this fact there may be a lesson for manufacturers in other lines of production, and that in Canada as well as in the United States.

#### THE NEW AMERICAN TARIFF.

Within a few hours of its dissolution the Forty-seventh Congress managed to pass a Tariff Bill. It was after two o'clock last Sunday morning when the bill was ready for the President's signature, which was promptly affixed, he having been in waiting for the purpose; and the official existence of that Congress ceased at noon the same day. As we have before explained, there were three different tariff bills up for consideration. First there was that of the Tariff Commission, on which several months of hard work at details had been spent. This bill made many reductions of duties, but was on the whole a pretty stiff protectionist measure after all. Next there was the Senate bill, which proposed greater reductions, and which was viewed with much alarm by manufacturers generally, but especially by those engaged in the various iron trades. Next again there was a bill prepared by the House Committee of Ways and Means, which left the duties mostly higher than recommended by the tariff Commission. Of the three the House bill had the highest figures, and the Senate bill the lowest, while the Commission's bill was between the two. On this latter the other two were really founded, but they made important departures from it, in opposite directions. Another circumstance was that the Senate bill was completed several weeks ago, whereas the House bill was not ready until a very late period of the session. It became evident that neither House could be got to adopt the bill prepared by the other, and so at the eleventh hour a conference committee of both Houses met for the pur-

pose of effecting a compromise, if possible. While all this was going on, influential manufacturers from all quarters had been pouring into Washington, and were busy night and day arguing their case and explaining points to Senators and Congressmen. Their efforts must have been to some purpose, for when the final tug of war came, in the Conference Committee, the Protectionist side scored a decided victory. The Free Trade papers say so, at all events; and we may accept their admission that they were beaten in the last struggle.

It is impossible thus early to say what precisely the effect of the new tariff is likely to be on the whole, with its enormous mass of details, embracing between two and three thousand specifications, even experts are puzzled to say what changes it may bring about, and opinions vary widely among practical men. As a measure of protection it is allowed to be a strong one on the whole, but already manufacturers in various lines say that their particular interests have been overlooked or even sacrificed. Day after day their complaints with regard to this and the other special manufacture are popping up, while the free trade papers keep repeating that the bill is an outrage, because, while professing to make reductions, it makes none of any account. Free traders declare that the fight must be continued, and hope to get a very much reduced tariff bill from the Democratic majority in the new Congress, which meets in December next.

The bill abolishes bank taxes to the amount of twelve millions, also several smaller internal revenue taxes, and reduces the excise on tobacco and cigars. The calculation is that the reduction of revenue will amount to some thirty or thirty-five millions on customs, and forty or forty-five millions on excise. The latter can be calculated pretty closely, but as to the former nothing but experience can determine, because no one can tell beforehand actually how importation in this and the other branch of trade will be affected by the changes made. Readers of the CANADIAN MANUFACTURER may depend upon having the more important details placed before them at an early day.

**DEADENING SOUNDS.**—The following plan for deadening floors is reported to have been made the subject of a recent patent. It is exceedingly simple, and not materially unlike plans that have been before proposed. A 3x6 inch plank is directed to be inserted between each joist, two inches from the bottom of the joists, and projecting four inches beneath them. The ceiling boards are nailed to these intermediate planks, and the space between is filled with sawdust to within one inch of the joists. By this mode of construction, the sound is said to be so effectually deadened, that the most vigorous hammering above cannot be heard in the storey beneath.

The *Blacksmith and Wheelwright* believes that the old system is, in the main, responsible for the aversion that such a large number of boys manifest for learning trades. For the first year a boy in a blacksmith shop, for instance, is put to the roughest and most disagreeable work. He is made to do a thousand and one things that will be of no use to him when he grows up, and have nothing to do with making him a skilful mechanic. He knows this and naturally rebels and wants to do something that will be of benefit to him. He is brought up to feel that to be a good blacksmith a man requires much brawn and little brains. That he obtains an erroneous idea of the trade he is trying to learn we all know, but, nevertheless, this impression is apt to become fixed in his mind from the character of the work he is put to do. Is it any wonder that he looks with envy on the boy behind a counter or in a lawyer's office, and longs to get away from an employment which has become irksome?

# Mechanics and Engineering.

## ELEMENTARY PAPERS FOR YOUNG MECHANICS.

No. II.—GRAVITATION.

(Continued.)

From what was explained in the former article of the effect of gravitation in increasing the velocity of falling bodies, the following rule may be made out:—

I. Given the time in seconds occupied by a body in falling, to find the distance fallen.

Rule. Multiply 16.1 by the square of the number of seconds, and the product will be the distance fallen in feet.

Example. A stone occupies  $2\frac{1}{2}$  seconds in falling to the ground from the top of a tower, what is the height of the tower?

The time is  $2\frac{1}{2}$  seconds, the square of  $2\frac{1}{2} = 2\frac{1}{2} \times 2\frac{1}{2} = 6.25$ , and  $16.1 \times 6.25 = 100.625$  feet. The height of the tower is 100.625 feet.

Example. A stone falls to the ground in one quarter of a second, from what height did it fall?

The time is .25 second and the square of .25 = .25 × .25 = .0625, and  $16.1 \times .0625 = 1.00625$  feet, or a little over one foot.

It should be carefully noted that in the examples given, the time occupied is ten times greater in the first, and the distance fallen is one hundred times greater.

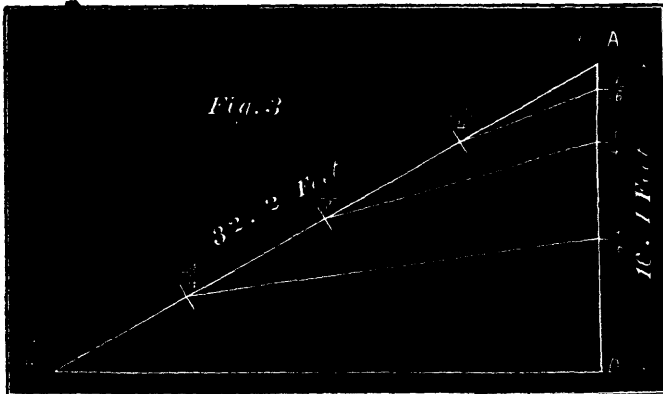


Diagram No. 3 illustrates the increase of velocity during a fall of one second. The line AB represents the velocity, and the line AD represents the distance fallen. The increase of velocity is equal during equal intervals of time, but the distance fallen varies as the square of the time. In the first  $\frac{1}{4}$  second, the distance fallen is 1.16th, in  $\frac{1}{2}$  second the fall is  $\frac{1}{4}$ , and in  $\frac{3}{4}$  second it is 9.16th of the whole distance fallen in one second.

A careful study of this part of the subject should be made, as it will repay for all the trouble.

II. The distance fallen being given, it is required to find the time in seconds.

Rule. Divide the distance fallen in feet by 16.1 and extract the square root of the quotient, the result will be the time in seconds.

Example. A tower is 50.3125 feet high, how many seconds will be occupied by a stone in falling to the ground?

The height 50.3125 feet divided by 16.1 = 3.125, and the square root of 3.125 = 1.767 seconds.

In all of the examples given it has been assumed that the stone in falling started from a state of rest; but it is necessary to consider another view of the question by supposing that the stone instead of falling from the tower is thrown down. How does this change the case? The stone begins its descent when thrown down with a certain velocity imparted to it by the arm of the person throwing it; and hence we have two forces acting upon it, the one "gravity," and the other a force produced by the arm of the thrower. Gravity begins to act so soon as the stone leaves the hand, and continues to act all the way during the descent; the other force ceases to act the instant the stone leaves the hand.

The effect of the force of the arm of the thrower is therefore very simply calculated, as we have merely to assume that at the moment the hand let go the stone it was moving at a certain velocity.

It has already been explained that the force of gravity is constant, that it is sufficient to increase the velocity of motion 32.2 feet per second for every second occupied in falling, and that in one second a body starting from a state of rest will in one second fall 16.1 feet. But now suppose that a stone is thrown down from a tower 100.625 feet high, and that when it left the thrower's hand it had a velocity of 32.2 feet per second, in how many seconds will it reach the ground?

A little consideration will make it plain that in commencing its fall with a velocity of 32.2 feet per second, it is in precisely the same condition as if it had started on its descent from a state of rest 16.1 feet higher up and had already occupied one second in descent.

But suppose, instead of throwing the stone downwards, it was thrown up with a velocity again of 32.2 feet per second in a vertical direction.

In this latter case the force imparted by the thrower is directly opposed by the action of gravity, and the stone ascends with a gradually diminishing velocity until the upward force is exhausted. This will be in one second, and the stone will ascend 16.1 feet, and then from that height will begin its descent.

The following is a summary of the explanations given, and rules for calculations regarding falling bodies.

Rule I. The time in seconds occupied in falling being given, to find the final velocity.

Multiply 32.2 by the time in seconds, and the product is the velocity in feet per second.

Rule II. The time being given, to find the height or the distance fallen.

Multiply 16.1 by the square of the number of seconds, and the product will be the distance fallen in feet.

Rule III. The distance fallen being given, to find the time.

Divide the distance fallen in feet by 16.1, and extract the square root of the quotient, the result will be the time in seconds.

Rule IV. The final velocity being given, to find the height of fall required to produce that velocity.

Square the velocity in feet per second and divide by 64.4, and the quotient is the height in feet.

Rule V. The height being given, to find the velocity due to that height.

Multiply the height in feet by 64.4 and extract the square root of the product, the result is the velocity in feet per second.

Rule VI. The velocity being given, to find the time occupied in acquiring that velocity.

Divide the velocity in feet per second by 32.2, and the quotient is the time in seconds.

It should be clearly understood that a body projected upwards is uniformly retarded by the action of gravity, and will ascend to the height through which it must fall in order to acquire its initial velocity.

The letter "g" is used as a symbol in books on mechanics to represent the force of gravity, and for all mechanical questions may be taken as equal to 32.2 feet per second. As exercises for our readers, we ask them to study the following questions:—

3.—Suppose a cannon pointed vertically discharges a ball with a velocity of 1200 feet per second, to what height will it rise?

4.—Two cannons with different charges of powder are pointed exactly horizontal and discharged simultaneously. They are 40 feet above the level of the ground, and the one ball goes 600 yds. and the other 1200 yds. In what time will the balls reach the ground?

ANSWERS TO QUESTIONS 1 AND 2.

In the first question, the cage is supposed to be 16.1 feet high and to be descending the mine at the rate of 16.1 feet per second. When a stone falls from the roof of the cage to the floor, required to find the time.

If the cage were at rest the time would be one second, because a body falls 16.1 feet in one second when starting from a state of rest. By the supposition the cage is descending at the rate of 16.1 feet per second, and while the stone is falling one second the floor of the cage has descended 16.1 feet, yet experiment has proved that the floor of the cage is reached by the stone in exactly one second, and consequently it must have fallen 32.2 feet. When it left the roof of the cage it had the same velocity as the cage, 16.1 feet per second, and that velocity is increased by the action of gravity sufficient to carry it through another 16.1 feet, thereby causing the stone to reach the floor in one second, the same as if all had been at rest.

In the second question the cage is supposed to be ascending. The same reasoning applies in this case, and no matter at what velocity moving, and whether ascending or descending, one second is the time.

THE DIFFERENCE BETWEEN STEEL AND IRON.

BY BRACEBIT.

The question has often occurred to me, and doubtless to others: What is the difference between iron and steel, and where ought the dividing line to be drawn? Almost any manufacturer of or dealer in iron and steel feels competent to answer the question when it is first propounded, and will give an answer, for all practical purpose, nearly enough correct. If you press him closely, however, with your question, and ask him to draw a line sharp and clear between the two manufactures, so that one may not be mistaken for the other, you will confound him without doubt. Steel and iron are very carefully defined: several books now before me, but notwithstanding this I am unable to establish a technical difference, such as would enable me to determine when iron ceases to be iron and becomes steel. Thinking the other day that I might obtain some information from practical men that would throw light on the subject, and partly out of curiosity, I made the rounds

of the manufacturing parts of the city, and gathered the views of several business men, which I will endeavor to portray "true to life."

The first gentleman called upon is a manufacturer of iron and steel boilers on Main-street. In answer to my abrupt question, "What is the difference between iron and steel?" he gave me a look of astonishment that would have done credit to the stage, but made no reply. On my repeating the question he first smiled pityingly at me, and then remarked, with evident disgust, that "anybody outside of the blind asylum" could tell the difference. At this remark I "flared up" somewhat, and endeavored to impress him with my occult acuteness by a lavish and ostentatious display of learning, but it was "no go." I saw that I had made an unfavorable impression, and that I could no more free his mind from prejudice than a fire fly could illuminate an acre of London fog. I accordingly left.

The next establishment visited was also an iron and steel boiler works. The proprietor received me very graciously; and as I put my question as gently as one would spring an abstract proposition, I succeeded in obtaining his views: "The way I distinguish iron from steel," he remarked, "is by the grain and the color. Steel has a much finer grain than iron and also a much brighter color. Iron is much rougher to the touch, owing to the coarseness of its grains or fibres, and when broken does not present so bright and silvery a color as steel: in fact, its color is not bright at all, but dark and lustreless."

"But have you never come across iron and steel which very closely resembled each other in appearance?"

"Oh, yes, I have; and I understand there are custom house cases on record in which duties were collected on 'steel' which was not steel but iron, and that the best experts have given conflicting opinions in cases of this kind. In my shops I use 60,000 T. S. homogeneous steel and 60,000 T. S. iron (the kind required by the government in iron marine boilers), and I occasionally come across employees of mine who cannot, for the life of them, tell the difference between the two manufactures. While I do not claim to be an expert, I do claim that I can tell the difference between iron and steel sufficiently well to carry on my business and manufacture both kinds of boilers."

The third boiler maker, against whom I launched my question, made reply about as follows: "It is easy enough to distinguish iron from steel in nearly all cases; but in the excepted cases it is difficult if not impossible. There are a few things which one may understand and yet not be able to explain. I believe that I can tell iron from steel in nearly every instance, and yet I am sure that I could not explain how I can select one from the other with accuracy and precision—at least not so another would understand me as well as I understand myself."

"I understand you perfectly. Now will you inform me whether there is a very great difference between the iron and steel you use for boiler making?"

"No, there isn't; the difference, practically considered, doesn't amount to anything, and I am of the opinion that such homogeneous steel as is used for boiler purposes ought to be called iron."

Several dealers in iron and steel were interrogated, but nothing was learned, except the following from a book, to which my attention was politely called by the last dealer visited. "Steel is a compound of iron and carbon, varying in proportion of 0.5 per cent. to 5 per cent. of carbon. Specific gravity, 7.8; tensile strength, 120,000 pounds per square inch. Ordinary steel is carbon steel, but steely compounds of iron have been produced which have the same general properties as ordinary steel, the carbon of which is replaced by other chemical elements."

The same authority says: "Pure iron has a specific gravity of 7.3 to 7.8; hardness, 4.5; chemical equivalent, 28. It is the most tenacious of metals; the hardest of all things which are malleable; has a slight smell when rubbed; is astringent



to the taste, and in moist weather oxidizes and becomes covered with a coating called rust; it is attracted by the magnet; becomes magnetic by induction; loses its polarity when removed from the magnet; when combined with 2 to 5 per cent. carbon is fusible cast iron; with less than 1.2 per cent. is malleable iron; 1.2 per cent. very soft steel; 1 per cent. cast steel."

Another authority, more to the point, says: "Steel is a compound of iron and carbon in which the proportion of the latter is from 1 to 5 per cent., and even less in some kinds. Steel is distinguished from iron by its fine grain and by the action of diluted nitric acid, which leaves a black spot upon steel and upon iron, a spot which is lighter colored in proportion to the carbon it contains. *St. Louis Age of Steel.*"

MILL AND FACTORY BUILDING.

BY LOUIS H. GIBSON.

(Continued from our Last.)

INTERIOR FRAMING.

The method of construction which I wish to describe is one suggested by Mr. Atkinson in the special reports to the Manufacturers' Mutual Fire Insurance Co., and meets all the objectionable features of the ordinary style of building. It consists of a rigid self-supporting frame structure inside of a self-supporting brick shell. According to present methods of building,

ing to the number of stories. In none of these modes of construction has there been any horizontal trussing or method of preventing sideway vibration or oscillation, except the dead weight of the whole structure, frame and wall together.

Mr. Atkinson advises a method of horizontal trussing which, combined with other features of construction adopted by the factory mutuals, makes a thoroughly good building. In this method there should be an alleyway entirely around the inside of the building, which is formed by placing a row of posts four feet from each wall.

In this alleyway is placed horizontally a truss, as shown in plan, which consists of two thicknesses of 1 1/2-inch plank laid crosswise at an angle of 45° to the wall. The weight of the structure and machinery is carried entirely by the posts, which are anchored together at the girders that in the event of fire one part of the building may fall without disturbing the adjacent parts. The girders in the engraved plan are shown 8'6" between centres, and the posts 16'6". The floor is made by 3" tongue-grooved plank laid flatwise from girder to girder, on which is placed a 3/4" bed of concrete which is followed by the common floor. The thickness of the horizontal truss corresponds to that of the first layer of 3" plank.

"It will be apparent that this outer alleyway, thus constructed, will constitute a horizontal truss of the best available kind at each floor surrounding the whole portion of the floor upon which the machinery is placed." Under the alleyway thus formed, the girders, timbers and posts are bolted and framed together, so as to hold the building in a rigid upright position

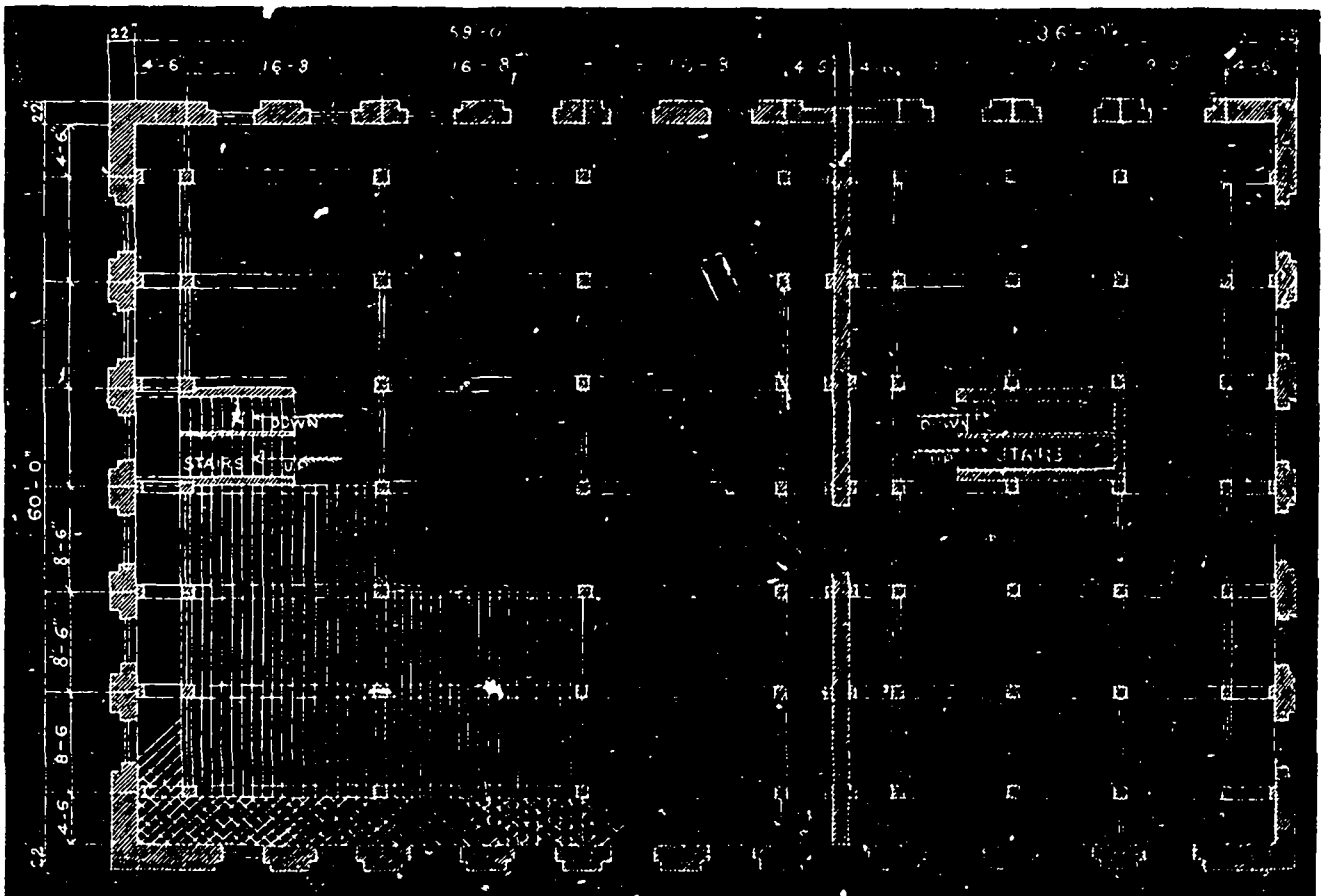


FIG. 1.—GROUND PLAN.

one part of the structure is dependent upon the other for stability. "A series of floors placed one above another, upon the top of unbraced posts, must obviously depend upon the weight, stability and mode of construction of the containing wall to give strength of any sort except to bear mere vertical stress. The structure will be liable to vibration or oscillation, accord-

The engraved cross sections show how the timbers are connected with the walls. In case of a fire, they will slide from their positions in a way not to disturb the brickwork. Mr. Atkinson suggests a method of recessing the posts into the walls in the way shown on the floor plan, but not in sections, which entirely relieves the walls from the weight on the interior.

To Mill Owners and Manufacturers.

USE

**F. E. DIXON & CO.'S**

PURE BARK-TANNED

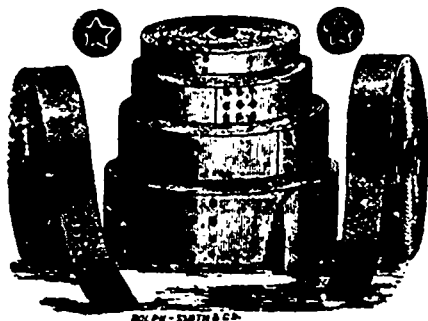
**Star Rivet Leather Belting !**

**FIRST PRIZE FOR LEATHER BELTING**

—AT—  
 Provincial Exhibition, Ottawa, - 1875.  
 " " Hamilton, 1876.  
 " " London, - 1877.  
 Industrial Exhibition, Toronto. - 1879.  
 " " Toronto 1880

**EXTRA PRIZE FOR Genuine Oak Tanned Belting,**

—AT THE—  
 Provincial Exhibition, Hamilt, 1876.



**INTERNATIONAL MEDAL**

—AT THE—  
 Centennial Exhibition,  
**PHILADELPHIA, 1876.**

**FIRST PRIZE FOR BELTING LEATHER**

—AT THE—  
 Industrial Exhibition, Toronto, 1879.  
 " " " 1880.

Our Belting is **Short Lap**, and is warranted to run straight and even on the pulleys, and certainly cannot be surpassed in quality by any other Belting in the market at the same prices.

Our **Leather** is of **Pure Bark Tannage**, and consequently is much more durable than the chemical tanned leather of which most of the American Belting imported into Canada is made, though sold under the name of **Oak Belting**.

To accommodate those who desire to have a really genuine article of Oak Belting, we beg to say that we keep in stock a quantity of

*Oak Leather of the Celebrated Tannage of J. B. HOYT & Co., of New York,*

and as the duties on imported rough Leather are much less than on the manufactured Belting, we are thus enabled to sell the Belting made from this quality of Leather much cheaper than it can be imported.

**LARGE DOUBLE BELTS A SPECIALTY.**

Please note that our Price List averages **Twenty to Twenty-five per cent.** lower than the American Price List at which all American Belting is sold in Canada.

Lace Leather of the very best quality always on hand.

*All Work Warranted.*

*Orders Solicited.*

**F. E. DIXON & Co.,**

**81 Colborne Street, Toronto**

## MILL OWNERS

### WHEN YOU BUY BELTING

Do you want Belting that is made from pure Leather?

Do you want Belting that will run straight and even?

Do you want Belting that is thoroughly stretched?

Do you want Belting that will run without stoppage of machinery to "take up," causing loss of men's time, etc.?

IF YOU DO, BUY

## H. L. FAIRBROTHER & CO'S

### AMERICAN

## LEATHER BELTING.

---

We keep a larger stock of Leather and Rubber Belting on hand than any other Makers or Dealers in the Dominion of Canada.

ORDERS SOLICITED.

## GEO. F. HAWORTH,

SOLE AGENT FOR DOMINION OF CANADA,

WAREHOUSE, 65 YONGE STREET, TORONTO.

THE  
**Canadian Manufacturer**  
AND INDUSTRIAL WORLD.

Published fortnightly by the CANADIAN MANUFACTURER PUBLISHING Co., (Limited).

MECHANICS' INSTITUTE (corner Church & Adelaide Streets), TORONTO.

ANNUAL SUBSCRIPTION, IN ADVANCE, \$2.00.  
CARD OF ADVERTISING RATES ON APPLICATION.

FREDERIC NICHOLLS,  
*Managing Editor*

All communications to be addressed CANADIAN MANUFACTURER, Toronto, Ont.

AUTHORIZED REPRESENTATIVES.

Montreal, Que. . . . .	(Box 1994)	Mr. C. R. Scott.
St. John, N.B. . . . .		Mr. J. S. Knowles.
Winnipeg, Man. . . . .		Mr. K. Graburn.
TRAVELLING CORRESPONDENT . . . . .		Mr. A. L. W. Begg.

**Editorial Notes.**

The office of the CANADIAN MANUFACTURER has been removed to Room No. 5, Mechanics' Institute, corner of Church and Adelaide streets. One stair up, turn to the right.

In consequence of the new American tariff the business of manufacturing shellac varnish here for export to the States is done for. Twenty cents per gallon, and the regular tax on the alcohol contained in it besides, is prohibitory.

The town of Dundee, with its manufactures of linen, jute, and hemp, is the subject of one of Mr. Porter's letters on "Industrial England," elsewhere copied. The table of wages, in particular, will be found valuable for future reference.

In our legal column will be found a synopsis of an important legal decision, recently given in the United States Supreme Court. It is held that parties holding stock as collateral security merely, are not liable for debts of the company whose stock they hold.

In our Railways and Shipping department we copy an article from the Philadelphia *Railway World*, on the subject of the transfer of carriage of crude petroleum from railways to pipe lines. The article is worthy of special attention on account of the almost startling fact brought to light, that already three-fourths of the petroleum delivered at Buffalo, at Cleveland, and at tidewater, comes through pipes instead of being carried over the rails as formerly.

In connection with what we have said elsewhere on the subject of prison labor, the following recent despatch, which came to hand since that article was in type, is of interest:—  
Pittsburgh, March 7.—The Grand Secretary of the Knights of Labor will shortly issue a circular to the members of the order in New York and Pennsylvania, calling on them to

organize an opposition to the convict labor system, and send protests to the Legislature. He says the question will make a political issue next campaign."

We have received from Mr. John C. McLaren, 10 and 12 St. James-street West, Montreal, his catalogue and price list for the current year, extending over some 45 pages, tastefully got up, and including articles used by manufacturers in the cotton, woollen, and other lines. He manufactures at his establishment leather belting, leather hose, lace leather, picker leather, loom strapping, and other factory requisites, and deals in such supplies as slasher cloths, rubber belting, canvas belting, patent cotton belting, linen rubber-lined hose, rubber hose, etc., etc.

As manufactures increase and spread in Canada, the popular demand for factory legislation will increase too, just as it has done in Great Britain and the United States. Manufacturers would do well, therefore, to acquaint themselves with what British and American factory laws respectively are, and to prepare themselves for what is surely coming. In another page we copy certain extracts from the report of Mr. Blackeby, Government Commissioner, on the factory laws prevailing in several of the neighbouring States. Mr. Lukes, the senior Commissioner, went to England on a similar errand a few months ago, and doubtless a report from him on the same subject may be expected shortly.

English manufacturers are as a body strongly opposed to the Canadian N. P., but the makers of textile machinery form an exception to the general rule. They are taking great interest in the new demand for their machinery here, and already they have largely assisted our cotton and woollen companies by taking stock instead of cash in payment of their bills. As an instance of this, it is mentioned that James Holt, an agent for English mill machinery, was in Kingston recently, in connection with the proposed blanket factory. He has taken a tour through Canada, and reports cotton and woollen mills in full operation and with plenty of orders on hand. The Valleyfield mill is being doubled in capacity; the Thorold new woollen mill is being erected, and a hosiery factory is in course of construction. Other mills are being extended. He reports cotton manufacturing brisker in Canada than in the States.

We take pride in the fact that the present age far exceeds all former ones as "the patent age of new inventions," to quote what Byron wrote sixty or seventy years ago. The material gain to the civilized world through new machinery and methods makes an immense aggregate; but there is another side to the picture which is not so pleasing to look upon. The aggregate waste from the discarding of old machinery and old methods, to be replaced by new improvements, must be something enormous; and the thing is going on all the time at a tremendous rate. It is obvious at a glance that the greater, the more numerous, and the more important such new improvements are, the greater must be the loss on the old machinery and methods forced out of use in consequence. Take as an example the following, from the *British Trade Journal* of a recent date:

"The crisis in the chemical trade, due to a continued fall of prices, is assuming serious proportions. Leblanc's method of manufacturing soda, first introduced into this country after the repeal of the salt duty, is used in factories which produce about 400,000 tons per annum, or more than half the total production of the world. It depends for its successful working on cheap salt, fuel and sulphur; but the newer process, where salt, in the form of brine, is treated with ammonia, has brought down prices to such an extent that the working of the older and commoner process is all but unremunerative.

We give prominence to the following, from the *N. Y. Turf, Field and Farm*, on the subject of mining prospects in the Canadian North-west:—"Not only has coal in abundance been discovered along the Saskatchewan, but the undoubted richness of the gold fields around the Lake of the Woods is building up a mining town at Rat Portage, 137 miles from here, which bids fair to equal Leadville. From my observations, and the testimony of mining experts both from the States and Canada, the quartz mining in that section should attract attention and capital from the financial centres of the new and old world. I can only briefly refer to this point in speaking of the richness of Manitoba; so will mention a few of the companies now in active operation and producing gold bearing ore assaying from \$50 to \$500 per ton. The "Keewatin," of Hay Island, under the management of M. W. Meagher, whom you will remember as a New York counsellor and journalist. The "Winnipeg Consolidated," under charge of John R. Brown, well known in New York mining circles as an expert and practical miner. The "Lake of the Woods" and "Hay Island," incorporated by Winnipeg and New York capitalists, and the "Argyle." These companies are working with best results. The directors, I learn, are men of prominence, in finance and business, and no wild-cat schemes have developed thus far. Here the stock in the above mines is obtaining a strong foothold, and numerous other companies will doubtless be incorporated in the spring."

#### SPECIAL NOTICE.

##### THE NEW CHAMPION COMBINED SEED DRILL.

The New Champion Combined Seed Drill, manufactured by Coulthard, Scott & Co., is meeting with great success. The Works are now in full blast, and we understand the Company have almost orders enough in to keep them going to the first of the year. Agents claim it to be the best drill ever manufactured in the Dominion, the main feature being that it is convenient to handle: sows accurately the exact quantity it is set to sow; is simple in its construction, and is so easily operated that any boy can handle it; it is very durable, being built from the best material which money can buy, and by skilled and experienced mechanics; is light of draft; is handsomely finished; never breaks nor injures the seed; does not bunch or clog the grain; may be changed instantly from one quantity to another without stopping the team, is a true force feed drill, and sows exactly the quantity it is set to sow. We wish the Company every success in their undertaking, and we have no doubt that they will be hard pushed to fill the demand for machines in a few months.—*Oshawa Vindicator*.

## Legal.

### Holder of Hypothecated Stock Not Liable.

The *American Railroad Journal* gives this synopsis of a decision of the United States Supreme Court, rendered on the 29th January, 1883, in the case of Edward Burgess, plaintiff in error, against Jesse Seligman *et al.*, executors in error to the Circuit Court of the United States, for the eastern district of Missouri: This was an action brought by the plaintiff in error against J. & W. Seligman & Co. as stock-holders of the Memphis, Carthage & Northwestern Railroad company, under a statute of the State of Missouri, to recover a debt due him by the company. The plaintiff in his petition alleges that on November 5th, 1874, judgment was rendered in his favor against the corporation by the District Court of Cherokee County, Kansas, for \$73,661, which remains unsatisfied; that in December, 1874, the corporation was dissolved; and that the defendants at the date of the dissolution and of the judgment were, and still are, stockholders of the corporation to the amount of \$6,000,000, on which there is due and unpaid one million dollars, and he demands judgment for his debt. Joseph Seligman, the principal defendant, answered, denying that the defendants were ever stockholders or subscribers to the stock of the corporation, and setting forth certain facts and circumstances (stated in the findings) under which the stock alleged to be theirs was merely deposited in their hands by the corporation, in trust for a temporary purpose by way of collateral security, to be returned when the purpose was accomplished. The cause was tried by the court, and judgment rendered for the defendants on certain findings of fact, and the question presented here is whether the facts as found are sufficient to support the judgment. This Court holds that they are; that upon a careful examination there can be no doubt that the Seligmans held the stock in question as trustees and custodians by way of collateral security for themselves and the purchasers of the bonds, and that they are not liable for the company's debts. The judgment of the Circuit Court is affirmed with costs. Opinion by Justice Bradley.

In the case of Wisner vs. The Bank of Gallatin, decided by the Supreme Court of Tennessee, on January 27, it was held that a bank-note in which the cashier set down the amount of money put in the bank by the depositor, and the date when the money was deposited, is not such a contract or receipt as cannot be contradicted by parol testimony. It was not, the court said, a contract in terms, nor was it intended to be such. It more nearly corresponded to the meaning of the word "memorandum," a record of something to be remembered, a note to help the memory. The court, taking this view of the case, applied the general rule of evidence relating to documents of this character, and held that the book or memorandum was merely *prima facie* evidence of the fact recited by it and not conclusive, and, therefore, that its recitals might be explained or contradicted by oral testimony.

The *American Manufacturer* (Pittsburgh) of the 3d inst., says: "The Nova Scotia Glass Works, which was operated by Pittsburgh glassblowers, has closed and the men are coming home. The bench in the furnace broke, tumbling the pots into the furnace. It is estimated that six weeks will be required to make repairs, and the firm asked the men to agree that these six weeks should be deducted from the two months shut down which commences in July and ends in September. The proprietors thought that, as their factory would have to lie idle six weeks for repairs, they should be allowed to make up the lost time in July and August. The men considered the matter and finally answered that to give one firm privileges would open the way for other concerns so they must refuse to grant the request. The proprietors then went to considering and decided that it would not pay to repair the factory and start for a spring run alone so they ordered a shut down until September 1, when the winter season opens."

**Financial and Commercial.**

TORONTO, Thursday, March 7, 1883.

Last week was one of but small business on the Toronto Stock Exchange, and what little there was appeared to be that of a brokers' market only, the general public holding back. With the opening of the present week a better feeling was developed, which is still continued. On Monday business became active, and prices showed considerable strength. Monday was settling day, when notes to a large aggregate amount fell due at the banks, and the day's payments were pronounced highly satisfactory. This favorable circumstance had, of course, an influence on the stock market, which on Tuesday was stronger than on Monday. The feature of the week is the advance in Federal, which has moved up several points, with considerable business done.

The Montreal stock market is also reported buoyant and strong, with increased transactions. A despatch of Monday's date says:—"The notes maturing in the banks here to-day were generally promptly met. Out of seven hundred and fifty due, only one remained at 3.30 p.m. The manager said on the 14th of February there were nearly two thousand notes due in the leading bank, the manager of which seemed satisfied with the results of the payments, and, of course, he said their local customers always took good care of their paper, which they did as usual to-day. But he remarked that he could not say how the country dealers had paid-up. A general manager of another leading bank, with ramifications all over the dominion, said payments at his head office were good, but, like his *confrere* already mentioned, he could not say how outside dealers had met their obligations. The next great day of trial as to the strength of commercial interests will be April 4, when the amount coming to maturity will be equal to the aggregate of February 4th and March 5th. Money was easier to-day, and a more cheering feeling was exhibited. This feeling was strongly reflected in the stock market, which advanced."

The following are the quotations on the Toronto Stock Exchange for Wednesday, March 7, compared with those of the same day two weeks before:—

	Feb. 21.		March 7.	
	Asked.	Bid.	Asked.	Bid.
<b>BANKS</b>				
Montreal.....	206½	206½	207½	207½
Ontario.....	112½	112	113	112½
Molsons.....	130	130	130	130
Toronto.....	183½	183½	186½	186½
Merchants'.....	125½	125½	126	125½
Commerce.....	134	133	135	134½
Imperial.....	140½	140	142	141
Federal.....	155½	155½	160½	160½
Dominion.....	199	198½	199½	199
Standard.....	115	114½	115	114½
Hamilton.....	115	.....	115	.....
<b>MISCELLANEOUS.</b>				
British America.....	119½	.....	.....	.....
Western Assurance.....	142½	142½	150½	149½
Canada Life.....	.....	.....	.....	.....
Confederation Life Association.....	.....	.....	.....	.....
Consumers' Gas.....	148½	.....	.....	118½
Dominion Telegraph.....	89½	87½	.....	.....
Montreal Telegraph.....	.....	.....	.....	.....
Globe Printing Co'y.....	.....	.....	.....	.....
N. W. L. Co.....	57s	55s.	58s.	57s.6d.
Ontario and Qu'Appelle.....	180	.....	.....	.....

Montreal quotations for the same dates respectively:—

	Feb. 21.		March 7.	
	Asked.	Bid.	Asked.	Bid.
<b>BANKS.</b>				
Montreal.....	206½	206½	207½	207
Ontario.....	112	111½	113	112½
People's.....	90	85	.....	85
Molsons.....	132	130	132	130
Toronto.....	183½	183	186½	186
Jacques Cartier.....	115	110	115	111
Merchants'.....	125½	124½	126	125½
Quebec.....	.....	.....	53	56
Exchange.....	.....	160	163½	159
Union.....	.....	.....	92	85
Commerce.....	134	133½	134½	134½
Federal.....	157	154	161	160½
<b>MISCELLANEOUS.</b>				
Montreal Telegraph.....	122½	122	124½	123½
Dominion Telegraph.....	.....	.....	.....	.....
Richelieu and Ontario Nav.....	68	67	71	69½
City Passenger Railway.....	142	140	146½	146
Montreal Gas.....	187	186½	192	191½
Canada Cotton.....	110	102½	.....	.....
Dundas Cotton.....	107	106	.....	.....
Ontario Investment.....	133	129	.....	.....
St. Paul M. & M. xl.....	134	133	143	142½
North-West Land Co.....	57s	54s.6d.	.....	.....
Canadian Pacific.....	62½	60	61	59

The members of the Winnipeg Stock Exchange met on February 27th, in the Board room over the Bank of Montreal, when the following officers were elected: President, Ernest Stuart; Vice President, G. H. R. Wainwright; Secretary-Treasurer, Alex. Moffatt; Governing-Committee, John Macdonald and T. H. Carman; Solicitors, Ross, Killam and Haggart. The Exchange opened for business on the 1st of March. Stocks will be listed free of charge until further notice, but it is the intention shortly to make the usual charges for listing them. The meetings of the Board will be held daily from 11.15 to 12.15. Col. Walker is now making arrangements in Chicago, Toronto and Montreal for telegraphic stock reports.

In response to a circular summons, about sixty of the private bankers of the Province assembled on Tuesday at the Rossin house. The convention was called for the purpose of considering the legislation proposed by the Finance Minister in relation to private banking. A permanent association was formed, to be called "The Private Bankers' Association of Canada," and the following officers were chosen:—President, Mr. A. Johnston, M.P.P., Strathroy; First Vice-President, Mr. J. W. Scott, Listowel; Second Vice-President, Mr. Thomas Fawcett, Watford; Secretary-Treasurer, Mr. D. E. Cameron, Lucknow. The proposed regulations were then fully discussed. The speakers all disclaimed any desire to assume names that would lead the public to believe that they are chartered institutions. A modification of the proposed legislation was the general desire. Plans suggested to meet the present difficulties were that private banks should use the words "Not incorporated," or publish the names of the proprietors. The following were appointed a deputation to proceed to Ottawa to lay before the Finance Minister the views of the convention:—Messrs A. Johnston, N. M. Livingston, W. H. Cutten, and D. E. Cameron. The deputation left for Ottawa the same night.

Concerning the result of the interview with the Finance Minister the *Mail's* Ottawa despatch says:—

"There are over two hundred private bankers in the Dominion,

but of these not more than twenty assume the title of banking company. The bill aims at the prevention of this assumption of a title which in one case has deceived the people and induced them, under a false impression, to make deposits. There is nothing in the bill to prevent private bankers under their own name taking deposits and performing all the functions they now perform. It is simply because of the fact that it has been shown that persons deposited with a private banker, who had taken a name which conveyed the idea that his establishment was an incorporated bank, that the use of the word bank was prohibited in 1880, except by chartered banks. But private bankers have, by adopting the name of banking companies, managed to evade the spirit, if not the letter, of the law. The Government want the private bankers to be known as such, and not to be sailing under false colors. Sir Leonard explained the position, met the objections of the deputation, and so thoroughly convinced them of the wisdom of his bill, that they finally confined their efforts to the work of securing time before the law came into force, on the ground that they had large supplies of stationery printed with the objectionable titles. The Minister thought that possibly there was something in the request for delay, and promised to lay the matter before his colleagues. The private bankers who have called themselves banking companies will probably conform to the new law before the time arrives for it to come into operation, and thus the evil will be checked, while as yet it has only been partially developed."

The following is a synopsis of the resolution providing for amendments to the Banking Act, a bill founded upon which had its first reading in the House on the 2nd inst. :-

It is intended to impose a penalty on banks failing to regularly from year to year send a list of shareholders to Government, the requirements of the law in this respect not having hitherto been complied with. A penalty is also to be imposed on banks allowing the amount of their note circulation to be in excess of that fixed by law. During the fall months of the year it is not unusual that the circulation of some of the smaller banks exceeds the amount of their paid-up capital. Through anxiety to maintain the circulation at the maximum, issues by the several branches, which cannot well be checked except at the close of the month when the returns come in, run up the aggregate beyond the legal limit, and the Finance Minister proposes to put a stop to the practice by imposing penalties based on the sliding-scale principle, which, while not too severe, shall yet make the operation of a contravention of the law an unprofitable one. In England the penalty is forfeiture of the amount by which the circulation exceeds the legal limit, but so stringent an enactment is not contemplated in the present Bill. Another amendment provides that the banks shall be obliged to pay in notes of small denomination the sum of sixty dollars on demand, instead of \$50 as at present. A third requires banks to make statements to Government of the condition of their reserves and capital, when the dividend is increased beyond 8 per cent. Still another amendment is that imposing a penalty on banks failing to send in to the Government the monthly statement of their affairs required by law within twenty days after the close of the month. The last change relates to private banks. It has been the custom of many persons in various parts of the Dominion to style themselves banking company, banking house, banking institution, or banking corporation, employing these terms for the purpose of leading the public to suppose that they have been constituted by Act of Parliament, and are working under the Banking Act. A case in point is that of the Mahon Bank of London, which failed the other day, and which, though a private corporation, had been transacting a regular banking business. These private institutions are to be debarred from employing any term to designate their business, other than that of "bankers." In the resolution as first introduced it was proposed to make it unlawful for any parties

to assume a designation implying that they are acting as a chartered bank, or as an agent of any such bank, but the words in italics have since been omitted. Mr. Mackenzie expressed a doubt whether Parliament had jurisdiction in this matter, and the Finance Minister promised to give the point consideration.

In general business there is no decided change to report. The spring opening in the wholesale millinery trade took place the beginning of the week, and adds something to the movement in dry goods. Groceries generally hold their value well, and the hardware trade is improving. Of late, reports of failures in Manitoba have been coming thick and fast, but some say that this is nothing more than ought to have been expected. It is remarkable that a good many of those reported as being in difficulties in the North-west, are parties who were in the same "box" before in this Province. Meanwhile there is a disposition among wholesalers to favor the pioneers of business out there, and to give them the best chance possible.

Respecting the drop in coal oil, the Montreal Gazette of the 7th inst, says:—"There has been a further reduction in the price of refined petroleum at points of production, which is now down to 14cts in London, f. o. b., and at Petrolia it is reported to have declined to 13cts f. o. b. This market in consequence is very quiet, and buyers take only just what they require for immediate wants. Prices here have declined fully 1c. per gallon, and we quote car lots at 16½cts to 17cts, broken lots 17½cts to 18cts, and single barrels 18½cts to 20cts. We hear great complaints of certain parties selling below market value, and we know of one firm selling at 18cts by the single barrel, but there is said to be no margin of profit in it. The market in the west is said to be weak, under keen competition and large stocks."

The following are Toronto wholesale quotations of produce for Wednesday, March 7 :-

FLOUR—f. o. c.		
Superior Extra, per 196 lbs.	\$4 60	— \$ 4 65
Extra .....	4 50	— 4 55
Fancy and Strong Bakers' .....	none.	
Spring Wheat, extra .....	none.	
Superfine .....	none.	
Oatmeal, per 136 lbs.	4 85	— 4 95
Cornmeal, small lots .....	4 25	— 0 00
BAG FLOUR, by car lots, f. o. c.		
Extra, per bag .....	2 17½	— 2 20
Spring Wheat, extra, per bag .....	none.	
GRAIN—f. o. c.		
Fall Wheat, No. 1, per 60 lbs.	1 06	— 0 00
" No. 2, " .....	1 03	— 1 04
" No. 3, " .....	1 00	— 0 01
Red Winter .....	none.	
Spring Wheat, No. 1 .....	1 10	— 0 00
" No. 2 .....	1 08	— 0 00
" No. 3 .....	1 02	— 1 03
Oats (Canadian), per 34 lbs.	0 43	— 0 44
Barley, No. 1, per 48 lbs.	0 75	— 0 76
" No. 2, " .....	0 72	— 0 00
" Extra No. 3 .....	0 65	— 0 66
" No. 3 .....	0 53	— 0 56
Peas, No. 1, per 60 lbs.	0 00	— 0 00
" No. 2, " .....	0 76	— 0 77
Rye .....	0 65	— 0 00

James Downs, general dealer, Virden, Man., has obtained an extension of time.

Alexander Ross, merchant tailor, Winnipeg, has assigned in trust. Liabilities \$4,500.

J. W. French, jeweller, Hamilton, has been closed by sheriff.

A Mount Forest grocer named E. Sherwood is reported missing. He leaves very little behind him.

J. B. Rutherford, grocer, &c., of Stonewall, Man., is offering his creditors less than one hundred cents on the dollar.

P. Waram, who has been in business in Brandon, Man., about a year, has failed with liabilities of \$5,500. Assets \$4,000.

Both storekeepers at St. Leon, Man., are in difficulties, much to the surprise of Winnipeg houses who are principal creditors.

The liabilities of Wm. W. Bezanson, general dealer of Grafton, N. S., are about \$7,000, assets \$4,000, being covered by a bill of sale.

A. G. Murray, who has been carrying on a grocery business in Ingersoll, under style A. G. Murray & Co., has levanted, leaving a large number of creditors.

John Cowan, grocer, of Ottawa, who failed in 1874, is again in difficulties. His statement shows liabilities and assets about \$6,000. He is asking a compromise.

The Globe Agricultural Works of London, Ontario, in which the Mahon Bros. were heavily interested, are being sued for a large amount, and their suspension is looked forward to at any time.

Mrs. E. Hubbard, a respectable milliner carrying on business in Hamilton, has assigned to McKinnon, Proctor & Co. Her liabilities are about \$3,000 and assets nominally a few hundred dollars in excess.

For the second time Alfred Mellish, auctioneer and dealer in fancy goods, Chatham, has failed. In Nov., '81, he was burned out, and compounded with creditors at 45 cents on the dollar. His liabilities are heavy—said about \$10,000.

W. B. Robertson, grocer and liquor merchant, of West Lynne, Man., is in difficulties. He has over-bought and credited too freely—claims that he cannot make collections, and is unable to meet his liabilities, which are stated to be above \$12,000.

P. A. Blanchet, saddler, of St. Hyacinthe, Que., is offering to compromise with his creditors at 10 cents on the dollar.—J. E. Clement & Co., and Dunn & McQuillan, of St. Johns, Que., have both assigned: the latter firm asks creditors to accept 40 cents on the dollar.

H. P. Cook, general dealer, Gravenhurst, who succeeded P. Bartholomew about a year ago, is in the hands of the law on the charge of arson. His premises and stock were destroyed by fire recently under suspicious circumstances, and creditors are likely to suffer in consequence.

George E. Twomey, clothing and boot and shoe dealer, of Amherstburg, has sold out to D. Henley. He compromised with his creditors about nine months ago. The present sale will, it is understood, enable him to pay all his creditors the balance of the composition remaining unpaid.

The dry goods trade in Ottawa appears to be in a demoralized condition. Another merchant (Joseph Flanagan) has assigned in trust, with heavy liabilities. The estate shows a surplus, but his chief creditors (A. R. McMaster & Bro.) have not been satisfied with the account for some time past, and closed him up.

A meeting of the creditors of R. Heyneman, of Montreal, one of the largest importers of cigars in the Dominion, has been called for the 8th inst. The amount of liabilities has not transpired, but they are no doubt heavy. His failure has been expected the past few months, as he has been making great sacrifices to raise funds.

Thomas Harrison, general merchant of Souris City, Man., has assigned in trust with liabilities of about \$9,000. He commenced business about a year ago, and the trade in Winnipeg regarded his prospects with favour. His failure is attributed to too much attention to politics and municipal matters, together with dulness in trade.

The assignment in trust of W. S. Wood, general dealer, etc., of Cayuga, has been brought about by intemperate habits and inattention to business. He shows a surplus of several thousand dollars, but his friends have expected disaster for some time past unless a reformation in his habits took place. The liabilities are about \$9,000.

In the Province of Nova Scotia the following have assigned in trust—A. W. Loomer, trader, of Aylesford; Sylvanus D. Munro, lumber dealer, of Melvern Square, and A. D. Munro, hotel keeper, of Wilmot. James C. Gillespie, boot and shoe dealer, of Pictou, and W. E. Gardner, general merchant, of Louisburg, have both given preferences to the detriment of other creditors.

Hanson & Tobias, general dealers, Turtle Mountain City, Man., after a few months experience in business, have handed over everything to creditors. Their liabilities are about \$10,000, largely in Winnipeg. They are each young and inexperienced in business; but having settled in a good district with but little competition to contend with, the trade in the Province sold them freely.

St. Marie, Thibault & Co., dry goods merchants, of Montreal, assigned on the 26th inst. to C. Taten, who was security for their composition made last October. Liabilities are about \$15,000 and assets \$13,000. Joseph St. Marie, of this firm, has failed three times within four years, and Thibault has also had some experience in that line. They are offering their creditors 40c. on the dollar.

The firm of Booth & Son, copper-smiths, of Toronto, are likely to get a settlement at 40 cents on the dollar, in 6, 12, 15 and 18 months—the last two payments secured. Creditors to the extent of \$22,000 were secured, and will be paid in full. The composition will be effected on liabilities of \$42,000. The above arrangement leaves the firm ample surplus to continue the business, it is thought to advantage.

A. Purvis, who has been engaged in millinery business in St. Catharines for many years, has become involved through giving accommodation paper to the late firm of Paterson Bros. A settlement has been effected with the banks at 40c. on the dollar spreading over 2 years, and in some cases creditors have given him a clear receipt and are assisting him to continue in business. He is a worthy man, but not sufficiently energetic.

The old established drug house of B. A. Mitchell & Co., of London, has been in financial straits the past few months, and it was rumored the firm had assigned. We are pleased to learn, however, that a satisfactory sale of the business has been made to Kerry, Watson & Co., of Montreal, who purpose carrying it on as a branch house. The old firm will be able to pay their creditors in full, and the senior partner will be left with a comfortable competency.

Blair & Larmour, wholesale and retail dry goods, Winnipeg, have failed, with liabilities of about \$80,000, Stobart, Eden & Co. being secured to the extent of \$43,000. The firm was in business many years at Prescott, Ontario, and started in Winnipeg less than a year ago, having a capital of over \$10,000; but in the purchase of Stobart, Eden & Co's business they assumed too much for their capital, and their expenses were such as made their suspension only a matter of time.

Both storekeepers at St. Leon, Man., are in difficulties much to the surprise of Winnipeg Houses who are principal creditors. A. Messuer carried on business many years at Formosa, Ont. He obtained a partial extension from his creditors about two years ago, which was promptly met, and the opinion seemed to be that he would succeed, but the past winters trade has been too much for him. His liabilities will it is said reach \$30,000 but this is not definite.—Lacasse & Warnecke, of the same town, are also unable to meet their liabilities which are estimated at \$9,000.



In Nov. '81, Job C. Thompson commenced the hat and fur business in Winnipeg, under style Thompson & Co., having, it was believed, excellent prospects. Although refraining from speculating during the boom, the trade of the past six months has been very light, and he is unable to meet his liabilities. E. K. Greene and two other Montreal creditors have accepted an assignment in trust. Liabilities are \$29,000—assets nominally \$32,000. His principal creditors are Greene & Sons, \$5,200—Taylor, Robertson & Co., \$4,000—Gnaedinger, Sons & Co., \$3,000.

A meeting of the creditors of Messrs. Hodgson & Co., successors to the Dann Boot and Shoe Company, was held recently at the office of the firm, Montreal. After discussing the business and position of the Company, it was decided to take stock and report at a second meeting of creditors to be held on Monday next. The firm has assigned to Mr. J. M. M. Duff, with Messrs. A. F. McCallum, Col. Whitehead and J. Dougall & Son, trustees of the estate. The liabilities amount to \$33,000. The assets are not yet known. A compromise may possibly be effected at the second meeting.

The affairs of A. M. Foster & Co., wholesale dry goods, of Montreal, appear to be very complicated. E. A. Reinhardt, who recently invested \$4,000 as a partner, obtained possession of the keys of the warehouse, but Foster obtained an injunction, restraining him from interference. Several suits have been entered against A. M. Foster, individually, and a seizure was made on his real estate and certain stocks. It was proposed to sell off the stock and close up the business, and pay creditors by getting time, but Foster does not appear to do anything definite, and it is thought he will eventually be forced to assign in trust.

The following are among the business changes in the Province of Quebec during the past two weeks:—In Montreal, John Connolly, wood dealer, has assigned.—Wm. Elhot, grocer, is offering twenty-five cents on the dollar.—Joseph Versailles, roofer, &c., has called a meeting of creditors.—The stock of Louis Louis & Bro., wholesale cigars, etc., is advertised for sale by trustee.—I. Salle and LaSalle, general dealers, of St. Thomas de Pierreville, have assigned in trust.—P. H. Matte, tanner, of Stanford, has effected a compromise at 20cts. on the dollar, and W. Loisselle, grocer, of Richelieu village, asks his creditors to accept 60 cts.

#### AMERICAN CORRESPONDENCE.

TEXTILES AND THE IRON TRADES—LETTERS FROM PHILADELPHIA, PITTSBURGH, BOSTON, AND NEW YORK.

##### PHILADELPHIA.

Philadelphia, March 1, 1883.

The situation in Philadelphia is without special interest. Manufacturers and consumers in all departments of manufacturing activity are waiting for Congress to dispose of the tariff problem in order that they may know what inside prices are to be. The furnaces throughout Eastern Pennsylvania are all engaged, but stocks are accumulating slowly. Mills are nearly all busy though not making a full output. The textile establishments are fairly engaged but not fully. A good many thousand looms are idle and will likely remain so until there is a general revival of trade. The iron interests are waiting for tariff legislation, which is confidently expected to be disposed of this week. Pig iron is selling at \$25 for No. 1, \$23 for No. 2; \$20 for gray forge. Merchant bar is selling at 2 cents to 2.30. Construction iron of all kinds is in very moderate demand, but the probabilities point to an active demand as soon as outside operations are begun in the spring. Steel rails are quiet and selling in a slow way at \$39 to \$40, and considerable apprehension exists among rail makers as to the competition which must be endured from foreign rail makers on account of the reduction of duties from \$29 to \$15 or \$16. The iron situation is not by any means satisfactory, but there is a large latent demand waiting for a settlement of the difficulties surrounding it.

The textile manufacturers are also in a state of uncertainty, but with all this there is an undertone of confidence which leads them to anticipate an active demand and good prices in a few weeks. The industries of Eastern Pennsylvania are checking-up, avoiding over-production, restricting output, and in fact acting in a cautious and sensible manner. This checking up will be productive of good in the long run. The extraordinary expansion of productive capacity in all directions during the past year or two has given a productive capacity which could in a short time crowd the market with stocks and depress prices to dangerous limits. The failures in the iron trade have pointed out to manufacturers the dangers that are in store for them if they do not gauge production by the market's requirements.

##### PITTSBURGH.

Pittsburgh, March 1, 1883.

The depression in the iron trade at this great iron centre continues, and our prospects for an active spring trade which all believe is sure to come are still clouded by uncertainties growing out of threatened free-trade legislation at Washington. Neutral mill iron is selling at \$19.50 to \$20. Muck bars \$35 to \$36. Manufacturers are not looking for an active demand for finished iron until tariff legislation is out of the way. The nail manufacturers held a meeting recently and fixed the card rate at 3.40. Steel rails are quoted at \$39 to \$41 on cars at works.

The coke trade has met with a check which has depressed prices considerably, and has led to the banking up of several hundred ovens. The dulness will continue until the demand improves in the west. The coke manufacturers have controlled the situation for a long time, but recent events point to the probability that they are reaching a point where production will likely be equal to demand, and thus depress prices by competition. Large quantities of coal have recently gone down the river. The high water at this point has done considerable damage, and for several days prevented the operation of the mills. The coal trade is satisfactory. The miners and operators are endeavoring to arbitrate their differences and to continue digging on prices fixed by an arbitration board. It is to be hoped that the effort will succeed.

The railway connections which this city is making west and north and south will increase its advantages as a manufacturing centre, and enable it to maintain the lead which it has secured in this direction.

##### BOSTON.

Boston, March 1, 1883.

The Mining Engineers held a three days session in this city. The meeting was attended by your correspondent, where he found a welcome which was fully appreciated. After the convention was over the members visited Watertown and witnessed the testing of the great machine at the Arsenal. They then visited Harvard Hall, Cambridge, at noon, and were welcomed by Prof. Lovering. Their proceedings, which were full of interest, will be published and furnished to the press in due time. The New England Gas Engineers held a two days' session at Young's hotel last week. The attendance was large. The electric lighting systems in use were thoroughly discussed, and the conclusion arrived at was that the present condition of the electric arc light is far from being reliable, and that it only tends to exertion on the part of inventors to cheapen gas. These proceedings will also be published in due time. They were not marked with any particular brightness, but were of special interest to the gas engineers. A. B. Slater, of Providence, R. I., was elected president for the ensuing year.

Prices of wool are very firm and transactions have been recently quite large. For five days just passed the total reached 2,579,200 pounds, of which 85,000 pounds was foreign. For the corresponding week in 1882 the sales were only 1,703,300

pounds, of which 324,500 pounds were foreign. The sales of wool from this market for the first two weeks previous to the one under review were nearly 10,000,000 pounds, while for three weeks they foot up to 12,355,200 pounds. Since January 1st the sales of wool from this market total up to 25,403,200 pounds. Receipts of wools for the past week have been 7,935 bales domestic, and 202 bales foreign. A good deal of comment has been indulged in with regard to these heavy transactions and what they mean. Sales of foreign wool have been very light.

NEW YORK.

New York, March 1, 1883.

There is a better feeling in commercial circles this week than has prevailed for several weeks past. The textile interests have been thoroughly aroused by the dangers growing out of tariff agitation. A number of textile manufacturers have hastened to Washington in order to prevent some threatened damage being done to their interests. The Senate bill has been finally changed to agree with the House bill on raw wools. Some careless punctuation has been made which, unless corrected, will destroy the protection desired. There is a steady movement in dry-goods of most kinds. Southern and western retailers are in the market placing fair orders. A brisk business is anticipated in the early future. Cotton goods are in steady demand, print cloths have been moving with considerable freedom, and prices for prints are for the most part firm, and some styles of 56 by 60 fancies have been already marked up. Fancy cassimeres are in active demand and large orders are being placed. A new color is out called port wine. Imports of dry-goods since January 1st amount to \$22,573,461, which is a little less than imports for same time last year.

All grades of wool have received more or less attention and stocks are being reduced. Advices are strong from good home wool-growing centres. Speculation is apparent in some quarters. A number of buyers went out a short time since to attend the London sales but thus far no very extensive purchases have been made. Manufacturers are deterred from laying in large stocks because of tariff agitation, and an active demand is anticipated as soon as it is known what the duties will be.

In hardware there is a lull in demand growing out of western floods, tariff matters, and general apathy. Prices are without change, and hardware manufacturers are quietly waiting for a blowing away of the clouds which have surrounded their trade, and believe that with a revival of building operations and an improvement of agricultural activity there will be a sufficient demand for hardware of all kinds to absorb their production at good prices.

Railways and Shipping.

TRANSFER OF CARRIAGE OF CRUDE PETROLEUM FROM RAILWAYS TO PIPE LINES.

It is noticeable that while disputes relating to methods of carrying petroleum have been fomenting bitter agitations in some communities, the entire movement from the producing regions has been rapidly transferred from railway companies to the pipe lines. If the influences which have hitherto been powerful continue to prevail, by the time the entire railway system of Pennsylvania is adjusted or distorted to suit the views of a few of the petroleum producers or speculators there will be little or no petroleum to be moved from the original points of production by railways to any of the distant consuming centres. The statement contained in Stowell's Petroleum Report, of February 26th, of the total shipments of crude and refined reduced to crude equivalent out of the producing regions in January, 1883, shows that of a total movement of

1,357,815 barrels of crude and crude equivalent 300,000 consisted of pipe deliveries at Cleveland; 105,716 of movements in pipe lines to Buffalo; 206,600 of movements of the Tidewater Pipe Company; and 376,574 of movements of the Seaboard Pipe Line. Thus, of 1,357,815 barrels moved, 988,890, or nearly three-fourths, were carried by pipe lines. Independent of an immense reduction in the volume of the railway movement of crude petroleum, and the rapid substitution of pipe lines for tank cars, it is generally understood that few, if any, of the shippers or producers of the oil region pretend that they have any present cause of complaint of railway discriminations. It seems, therefore, to be an especially and exceptionally nonsensical proceeding to prolong a bitter strife over a dead issue, and to pass obstructive laws which would injuriously affect many interests and industries for the purpose of regulating the carriage of crude petroleum, when it is no longer carried to a considerable extent by any of the railway lines of this commonwealth. The railway movements of crude petroleum out of the producing region in January last had shrivelled down to relatively infinitesimal proportions. Of the total rail movements in that month 64,000 barrels consisted of refined oil reduced to crude equivalent, leaving only 304,837 barrels of crude moved from the producing region by all the lines participating in this traffic.—Philadelphia Railway World.

PROSPERITY OF THE SUEZ CANAL.

The returns of the Suez Canal Company to Dec. 31 1882, show that the past year has been the most prosperous one the canal has ever seen, the number of vessels making the transit being 3,198 as against 2,727 in 1881, the tonnage being 6,811,521 as against 5,794,401, and the receipts being 60,504,878 francs as against 51,274,352 francs. The excess is therefore 471 vessels, 1,017,120 tons and 9,230,526 francs. The business done by the company since its first complete year's working in 1870 appears from the following table:

	Vessels.	Tonnage.	Receipts.
			Francs.
1870 .....	486	435,911	5,159,327
1871 .....	765	761,467	8,993,732
1872 .....	1,082	1,439,169	16,407,591
1873 .....	1,173	2,085,072	22,897,319
1874 .....	1,264	2,423,672	24,859,383
1875 .....	1,494	2,940,708	28,886,302
1876 .....	1,457	3,072,107	29,974,998
1877 .....	1,663	3,418,949	32,774,344
1878 .....	1,593	3,291,535	34,098,220
1879 .....	1,477	3,236,942	29,686,060
1880 .....	2,026	4,344,519	39,840,487
1881 .....	2,727	5,794,401	51,274,352
1882 .....	3,198	6,811,521	60,504,878

The dividend of the company in 1881 was 13.7 per cent., including the 5 per cent. interest which each share carries. The increase in the revenue in 1882—namely, about 9 per cent.—will probably raise the dividend for that year to something over 20 per cent. for each share of the nominal value of 500 francs.

A practical test is to be made of the feasibility of steam towing on the Erie canal, a bill having been introduced into the New York legislature for that purpose. The bill authorizes the allotment of any five miles of the canal which shall present such difficulties as are likely to be encountered, and to allow the inventor of the proposed single-rail system of steam or electric towage for canals to make a fair and satisfactory test thereon. If such test proves satisfactory, and the general introduction of the system is deemed advisable, the inventor is to be allowed to operate it on all of the State's canals, but in such manner as least to interfere with such other systems as are now in use.

Textiles.

INDUSTRIAL ENGLAND.

DUNDEE.—A TOWN OF TEXTILE INDUSTRIES—NEITHER COTTON NOR WOOLLEN, BUT ALL OF LINEN, JUTE AND HEMP.

For this Department we select on the present occasion, what Mr. Porter has to tell us of the flax, jute and hemp industries in Dundee :—

At this time (before the dawn of trade in the eighteenth century) the principal street of the town could not boast six houses completely built of stone. The shops did not rent at above £3 per annum, and many were closed altogether. In the midst of the depressed condition of affairs Parliament inaugurated the protective theory with Dundee, by granting a bounty on brown linens made for exportation—a manufacture which, from weight of fabric and lowness of price, could not then be carried on without a loss. This again revived trade, and stimulated the industry of the inhabitants. Manufactures were established and prosecuted with a success that operated in a most beneficial manner on the domestic habits and comforts of the people. From the establishment of the British Linen Company, the object of which was to encourage native industry by advancing money to the poorer manufacturers, the linen trade of Dundee underwent a rapid development. Warden, in his history of the linen trade, says that a large bonus was paid the manufacturer who first started flax-spinning by power, and from this time the trade became completely changed. The spinster and the hand-wheel of the last century gave place to the factory girl and the spindle of the present; the manufacture ceased in the rural districts, and became concentrated in towns, where spinning-mills were erected. The manufacture of fine linens, lawns, cambrics, and "Glasgows," which formed the staple in Glasgow and the West of Scotland down till the latter part of the eighteenth century, has now become an almost extinct industry there, and has taken a deep hold of the eastern manufacturing districts, and centres principally in Dundee, for yarns and heavy goods, and in Dundermline for fine damasks. Ireland, of course, takes the lead of all the three kingdoms, and indeed, of Europe at the present time, in the production of linen fabrics, as a glance at the following statistical exhibit will show :

COUNTRIES.	Number of Spindles.	Number of power Looms.
Ireland .....	911,111	21,153
France .....	762,047	18,323
Austria-Hungary .....	342,503	500
Germany .....	318,467	8,000
England .....	190,808	4,081
Belgium.....	289,000	4,755
Scotland .....	265,263	16,756
Russia .....	144,734	2,500
Italy .....	50,149	524
Switzerland .....	9,000	.....
Holland .....	7,500	1,200
Sweden .....	38,10	98
Spain .....	.....	1,000
Total .....	3,294,597	78,790

In the early days of mill-spinning in the East of Scotland, Mr. Warden says, it was with difficulty that a sufficient number of hands could be got for preparers, spinners or reelers, and it was then the practice, in and around Dundee, for the owners of mills or their managers to attend the neighboring county fairs to engage hands, and sometimes open tent had to be kept all day as inducements to come to terms. Engagements were generally made for six or twelve months, as with farm and household servants at the present day. This was before the Factory Act, and mill operatives in towns had to labor fourteen and fifteen hours a day. The miserable pittances

earned by the workers in this industry, then as now, perhaps explain why the flax industry migrated from the great iron districts of the West to the East of Scotland, and why it was the only industry which England permitted Ireland to embark in. In 1820 the report of a committee on the State of the Laboring Poor, quoted the wages then paid in Dundee—to women of sacking, 7s. 6d. per week; sail-cloth and bagging, 8s. 6d.; osnaburgs, 9s. 6d.; and sheetings, 10s.; in all cases, an average of a trifle over \$2 a week for the best workmen. Female labor was still more miserably paid; women in 1811 rarely made 5s., or \$1.20, a week; hand-spinners, when fully employed, 2s. 6d., but more generally 1s. 2d. per week. It was said that women had to spin for \$1 as much yarn as would reach from Dundee to Abereeen—65 miles. After a very careful enquiry and an examination of the books of several firms, the wages in this industry in Dundee may be said to have fluctuated in the last thirty years as follows: (I have made the estimate in United States money):

	1853. 60 hrs. per week.	1863. 60 hrs. per week.	1873. 58 hrs. per week.	1883. 56 hrs. per week.
SPINNING MILLS.				
Preparers .....	\$1 25	\$2 00	\$2 75	\$2 25
Spinners .....	1 35	2 15	2 70	2 50
Shifters.....	75	1 50	1 75	1 50
Boys.....	1 20	1 10	2 00	2 00
Reelers.....	1 75	2 50	3 00	3 00
Overseers.....	5 00	5 75	7 50	7 00
FACTORIES.				
Winders.....	1 75	2 00	2 75	3 50
Weavers .....	2 30	2 50	3 50	3 50
Tenters.....	4 50	5 75	6 00	6 50
Warpers.....	3 50	4 00	4 50	4 00

I was repeatedly assured by the factory hands whom I met in an hour's stroll through the Scouringburn, perhaps the most thickly populated, and certainly the worst, quarter of the modern town of Dundee, that the spinners on the average earned about 8s. and 9s. a week, and the weavers a trifle more. I think the wages in the flax industry are a trifle higher than in the manufacture of jute goods. A large number of the operatives are Irish, and they will not compare in social conditions to those of Paisley. Unquestionably some of the mills, such as the Baxter Brothers', have accomplished something in the way of elevating the operatives, in the way of schools attached to the factory for the "half-timers," or children under fourteen, etc. But upon the whole the Dundee operatives are badly paid, and live, the best of them, from hand to mouth, and the worst in squalid misery.

The Scouringburn, the operatives' quarter of the city, contains hundreds of houses totally unfit for human habitation. They are low gray stone buildings, with but one room on a floor, and windows about two feet square. Some of them which I entered fairly reek with filth, and I actually found in some whole families living like animals on the bare ground with a couple of boards in the corner upon which, covered with the vilest of rags, the mother of the family lay dying. A man told me, literally of starvation. And yet this was within two rods of the police station. The room in which I witnessed this scene faced a public thoroughfare. It was lower than the street, and as the life of the poor starving creature on the floor was ebbing the slime from the drains oozed through the walls of the cellar, and dropped in a thick pool in the corner. And yet in this same room were children, poor, pinched, half-naked, half-starved little creatures, who looked upon me in a terrified manner. I visited at least a dozen houses in this part of Dundee, and found the inmates in almost a similar state of misery and want. Some had been factory hands, and some were laboring men, who said it was impossible to get work even at 10s. and 12s. a week. They paid about 2s. a week rent for the dens they inhabited, and lived principally upon bread. The houses of the more thrifty operatives I found to be fairly comfortable, but not comparable with those in the neighborhood of Glasgow. The girls of the Scouringburn

patronize the public houses with the men, and some of them are very rough. Some of the principal mills have greatly improved the tone of their employees by taking only respectable girls, and promptly dismissing those who are found to be otherwise.

The jute industry of Dundee was comparatively unknown before 1830. About 1824 a few bales of jute reached Dundee. Towards the end of 1833 James Taws first began to spin pure jute, and in 1835 jute yarn was regularly sold in the market. In 1838 the total importation of jute into Dundee was 1,136 tons, and in 1881 it exceeded 100,000 tons. The whole of the jute used in Europe and India is now estimated at 2,000,000 bales. Of this quantity Great Britain takes about 1,100,000 bales, and nine-tenths of all that comes into Great Britain is consumed in and around Dundee. In 1875 there were 35,000 persons employed in this industry in Scotland, but I am unable to obtain later statistics. It will be seen that within a limited time this industry sprang into the greatest importance and enormous fortunes were made out of it, but a natural desire to share the good thing led to the business being overdone, and according to United States Consul Winter the wages paid by the Dundee jute mills are even less than those in the long-established flax industry. The following table shows the average amounts received by the Dundee operatives in jute manufacturing, per week of fifty-six hours, in 1881:

Pickers of jute (men).....	\$ 15	Warpers (piece work, women) .....	\$ 75
Strikers up (piece work women).....	2 88	Overseers.....	6 25
Hand at softeners (young men).....	3 15	Single loom weavers (piece work, women).....	2 50
Preparers (women).....	2 00	Double loom weavers (piece work, women).....	3 75
Boys 14 to 15 years of age, jute workers.....	1 94	Tenters (men).....	6 25
Overseers (men).....	6 25	Dressers (men).....	6 50
Coarse spinners of jute (women).....	2 62	Overseers.....	7 25
Fine spinners of jute (women).....	2 15	Croffers (men).....	4 50
Piercers (girls 14 to 15 years of age) jute workers.....	1 60	Calenderers (men).....	5 00
Shifters (girls).....	1 37	Measurers (men).....	4 62
Half-timers (boys and girls 10 to 14 years of age).....	60	Laffers (men).....	5 00
Reelers (piece work, women).....	2 75	Packers (men).....	5 00
Bobbin winders (piece work).....	3 62	Overseers (men).....	7 50
Cop winders (piece work, women).....	3 37	Mechanics, iron fitters and turners (men).....	6 50
		Millwrights (men).....	6 50
		Joiners.....	6 50
		Other tradesmen employed in these works.....	6 50
		Overseers.....	7 50

Although flax, hemp, and jute are the staples of Dundee, it has a ship-building interest, engineering and iron works, and within fifteen years has gone into the manufacture of boots and shoes on a large scale. Its fishing interest is also important. Dundee is noted for its enterprise, and, although its industrial history is somewhat checkered, it may safely be said that it now has two staples—linen and jute. It once was celebrated for soap, glass, ale and sugar-refining. Glass-making and sugar-refining have entirely died out. In 1866 linseed oil crushing was begun with indifferent success. Dundee marmalade has become famous. Ship-building once flourished, but it is not so important as formerly. The manufacture of cotton goods was also tried, but died away in favor of Glasgow. Attempts to establish woollen factories followed with the same result. But successive failures seem only to have stimulated these thrifty, hard-working Northerners, and after the bounty was offered by Government, I have shown how they soon took the lead in linen and jute goods. Dundee has an abundant capital, and invests large amounts in the United States. It is about the size of Cleveland, though it can never become such an important city. There are some handsome residences, and a few fine public buildings. In the summer, forth from this ancient town

spreads one of the richest and most varied landscapes in Scotland. At this time of the year, and approaching it on a rainy day along the muddy banks of the Tay, it looked bleak and unattractive. The streets are well paved, but the houses in the lower parts of the city belong to the old town as described in the first part of this letter, and should give place to homes that would elevate instead of debase the poorly-paid operatives of the mills.

### FACTORY LAWS.

FACTORY LAWS IN THE UNITED STATES—MR. BLACKBEY'S REPORT.—SUMMARY OF THE LAWS IN THE VARIOUS STATES.

OTTAWA, March 3.—Yesterday the report of Mr. A. H. Blackbeby, the Commissioner appointed to enquire into the system of laws regulating labor in Massachusetts, was presented to Parliament. The Commissioner states that, although some of the laws governing labor have been on the statute books of the State for a considerable period of time, it is only since the year 1879 that any systematic or organized method of enforcing those laws has been in operation. In such a short time it has been impossible to accomplish to the full all the expectations of the promoters of those laws. But when the period of their enforcement is taken into account, the amount of good which has already been realized is a hopeful augury of what may confidently be anticipated by the time that the laws shall have had a reasonable time in which to develop their usefulness as promoters of the physical, mental and moral welfare of that portion of the citizens of the States who are earning their bread amidst the noise of machinery in the factory and the workshop. A supplementary report gives a synopsis of factory laws in several other States.

#### HOURS OF LABOR.

The law with reference to the hours of labor was, as the chief inspector stated in one of his reports, "the outcome of a long and somewhat bitter agitation. Happily it is now conceded by those who were arrayed in opposition upon this subject that the policy of the State in regard to the employment of labor is established, and that results have shown the wisdom of such legislation. The operatives are more contented, obtain better wages, and are more valuable members; the interests of the operatives and manufacturers are more nearly in accord, and there is much less antagonism than formerly."

#### LAW WITH REFERENCE TO.

The clauses which relate to this subject read as follows:—  
"Section 4.—No minor under eighteen years of age and no woman shall be employed in laboring in any manufacturing establishment more than ten hours in any one day, except when it is necessary to make repairs to prevent the interruption of the ordinary running of the machinery, or when a different apportionment of the hours of labor is made for the sole purpose of making a shorter day's work for one day of the week; and in no case shall the hours of labor exceed sixty in the week...."

#### MUST POST NOTICES.

Every employer shall post in a conspicuous place in every room where such persons are employed a printed notice stating the number of hours' work required of them on each day of the week; and the employment of any such person for a longer time in any day than that so stated shall be deemed a violation of this section, unless it appears that such employment is to make up for time lost on some previous day of the same week in consequence of the stopping of machinery upon which such person is employed, or dependent for employment.

#### PENALTIES FOR VIOLATION.

"Section 5.—Whoever, either for himself, or as superintendent, overseer, or other agent of another, employs, or has in his employment, any person in violation of the preceding sec-

tion, and any parent or guardian who permits any minor to be so employed, shall be punished by a fine of not less than fifty, nor more than one hundred dollars for each offence. Said penalty shall extend to corporations. A certificate of the age of a minor, made by him and by his parent or guardian at the time of his employment in a manufacturing establishment, shall be conclusive evidence of his age upon any trial for a violation of the preceding section."

#### DIFFICULT TO ENFORCE.

This part of the law has been found more difficult to enforce than that portion which refers to the schooling of children. Although a fair majority of employers are in favor of working but ten hours per day, and would not, even if the law permitted them to do so, revert to the longer hours, there is considerable dissatisfaction existing by reason of the fact that the law applies only to the State of Massachusetts. It is considered that while factories in New Hampshire, Maine, Connecticut, Rhode Island, and Vermont are allowed to work as long as the proprietors deem advisable, this restriction should not have been placed upon the industries of Massachusetts. The objections seem to be well taken, and efforts are at present being made by the labor organizations to have a ten-hour law carried through the Legislatures of the other New England States. Most of the manufacturers spoken with were willing to concede that ten hours of faithful work each day is as much as should be required of mill operatives, and they further stated that were the law a National, instead of a State one, they would be entirely satisfied.

#### NO LOSS IN PRODUCTION.

Taking the mills as a whole there has been little or no loss in the output since the shorter hours of labor came into operation. The works in Massachusetts were competing with trade rivals just across the State border, whose hours of labor were sixty-six per week, and in order to get the same production as their neighbors, the machinery was made to work much more rapidly. Looms which had formerly been run at the rate of one hundred and thirty picks per minute were speeded up to one hundred and seventy picks, and in this way very little diminution in the output was observed. Mr. Carroll D. Wright in his work on "Uniform Hours of Labor," has proved that in most mills where a proper system of management prevails, as good results can be obtained in ten hours as was formerly the case when eleven hours per day was the ordinary running time. In commenting upon the figures bearing upon this subject which he has collected throughout the New England States, Mr. Wright says:—

#### AS MUCH WORK DONE IN MASSACHUSETTS IN TEN AS IN OTHER STATES IN ELEVEN HOURS.

"It is apparent that Massachusetts, with ten hours, produces as much per man or per loom, or per spindle, equal grades being considered, as other States with eleven or more hours; and also that wages here rule as high if not higher than in the States where the mills run longer time.

#### VOLUNTARILY ADOPTED TEN HOUR SYSTEM.

Some mills have voluntarily adopted the ten hours, and have achieved the result of accomplishing as much in that time as formerly in eleven. Such is the case with a large cotton mill employing several hundred operatives, and standing in the midst of eleven hour mills. As a result, with some changes of machinery, with careful management, and with stricter discipline, which can be maintained under shorter hours, the superintendent finds his products so nearly what they were before that the directors are satisfied; and, after a trial of a year and a half, the experiment has become an established success.

One large cotton mill reduced time for four months a few years ago, and found by their books that from two to four-tenths of an hour was gained. Had the experiment been

continued for a year an even greater gain might have been expected, as that period of time might fairly be required for the vital condition of the operatives to rise from the eleven to the ten hour level, and so for them to make the full gain which they were capable.

Another case is that of a woollen mill in an eleven hour State, which has been running but ten hours a day for ten years. It has been under the same management during the whole time, and its whole product comes in direct competition with 11 and 11½ hour mills. Yet in the judgment of the manager, who is also one of the largest owners, the product has been as great and the profits as large as if the mill had been run eleven hours.

#### RATE OF PAY NOT DIMINISHED.

In both the above cases the rate of pay which the operatives receive is just as large as in eleven hour mills. The theory is which such facts, and others equally significant, which we have yet to give, may be explained, and correctly, we think, is that there is only so much work in a person, and that all the work there is in the great body of the operatives can be got out of them in ten hours, and no more for any considerable period can be got out of them in eleven; for no mill has yet been built in which the machinery is more than the man.

#### TESTIMONY AS TO BENEFIT OF TEN HOURS.

But perhaps the most emphatic testimony is that of a carpet mill employing about twelve hundred persons. This mill which has been running but ten hours for several years, has during this period tried the experiment of running overtime, and gives the following result. The manager said:—"I believe with proper management and supervision, the same help will produce as many goods, and of superior quality, in ten hours as they will in eleven. I judge so from the fact that during certain seasons, being pushed for goods, we have run up to nine o'clock; and for the first month the production was increased materially. After this, however, the help would grow listless, and the production would fall off, and the quality of the goods deteriorate."

"That is, one of the largest and most perfectly equipped and most thoroughly managed mills having tried the experiment of running more than ten hours, finds that, although paying extra for over-time, while during the first month adequate returns can be obtained, yet by the third month the whole production of the ten hour day and over time together cannot be made to be more than it was before the overtime began, 'as the books will show.' The reason is, the flesh and blood of the operatives have only so much work in them, and it was all got out in ten hours, and no more could be got out in twelve; and what was got extra in the first month was taken right out of the life of the operatives."

#### ANOTHER INSTANCE OF THE SAME.

A case which tended to corroborate the above came under the notice of your commissioner at the works of the William's antic Thread Company. This corporation had been working eleven hours per day up till 1879, when it was decided to reduce the hours of labor to sixty per week. A close record of the output was kept for the first six months, at the expiration of which time it was ascertained that there was a loss in production of some fifteen hundred pounds of cotton, equivalent to half a day's work, and even this small reduction was attributed as much to other and accidental causes as the shorter number of working hours. The sixty hours has been continued ever since, although the mills around are nearly all working sixty-six. One of the results has been that the class of operatives in New England may be found at the works of this company. The slovenly, untidy factory hands who are to be met with in other mills, not so well conducted, are conspicuously absent from this factory, and in their places may be seen as intelligent, cleanly, and neat looking a body of operatives, both male and female, as could be found behind the

counter of many first-class city stores. The president of this company says:—"Skill in management and thoroughness in discipline are more important than the eleventh hour in the product of a mill: and thorough discipline is much more attainable under ten than under eleven hours, for men and women are flesh and blood, and they cannot be held up to such steady work during eleven hours as during ten; and overseers are flesh and blood, and cannot hold them up."

NO REDUCTION IN RATES OF PAY.

In Massachusetts the reduction to ten hours has not been followed by a corresponding reduction in the rates of pay. The answers to inquiries made by your commissioner go to show that factory operatives of the same class earn fully as much wages in this State as they do in the eleven hour mills in the State of Connecticut. Whether this is owing to the speeding up of the machinery, or to the improved physical conditions of the workers, or to both causes combined, is a difficult matter to determine, but the fact is there, and it is of deep significance to all who study the welfare of the industrial classes.

MASSACHUSETTS HAS NOT SUFFERED BY THE TEN HOUR LAW.

Although the sectional character of the ten hour law is a decided bar to its usefulness, yet the Massachusetts industries have certainly not suffered by its operations. As proof of this, it may be mentioned that out of 8,806,417 spindles and 129,229 operatives engaged in the cotton trade in the new England States, 4,465,290 spindles and 62,794 operatives are to be found within the borders of the old Bay State.

SUPPLEMENTARY REPORT.

SUMMARY OF THE VARIOUS STATE LAWS REGULATING LABOR IN FACTORIES.

STATE OF MAINE.

No child can be employed in a cotton or woollen factory without having attended school as follows:—If under the age of twelve years, four months; if over twelve and under fifteen years, three months or the twelve next preceding such employment. A teacher's sworn certificate of attendance filed with the employer constitutes proof of schooling. A fine of \$100 is imposed for a violation of this law.

No person under the age of sixteen years can be employed more than ten hours per day. The penalty for a violation of this section being \$100.

Factories more than two stories in height, in which work-people are employed above the first storey, must be provided with outside fire escapes satisfactory to the municipal authorities.

STATE OF NEW HAMPSHIRE

No child under fifteen years of age can be employed more than ten hours per day without the written consent of a parent or guardian.

No person to be employed more than ten hours per day except in pursuance of an express contract requiring longer time.

No child under ten years of age to be employed by any manufacturing corporation.

Children under sixteen years of age are not to be employed in factories unless they have attended school twelve weeks during the year next preceding such employment, and no child under the said age shall be employed (except during school vacations) who cannot write legibly, and read fluently in the third reader.

No child under fourteen years of age can be employed unless it has attended school six months in the year next preceding such employment.

No child under twelve years of age can be employed unless it has attended the school of its district during the whole time it was in session.

STATE OF VERMONT.

Children under ten years are not allowed to be employed. Children under fifteen must not be employed more than ten hours per day, and children between the ages of ten and fifteen are not to be employed in any mill or factory unless they have received three months' schooling during the year next preceding such employment.

STATE OF RHODE ISLAND.

No child under the age of twelve years can be employed in any manufacturing establishment.

No child under fifteen years of age can be employed unless it has attended school at least three months during the preceding year, and no such child shall be employed for more than nine months in any year.

No child between the ages of twelve and fifteen can be employed more than eleven hours per day, nor before five o'clock in the morning nor after half past seven in the evening. Violation of any of these provisions is punishable by a fine of twenty dollars.

Ten hours constitute a legal day's work unless otherwise agreed by the parties to the contract for same.

Town and City Councils may pass laws requiring fire escapes to be provided on factories in which workmen are employed above the second story.

STATE OF CONNECTICUT.

No child under the age of fourteen years can be employed in any business unless such child has attended a day school for sixty days during the preceding year, six weeks of such attendance to be consecutive. School trustees are to visit the manufactories in their district one or more times in every year in order to see that the law is complied with. Parents and guardians who neglect to send their children to school the legal time render themselves liable to a fine of five dollars for each week's neglect. Employers are required to keep on file a certificate of the child's attendance at school.

No child under the age of fifteen years can be employed for more than ten hours in any one day, or fifty-eight in any week, under a penalty of fifty dollars.

Each storey above the second must have more than one flight of stairs, or outside fire escapes satisfactory to the fire department of the city or town.

Eight hours constitute a legal day's work unless otherwise agreed upon.

STATE OF NEW YORK.

Children under the age of fourteen years are not to be employed during school hours, unless they have attended school for a period of fourteen weeks in the year next preceding such employment, and employers must have a certificate of such school attendance.

Eight hours constitute a legal day's work, except for farm and domestic labor. Over-work for extra compensation is permitted.

STATE OF NEW JERSEY.

No child under ten years of age can be employed in any factory, and no minor shall be required to work more than ten hours per day or sixty hours per week; the penalty for violation of this law being fifty dollars.

Ten hours per day constitute a legal day's work in all cotton, woollen, silk, paper, glass, and flax factories, and in all manufactories of iron and brass.

STATE OF PENNSYLVANIA.

Eight hours constitute a legal day's work in the absence of a special contract, except for farm labor, and labor employed by the year, month, or week. Ten hours constitute a legal day's work in cotton, woollen, silk, paper bag, and flax factories. No minor under thirteen can be employed in any such factories under a penalty of fifty dollars.

# MECHANICAL AND SCIENTIFIC TEXT BOOKS,

— FOR SALE BY —

The "Canadian Manufacturer" Publishing Company,  
AT PUBLISHERS' PRICES.

WE have made arrangements to supply Mechanical, Industrial and Scientific works to our subscribers and others, at publishers' prices. These works are only published in the United States, and by purchasing from us fifteen per cent duty will be saved. Below we give the titles of a few books that we have on hand, but we can supply almost any technical work by having particulars furnished. Cash must accompany all orders, and letters of enquiry should have enclosed a three cent stamp for reply.

THE CANADIAN MANUFACTURER PUBLISHING CO. (Limited.)

**AMERICAN HOUSE CARPENTER.** A Treatise on the Art of Building, etc., etc., for the practical use of Architects, Carpenters and Stair Builders. With numerous fine wood engravings. . . . . 8vo. cloth, \$5 00

**BALDWIN, WM. J. STEAM HEATING FOR BUILDINGS.** Or, Hints to Steam Fitters. Being a description of Steam Heating Apparatus for Warming and Ventilating Private Houses and Large Buildings, with Remarks on Steam, Water and Air in their Relations to Heating. To which are added useful miscellaneous tables. Third edition. With many illustrative plates. . . . . 12mo, cloth, 2 50

"Mr. Baldwin has supplied a want long felt for a practical work on Heating and Heating Apparatus."—*Sanitary Engineer*.

**BENJAMIN, PARK. WRINKLES AND RECIPES.** Compiled from the Scientific American. A collection of practical suggestions, processes, and directions for the Mechanic, Engineer, Farmer, and Housekeeper. With a Color Temperature Scale, and numerous wood engravings. Revised by Prof. Thurston and Vander Weyde, and Engineers Buel and Rose. . . . . 12mo, cloth, 2 00

**BOWMAN, F. H. THE STRUCTURE OF COTTON FIBRE IN ITS RELATION TO TECHNICAL APPLICATIONS.** Illustrated with numerous engravings and colored plates. . . . . 8vo, cloth, 4 00

"Its special purpose is in the interest of Cotton Manufacturers, it not only fulfills this purpose but carries its teachings over a wide field."—*Providence Journal*.

**CRACE-CALVERT, DR. F. DYEING AND CALICO PRINTING.** Including an account of the most recent improvements in the Manufacture and Use of Aniline Colors. Edited by Dr. Stenhouse and C. E. Groves. Illustrated with wood engravings and numerous specimens of printed and dyed fabrics. . . . . 8vo, cloth, 8 00

**DREDGE, JAS. ELECTRIC ILLUMINATION.** General Principles, Current Generators, Conductors, Carbons and Lamps. By Conrad W. Cooke, M. F. O'Reilly; James Dredge, S. P. Thompson and H. Vivarez, chiefly compiled from Engineering, edited by James Dredge. With abstracts of the specifications deposited at the Patent Office between 1837 and 1872 having reference to Electric Lighting, prepared by Mr. W. Lloyd Wise. About 600 pages Text, nearly 800 illustrations. . . . . 4to, cloth, 7 50

**—HYDRAULICS AND HYDRAULIC MOTORS.** With numerous practical examples for the calculation and construction of Water Wheels, including Breast, Undershot, Back-pitch, Overshot Wheels, &c., as well as a special discussion of the various forms of turbines, translated from the fourth edition of Weisbach Mechanics, profusely illustrated. Second edition. . . . . 8vo, cloth, 5 00

**—THE CALCULATIONS OF STRENGTH AND DIMENSIONS OF IRON AND STEEL CONSTRUCTIONS.** With reference to the latest experiments. By Prof. J. J. Weyrauch, Polytechnic Institute of Stuttgart. Translated by A. J. Du Bois. With Plates. . . . . 8vo, cloth, 1 50

**FITZGERALD, WALTER. THE BOSTON MACHINIST.** Being a complete School for the Apprentice as well as for the advanced Machinist, showing how to make and use every tool in every branch of the business; with a Treatise on Screws Gear-cutting. Sixth edition. . . . . 8vo, cloth, 0 75

**GELDARD, JAS. HANDBOOK ON COTTON MANUFACTURE; OR, A GUIDE TO MACHINE-BUILDING, SPINNING AND WEAVING.** With practical examples, all needful calculations, and many useful and important tables. The whole intended to be a complete yet compact authority for the manufacture of cotton. With steel engravings. . . . . 12mo, cloth, 5 00

**GRIMSHAW, DR. ROBT. H. SAW FILING.** A Practical Treatise on Filing, Gumming, and Swageing Saws. Fully illustrated. . . . . 1 vol., 16mo, 1 00

**HOLLY, H. W. CARPENTERS' AND JOINERS' HANDBOOK.** Containing a Complete Treatise on Framing Hip and Valley Roofs, together with much valuable instruction for all Mechanics and Amateurs, useful Rules, Tables never before published, etc. New edition, with additions (1881) . . . . . 18mo, cloth, 0 75

**—SAW FILING.** The Art of Saw Filing Scientifically Treated and Explained on Philosophical Principles. With explicit directions for putting in order all kinds of Saws, from a Jeweller's Saw to a Steam Saw Mill. Illustrated by forty-four engravings. Third edition. By H. W. Holly. . . . . 18mo, cloth, 0 75

**MACFARLANE, ROBT. A PRACTICAL TREATISE ON DYEING AND CALICO PRINTING.** Including the latest Inventions and Improvements. With an Appendix comprising definitions of chemical terms, with tables of Weights, Measures, etc. By an experienced Dyer. With a Supplement containing the most recent discoveries in color chemistry. By Robert Macfarlane. . . . . 8vo, cloth, 5 00

**—PRINCIPLES OF ELEMENTARY MECHANICS.** Fully illustrated. Revised edition. 1882. 12mo, cloth, 1 50

"This work is designed to give more attention to the fundamental principles of mechanics. Analysis is subordinated, and what is used is of a very elementary character. No Calculus is used nor any analysis of a high character, and yet many problems which are generally considered quite difficult are here solved in a very simple manner. The principles of Energy, which holds an important place in modern physics, is explained, and several problems solved by its use. Every chapter contains numerous problems and examples, the former of which are fully solved; but the latter, which are numerical, are unsolved, and are intended to familiarize the student with the principles, and test his ability to apply the subject practically. At the close of each chapter is a list of Exercises. These consist of questions of a general character, requiring no analysis in order to answer them, but simply a good knowledge of the subject. The mechanics of fluids forms an important part of the work.

**WEST, THOMAS D. AMERICAN FOUNDRY PRACTICE.** Treating of Loam, Dry Sand and Green Sand Moulding, and containing a Practical Treatise upon the Management of Cupolas, and the Melting of Iron. By Thomas D. West, practical Iron Moulder and Foundry Foreman. Fully illustrated. . . . . 12mo, cloth, 5 00

**WOODBURY, C. J. H. FIRE PROTECTION OF MILLS.** With many illustrations. A Practical and Scientific View of the Best Methods to prevent Conflagrations in Cotton, Flour and other Mills. Showing forms of apparatus for extinguishing flames, and methods of preventing their occurrence. With a chapter on proper construction of floors and proportioning of floor beams. Also a thorough explanation of the electric light as applied to mills, and the regulations for its use adopted by the insurance companies. By C. J. H. Woodbury, Mechanical Engineer, and Expert for Various Mill Insurance Companies. . . . . 8vo, cloth, 5 00

N.B.—Watch this page, as the different works will appear every month.

No child between the ages of thirteen and sixteen years shall be employed for more than nine months in any year; the other three months to be spent at school.

No minor can, by any contract, be employed in any factory for more than sixty hours per week, or an average of ten hours per day. Penalty for violation of any of these provisions, fifty dollars.

Factories in which employees are at work in third or higher stories must have permanent exterior fire escapes satisfactory to the fire authorities of the city or town.

STATE OF MARYLAND.

The law prohibits the employment of children under sixteen years of age in factories, for more than ten hours per day, under a penalty of fifty dollars.

STATE OF OHIO.

No child under the age of fourteen years can be employed in mills or mines during school hours, unless it shall have attended school for at least twelve weeks during the year preceding such employment. Employees must have certificates to that effect. Two weeks' attendance at half time, or night school, to be considered equivalent to one week at a day school.

Whoever compels a child under fourteen, or a woman, to labor in a mechanical or manufacturing business for more than ten hours per day shall be fined not less than five nor more than fifty dollars.

THE TEAZEL.—Our readers who never saw a teazel (spelled also teasel and teaz'e, and even tassel) can imagine a fir cone or a "swamp cat-tail" set all over with little stiff hooks. It is the burr (or tassel, or flower-head, or thistle-top) of the plant *dipsacus*; and so identified is it with cloth-dressing that this use of it gave it its botanical name, *dipsacus fullonum*, or "fuller's teazel."

However familiar to people who live in lands where the teazel is extensively grown, the fact may be that the prickly heads of that plant are universally used to raise the nap on cloth. a multitude of persons in this country probably never heard of it, and will be astonished to learn in what enormous quantities the plant is raised.

In France alone six thousand acres of land are exclusively devoted to the cultivation of the teazel. French manufacturers use \$1,500,000 worth of the prickly heads, and export 60,000 tons of them, valued at \$2,500,000. From 45,000,000 to 98,000,000 are produced in Austria and England, Belgium, Poland, and the Crimea.

The prickles of the teazel have a small knob at the end, and this, mounted on an elastic stem, and set with great precision on the central spindle, affords a little brush, such, it is said, as the utmost mechanical skill has never been able to rival; at all events at the same price.—*Unidentified Exchange.*

IRON SHUTTERS CONDEMNED.—During the examination of Mr. Esterbrook, superintendent of buildings, by the coroner's jury impanelled to fix the responsibility for the loss of life at the fire in New York, he said that there ought not to be an iron shutter permitted in any building in the city. He stated that the effect of iron shutters was to confine a fire within a building, preventing the firemen from gaining access thereto, until it became a raging furnace within, resulting in a fire that could not be controlled. This is also the experience of all veteran firemen, and they are unanimously of the opinion that iron shutters have caused greater losses than they ever prevented. We have, says the *Fireman's Journal*, frequently given expression to this opinion in these columns, and are glad to have the fact so emphatically repeated by so good an authority as Mr. Esterbrook. He suggests that they might be of service in narrow streets, in protecting a building from a raging fire on the opposite side of the street, but when employed for this purpose they should be left open habitually, and only closed when danger is imminent. A far better protection, however, is a solid shutter made of wood, and lined on both sides with tin. It would resist fire longer than iron, and will not break or shrink away from its position and give access to the flames. The sooner iron shutters are abolished the better it will be for property owners, and the more effectively will the firemen be enabled to do their work.—*Baltimore Journal of Commerce.*

Milling.

WHY THE WHEAT MARKETS ROSE.

It has been quite common lately to attribute the rise going on in the wheat markets to the lessened area thus far sown to that cereal in France and England by reason of unfavorable weather conditions, and also to floods in central and western Europe generally, which it is assumed further militated against the prospects of a good harvest next summer. But while these considerations are no doubt entitled to some weight, and probably precipitated the late improvement in the markets, we believe it will be found later on that the rise was inspired and has since been sustained by the market opinion that the level of value from which the rise started was too low to fairly represent the situation before the adverse circumstances in Europe had transpired. This low level of value was largely brought about by aggregated accounts of the late American harvest, which all conversant with events then passing in the trade will remember. At and about that time it was quite a common belief on both sides of the Atlantic that our crop was fully 600,000,000 bushels, and some thought even larger. Now, however, it is pretty generally admitted that it did not exceed the estimate of 500,000,000 bushels. Assuming these figures as a crop basis, our exports are likely to prove less in 1882-83 than they were in 1880-81 from a crop of about the same magnitude, and when the reserves of old grain and flour in the country were considerably larger. Instead, therefore, of 225,000,000 to 275,000,000 bushels for export this year as was currently estimated at last harvest time, probably 175,000,000 will come nearer the mark as against 186,000,000 bushels in 1880-81; and this dwindling of estimates of our exportable surplus has doubtless had much to do in creating the greater confidence in the markets on both sides of the water which now prevails.—*N. Y. Prod. Ex. Reporter.*

Indianapolis is looming up as a grain-receiving and flour-milling point. Twelve years ago the wheat receipts were less than 1,200,000 bushels, for the year ending with next month the aggregate will not be less than 8,000,000 bushels. Our mills turned out last year over half a million barrels of flour, and will increase the amount this year, from present indications, at least twenty per cent.—*The Millstone.*

Like the wolf upon the fold, the now enlightened victims of the swindling grain commission firms are sweeping down upon the scoundrels, and howling for judgment and their lost dollars. Very few sensible people will pity them—but will be pleased that there are just so many thousands who will not be bit that way again. A few more flashes of the same sort of lightning that struck them, and per-aps few fools of that sort will be left.—*The Millstone.*

As a contribution to the literature on the "Too Many Mills" subject we submit the following extract from a letter recently received from a representative miller:

"I have read the article 'Too Many Mills' carefully, and while I believe the writer to be 'level-headed' in his views, I have no idea that 'a protest' will have much, if any, effect in the way expected. The 'new north-west' is developing so rapidly, and each considerable town or expectant town will entuse to the extent of more or less of a 'bonus,' and the fool to step in and win the bonus can always be found, even though ninety per cent. of the ventures should fail. The mill, once built, is bound to be operated while it stands. I really do not look for more merchant mills to be built in the civilized portion of the States. The subject is a serious one, and will sooner or later come to be considered in all soberness, but at present too many think 'they can hold their own if others can.'—*North-western Miller.*

Shantymen recently returned to Belleville from the woods say that the cut is very large and that the drive will be an early one.



## Iron and Machinery.

### IRON TRADE PROSPECTS IN THE UNITED STATES.

The failure of the iron house of John V. Ayer's Sons has so far made but little difference to the men employed in the Youngstown rolling mills, or with the coal and coke interests pertaining thereto, as the works are to be kept running for the present under the management of the receiver. This failure has had but little effect upon the general iron industries of the country, but one or two failures of small concerns being reported.

On the other hand, as spring approaches there is more demand for iron products, and all the mills now running report good orders. At St. Louis the Vulcan Company has started up again with new hands, and the result seems very satisfactory so far, and all departments are expected to be in full blast during the coming week.

Renewed attention is being paid in the neighborhood of Pittsburgh to manufacturing iron directly from the ore, and with fair prospect of success. A number of capitalists are about to establish works of 100,000 tons yearly capacity at Linden Station. If successful a material reduction can be made in the cost of manufactured iron.

English advices report great expectations for the coming year from the Thomas-Gilchrist process, which enables English ores to be used to a large extent in the manufacture of steel rails. Various forms of the open-hearth process are also outstripping the Bessemer method, which until lately has been entirely used in the manufacture of English steel rails.

It is gratifying to see in the mining districts of Pennsylvania that the method of settling differences between operators and men is fast becoming one of consultation and arbitration, rather than by strikes, which bring so many attendant disorders with them.

Workmen throughout the country are giving much attention to tariff matters, which cannot but be productive of good in spreading information concerning the resources and needs of the manufacturing community in that direction.

Carbuilders report more orders and a good outlook for the season's business notwithstanding the policy of retrenchment which is now being practised by many roads.—*Chicago Railway Review.*

### IRON SHIP-BUILDING.

The *Ironmonger*, speaking of the pig iron trade in the Glasgow market, says that the cheerful tone that prevailed there at the time indicated was "the result of a widespread impression that the iron industry here was likely to reap substantial benefit from the proposals for the encouragement of home ship-building in the United States. On the strength of this idea the prices of warrants manifested some improvement, but next day the views of this question held in the iron market had completely changed, the impression now being that only the American shipowners will benefit, along with manufacturers of shipbuilding iron in the States. The opinion here is that for iron vessels to be constructed in America there is very little chance of there being any demand for angles, plates, etc., made on this side of the Atlantic. All defective plates are taken back from British shipbuilding yards and replaced by new ones; but this would create such a difficulty in the case of vessels built in America that the builders would be obliged to purchase the plates, etc., from their own manufacturers. Such is the view held by the best authorities in Glasgow, and it has been so generally adopted on 'Change that all expectation of substantial benefit to the iron industry of the country has been given up."

This is an indication of the anxious way in which political

affairs in this country are watched by foreign manufacturers, particularly that part of the tariff question that might possibly result in our domestic enterprises being subverted in the interests of foreign competitors.—*St. Louis Age of Steel.*

At a meeting of the committee of the London East Council the other night, it was decided to grant exemption from taxes for ten years to the bell and brass foundry which Mr. John Law proposes to establish in the town, with a capital of \$10,000.

A new enterprise, with a capital of \$40,000, is to be started at Pictou in the form of a horseshoe manufactory for making the patent steel spring shoe, as well as a very superior solid shoe. A charter has been applied for, and already three foundries are at work on the machinery.

Another combination is likely soon to see its last days, and that is the barbed wire combination. A goodly share of the manufacturers who took licenses from the Washburn & Moen Company have repudiated their contracts and refused to pay the royalty, and have gone into the market to sell wire at the best figures they can obtain. The upshot of the whole matter will be a breaking of the combination, when prices will drop very materially. We advise buyers of wire to hold on awhile.—*St. Louis Age of Steel.*

**PIG-IRON PRODUCT.**—Reports from all the pig-iron makers of the United States received by the American Iron and Steel Association show that the quantity of pig-iron made in 1882 was 4,623,323 tons, which is almost 500,000 tons more than ever before made in one year in this country. The production in 1881 was 4,144,254 tons. The production of the different kinds of pig-iron in 1881 and 1882 was as follows in gross tons:

	1881.	1882.
Bituminous .....	2,025,235	2,176,855
Anthracite .....	1,548,627	1,823,338
Charcoal .....	570,391	623,130
<b>Total .....</b>	<b>4,144,254</b>	<b>4,623,323</b>

The stock of pig-iron held unsold in the hands of makers at the close of 1882 was 383,655 tons. At the close of 1881, the stock on hand was 188,300.

A new system of melting iron ore together with scrap, wrought iron, etc., has been devised by Herr Ibruegger, an engineer of considerable note in Europe. The cupola of his new furnace, which stands at Norden, is supplied with two sets of tuyeres or ports, one above the other, with eighteen in each set. The tuyeres, which have the form of a vertical slot, are directly connected with a circular tuyere ring. The particular feature of the cupola is that the bottom is a slightly inverted arch, which is pierced by two openings through which both blasts, or rather imperfectly consumed gases of combustion, and the fluid iron can flow. Below is a small chamber in which the iron collects. It is heated by the gases forced downward from the cupola above, which are supplied with the necessary air for combustion by a special tuyere leading from the main blast pipe. The chamber at the same time serves for preheating scrap, etc., which need only be pushed into the bath for dissolving it. Of course, it is well known that considerable quantities of scrap can be used by directly charging in the ordinary cupola; but it is claimed that in this case there is economy of fuel and a greater facility in making sharp, strong castings and a purer metal. The best iron for this is said to be inferior pig, holding considerable silicon and little manganese. To it from 40 to 50 per cent. of scrap, etc., may be added. The total consumption of fuel is said to be 10 per cent. of the weight of the product.

The completion of that gigantic enterprise, the Hoosac tunnel, some years since, has resulted as its projectors—the Fitchburg railroad company—foresaw, in the opening of a great trunk line between Boston and the West, which has become an important factor in New England commerce. Not only is this the shortest route between Boston and Albany and thence west, but its management is of the progressive order, and the road is provided with one of the most successful systems of railway safety signals ever tried, by the operation of which collisions are well nigh impossible. Its rolling stock is of the most elegant and improved patterns.

## Lumber.

### KNOCK-DOWN HOUSES.

The Bay City *Call* calls for somebody in that wood-working city to engage in the manufacture of houses in the "knock-down," and suggests particularly the probability that a good business in this direction can be done in furnishing ready-made houses for summer resorts. The suggestion is a good one. It has come to be such a fashion for people of independent means--and some whose means are not so very independent--to "resort to the eligible sites on the shores and islands of the great lakes for a summer sojourn, that there is a great demand for light structures in which to live during the season of relaxation. Doubtless many more people than hitherto would seek a summer retirement if a handy means of obtaining a neat and comfortable pavilion were provided. A ready and sufficient supply always creates a demand greater than would otherwise exist were there no such supply. Now that the summer-resort boom has grown to such considerable proportions, it seems as if the furnishing of ready-made cottages on a large scale could be made a profitable business. The same scheme might embrace the supply of necessary light, portable furniture. Then a resorter could order his outfit of the knock-down house factory, have it shipped to the designated locality the same as he would his trunk, and in a day or two after arrival he would be living comfortably under his own roof by the lakeside. If the scheme were once under full headway, it would become very popular, and develop an important industry in the preparation of portable summer cottages. --*N.W. Lumberman.*

Mr. Joseph Buckler, of Ridgetown, N. B., has a steam saw-mill in his lumber woods, instead of having the logs hauled out and floated to the mill. He purposes sending a car-load to Annapolis.

The British and Canadian Lumbering Co., head quarters in this city, have purchased the extensive saw-mill, near Ottawa known as Skead's mill. The sum is said to be in the neighborhood of \$100,000. --*Toronto World.*

A Quebec despatch says that Mr. P. Ouellet, of Levis, has purchased from the Bank of Montreal more than a million feet of timber belonging to the estate of the late Leandre Mohot, of Cap St. Ignace. Mr. Vachon has purchased all the timber on the seignory owned by the seminary of Quebec. Over one hundred men are engaged in cutting timber and building a dam on the Montmorenci River, about half a mile above the Natural Steps. Part of the mill is expected to be in operation in June next. Mr. Vachon leaves for London on the 6th inst., in connection with the above and other important business.

The largest lumber firm in Trenton, Canada, and one of the largest, if not the largest in the dominion, operating one of the largest mills on the continent, have published their list of wages as follows. Men for the woods, from \$18 to \$20 per month and teams \$1.25 to \$1.75 per day; and yet Mr. Little has the assurance to tell us that the manufacture of lumber in Canada costs more than in Michigan where men's wages are 50 per cent higher, and teams 100 per cent higher, or precisely double, and all the supplies bear about the same proportionate rate as wages. We can only express our astonishment at Mr. Little's assurance, in the face of such facts. It looks very much "like a whale," that free trade yarn of his, to every person acquainted with the facts, but he is extremely foolish to shatter his reputation by such a pamphlet as he has seen fit to father. --*Lumberman's Gazette.*



**MATHESON & CO.**  
ENGINEERS & BOILERMAKERS  
ACADIA FOUNDRY.  
NEW GLASGOW - NOVA SCOTIA

PORTABLE & STATIONARY STEAM  
**ENGINES & BOILERS**  
MILL & MINING MACHINERY  
IMPORTERS OF STEAM PIPE, BOILER TUBES,  
IRON & BRASS FITTINGS,  
SAWS, BELTING & CO.  
SEND FOR PRICES OF PORTABLE SAW MILLS.



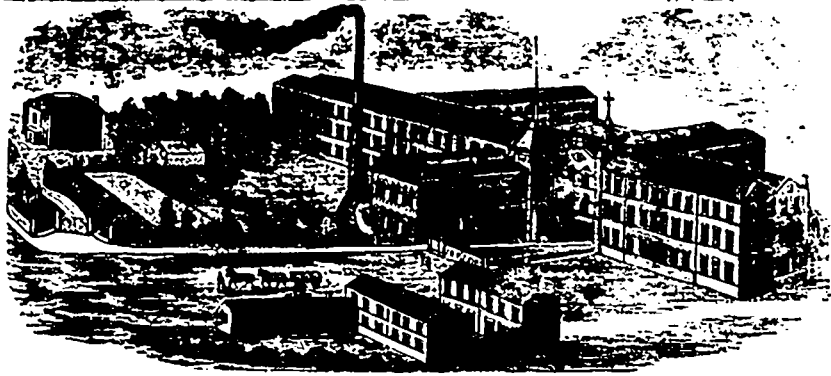
**GRANT BARFOOT & CO.**  
**WOOD ENGRAVERS**  
AND  
**Lithographers.**  
TORONTO.

## TO USERS OF GLUE.

We are manufacturing a reliable GLUE, and can supply a limited number of consumers only. We guarantee our Glues to be made from selected stock, and to be of the same uniform quality. Glues not as represented, or not proving satisfactory, returnable at our expense.

**JAMES HAY & CO.**  
WOODSTOCK, ONT.

**Boilers of either Iron or Steel,  
IRON MASTS,  
CASTINGS of Every Description.**



# SAMUEL LAW & SONS, OLECKHEATON, - ENGLAND. CARD CLOTHING AND WIRE MANUFACTURERS

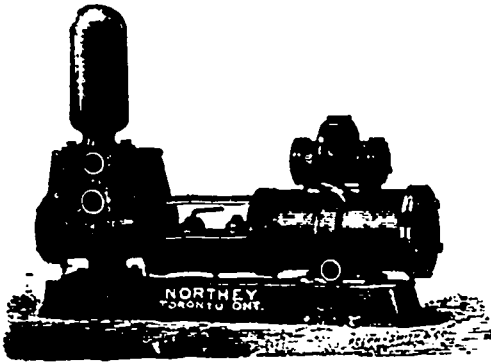
PATENTEES AND SOLE MAKERS OF

ROLLED DOUBLE CONVEX WIRE,

Especially adapted for Fine Spinning.

RUBBER and NANKEEN CLOTHING for Cotton Cards, VULCANIZED RUBBER for Woisted Cards, with tempered steel, or tinned wire.  
G. M. CUMMINGS, 178 Devonshire Street. Boston, Mass., Agent for UNITED STATES AND CANADA.

## NORTHEY'S STEAM PUMP WORKS.



*BOILER FEED PUMPS,  
AIR & CIRCULATING PUMPS,  
STEAM FIRE PUMPS,  
WRECKING PUMPS,  
MINING PUMPS,*  
Pumps specially adapted for Oil Pipe Lines,  
City Waterworks.

SEND FOR CIRCULAR.

Corner Front and Parliament Streets,  
TORONTO, ONTARIO.

## H. F. IDDIOLS,

MANUFACTURER OF

### Fire & Burglar-Proof SAFES,

Vault Doors.

Wire Window Guards,

Iron Shutters,

Iron Railings, &c.

Express, Cash and Jewel Boxes made to order. Locks made and repaired, and Keys fitted. Gunsmithing executed in the best manner and with despatch.

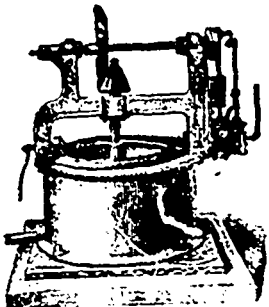
Also—Successor to J. B. Smithers, Electric and Mechanical Bell Hanger. Speaking Tubes fitted up at short notice.

All Job Work in the above lines promptly attended to.

9 WATERLOO STREET,  
SAINT JOHN, - - N.B.

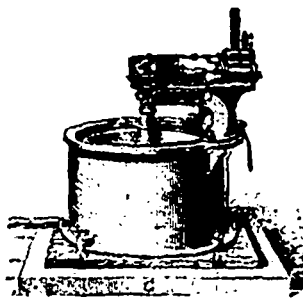
# IMPROVED CENTRIFUGAL HYDRO-EXTRACTORS.

MACHINE **A**



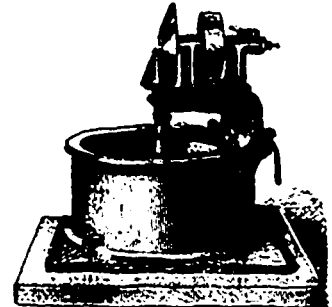
For Silk Dyers, with vertical engine on the axle and cone pulley friction.

MACHINE **B**



For Wool and Cotton Dyers, with direct acting steam engine.

MACHINE **C**



Runs by Belt and Friction Cone suitable for water-power.

THREE SIZES OF EACH KIND BUILT BY

**W. P. UHLINGER, Nos. 38 to 48 East Canal-st., PHILADELPHIA, Pa.**

East of Front-st., between Laurel and Richmond-sts.

SEND FOR CIRCULAR AND REFERENCES.

## LEITCH & TURNBULL'S

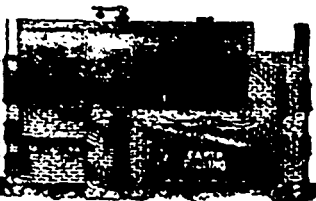
PATENT SAFETY HAND AND POWER

# ELEVATORS.

CORNER REBECCA & HUGHSON STREETS,

**HAMILTON, - - - ONT.**

### JARVIS PATENT FURNACE FOR SETTING STEAM BOILERS.



Economy of Fuel, with increased capacity of steam power.

The same principle as the SIEMENS' PROCESS OF MAKING STEEL, utilizes the waste gases with hot air on top of the fire.

Will burn all kinds of Waste Fuel without a blast, including screenings, wet peat, wet hops, sawdust, logwood chips, slack coal, &c.

Over 1,500 boilers set this way in the United States and Canada.

Send for Circular.

**JAS. B. ANNETT, Agent,**

110 KING STREET (P. O. Box 33), MONTREAL, QUE.

Please mention this paper.

### W. & F. P. CURRIE & CO. 100 GREY NUN STREET, MONTREAL.

Manufacturers of

### SOFA, CHAIR & BED SPRINGS.

A large Stock always on hand

Importers of

DRAIN PIPES, VENT LININGS,

FLUE COVERS, FIRE BRICKS,

FIRE CLAY, PORTLAND CEMENT,

ROMAN CEMENT, WATER LIME,

PLASTER OF PARIS, &c.

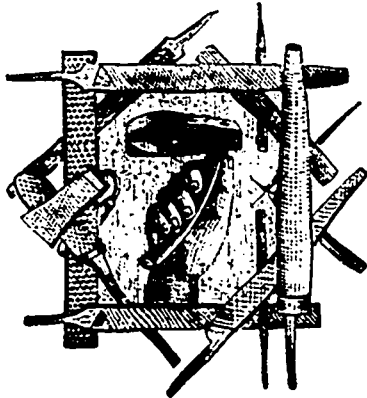
Hay Forks,  
 Patent Waggon Arms  
 or Thimble Skeins,  
 Patent Pumps.

GENERAL LIGHT CASTINGS

**WORTMAN & WARD,**  
 Cor. York & William,  
**LONDON, ONT.**

**FILES !**

Sherbrooke File Works.  
 Established 1875.  
 J. H. CHAPMAN & CO.



ALL HAND-CUT FILES made from the Best Sheffield Cast Steel. Warranted equal to the Best Imported Brands. Send for Price Lists and Discounts. FILES RE-CUT.

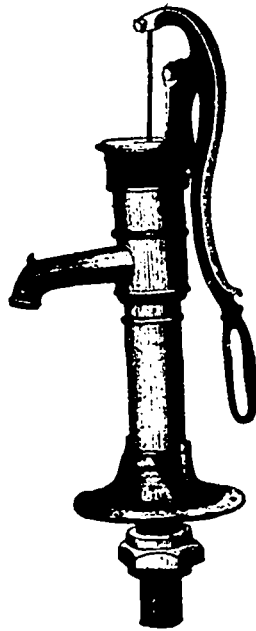
**SHERBROOKE, - QUE.**

**VULCAN IRON WORKS,**  
 OTTAWA.

ENGINE & MILL  
**MACHINERY**  
 Of Every Description  
 MANUFACTURED.

GENERAL REPAIRS DONE.

THOS. STEWART - STEWART & FLECK JR.,  
 ALEX. FLECK



**R. MOUGALL & CO.**  
 MANUFACTURERS OF  
**Cresting Pumps & Windmills,**  
 And all kinds of Small Castings.  
**EXCELSIOR IRON WORKS, - GALT, ONT.**  
 Mention THE MANUFACTURER in ordering.

**PORTLAND**

Forge and Ships' Iron  
**KNEE MANUFACTORY.**

**J. A. & W. A. CHESLEY,**

CORNER OF

Harrison St. & Straight Shore Road,  
**PORTLAND, ST. JOHN, N.B.**

—MANUFACTURERS OF—

Shafting, Locomotive Frames,  
 Ships' Iron Knees, Piston & Connecting Rods,  
 Windlass Necks, Truck, Engine & Car Axles,  
 Windlass Breaks, Davits, Truss Bows,

And all kinds of Hammered Shapes.

Diploma awarded at New Brunswick Exhibition of 1880 for assortment of HEAVY FORGINGS, consisting of Locomotive Frames, Locomotive Engine Axles, Shafting, Ships' Iron Knees, &c., with Special Commendation for Excellence of Workmanship. Also—Special Diploma for Hammered Ships' Knees.

**THE BELL**

**Telephone Co'y**

OF CANADA.

—Manufacturers and Dealers in—

*Telegraph & Electrical*

INSTRUMENTS,

Electro-Medical Apparatus,

Fire Alarm Apparatus,

Magnets for Mills,

Electrical Gas Lighting Apparatus,

Burglar Alarms,

Hotel and House Annunciators,

Electric Call Bells, &c., &c.

For further particulars apply to

**No. 12 HOSPITAL STREET,  
 MONTREAL.**

**ROBERT SMITH & CO.**  
**ENGRAVERS ON WOOD**  
 LITHOGRAPHERS BY STEAM POWER  
**COPPER PLATE ENGRAVERS**  
**DRAUGHTSMEN**  
 DIE SINKERS, EMBOSSERS  
 & HERALDIC ENGRAVERS.  
 36 WELLINGTON STREET E  
**TORONTO.**

**INTERNATIONAL  
 PATENT AGENCY**  
 FOR THE NEGOTIATION AND SALE  
 OF PATENTS, ETC.  
 132 ST. JAMES STREET,  
 MONTREAL

Patents sold and disposed of. Capital procured for developing inventions of merit, and Companies formed for working the same. Special attention given to the production and sale of manufactured patents. Agents, H. STUBBENDORFF & CO.

THE

**MOST POPULAR**

—OF ALL—

**Sewing Machines**

—IS THE—

**LIGHT-RUNNING**

**New Home.**

Rapidly taking the place of  
 all other Machines where-  
 ever introduced.

**200,000 Sold Yearly**

Has more points of excellence  
 than all other Machines  
 combined.

Liberal Inducements to Dealers.

**NEW HOME**

**Sewing Machine Company**  
 30 UNION SQUARE, N.Y.

# PLATT BROTHERS & CO.,

(LIMITED.)

## MACHINISTS,

HARTFORD WORKS, OLDHAM, LANCASHIRE,

See to call the attention of Worsted Spinners and Manufacturers to their Improved Machinery for

**Carding, Combing, Preparing, Spinning and Weaving Worsted**  
ON THE FRENCH SYSTEM.

**PLATT BROTHERS & CO., Limited, are also makers of the following Machinery :**

New Patent Cleaning Machines for Cotton.  
Crighton's Patent Opening Machines for Cotton.  
Hard Waste Breaking up Machinery.  
Patent Burring Machines for Wool.  
Machinery for Preparing, Spinning, and Doubling Cotton,  
Wool, Worsted and Silk.  
Ring Spinning and Doubling Machines.  
Combing Machines for Cotton—Heilmann's or Whipple's  
Patent.  
Patent Brick-making Machinery.

Combing Machines for Wool, Worsted, etc.—Little and East-  
wood's Patent.  
Machinery for Carding and Spinning Silk Waste.  
Power Looms for all Descriptions of Plain and Fancy Cloths  
in Cotton and Wool.  
Sizing, Dressing, Warping, Beaming, Winding, and Reeling  
Machinery.  
Cloth-folding and Measuring Machines.  
Hydraulic and Cam Bundling Presses for Yarn and Cloth.

Also, Makers of Patent Macarthy Cotton Gins, Hand or Power, for long or short stapled Cottons.

For further information and prices apply to

**SAMUEL WOOD, Agent, 34 LETITIA ST., PHILADELPHIA.**

Agent for Thompson & Co.'s English Card Clothing.

# LINDSAY, HYDE & CO.,

**Machinists, Pattern Makers, Etc.,**

MAKERS OF

—Cotton, Woollen and Worsted Reels,—

With improved counting motion for the accurate reeling of any size of skeins, or any given number of turns or yards. Reels for Carpet Yarns, reeling and twisting at the same time two or more ply yarns. Balmoral Reels, etc. Uteley's patent stop motion for two or more ply yarns, preventing making single yarns when doubling and twisting or spooling two or more ply yarns. Uteley's patent stop motion applied to Twisters. Spoolers (either plain or) with Uteley's patent stop motion. Ball-winders for Noble's Comb Warp Balling Machines for Mills and Dye Houses. Self-acting Mules (Cotton, Woollen or Worsted.) Twisters, Stubbers, Intermediate and roving frames, lengthened out and repaired in the most improved manner.

## MACHINERY OF ALL KINDS, HOME OR FOREIGN,

Set up in working order, removed, repaired, reset on the most reasonable terms. Practical and experienced workmen sent to all parts of the country. Keep in Stock

**TWIST RIMS, CHANGE WHEELS, CUT WHEELS of Various Kinds.**

**RUBBER ENDS FOR CONDENSERS, LONG COLLARS FOR ROVING FRAMES, &c.**

And general findings for Cotton, Woollen and Worsted (Home and Foreign) Machinery.

**Findings for Platt Bros. & Co.s (Lim.) Machinery, Oldham, Eng., always on hand.**

Hangers, Shafting, Pulleys, Etc., Supplied. Gear Cutting of every description.

**No. 531 EAST YORK STREET, PHILADELPHIA.**

# THE CHATHAM MANUFACTURING CO.

(Limited.)

Capital. . . . \$100,000.

CHATHAM, ONTARIO, CANADA.

JOHN RICE, PRESIDENT.  
WM. NORTHWOOD, VICE-PRES.  
D. R. VANALLEN, MANAGER.

WM. BALL, ASSISTANT MANAGER.  
GEO. E. IRELAND, SECY-TRAS.  
WM. MILNER, SUIT. WAGON WORKS

Manufacturers of the Very Best

WHITE AND RED OAK,  
WHITE AND BLACK ASH,  
HICKORY, HARD & SOFT MAPLE.  
WHITEWOOD, BALM, BASSWOOD,  
AND ALL KINDS OF HARDWOOD  
LUMBER AND WHITE OAK SHIP PLANK.

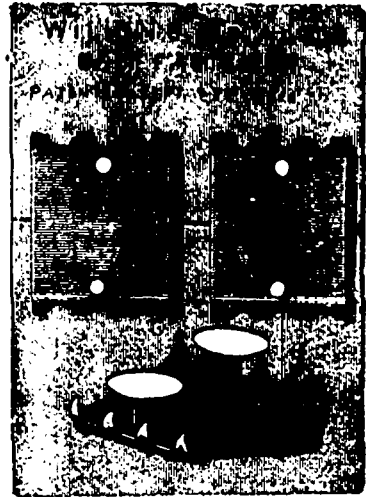
Also the Most Extensive Manufacturers of

Wagons, Carts & Sleighs, and Wagon Stock  
In the Dominion of Canada.

Having ample capacity for turning out from 3,000 to 5,000 Wagons annually.

## Wilkins' Metallic Belt Fastener.

IMPORTANT TO MANUFACTURERS,  
MILL OWNERS,  
AND ALL USERS OF BELTING



A MOST PRACTICAL INVENTION.  
SIMPLE, CHEAP,  
EFFECTIVE AND DURABLE.

Lately Patented in the U. S.

A New Device for Joining together the Ends of Machinery Belting both Leather and Rubber of all Widths and Thicknesses.

Wilkins' Metallic Belt Fastener is made of fine tempered steel with small V-shaped teeth projecting from the plate at right angles. Being applied as shown in the foregoing cut with the teeth inserted into the material of the belt, and secured by copper or other rivets, it makes the strongest possible joint.

It has been thoroughly tested and is approved of, in preference to lace leather belt hooks, and all other fastenings now in use. Send for Circular and Price List or sample package, Minimum size, which is suitable for most belts.

Manufactured in three sizes, by the Inventor, W. F. WILKINS, Adamsville, P.Q. to whom orders may be sent.

ALL ONTARIO orders should be addressed to

**JOHN WILKINS,**  
47 Wellington St. East, Toronto.

## MORRISON BROS.,

"Soho Machine Works,"

TORONTO.

Esplanade, near Union Station,

DEALERS IN

Iron and Wood Tools,

Mill Machinery,

Foundry Supplies,

Planing Mill Supplies,

&c., &c., &c.

MANUFACTURERS OF

Iron Tools,

Wood Working

Machinery,

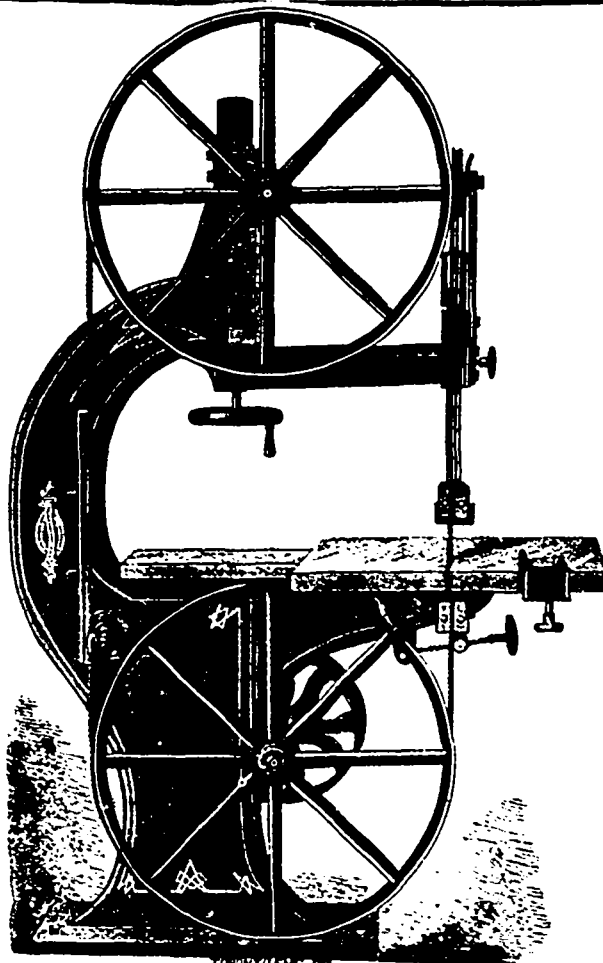
Saw Mill Machinery,

Mill Work, &

Architectural Iron Work.

SEND FOR LISTS.

Mention this advertisement when writing.



## Machinery in Stock.

- 16 Iron Lathes, various sizes, new and second hand.
- 5 Iron Planers, do.
- 10 Iron Drills, do.
- 1 Iron Shears.
- 1 Hydraulic Shears.
- 2 Milling Machines.
- 1 Gear Cutter.
- 2 Band Saws.
- 8 Scroll Saws.
- 5 Shapers.
- 4 Planers and Matchers.
- 4 Surface Planers.
- 1 Dimension Planer.
- 2 Daniel's Planers.
- 2 Buzz Planers.
- 7 Moulding Machines.
- 3 Tenoning Machines.
- 8 Mortising Machines.
- 10 Saw Tables.
- 4 Wood Lathes.
- 4 Dowel Machines.
- 2 Sand Papering Machines.
- Etc., Etc., Etc.

**SEND FOR LIST.**

Give particulars and price of any Machinery you have for sale

# J. McLAUGHLIN'S SONS,

GROWERS,

Merchants and Exporters of Assorted and Sized

# American Teasels,

SKANEATELES, N. Y.

We respectfully call the attention of woollen manufacturers to an important addition we have made to our method of preparing Teasels for use. We have succeeded in perfecting a machine which automatically performs the work of grading Teasels into *perfect exact diameters*, making, instead of the *six* sizes of the old way of assorting, *thirty six* perfect grades, beginning with the smallest, which is 61-64 of an inch in diameter, and is numbered 61, and so on in consecutive order, each number or grade increasing 1-64 of an inch in diameter, to number 96, which is 96-64 or 1 1-2 inches in thickness and is the thickest grade.

We have had our attention repeatedly called to this subject, and it has been suggested by practical manufacturers, that having teasels agreeing as to thickness, while saving labor in placing upon the "gig," will require less experience in the "gigging" to avoid *streaked cloths*, and assure more uniform work generally.

The "gig" makers have, to some extent, obviated this difficulty, by making the "gig" cylinder "vibrate," which prevents teasels of uneven thickness striking the cloth every turn of the cylinder at the same point; but this has only been a makeshift, as zig-zag streaks are often traced upon the surface of faced goods finished upon a vibrating cylinder gig.

As teasels were assorted, viz: 1 to 1 1-2 inches, 1 1-4 to 1 3-4 inches, 1 1-2 to 2 inches, 1 3-4 to 2 1-4 inches, 2 to 2 1-2 inches, 2 1-2 to 3 inches, sized as to *length only*, streaks in goods more or less could not be prevented.

In the above classification teasels will be found of the *same diameter* in each of the six sizes, although differing in length. Such assorting is very faulty, as the *diameter* of the teasel should regulate its grade, and this is what our invention does. In some of the best regulated mills skilled labor is employed in selecting from such a diversity of sizes, those that will answer for the work to be performed, *accuracy* being out of the question, and more or less imperfections in the finishing are sure to follow even with the best of help and with the greatest care.

The saving made by using gauged teasels, both from rejected teasels on account of some being uncommonly thick or thin, and in the labor of selecting these suitable to set, is fully equal to their first cost, and an equal gain is made in the perfection of cloths, thus saving twice the cost of the teasels, besides having the satisfaction of making perfect goods; and no claims for damages or tender cloths.

Our teasels are neatly clipped, and the quality well graded, carefully hand packed with stems only 3 inches long. We shall sell them strictly gauged an exact diameter at the very lowest price in the market for the quality with 2 1-2 cents per pound additional to pay for extra labor in gauging them, and we trust you will appreciate our efforts in your behalf.

The great demand made upon us for our teasels sorted per an exact diameter, having rendered it necessary to meet a much larger demand than we could have reasonably anticipated, we have just completed an extension of our works, and secured an abundant water power to drive our sorting machinery, which doubles our capacity for business.

Parties desiring to order from us may therefore depend on having their orders executed with the same care as heretofore, and within reasonable time.

Reference to all the leading Canadian users.

## CORRESPONDENCE SOLICITED.

Post Office Address,.....Skaneateles Falls, N.Y

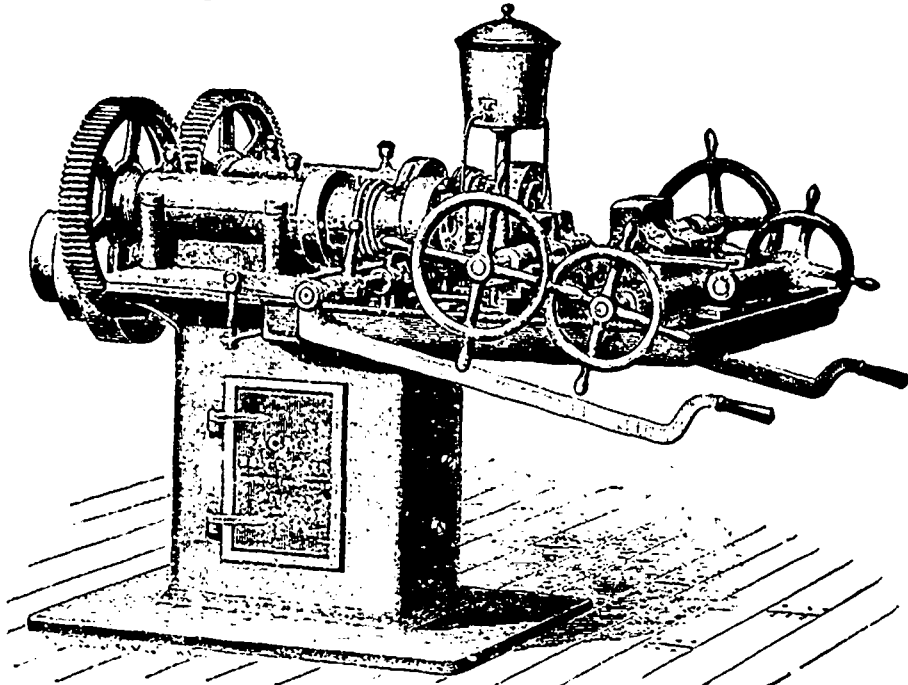
Telephone Address, .....Skaneateles, N.Y

TELEPHONE CONNECTIONS.



# BOLT CUTTERS.

ACME NUT TAPPERS.



ACME BOLT CUTTER HEADS.

## "THE ACME" SINGLE & DOUBLE BOLT CUTTERS,

— From 3/8 inch to 1 1/2 inch. —

Agents in Canada, The Machinery Supply Association, Machinery Dealers,  
CORNER OF CRAIG AND BLEURY STREETS, MONTREAL.

NEW BRUNSWICK  
**COTTON MILLS,**  
SAINT JOHN, N.B.

**WM. PARKS & SON,**  
*Cotton Spinners, Bleachers and Dyers,*

Have been awarded "PRIZE MEDALS" for 1882—

At the **TORONTO INDUSTRIAL EXHIBITION**—  
Four Silver Medals and Three Bronze.

At the **MONTREAL EXHIBITION**—  
Silver Medal for "Best Exhibit."

At the **KINGSTON PROVINCIAL EXHIBITION**—  
Silver Medal for Best Exhibit, and First Prize.

For their celebrated Beam Warps, Cotton Yarns, Carpet Warps,  
Ball Knitting Cotton, Manufacturers' Knitting Cottons and Apron  
Checks.

The smoothness and even finish of the goods, and brilliancy of colour  
resulting from the use of the "St. John" Waters cannot be excelled.

AGENTS:

**Wm. Hewett,**  
11 Colborne Street,  
TORONTO.

**Alex. Spence,**  
Lemoine Street,  
MONTREAL.

**HAMILTON  
COTTON COMPANY**

MANUFACTURERS OF

COTTONADES, DENIMS,  
TICKINGS,

BEAM WARPS of every variety.

HOSIERY YARNS of every description.

BALL KNITTING YARNS,

BUNDLE YARNS,

and

CARPET WARP.

First Prize, Silver Medals, for Beam Warps and Denims  
Toronto, 1881.

Agents in Montreal,—

**F. McELDERY & CO.,**

Agents for Beam Warps,—

**WINANS & CO., TORONTO.**

**DAVID JONES'**  
 CELEBRATED  
**Cast Steel Table Cutlery!**  
 BEST CAST STEEL, Warranted.  
 EDGE TOOL & CUTLERY  
 WORKS,  
**WOODSTOCK, N.B.**  
 Awarded Diploma and Medal by the New Brunswick Government in 1873.

**Woollen & Cotton Picker**  
 PROP'S WOOLLEN AND COTTON MILLS:—  
 Having put up a Woollen and Cotton Picker on the Corner of Mary and Cannon-sts., Hamilton, am prepared to do all Custom Work that may be entrusted to me in a first-class manner, (samples of work always shown,) or will buy your Cuttings and give the Highest Price in Canada.  
 Yours respectfully,  
**JOHN QUARRIER.**

**THOS. L. KAY,**  
 MACHINIST  
 PATTERN & \*  
 \*MODEL MAKER.  
 —MANUFACTURER OF—  
**HAMILTON PRESSING MACHINE.**  
 All kinds of General Jobbing and Repairing.  
 158 KING ST. WEST, - HAMILTON

W. B. SCARTH. R. COCHRAN.  
**SCARTH, COCHRAN & CO.**  
 MEMBERS OF THE  
**Toronto Stock Exchange,**  
 Buy and sell Canadian and American Stocks on margin or for cash.  
 Also Hudson Bay Stock and American Mining Stocks.  
 32 and 34 Toronto Street,  
**TORONTO.**

**Lamp Goods.**  
**YOUNG & BROTHER**  
 Manufacturers of  
 Coal Oil, Chandeliers, Brackets, &c  
 And Wholesale Dealers in  
**GENERAL LAMP GOODS.**  
 SALESROOMS: FACTORY:  
 John-street North. 135, 137 King Wm-st  
**HAMILTON, Ont.**

ONTARIO  
**Electrotype Foundry**  
 The Only Complete Foundry in  
 Canada.  
 ESTABLISHED 1870.  
 Merchants and Manufacturers wishing Business Cuts will find it to their advantage to give us a trial.  
**SMITH & VAUGHAN,**  
 26 & 28 COLBORNE STREET, TORONTO

**D. MORRICE & Co.,**  
 CANADIAN MANUFACTURERS,  
**MONTREAL & TORONTO.**  
**HOCHELAGA**  
 Br. in Cottons, Canton Flannels, Yarns and Bags.  
**VALLEYFIELD**  
 Bleached Shirtings, Wigans and Shoe Drills.  
**STORMONT**  
 Colored Cotton Yarns, Ducks, Tickings, Checks, &c.  
 Knitted Goods, Tweeds, Flannels, &c., &c.  
 The Wholesale Trade Only Supplied.

**JOSEPH JOHNSTON,**  
 Manufacturer of and dealer in  
**Sawn & Planed Lumber,**  
 SHINGLES, LATH,  
 And all kinds of  
**DIMENSION TIMBER**  
 Bridge Timber & Deck Plank a Specialty.  
**RICHMOND ROAD, NEPEAN,**  
 Skead's Mills P.O. OTTAWA, Canada.

**TOLTON BROS.,**  
 MANUFACTURERS OF  
 Creels, Reels, Warping Mills  
 and Sizing Machines,  
 Winding Machines for Knitters,  
 Spooling Machines,  
 Rolling Machines for Carpets,  
 Folding Machines for Cloth or Carpet,  
 Hand Winding Machines.  
 Estimates furnished. Repairing done.  
 For particulars send for Catalogue.  
**GUELPH, - ONT.**

**D. McLAGHLAN & SONS,**  
**ST. JOHN, N.B.,**  
 Manufacturers of all kinds of  
**BOILERS!**  
 And Ships' Tanks.

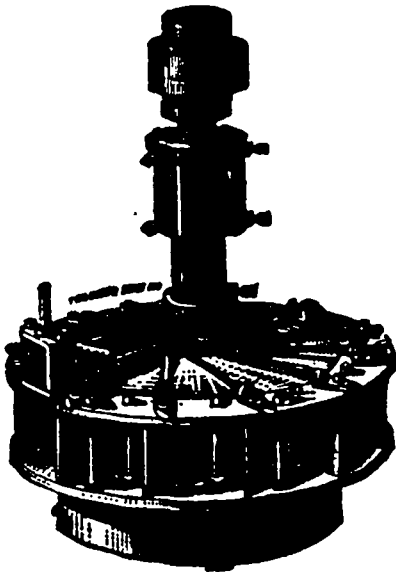
**The Canadian Bank of Commerce.**  
 HEAD OFFICE, - - TORONTO  
 Paid up Capital, - - - - \$5 000 000.  
 Rest. - - - - 1,650,000.  
**DIRECTORS,**  
 HON. WM. MASTERS, President.  
 WM. ELLIOTT, Esq., Vice-President.  
 Noah Barnhart, Esq., James Michie, Esq.  
 Hon. Adam Hope, T. Sutherland Taylor, Esq.  
 George Taylor, Esq., J. G. Arntson, Esq.  
 W. N. ANDERSON, General Manager.  
 J. C. KEMP, Asst. General Manager.  
 ROBT. GILL, Inspector.  
 H. A. NICHOLSON, Asst. Inspector.  
 New York—J. H. Goadby and B. E. Walker, Ag'ts  
 Chicago—A. L. DEWAR, Agent.  
**BRANCHES.**  
 Ayr, Guelph, St. Catharines,  
 Barrie, Hamilton, Sarnia,  
 Belleville, London, Seaford,  
 Berlin, Lucan, Simcoe,  
 Bradford, Montreal, Stratford,  
 Chatham, Norwich, Strathroy,  
 Colbywood, Orangeville, Thorold,  
 Dundas, Ottawa, Toronto,  
 Dumville, Paris, Walkerton,  
 Durham, Peterboro, Windsor,  
 Galt, Port Hope, Woodstock,  
 Galteneh,  
 Commercial credits issued for use in Europe, the East and West Indies, China, Japan, and South America  
 Sterling and American Exchange Bought and sold.  
 Collections made on the most favorable terms.  
 Interest allowed on deposits.  
**BANKERS.**  
 New York—The American Exchange National Bank.  
 London, England—The Bank of Scotland.

**BOOTH & SON,**  
**Coppersmiths and Metal Spinners.**  
**TORONTO - - - ONT.**  
 Distillers', Brewers', Confectioners', House-furnishers' and Plumbers'  
**COPPER and BRASS WORK**  
 In Stock or Made to Order.

**JAMES PETT,**  
 MANUFACTURER OF  
**Colored Sheepskin Mats,**  
**Hearth Rugs, and**  
**Drum Heads.**  
**HAMILTON, ONT.**  
 Office and Factory, - WELLINGTON ST. NORTH,  
 Below Barton Street

**FILES.**  
**THE GRAHAM FILE WORKS,**  
 ESTABLISHED 1874.  
 THOMAS GRAHAM, Proprietor.  
**HAND CUT FILES**  
 Made from the best Refined English Cast Steel, Warranted, Equal to the best Imported brands.  
 Orders Solicited from Importers and Large Dealers.  
**OFFICE & FACTORY, 150 FRONT STREET EAST, - TORONTO**  
 (Late of 15 Sherbourne Street.)  
 Files Re-cut. Send for Price Lists and Discounts.

15,000 IN USE.



**JOSEPH HALL  
MANUFACTURING CO.,**  
(ESTABLISHED 1851.)  
**OSHAWA, ONT.**

Manufacture the celebrated  
**James Leffel's Double Turbine  
Water Wheel,**

All sizes of Stationary and Portable En-  
gines and Boilers, Shafting, Pulleys,  
Hangers, Gearing, Latest Improved  
English and American Gangs.

The Stearns' Circular Saw Mills with Frac-  
tional Head Blocks an King of Dogs—this  
Mill is acknowledged in the United States and  
Canada to be superior to all others—also a very  
complete Circular Saw Mill with Iron Frame  
and cheaper Head Blocks for Small Mill. Saw  
Mill, Flour Mill, Paper Mill and Water Works  
Machinery a Speciality.

For further particulars address

**Joseph Hall Manufacturing Co.,**  
**OSHAWA, ONTARIO.**

ONTARIO  
**File Works.**

**G. E. HEMING,**

(SUCCESSOR TO S. BEECH & CO.)

Files Re-cut and Warranted  
Equal to New.

WORKS AND OFFICE:

Corner Cannon and Mary Streets.  
**HAMILTON, ONT**

**C. W. BROWN,**

Manufacturer of all kinds of

**Machine Screws!**

Metal Punching done to Order.

530 CRAIG STREET,

**MONTREAL.**

**James Leslie**

Manufacturer of

**CARD CLOTHING,  
LOOM REEDS, &c.,**

Dealer in

**COTTON & WOOLLEN  
MILL SUPPLIES.**

OFFICE AND FACTORY:

Junction of Craig and St. Antoine Sts.,  
**WEST END MONTREAL.**

P. O. Box 996.

**A. & T. J. DARLING & Co.,**

—WHOLESALE—

**HARDWARE  
SPECIALTIES,**

CUTLERY & "BLACK DIAMOND"  
FILES, "DARLING AXES,"  
"BABBIT METAL."

**TORONTO.**

**THE**

**DARTMOUTH**

**ROPE WORK CO.,**

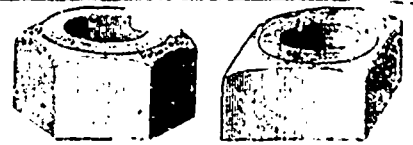
Manufacturers of all descriptions of

**CORDAGE**

**AND OAKUM,**

**HALIFAX,**

**NOVA SCOTIA.**



**ONTARIO NUT WORKS**  
**PARIS, Ont.**

**Brown & Co.,**

Manufacturers of all sizes of

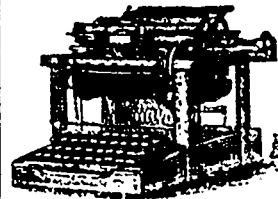
**HOT PRESSED NUTS**  
Square and Hexagon.

**CANADA LAND-PLASTER CO.**  
**PARIS, - - Ont.**

**GILL, ALLAN & CO.**

**REMINGTON**

**TYPE-WRITER.**



WYCKOFF,  
SEAMAN &  
BENEVO,  
NEW YORK,  
Sole Exporters

The only Machine which will suc-  
cessfully supersede Pen Writing. Used by Mer-  
chants and Professional men, and in Rail-  
way, Insurance and other offices, etc., etc.  
Send for Catalogue and Testimonials.

**J. O'FLAHERTY,**

32 Lemoine Street, Montreal,

P.O. Box 1324.

Canadian Agent

**LEATHER BELTING.**

Two first prizes and only Medal at Do-  
minion Exhibitions.

**LACE LEATHER.**

Three first prizes and only Medal at Do-  
minion Exhibitions.

Factory---**DANVILLE, QUE.**

Others have their speciality—we have none.  
With the best possible appliances, we are de-  
termined to make

**ALL OUR BELTING**

The Best in the market, including our Driv-  
ing Bolts—both Double and Ribbed—which are  
not, and cannot be, excelled.

Orders promptly filled.

Full satisfaction guaranteed.

**J. L. GOODHUE & SON**

JOHN WILSON, GLASGOW. JAS. R. WILSON, MONTREAL.

# THOMAS ROBERTSON & CO., MONTREAL & GLASGOW.

ESTABLISHED 1856.

## IRON, TIN PLATE AND GENERAL METAL MERCHANTS.

SOLE AGENTS FOR

"Gartsherric" and "Eglinton" Pig Iron,  
"Lonsdale" Hematite Pig Iron,  
"Dalzell" Celebrated Steel Boiler Plate,  
"Luken's" Charcoal Boiler Plate,  
Fox. Head & Co.'s" Tank and Boiler Plate.

MANUFACTURERS OF

Wilson's Celebrated Lap-Welded Boiler Tubes,

Made from Iron or Steel. Also

### WROUGHT IRON TUBING

For Gas, Steam and Water.

CONTRACTORS FOR

### Cast Iron Pipes

For Gas and Water Works

Supplies for Engineers, Railways, Boiler Makers, Steam Fitters and Plumbers.

## AMERICAN HEAVY Oak Tanned Leather Belting

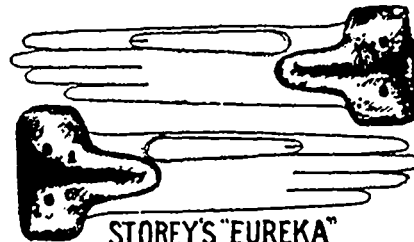
RUBBER BELTING,  
RUBBER HOSE,  
RUBBER PACKING,  
LINEN HOSE, and  
COTTON HOSE

A full and complete stock always on hand.  
Write for prices and discounts.

### T. McILROY, Junr.,

Warehouse—10 & 12 King St. East, Toronto.

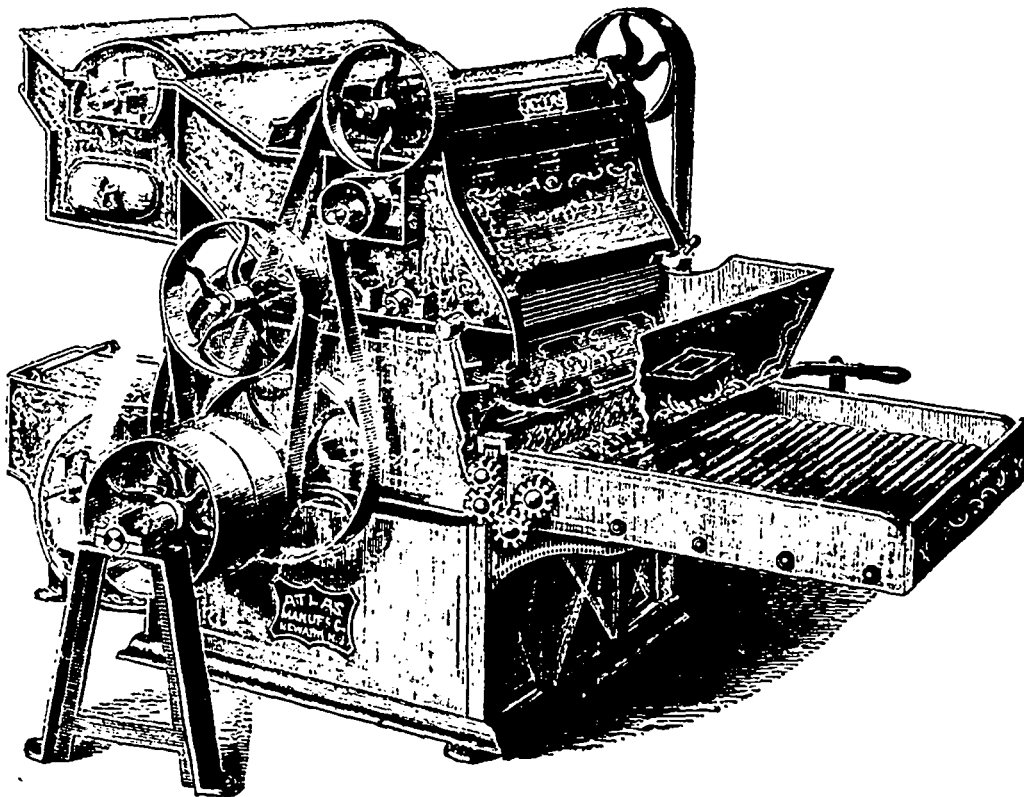
P. O. Box 556.



STOREY'S "EUREKA"  
SPRING GLOVE FASTENER, PAT?

W. H. STOREY & SON, Glove Manufacturers, ACTON, ONT

The quality of our Goods is unsurpassed.



### PARKHURST'S PATENT DOUBLE CYLINDER BURRING PICKER,

For Picking, Burring and Dusting all grades of Wool. Recent Improvements, including a beater attached to the spout for the purpose of most thoroughly sizing and Cleaning the Wool without injury to the staple, make it superior to any other machine now in use.

Manufactured only by

GOLDIE & McCULLOCH, AGENTS,  
GALT, ONT.

THE ATLAS MANUFACTURING CO.  
NEWARK, N.J.

### Double and Single BURRING MACHINES

for First and Second  
Breakers, superior to any  
others made in the  
UNITED STATES.

Patent Steel Ring  
Feed Rollers,  
Waste Cards,  
Cylinders, &c.

## Industrial and Trade DIRECTORY.

### Asbestos.

FENWICK & SCLATER, Montreal.—Asbestos packing, paints, and roofing.—Send for lists. Files, &c.

### Agricultural Implements.

A. S. WHITING MANUFACTURING CO., Cedar Dale, Ont.—Manufacturers of scythes, forks, hoes, etc.

WELLAND VALE MANUFACTURING CO.—Lock No. 2, St. Catharines, Ont., Canada.—Manufacturers of axes, scythes, forks, hoes, rakes and edge tools.

### Bobbins and Spools

THOMPSON & CO., Sherbrooke, P. Q.—Manufacturers of all kinds of Bobbins and Spools for Cotton and Woollen Mills—Special patterns made to order from sample.

### Bridge Builders.

TORONTO BRIDGE CO., Toronto.—Builders of Steel and Iron, Railway and Highway Bridges.

### Chemicals.

JOHN MCARTHUR & SON, Montreal.—Offer at closest figures chemicals required by soap-boilers, oil refiners, paper-makers, and by manufacturers of woollens, cottons, leather, &c.

### Coal and Wood.

P. BURNS Offices cor. Front and Bathurst Sts., Yonge St Wharf 51 King St. East, 532 Queen St. West Toronto.—Wholesale dealer in Coal and Wood. Telephone communication between all offices.

### Cotton Brokers.

M. WRIGHT, next Exchange Bank, Hamilton, Ont.—Sole agent in Canada for Ordway & McGuire, cotton factors, Nashville, Tenn.

### Cotton Mills.

HAMILTON COTTON MILLS CO., Hamilton.—Denims, tickings and yarns.

### Dye Stuffs.

WULFF & CO., sole agents for Canada for Wm. Pickhardt & Kuitroff (B. Anilin and Soda Fabrik Sp. P.), New York. Full supply of Anilin dyes, &c.

EMIL THOURÉT & CO., Montreal.—Agents for K. Oehler, Offenbach O. M., Germany.

JOHN MCARTHUR & SON, Montreal.—Supply of best quality at closest prices. Every description of coloring materials required by manufacturers of woollens, cottons, silks, paper, leather, &c. Are sole agents in Canada for the celebrated aniline dyes of A. Porrier, Paris.

LYMAN BROTHERS & CO., Nos. 71 and 73 Front Street East, Toronto—Dye Stuffs of all kinds for Woollen and Cotton Manufacturers; Warps, Shuttles, Bobbins, Card Clothing, etc., etc.

### Edge Tools.

R. T. WILSON, Dundas, Ont.—Manufacturer of axes, picks, mattocks, grub hoes and railway contractors' supplies.

WELLAND VALE MANUFACTURING CO.—Lock No. 2, St. Catharines, Ontario, Canada.—Manufacturers of axes, scythes, forks, hoes, rakes and edge tools.

### Emery Wheels.

HART EMERY WHEEL CO., Hamilton.—Manufacturers of every description of Emery Wheels and Emery Wheel machinery.

### Engines and Boilers.

G. C. MORRISON, Hamilton.—Engines, boilers, steam hammers, etc.

J. H. KILLEY & CO., Hamilton, Ont.—Manufacturer of economical, variable, cut-off, high pressure, and condensing engines. Improved boilers, portable engines for thrashing, saw-mills, hydraulic and hoisting machinery.

JOHN DOTY, Toronto.—Engines and boilers of every description and capacity, also shafting, pulleys, and hangers for factories.

THOS. WILSON, Dundas, Ont.—Manufacturer of stationary and portable steam engines, boilers and machinery of every description—cotton mill calenders, ho-ery steam presses and propeller wheels, all sizes.

### Files.

PHENIX FILE CO.—Hand-made files and rasps. No machines in our factory.—Fenwick & Sclater, Agents, Montreal. Anchor Brand. FILE & SPRING CO., Cote St. Paul, Montreal.—All kinds of files and springs. Files recut. Sole manufacturers of Spaulding's patent concave spring.

G. OUTRAM & SON, Dominion File Works, Montreal.—Manufacturers of every description of files and rasps.

### Fire Hose.

FENWICK & SCLATER, Montreal.—Canvas hose, plain and rubber lined, for fire departments and factories.—Write us before purchasing elsewhere.

### Furniture.

JACOB ZINGSHEIM, Hamilton, Ont.—Manufacturer of Parlour and Bedroom Sets, Center Tables, &c.

### Gas Engines.

JOHN DOTY.—Manufacturer in Canada of the new "Otto" silent gas engine, two, four, and seven horse-power and larger.

### Glove Manufacturers.

W. H. STOREY & SON, Acton, Ont.—Manufacturers of fine gloves and mitts in every variety and style.

### Harness and Trunks.

S. & H. BORBRIDGE, Ottawa.—The largest saddle, harness, and trunk manufactory combined in Canada. Wholesale and retail. Offer the trade and the public generally the largest assortment of goods in their line in the Dominion at lowest prices.

### Hoist and Elevator Manufacturers.

LEITCH & TURNBULL, Central Iron Works, cor. Rebecca and Hughson Streets, Hamilton, Ont.—Patent safety hand and power elevators.

### Hubs, Spokes and Bent Goods.

F. W. HORE & SON, Hamilton, Ont.—Manufacturers of hubs, spokes, rims, shafts, poles, sleigh and cutter stuff, etc.

### Iron Works.

CANADA SCREW CO., Dundas.—Manufacturers of iron and brass screws, bolts and rivets.

COWAN & CO., Galt.—Manufacturers of every description of wood working machinery.

DOMINION BOLT CO., 139 Front St. East, Toronto.—Manufacturers of every description of bolts, hot pressed nuts, railway spikes, bridge, boiler and iron rivets.

H. R. IVES & CO., Montreal.—Hardware manufacturers and founders; iron riveting and ornamental iron work a specialty.

HAMILTON BRIDGE & TOOL CO., Hamilton.—Iron railway and highway bridges and iron working machinery.

McKECHNIE & BERTRAM, Dundas.—Machine tools and wood working machinery.

MONTREAL MALLEABLE IRON WORKS, St. George Street, Montreal.—Manufacturers of malleable iron, steam, and gas fittings.

PILLOW, HERSEY & CO., Montreal.—Manufacturers of cut nails, horse shoes, railway and pressed spikes, tacks, brads, &c.

THE OSHAWA MALLEABLE IRON CO., Oshawa, Ont.—Manufacturers of malleable iron castings; also patent screw wrenches.

SMITH'S FALLS MALLEABLE IRON WORKS, Smith's Falls, Ont.—Manufacturers to order of agricultural, carriage, and other malleable iron castings.

ST. THOMAS RIVET WORKS (Brent & Sherman)—Manufacturers of boiler, tank, and cooper rivets, plate nails, wrought spikes, cotter pins, spring keys, &c.

B. W. RICHARDS, Brockville, Ont.—Manufacturer of selected Norway iron and Lake Superior copper rivets and burs, kettle ears, &c.

COLBORNE FOUNDRY AND STEEL MILLS (J. C. Scripture & Bro.), Colborne, Ont.—Manufacturers of mill gearing and agricultural implements, and stoves of all kinds.

VICTORIA FOUNDRY (N. S. Blasdell & Co.) Ottawa.—Engine and mill machinery of every description manufactured. General repairs done.

HARE & CO., Oshawa.—Manufacturers of plows, land rollers, cutting boxes, and all kinds of small castings.

T. PEPPER & CO., Guelph, Ont.—Manufacturers of the celebrated Anchor brand and duplex carriage and wagon axles. Our duplex axles are to be had at all the principal hardware stores in the Dominion.

GARTSHORE CAR WHEEL MANUFACTURING CO.,—Works, corner Front and Cherry Streets, Toronto.—Manufacturers of car, tender, and locomotive wheels, which are chilled castings of every description manufactured from the best brands of charcoal iron.

J. MATHESON & CO., New Glasgow, N. S.—Manufacturers of engines, boilers, mill and mining machinery, iron masts, etc.

### Inspirators and Ejectors.

THE HANCOCK INSPIRATOR CO., Montreal.—Manufacturers of inspirators, ejectors and general jet apparatus.

### Knife Works.

THE WHITEMAN & BARNES MANUFACTURING CO., St. Catharines, Ont.—Manufacturers of mowing and reaping machine knives, sections, guard plates, cutting apparatus complete, spring keys and cutters, etc.

### Knitting Mills.

S. LENNARD & SONS, Dundas.—Manufacturers of plain and fancy hosiery. OSHAWA KNITTING WORKS, Oshawa.—Manufacturers of cotton and woollen hosiery, Cardigan and ladies' jackets, scarfs, carriage rugs, mens' and childrens' jerseys, shirts, &c.

### Leather Belting.

DOMINION BELT AND HOSE CO., Toronto.—Oak tanned belting, lace leather, etc.

### Machine Brushes.

ULLEY'S BRUSH WORKS, 74 Bleury St., Montreal.—Machine brushes for cotton factories, flour mills, &c. Machine brushes of every description a specialty.

### Machinists.

SHEPARD & HOYER (late with J. Doherty 26 and 28 Colborne Street (in rear of the Ontario Electrotype Foundry), Toronto.—Machinists and Engineers. All kinds of machinery made and repaired. Jobbing promptly attended to.

### Manufacturers' Agents.

McKENZIE & NOLAN, Montreal, Manufacturers' Agents, Customs Brokers. Samples of manufactured goods intended for sale in the market and correspondence solicited.

### Manufacturers' Supplies.

E. JENCKES MANUFACTURING CO., Pawtucket, R. I.—Sole manufacturers of High Improved U. S. Standard Ring Travellers, Belt hooks, gimlet pointed wire goods, spinning rings, cotton banding, twine, &c. Manufacturers' Supplies. Leather belting and iron cloths. Special agents for Jos. Noone's saws.

### Marble and Stone.

ARNPRIOR MARBLE WORKS (P. T. Somerville), Office and Work near the C. P. Railway Station, Arnprior, Ont.—Wholesale dealer in Arnprior marble "Howe" granite and Renfrew granite.

### Oils.

JOHN MCARTHUR & SON, Montreal.—Afford best value in pure olive and lard oils, also in all other leading lines of vegetable, animal, and mineral oils for factory use. Give special attention to their celebrated crown diamond "engine" and "machinery" oils.

**Paints.**

**RAMSAY & SON**, St. Lawrence White Lead and Color Works, Office, 10 Inspector Street; Factory, Inspector, corner College Street, Montreal. — Specialties — Ramsay's patent white, twice the body of lead, mixed colors, car colors, white lead all qualities. Plate glass imported to order, and in stock all sizes.

**Paper Box Manufacturers.**

**ALBERT GIBB**, 122 King William Street, Hamilton, Ont. — Manufacturer of all kinds of paper boxes.

**BELL & Co.**, 96 and 98 Foundling Street, Montreal — Manufacturers of every description of paper boxes, paper bags, tea caddies, cigar cases, &c. — Orders solicited.

**Paper Manufacturers.**

**LINCOLN PAPER MILLS CO.**, Merriton Ont. — Manufacturers of every variety of paper paper bags and flour sacks.

**W. BARBER & BROS.**, Georgetown — Manufacturer of book and fine papers.

**Patent Agents.**

**R. STUBBENDORFF & CO.**, 132 St. James Street, Montreal. — Patents sold and disposed of. Special attention given to the introduction and sale of manufactured articles.

**Patterns and Patents.**

**JOHN HENRY**, corner of James and Rebecca Streets, Hamilton, Ont. — Pattern and model maker, solicitor of patents.

**Pot and Pearl Barley Mills.**

**JOHN QUARRIER**, Corner Mary and Cannon Streets, Hamilton, Ont.

**Saw Manufacturers.**

**R. H. SMITH & CO.**, St. Catharines. — Manufacturers of all kinds of saws, plastering trowels, straw knives, etc. Sole manufacturers for the Dominion of Canada of the celebrated "Simond's Saw."

**SHURLY & DIETRICH**, Galt, Ont. — Manufacturers of circular and cross-cut saws, plastering trowels, etc.

**Scales.**

**C. WILSON & SON**, 45 Esplanade Street East, Toronto. — Manufacturers of the Improved Wilson Scales. Designers to the Government. Received 29 first prizes, medal and Governor-General's grand diploma.

**Scythe Snaths.**

**THE DOMINION SNATH COMPANY**, Sherbrooke, Que. — Manufacturers of Patent Swing Socket, and every variety of Scythe snaths.

**Silk Mills.**

**CORRIVEAU SILK MILLS CO.**, Montreal. — First manufacturers in Canada of black and colored dress silks, ribbons, handkerchiefs, &c.

**Stereotypers, Engravers, &c.**

**F. DIVER & CO.**, Toronto. — Electrotypers and stereotypers. Designers and engravers on wood.

**Stoves.**

**LARTER BROS.**, Toronto. — Furnaces, ranges, stoves, marble and marbleized mantels. A large assortment of fireplace grate always on hand. Agents for McClary Manufacturing Company, London.

**Wire Works.**

**R. GREENING & CO.**, Hamilton, Ont. — Manufacturers of wire ropes, cloth and general wire workers.

**MAJOR & GIBB**, 646 Craig St., Montreal. — Manufacturers and importers of wire cloth and supplies.

**TIMOTHY GREENING & SONS**, Dundas, Ont. — Manufacturers of the strongest description of steel wire cloth, malt kiln floors and special wire weavers.

**Wooden Goods.**

**C. T. BRANDON & CO.**, Toronto. — Have special facilities and machinery for the manufacture of all kinds of wooden articles. Correspondence solicited.

**R. McLAREN, Jr.**, 63 College St., Montreal — Manufacturer of Sharpe's patent safety oil cabinets; also, refrigerators, children's carts' waggons, sleighs and general woodenware.

**Woollen Manufacturers.**

**J. ROUTH & CO.**, Cobourg. — Woollen Manufacturers.

**JOHN WARDLAW**, Galt, Ont. — Manufacturer of Scotch fingering, wheeling and knitting yarns.

**Wools and Cotton Warps.**

**WINANS CO.**, Toronto. — Dealers in wools and cotton warps.

**Special Notice.**

**Societe Postale Francaise**

**DE L'ATLANTIQUE.**

**BRAZILIAN DIRECT MAIL SERVICE.**

**WINTER ARRANGEMENTS.**

The magnificent new Steamships of this Line are appointed to sail from Halifax, N.S. (on arrival of the mails), on the 14th of each month for St. Thomas, Porto Rico, W.I., and all ports in Brazil and River Plate. Splendid passenger accommodation.

**BELGIUM AND FRENCH DIRECT MAIL SERVICE.**

The magnificent new steamships of this Line are appointed to sail monthly between Antwerp (Belgium), Havre (France), and Canada direct. Close connection with Rotterdam, Amsterdam and Bremen: unrivalled passenger accommodation. Special facilities granted to Emigrants from Europe. Through tickets issued from any part of Europe to Canada and United States. Through bills of lading granted.

For rates of freight and passage, apply to Kennedy & Hunter, Antwerp; A. Poudavigne, Havre; or to,

**WM. DARLEY BENTLEY**, Agent General,

317 St. Paul Street, Montreal, And at West India Wharf, Halifax, N.S.

**JOHN WARDLAW,**

**Galt, Ont.**

**MANUFACTURER OF Fingering, Wheeling, Knitting, Tweed & Cloud Yarns.**

**Woollen and Worsted Yarns a Specialty.**

Knitters supplied. Any description of All Wool Yarns made to order.

**INTERCOLONIAL RAILWAY.**

**THE GREAT**

**CANADIAN : ROUTE !**

To and from the Ocean.

**For Speed, Comfort and Safety**

**IS UNSURPASSED!**

Pullman Palace Day and Sleeping Cars on all through Express trains. Good Dining Rooms at convenient distances.

**NO CUSTOM HOUSE EXAMINATION:**

Passengers from all points in Canada and Western States to Great Britain and the Continent should take this Route as hundreds of miles of Winter Navigation are thereby avoided.

**IMPORTERS AND EXPORTERS**

Will find it advantageous to use this route, as it is quickest in point of time, and the rates are as low as by any other. Through freight is forwarded by FAST SPECIAL TRAINS; and the experience of the last two years has proved the Intercolonial route to be the quickest for European freight to and from all points in Canada and the Western States.

Through express trains run as follows;

<b>GOING EAST.</b>	<b>GOING WEST.</b>
Leave Toronto 7.12 a.m.	Leave Halifax 2.45 p.m.
" Montreal 10.00 p.m.	" St. John, N.B., 7.25 p.m.
" Quebec 8.10 a.m. next day.	Arrive Quebec 8.20 p.m. next day.
Arrive St. John, N.B., 7.30 a.m., day after.	" Montreal, 6.00 a.m. day after.
" Halifax 12.40 p.m., day after.	" Toronto 10.52 p.m., day after.

The Pullman cars which leave Montreal on Monday, Wednesday, and Friday run through to Halifax without change, and those which leave Montreal on Tuesday, Thursday and Saturday, run through to St. John, N.B., without change.

All information about the route, and also freight and passenger rates, will be given on application to

**R. ARNOLD**, Ticket Agent, Cor. King and Yonge Streets, 72 Yonge Street, and 20 York Street, Toronto.

**R. B. MOODIE**, Western Freight and Passenger Agent, 93 Rossin House Block, York-st., Toronto.

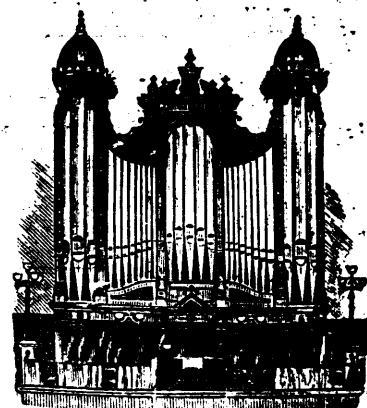
**GEORGE TAYLOR**, General Freight Agent, Moncton, N.B.

**A. S. BUSBY**, General Passenger and Ticket Agent, Moncton, N.B.

**D. POTTINGER**, Chief Superintendent, Moncton, N.B. Railway Office, Moncton, N.B., Nov. 28, 1882.

ESTABLISHED 1836.

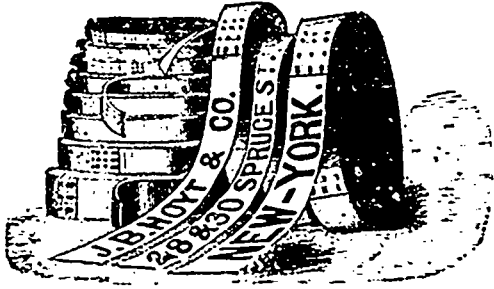
**S. R. WARREN & SON, CHURCH ORGAN BUILDERS TORONTO,**



Still take the lead in the manufacture of FIRST-CLASS INSTRUMENTS, and have great pleasure in referring to the many large organs of their manufacture in all parts of the Dominion. Correspondence solicited. Specifications and all information gladly given on application at Factory & Warehouses, cor. Wellesley & Ontario Sts.

**HOYT'S**

BEST AMERICAN OAK TANNED

**Leather Belting.****RICE LEWIS & SON,**

TORONTO,

**Agents.****H. W. BUTTERWORTH & SONS,**

York &amp; Cedar Streets, Philadelphia, Pa.

MANUFACTURERS OF

**DYEING, DRYING, AND  
FINISHING MACHINERY**

For COTTON, WOOLLEN, and WORSTED GOODS.

DRYING MACHINES, with cylinders of tinned iron or  
copper, for PRINT WORKS, BLEACHERIES, &c.**DYEING, SIZING & DRYING MACHINES**

For COTTON (CHAIN) WARPS.

**TENTERING MACHINES,**

With clamp chain for Lawns, Ginghams, &amp;c.

**TENTERING MACHINES,**

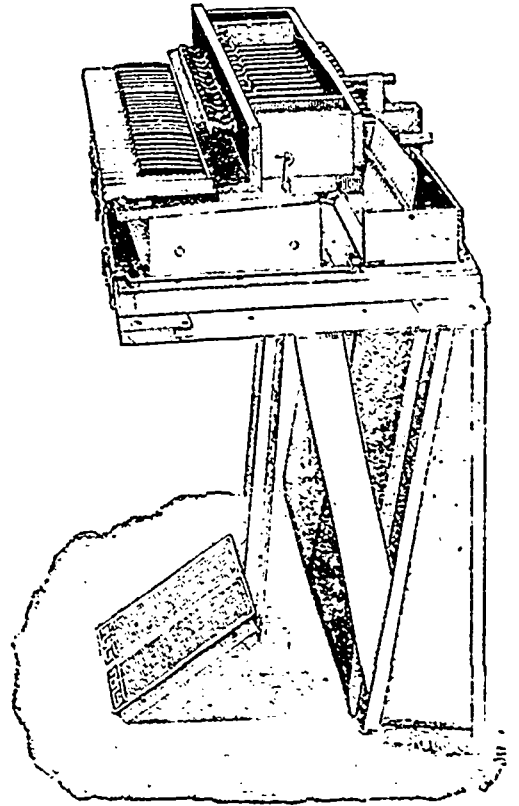
with Pin Chain for Woollen and Worsted Goods.

**SINGEING, WASHING, CRABBING,****DYEING, DRYING & FINISHING****MACHINERY, for Worsted Dress Goods.**

PHOTOGRAPHS AND PRICES SENT ON APPLICATION

**THE  
GUELPH ORGAN!**

AND

**ACTION COMPANY.****NO MORE MONOPOLY!****The Organ Business Open to all.**Complete Organs, except the outside case, at  
prices from \$30 upwards. Any part furnished.**SEND FOR CATALOGUE.****THE****GUELPH ORGAN & ACTION CO.**

Factory, Berlin Street,

**GUELPH, - ONT.**

**R. H. SMITH & CO.,**



Sole Manufacturers in the Dominion of Canada of the "SIMONDS" SAW  
**ST. CATHARINES, ONT.**

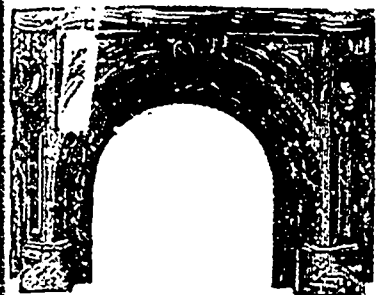
All of our cross-cut saws are tempered by the "SIMONDS" PROCESS.

Hand Saws from the cheapest to the very best for sale by

**HARDWARE DEALERS.**

THE LARGEST SAW WORKS IN CANADA

**CANADA MARBLEIZED SLATE WORKS, HAMILTON, ONT.**



MARBLE AND MARBLEIZED SLATE MANTELS.

**J. M. DURWARD,**  
 SUCCESSOR TO R. HANGER.

**THE HANCOCK INSPIRATOR.**

The best Feeder known for Stationary, Marine, or

Locomotive Boilers.



All sizes lift water 25 feet. No adjustment required for varying Steam Pressures.

**THE INJECTOR PERFECTED**

OVER 40,000 IN USE.

No adjustment required for the varying Steam Pressures.

Manufactured by

**The Hancock Inspirator Co.,**

5 Custom House Square, Montreal.

Manufacturers of Inspirators, Ejectors, and general Jet Apparatus.

**THE GALT FOUNDRY**

**ENGINE and MACHINE WORKS,**

FOR

Wood Working Machinery,

Engines, Boilers,

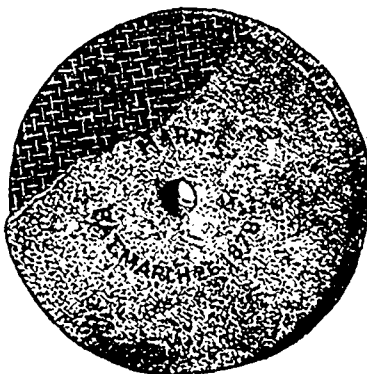
Shafting,

Hangers and Pulleys,

etc., etc.

ADDRESS—

**COWAN & Co.,**  
 Galt, Ont.



**HART Emery Wheel**

**COMPANY**  
 (LIMITED),

Hamilton, Canada.

MANUFACTURERS OF

**EMERY WHEELS**

FOR **FOUNDRIES, MACHINE SHOPS, SAW MILLS, & PLANING MILLS.**

SEND FOR CIRCULAR.

Also MANUFACTURERS

—OF—  
**EMERY WHEEL**

**MACHINERY.**

Illustrated Price List Sent on Application





**BARB**  
**Wire Fencing**

**FIRST PRIZE**

Awarded us at Exhibition held in Montreal, September, 1882, and SILVER MEDAL for the machine used in the manufacture of same

**"THE MANITOBA"**



Four-Point Barb Galvanized Steel Wire Fencing. Send for Circular and Price Lists.

**THE CANADA WIRE CO.,**

H. R. IVES, President & Manager.  
Queen-st., MONTREAL.

**DOMINION BOLT CO.,**

Front and Sherbourne Sts., Toronto.

FIRST PRIZE DOMINION EXHIBITION, 1880.

**CARRIAGE BOLTS:**

"Best Best."—Made from square and round Norway iron, the latter by patented machinery, ensuring a like full square to that made from square iron.

"Best."—Made from Best Staffordshire iron, same finish as "Best Best," and annealed.

"Common"—Made from Best Staffordshire iron, with black heads, the burr only being edged.

**Railway Track Bolts. Railway Track Spikes.**

Quality not excelled by any, native or foreign.

**Hot Pressed Nuts. Machine forged Nuts.**—None better. In a few weeks there will be another machine in operation for small sizes of

**Cold Pressed Nuts. Rivetting Burrs,** and very soon there will be in operation an improved machine for

**Plough Bolts. Boiler Rivets.** No better and no greater variety can now be had elsewhere of

**Fancy Head Bolts** for Carriage Builders and others, which always afford satisfaction to buyers

**Machine Bolts. Coach Screws. Bridge Bolts. Tire Bolts and Rivets.**

**Sleigh Shoe Bolts. Elevator Bolts.** All of best quality and annealed, not second to any imported.

**Stove Bolts. Stove Rods. Rivets.**

**F. Mumford & Sons**

**DARTMOUTH,**

**NOVA SCOTIA.**

MANUFACTURERS OF

SHIPS' KNEES,

STEAM FORGING,

CAR AXLES.

**MACHINE AND**

**BOILER WORKS.**

ESTABLISHED 1820.  
**EAGLE FOUNDRY.**

**GEORGE BRUSH,**

14 TO 24 KING AND QUEEN STREETS, MONTREAL,

Maker of

STEAM ENGINES,  
STEAM BOILERS,  
HOISTING ENGINES,  
STEAM PUMPS,  
CIRCULAR SAW MILLS,  
BARK MILLS,  
SHINGLE MILLS,  
ORE CRUSHERS,  
MILL GEARING,  
SHAFTING,  
HANGERS AND PULLEYS,  
HAND AND POWER HOISTS FOR  
WAREHOUSES, &c., &c.,

and Agent for

"Water's" Perfect Steam Engine Governor, and  
"Heald & Sisco's" Centrifugal Pumps.

**S. LENNARD & SONS**

**DUNDAS,**

Manufacturers of Plain and

**FANCY HOSIERY**

To the Wholesale Trade

Only.

REPRESENTED BY

**MR. S. DAVISON,**

16 Colborne St., Toronto.

AND

**MESSRS. R. HENDERSON & CO.,**

146 McGill St., Montreal.

**J. C. DIXON & BROS.**

MANUFACTURERS OF

FINGERING,

KNITTING

and

CARPET

YARNS.

HAMILTON

ONT.

**C T. BRANDON & CO.**

MANUFACTURERS OF

**WOODEN GOODS,**

Central Prison, Toronto.

Washboards, Express Waggon, The Domestic, Step Ladders, The Crown, Saw Frames, The Rattler, Mops, Union Churns, Kitchen Ware, Clothes Horses, Turned Goods.

Send for our Illustrated Price List.

CONTRACT WORK A SPECIALTY.

**WM. PICKHARDT &**

**KUTTROFF,**

(B. Anilin & Soda Fabrik Sp. P.)

**NEW YORK.**

Anilin Dyes,

Azo Dyes,

Eosin, Etc.

SOLE AGENTS FOR CANADA:

**WULFF & CO**

32 St. Sulpice Street,

**MONTREAL.**

**WINANS & CO.**

CHURCH STREET, TORONTO.

FOREIGN AND DOMESTIC

**WOOL**

WOOL for Medium Tweeds,  
WOOL for Coarse Tweeds,  
WOOL for Etoffes,  
WOOL for Medium Flannels,  
WOOL for Union Goods of all kinds,  
WOOL for White Blankets,  
WOOL for Horse and Shanty Blankets,  
WOOL for everything.

All selected personally by our Mr. BEN. WILSON, in Europe for the winter.

**The Cheapest Wools in Canada Knitting Wools a Specialty**

Sole Agents Hamilton Cotton Company's First Prize (Silver Medal) Cotton Warps, no other make compare with them. Every variety at lowest prices. Perfect satisfaction guaranteed. Empty returnable at value.

All second-hand Woollen Machinery for sale in Canada, or our books.

Send or printed list, no charge.