

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.

- |   |  |
|---|--|
| <input checked="" type="checkbox"/> Coloured covers/<br>Couverture de couleur   | <input type="checkbox"/> Coloured pages/<br>Pages de couleur   |
| <input type="checkbox"/> Covers damaged/<br>Couverture endommagée   | <input type="checkbox"/> Pages damaged/<br>Pages endommagées   |
| <input type="checkbox"/> Covers restored and/or laminated/<br>Couverture restaurée et/ou pelliculée   | <input type="checkbox"/> Pages restored and/or laminated/<br>Pages restaurées et/ou pelliculées                    |
| <input type="checkbox"/> Cover title missing/<br>Le titre de couverture manque  | <input checked="" type="checkbox"/> Pages discoloured, stained or foxed/<br>Pages décolorées, tachetées ou piquées |
| <input type="checkbox"/> Coloured maps/<br>Cartes géographiques en couleur  | <input type="checkbox"/> Pages detached/<br>Pages détachées  |
| <input type="checkbox"/> Coloured ink (i.e. other than blue or black)/<br>Encre de couleur (i.e. autre que bleue ou noire)  | <input checked="" type="checkbox"/> Showthrough/<br>Transparence   |
| <input type="checkbox"/> Coloured plates and/or illustrations/<br>Planches et/ou illustrations en couleur   | <input checked="" type="checkbox"/> Quality of print varies/<br>Qualité inégale de l'impression                    |
| <input checked="" type="checkbox"/> Bound with other material/<br>Relié avec d'autres documents   | <input checked="" type="checkbox"/> Continuous pagination/<br>Pagination continue                                  |
| <input checked="" type="checkbox"/> Tight binding may cause shadows or distortion along interior margin/<br>La reliure serrée peut causer de l'ombre ou de la distorsion le long de la marge intérieure   | <input type="checkbox"/> Includes index(es)/<br>Comprend un (des) index  |
| <input type="checkbox"/> Blank leaves added during restoration may appear within the text. Whenever possible, these have been omitted from filming/<br>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 on header taken from: /<br>Le titre de l'en-tête provient:   |
| <input type="checkbox"/> Additional comments: /<br>Commentaires supplémentaires:  | <input type="checkbox"/> Title page of issue /<br>Page de titre de la livraison                                    |
|   | <input type="checkbox"/> Caption of issue /<br>Titre de départ de la livraison                                     |
|   | <input type="checkbox"/> Masthead /<br>Générique (périodiques) de la livraison                                     |

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

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

# CANADIAN MANUFACTURER

AND INDUSTRIAL WORLD

DEVOTED TO THE MANUFACTURING INTEREST OF THE DOMINION

THE MANUFACTURER WHO PROSPERS  
 KNOWS THAT  
 MANUFACTURES FOR ITSELF

Vol. 18. TORONTO, MAY 2, 1890. No. 9.

**"Old Dyewood Warehouse"**  
 Established over Fifty Years.

**Theo. H. Eaton & Son,**  
 Windsor, Ont. : Detroit, Mich.

**DYEWOODS, DYEING DRUGS,  
 CHEMICALS, ACIDS, Etc.**

**HIGH GRADE LOGWOOD.**  
 Domestic and Imported-Extracts of  
 Logwood, Fustic and Indigo.

**FRENCH ARCHIL & CUDBEAR.**

SOLE AGENTS FOR THE UNITED STATES AND CANADA  
 FOR THE "CROWN ANILINE DYES."

— USE —  
**ALIZARINE**  
 AND  
**ANTHRACENE**  
 - COLORS -  
**For Dyeing Fast Colors on  
 Wool.**

For all particulars, address  
**Dominion Dyewood and Chemical Co.,  
 TORONTO.**

Sole Agents in Canada for  
**Farbenfabriken, Vormals Friedr  
 Bayer & Co., Elberfeld, Germany.**

**IMPERIAL BANK**  
 OF CANADA.

Capital Paid-up, \$1,500,000  
 Reserve Fund, 650,000

DIRECTORS:  
 H. S. HOWLAND, President.  
 T. R. MERRITT, St. Catharines, Vice-President.  
 William Ramsay, Hon. Alex. Morris,  
 Robert Jaffray, Hugh Ryan,  
 T. R. Wadsworth.  
 D. B. WILKIE, Cashier. B. JENNINGS, Asst. Cashier.  
 E. HAY, Inspector.

Head Office, - TORONTO.

BRANCHES IN ONTARIO.  
 Essex Centre. Niagara Falls. Welland.  
 Fergus. Port Colborne. Woodstock.  
 Galt. St. Catharines. Toronto.  
 Ingersoll. St. Thomas. " Yonge St.  
 Sault Ste. Marie. Cor. Queen.

BRANCHES IN NORTH-WEST.  
 Winnipeg. Brandon. Portage la Prairie. Calgary.

Drafts on New York and Sterling Exchange bought  
 and sold. Deposits received and interest allowed.  
 Prompt attention paid to collections.

Agents, London, Eng. Lloyd's Bank Ltd., 78 Lombard  
 St., E.C., with whom all deposits may be made for credit  
 with Head Office or Branches.

ESTABLISHED 1856 THE J.C. Mc LAREN BELTING CO. SUCCESSORS TO THE LATE J.C. Mc LAREN

# NEEDLE POINTED

TORONTO BRANCH 29 FRONT ST. E. CARD CLOTHING MONTREAL

**BERGHAUS & RUBBER CO.**  
 OF TORONTO.

SOLE AGENTS FOR THE  
 MANUFACTURE OF  
 RUBBER HOSE  
 AND ALL KINDS OF  
 RUBBER GOODS

WAREHOUSE & OFFICE, 43 HURON ST.  
**TORONTO.**

MONTREAL OFFICE:  
 81 Temple Building,  
 St. James Street.

**BERLIN ANILINE CO.**

**ANILINES**  
 BENZO COLORS  
**Methylene Blues**

— AGENTS —  
**MIDDLETON & MEREDITH,  
 MONTREAL.**

— ALSO —  
**EXTRACTS, DYEWOODS, CHEMICALS.**

**John Bertram & Sons,**  
**CANADA TOOL WORKS!**  
 Dundas, Ont.

SEE ADVERTISEMENT, PAGE 321.

---

This Space for Sale.

TRADE **IMPERIAL** MARK  
**BOILER COMPOUND**

FOR THE PREVENTION OF SCALE  
IN STEAM BOILERS AND  
LOCOMOTIVES.

Prepared only and separately for each case after analysis of scale from boiler to be treated.  
In successful use in Pennsylvania for over fifteen years.

**GUARANTEES.** Contains neither acid or any ingredient which will injure iron, brass, or packing.  
Payment required only after perfectly satisfactory results.  
Prices lower than any high-class purger in the market.  
REFERENCES.—All branches of Steam Users.

The **Imperial Chemical Co.**  
Soho Machine Works,  
Esplanade St., TORONTO, ONT.

ALFRED MYERS, A. R. WILLIAMS,  
General Manager. Selling Agent.  
Send us sample of Boiler Scale in envelope, by mail. We will analyse it FREE OF CHARGE.

Largest Manufacturers of **STEEL**  
and **BRASS STAMPS** in Canada.

**PRITCHARD**  
& **ANDREWS**

OTTAWA, ONTARIO.

Rubber Stamps,  
Stencils, Seals, &c.

SEND FOR PRICES.

THE

"Sterling" Patent

**Water Tube Boilers**

MANUFACTURED BY THE

**DOMINION SAFETY BOILER CO. Ltd.**

Are the safest and most economical, compact and durable Boilers, large mud drum, perfect circulation. Boilers built for any required pressure.  
All parts readily accessible for the closest inspection.

We guarantee dry steam and great economy of fuel.  
For full particulars and prices apply to e manufacturers.

31 : Wellington : Street,  
MONTREAL.

**McARTHUR,**  
**CORNEILLE & CO.**

(Successors to JOHN McARTHUR & SON)

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

**MATIERES COLORANTES ET**

**PRODUITS CHIMIQUES,**

DE ST. DENIS,

Successors to

**A. POIRRIER AND G. D'ALSACE,**

PARIS,

Manufacturers of

**ANILINE DYES.**

**ARCHIL.**

**GUDBEAR.**

&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 Commendations, Philadelphia Centennial Exhibition, 1876.

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

WILK KNOX. JOHN H. ELLIOT. EDGAR B. JARVIS.

**KNOX, ELLIOT & JARVIS,**

*Architects, Engineers and Mill  
Constructors,*

Office: 13 Victoria Street, TORONTO.

**New York Dyewood, Extract  
and Chemical Co.**

SOLID AND LIQUID EXTRACTS

OF

**LOGWOOD,**  
**Fustic and Hypernic,**

OF SUPERIOR QUALITY.

OFFICE, 55 BEEKMAN ST. N. Y.

**PILLOW & HERSEY MFG CO.**

Manufacturers of every description of Cut Nails, Tacks, Brads, Railway and Pressed Spikes, Horse Shoes, Carriage, Tire and other Bolts, Coach Screws, Hot Pressed and Forged Nuts, Felloe Plates, Lining and Saddle Nails, Tufting Buttons, &c., &c.

The Hardware Trade, Shoe and Leather Finding Dealers, and Boot and Shoe Manufacturers, will find the Largest and Best Assortment and Greatest Variety of above Goods always in stock, and can rely on orders being rapidly executed, our facilities for doing so being unequalled.

OFFICE, 105 Mill St., Montreal.

**ELECTRIC LIGHTING**

**Electric Gas Lighting, Electrical Apparatus and Supplies, Contractors for Electrical Work.**

**HENRY S. THORNBERRY & CO.**

39 King Street West, Room 2.

This Space for Sale.

# THE ONTARIO BOLT CO.

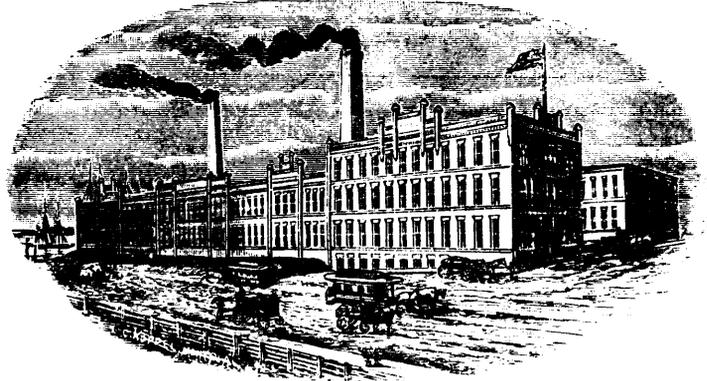
(LIMITED),

**SWANSEA, near Toronto.**

—MANUFACTURERS OF—

- Bridge Rods, Gib Plates, Straps, Braces and Bolts,
- Drift Bolts, Washers, Prisms and Roof Rods,
- Bolts, Braces, Straps, Bolt Ends and Blank Bolts,
- Drop Forgings, Carriage Hardware
- Including Clips, Steps, Stump Joints,
- Offsets, Stay Ends, Herbrand Fifth Wheels,
- Sleigh Braces, Couplings, Body Loops,
- Threshing Machine Teeth, Pitman Irons,
- And all kinds of Special Work.
- Machin<sup>e</sup> Bolts, all sizes,
- Coach Screws and Skein Bolts,
- Whiffletree Bolts, Best Elevator Bolts,
- Best Plough Bolts, all kinds,
- The Prize Tire Bolt, Best Shaft and
- Step Bolts, Best Eccentric Head,
- and Spring Bolts,
- Best Norway Shackle Bolts, Railway Track Bolts and Spikes,
- Rivets, Best Bridge and Boiler and Black Iron,
- Wire Nails and Pressed Spikes,
- Nuts, Hot Pressed, Forged and Cold Pressed,
- Carriage Bolts, Superb, Eclipse,
- Sleigh Shoe and Prize, all sizes.
- Howells Patent Iron Wheels.

# DOMINION TIN AND STAMPING WORKS



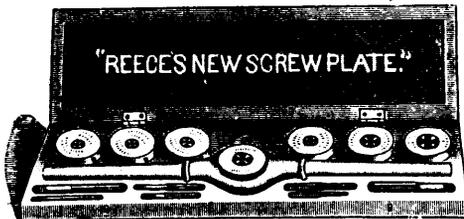
- Plain, Stamped and Japanned Tinware,
- Copper Goods,
- Star Patent Stove Pipe Thimbles,
- Stove Boards, Wire Goods,
- Machine Oilers, Coal Hods,
- Fire Shovels, House-furnishing Goods.

SPECIALTIES—Spice Tins, Mustard Tins, Baking Powder Tins, Blacking Boxes, Pain Irons, Lye Cans, Grocers' Canisters, Square and Round Oil Cans, Oil Tanks, Patent Butter Tubs (Tin Lined).

**KEMP MANUFACTURING CO.**  
Cor. Gerrard & River Sts., Toronto.

PERFECT THREADS AT ONE CUT.

## REECE'S NEW SCREW PLATES



CUT SHOWING SIZE C COMPLETE IN BOX.

Size: C cuts  $\frac{1}{4}$ , 5-16,  $\frac{3}{8}$ , 7-16,  $\frac{1}{2}$ ,  $\frac{5}{8}$  and  $\frac{3}{4}$  inch. Price, complete, \$20.

**SIZE A, SAME STYLE.**

Cuts  $\frac{1}{4}$ , 5-16,  $\frac{3}{8}$ , 7-16 and  $\frac{1}{2}$  inch. Price, complete, \$13.

**SIZE B, SAME STYLE.**

Cuts  $\frac{1}{4}$ ,  $\frac{5}{8}$ ,  $\frac{3}{4}$  and 1 inch. Price, complete, \$21.

**SIZE D, SAME STYLE.**

Cuts  $\frac{3}{8}$ , 7-16,  $\frac{1}{2}$ ,  $\frac{5}{8}$ ,  $\frac{3}{4}$  and 1 inch. Price, complete, \$25.

**SIZE E, SAME STYLE.**

Cuts  $\frac{1}{4}$ , 5-16,  $\frac{3}{8}$ , 7-16,  $\frac{1}{2}$ ,  $\frac{5}{8}$ ,  $\frac{3}{4}$  and 1 inch. Price, complete in box, \$29

All other Dies at Corresponding Prices.

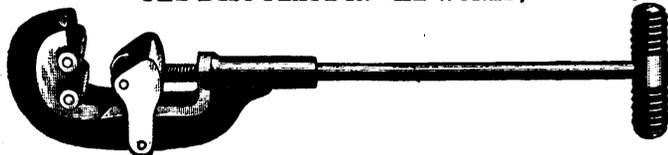
We furnish Collet and Die same as used in our Reece's New Screw Plate, to fit stocks B, D and large C stock, Little Giant, also B and C Wiley & Russell Lightning Screw Plate.

MANUFACTURED BY

**BUTTERFIELD & CO.**

Derby Line, Vermont, and Rock Island, Quebec.

THE BEST PLATE IN THE WORLD.



PATENTED IN UNITED STATES, JUNE 23, 1885.

# Balcony Fire Escapes

(BATTEN'S PATENT)

## ADVANTAGES:

The advantages of the BATTEN FIRE ESCAPE over all others are:

That the balconies are made of the best wrought iron, of any ornamental design or pattern, and securely bolted through the walls. Can be made any length or width. The brackets and flooring are capable of bearing any number of persons standing on them. The ladders, with wide steps and of easy grade, can remain down permanently, or folded up, as desired, showing the ornamental balcony only in sight, which does not mar the architectural beauty of the building, and can be instantly released when desired. No ice or snow will remain on them, neither will the working parts rust; and they will work admirably in any weather.

A Stand Pipe is also connected for high buildings, with valves at each door and on the roof.

Our Escapes have been fully tested at fires and proved themselves invaluable for saving life and property. Iron guards on windows of Asylums and Reform Schools can be so adjusted as to be instantly released in the case of fire by the unfolding of ladder or sounding of a gong.

## Straight Iron Ladders.

For situations not requiring a Balcony Fire Escape I can quote reasonable prices for strong and well finished STRAIGHT IRON LADDERS.

**FREDERIC NICHOLLS,**

Sole Manufacturer for Canada,

The Permanent Exhibition of Manufactures,

63 to 69 Front St. West, TORONTO.



Published on the First and Third Fridays of each Month

BY THE

Canadian Manufacturer Publishing Co.

(LIMITED.)

63 FRONT STREET WEST, TORONTO.

FREDERIC NICHOLLS,  
Managing Director.

J. J. CASSIDEY,  
Editor.

SUBSCRIPTION, - - - \$2.00 per year.

ADVERTISING RATES SENT ON APPLICATION.

MR. FREDERIC NICHOLLS is Secretary of  
The Canadian Manufacturers' Association,  
The Woolen Manufacturers' Association, and  
The Tanners' Association.

His Office is at the Publication Office of the  
CANADIAN MANUFACTURER,  
63 Front Street West, Toronto.

### PERNICIOUS LEGISLATION.

THE Dominion House of Commons has passed an amendment to the criminal law introduced by Sir John Thompson, Minister of Justice, which provides for the infliction of severe exemplary punishment for the seduction of or criminal intercourse with any female employe under the age of thirty years in any workshop, mill or factory, by any employer, or by any foreman or other person who may have any direction or control over such female.

When the Minister of Justice moved the third reading of his Bill, a motion was moved in amendment striking out this objectionable provision; but in contending against this amendment the Minister declared that the legislation was one of the measures which had been promised in the Speech from the Throne in relation to labor, and that it had been pressed upon the attention of the Government by the Knights of Labor, who, speaking for their own class, had, he said, a better knowledge as to the necessity of the legislation asked for than the Minister himself or his colleagues. He said: "When persons having such knowledge ask for legislation of this kind, I think it would be very hard for Parliament to turn a deaf ear to them." The Minister then quoted the statement which the Knights of Labor had made in their report as follows:—

"Although your Committee is glad to believe that so far in Canada the evil does not exist to any appreciable extent, yet by reports from other countries, and through their knowledge of the conditions which sometimes exist in workshops and factories where women and girls are employed, they are convinced that it would be the part of wisdom at the present time to throw around female employes special legal protection against seduction by employers, superintendents and foremen, who, by reason of their power over them, may be in a position to unduly coerce them. We have, therefore, urged upon the

Premier and the Minister of Justice the desirability of enacting legislation, making it a criminal offence, punishable by severe penalties, for any employer, superintendent, overseer, foreman or other person exercising authority over a female employe to have illicit intercourse with such female employe, either with or without consent."

Mr. Mitchell declared that if the Minister founded his argument in favor of the Bill upon this report, then the Bill did not go far enough—that, in order to be consistent, the words "factory, mill or workshop" should be stricken out and the scope enlarged. If such protection was necessary for females associated in labor where they are grouped together in buildings, it should also be extended to all classes of female labor, because we know that if they require protection in factories, mills or workshops, they require it equally in wholesale and retail stores where they are grouped together by the dozen, throughout the mercantile centres of the land. They require it equally in the offices where lady type-writers are brought into close proximity with the people who employ them and who control them; they require it equally in telegraph offices where thirty or forty of them are grouped together under one or two gentlemen; they require it equally in telephone offices where the same conditions exist, and in the offices of the Civil Service, where females are employed, and who are under the control of the heads of Departments. Is not this protection also required in Public schools? There are many female servants employed in hotels—indeed, in every occupation where females are employed they require protection equally as much as they do in factories.

The proposed amendment was voted down, whereupon Mr. Mitchell moved another amendment, striking out such parts of the Bill as confined the operation of it to factories, mills and workshops, and changing the age of consent to twenty-one years instead of thirty. This amendment, said Mr. Mitchell, will include all classes of female labor, whether they are typewriters, shop-girls, telegraph-girls, telephone-girls, female clerks in the Civil Service, clerks in general employment and school-girls. If protection is needed for girls in workshops it is also needed for all these others. He did not approve of such legislation, but the House having adopted the principle—now that it had decided that protection to female employes is absolutely necessary—it should be made general, and give all working girls and school girls that protection. He declared that literary women are ten times as dependent upon their employers as women in factories—that the masses of these latter can find employment anywhere, while literary women and shop-women cannot. Mr. Blake showed that it has been established by statistics, carefully obtained in England, that the ranks of prostitution are recruited, not mainly, or even to any large extent, from factory girls, but out of all proportion from the ranks of domestic servants seduced by their employers. Mr. Tisdale, discussing the age of consent, said that according to our law, if a man or woman ever comes to the age of discretion, it is at twenty one years of age; and he strongly objected to anything being placed on the statute books which will have the effect of saying that the age of discretion for all purposes is not twenty-one years.

After considerable discussion all the proposed amendments were voted down, and the original Bill was read the third time and passed.

And thus closed one of the most remarkable episodes known to Canadian Legislation. In it we see a demand made by the Knights of Labor for a special law, not bearing alike on all employers of female labor, but only upon manufacturers, the violation of which is made a crime punishable by imprisonment for two years. In it we see the Minister of Justice yielding a quick and ready assent to this demand, framing his obnoxious Bill in the very words and language supplied to him by his dictators. In it we see that Minister using all the power and influence of his political position in forcing compliance with this dictatorial demand, refusing to enlarge the scope of his Bill as much as a hair's breadth, although it was shown to him that while such legislation could not but be pernicious in its operation, that other classes of females were quite as much in need of such protection. In it we see Ministers and Members acting in flagrant disregard of the rights and interests of manufacturers, while on other occasions they always seemed ready to stand up in their places and champion their other causes. In it we see Members who never professed any special interest in Canadian manufacturers as a class, but with a sense of justice painfully unobservable in the others, denouncing the Bill as an outrage, and doing all in their power to defeat it.

Canadian manufacturers do not object to all proper safeguards being thrown around female employes to protect them from the acts of evil men. They prefer that such safeguards should be thus extended; but they want the provisions of laws made for that purpose to extend to all places where female labor is employed; and they seriously object to their being singled out from all the different classes of employers of labor and alone subjected to the operations of the law. As was shown in the debate, the ranks of prostitution are not recruited from factories and workshops, but from other sources; and that the occupants of the 'gilded hells' reach them more through other occupations than that of factory girls.

If the Dominion Government think that the women of Canada are in need of more protection to their virtue than is now thrown around them by existing laws, it is their duty to afford them that protection. But in doing this that protection should be extended to all classes of women; and it is legislation of the most pernicious and objectionable character to single out only those who are employed in manufacturing establishments. This was clearly shown in the debate in the House of Commons, and the attention of the Minister was directed to the injustice to be done to the manufacturers by it; but the demand of the Minister was that the Bill should be passed, and it was passed. It is an insult to Canadian manufacturers that they are not likely to submit to without a vigorous protest.

#### CANADA IS INDEPENDENT.

In a recent issue of this journal we reproduced an item seen floating about in our exchanges to the effect that a Mr. J. B. Anderson, steel manufacturer of Guelph, Ont., had said that American steel manufacturers had completely "knocked out" the English in Canadian markets; and that this very fact was only one of the thousand things that are changing public opinion from England to America which would finally result in Annexation. We showed that the item was misleading in

that there was no steel manufacturer whatever in Guelph; and we expressed the opinion that American steel manufacturers were not "knocking out" the English in Canadian markets, nor was there any change going on in Canada looking to annexation to the United States.

We are in receipt of a letter from Mr. J. B. Armstrong, President of the J. B. Armstrong Manufacturing Company, of Guelph, in which he informs us that the item in question referred to him, and that it originated in a Pittsburgh, Penn. paper while he was visiting that city a few weeks ago. The newspaper had blundered in naming him "Anderson" instead of "Armstrong."

Mr. Armstrong's Company are engaged in the manufacture of all kinds of carriage furnishings, and are sole manufacturers of Armstrong's carriage springs, sleigh gears, wheels, etc., all, or nearly all of the products of the Company being protected by both Canadian and American patents, a line on their business card announcing "Steel goods tempered under the Armstrong process a specialty." These Guelph works are probably the largest and most important of the kind in Canada; and the Company have recently established extensive works at Flint, Mich. The excellence of these products is undoubted, and they are well and favorably known not only throughout Canada, where the business originated, and in the United States, where the Company are building up a very large trade, but also in Great Britain, Australia, New Zealand, Japan and China, where agencies are established.

In the Pittsburgh interview Mr. Armstrong is reported as having said: "As for Commercial Union with America, I think it would be a good thing for Canada, and even Annexation if possible. A few years ago the people were afraid to talk much about either, but now they discuss both questions freely. Sir John Macdonald is the strongest man the Tories have in the Government, and after he dies I really don't know what they will do for a leader. The trouble with Canada is that the country is large and they haven't the people. What are five million inhabitants anyhow? They need outside assistance and immigration." In alluding to this interview Mr. Armstrong informs us that the facts stated therein are correct, and that he stands by them. "We have made arrangements," says he, "for the purchase of our steel for our Canadian business in the United States at better rates than we could in Europe."

While we entertain the highest respect for Mr. Armstrong, and look upon him as one of the most valuable citizens of Canada, we cannot but differ with him with regard of the dependence of Canada upon the United States. Mr. Armstrong's Company hold the monopoly of exceedingly valuable patents, which makes it impossible for any other concern, either in Canada or the United States, to enter their particular field for manufacturing, or to compete with them in any way. Our Canadian laws are so framed that to enjoy the benefit of their patents in Canada they must manufacture their goods in Canada. There are no steel works in Canada which produce the qualities of steel they require, and they find that these materials can be had of more satisfactory quality, and at cheaper prices in the United States than in Great Britain or any where else, and for this reason they buy their Canadian supplies in American markets. When these supplies are

brought into Canada they are subjected to our tariff duty ; and for this reason the Company, to avoid the payment of this duty, have established branch works in the United States. No one but this Company can manufacture these special lines of goods in either Canada or the United States. To carry on their business economically they find it necessary to maintain works in both countries. But it is evident that if Commercial Union existed, or that "good thing" as Mr. Armstrong call; Annexation, there would be no necessity for maintaining one factory in Ontario and another in Michigan ; and as Mr. Armstrong speaks rather depreciatingly of Canada because she has but five million inhabitants as compared with over sixty million in the other country, the prediction would probably be not wide of the denouement to say that should Mr. Armstrong's wished for political change occur, the Ontario factory would be closed and the entire business concentrated in Flint, Michigan. There are few if any other Canadian manufacturers who have a monopoly in two countries of so good a thing as Mr. Armstrong ; and we feel safe in saying that there are very few if any Canadian manufacturers who at all sympathise with him in his political views.

Canada's National Policy does not contemplate any such contingency as Commercial Union with or Annexation to the United States. This policy has been on issue before the voters of Canada frequently as Mr. Armstrong knows, and on each and every occasion it has received an overwhelming endorsement. Why then does Mr. Armstrong declare that Commercial Union or Annexation would be a "good thing for Canada?" He places his biased opinion on this subject against the unbiased opinion of a large majority of Canadian voters. Why, pray, does Canada need "outside assistance?" Is a population of five million such a bagatelle, and are the people so hopeless and helpless as to require such assistance? The fact of Mr. Armstrong's success as a Canadian manufacturer contradicts the idea ; and the thousands of tall chimneys all over the land indicating the investment of immense capital and the employment of many thousands of Canadian workmen, is conclusive evidence that Canada is able to go it alone and entirely independent of the assistance of the United States. Sir John Macdonald is yet in the enjoyment of good health that promises yet many years of usefulness to Canada in supporting that glorious policy of which he is the father, but whenever our beloved chieftain shall cease from his labors, all true lovers of Canada may rest assured that his mantle will fall upon worthy and competent shoulders.

#### THE EFFECTS OF PROTECTION.

ACCORDING to Mr. J. B. Armstrong, the Americans can now not only compete with other nations in the point of cheapness in the manufacture of steel, but the quality is much better. Mr. Armstrong is President and Manager of the J. B. Armstrong Manufacturing Company of Guelph, Ont., with a factory also at Flint, Michigan. The concern are large consumers of certain qualities of steel in the manufacture of carriage and sleigh gears, wheels, axles, springs, etc. Mr. Armstrong's Canadian business was established in 1834, and the wealth and importance attained by that business indicates that Canada is a good place for such an enterprise. This con-

cern are proprietors of a valuable monopoly consisting of patents covering many of the details of their business ; and they established their American branch factory for the purpose of escaping the payment of duties upon their importations of steel consumed in the manufacture of goods intended for the American market.

The fact that this concern were forced to establish works in the United States because of the tariff, speaks much for Protection. They enjoy the exclusive benefit of the Canadian market, and all their products for that trade are manufactured at Guelph. They also enjoy the exclusive benefit of the American market, and all their products for their American trade are manufactured in Michigan. They established their factory in the United States because in manufacturing for that trade they could not afford to pay the Canadian duty upon their importations of steel materials to be worked up at Guelph, and then also pay the American duty upon their finished products when sent to that country. They have the monopoly of the markets of two countries, Canada and the United States, and they have to maintain a factory in each country wherefrom to supply the respective demands. Mr. Armstrong wants Canada to be annexed to the United States, but if that should occur there would be but one large market instead of two smaller ones, and there would be no necessity for the maintenance of but one factory ; and that in Canada would most probably be the one to be closed. Therefore, as far as this case in point is concerned, Annexation would be a good thing for the United States and a bad thing for Canada.

But why is it that this company cannot obtain Canadian-made steel for the purposes of their business? And why is it that they can obtain a better quality at a lower price in the United States than in Great Britain? They inform us that they purchase their steel for their Canadian business in the United States at better rates than they can obtain in Europe. The American duty is considerably higher than the Canadian duty ; and there is no discrimination in the Canadian duty as between American and European importations. Britain imposes no duty on steel, and Free Traders claim that the minimum of cost of production obtains in Britain under Free Trade : and they also claim that the duty invariably enhances the price to the extent of the duty. Now these contentions, which are entirely theoretical, are successfully contradicted by the facts as stated by one of the most successful and practical manufacturers in the country ; for we see that British steel, manufactured under Free Trade, is not the best made, nor is the cost of it the lowest ; and we also see that American steel, which is highly protected, is really the best made, and is cheaper than any similar steel made anywhere in Europe.

The acme of steel making in the United States was not reached in a day, nor by any spasmodic effort. The process in its earlier stages was slow, tedious and expensive ; and in addition to the disadvantages of an inferior product, higher cost and prevailing prejudices, it had to contend against the bitter hostility of British manufacturers who have always and systematically opposed and obstructed the development of competition elsewhere. Nothing, then, could have developed the industry in the United States but that wise policy of Protection, which has for so many years prevailed there, and under which it has grown, improved and strengthened into a robustness and

perfection that gives it its proud eminence of to-day, and this is why the Armstrong Company buy their steel in the United States rather than in Europe.

With such a policy prevailing in Canada as in the United States a similar result would ensue. But, unfortunately, our tariff never encouraged the steel industry. It is for revenue only; and until it is increased we can never expect to see steel works in Canada producing such qualities as the Armstrong people require; and this is why they do not buy their steel in Canada. The nation that manufactures steel for itself, prospers.

#### CANADA NEEDS STEEL RAIL MILLS.

A VERY generally credited rumor is to the effect that the Grand Trunk Railway Company and the Northern Pacific Railway Company will in conjunction build a railroad across Canadian territory from probably about Winnipeg to the Pacific, paralleling the Canadian Pacific Railway. A most important feature in connection with this new road would be the equipment of it with rails and other metals for making the roadway. The road would require probably 2,000 miles of rails, and there are no rail mills in Canada. The requirement of rails, etc., for such a length, at say 100 tons per mile, would be about 200,000 tons, which amount would give employment to several large steel producing plants for a considerable length of time. In the construction of the Canadian Pacific road, nearly all the rails were imported from Great Britain, but for some sections considerable quantities of American rails were used, the preference for these having been given because they could be delivered at desirable points cheaper than the English rails. The American duty on steel rails is \$17 a ton; yet in the face of this duty American rail mills could sell rails to the Canadian Pacific road cheaper than British rail mills could. There can never be any steel plants erected in Canada for the manufacture of rails as long as there is no duty imposed upon the article. It is contended by some that the railroad mileage of Canada is not large enough to support the steel rail industry, but this is, we think, a mistaken idea. There are now about 13,000 miles of railroads in operation in Canada, which means the use of about 1,300,000 tons of rails, and this mileage and quantity of rails is constantly being increased; and if the new trans-continental road here alluded to is built, the mileage would amount to at least 15,000 miles, and the rail requirement 1,500,000 tons. The deterioration of these rails amounts to probably ten per cent. per annum, which means that the regular yearly demand for new rails to maintain our railroads in serviceable condition calls for 150,000 tons of rails. If this proposed road is built within the next two years it means that the consumption of steel rails in Canada in that time will amount to considerably more than 300,000 tons, and a minimum consumption of 150,000 tons, thereafter. This means profitable investments of large capital, and the employment of large armies of workmen. These investments of capital and employment of labor begin in the earth from which the iron ore, fuel and fluxes are dug, extending to the furnaces where the ore is converted into iron, to the converters where the iron is made into steel ingots, to the mills where the ingots are made into rails, and to the railroads that do the hauling of this immense traffic.

Will Canada enjoy all the benefit of this industrial boom? Not much. These large quantities of rails will be made in some other country than Canada, and all of the benefit any Canadian investment will receive out of it, will be the hauling of the importations from their ports of entry to destination. Why? Because the wise men of Canada have never considered it to the interest of Canada to have the steel rail industry built up in Canada. Is Canada able to support such an industry? In the United States, or Great Britain, or Belgium, a guarantee of a steady minimum demand of 150,000 tons of rails a year would be considered the strongest sort of an inducement. There are about 150,000 miles of railroads in operation in the United States—ten times the mileage of Canada, and there are about twenty plants there engaged in manufacturing steel rails. This is about one plant to each seven or eight thousand miles of railroad; but Canada with 15,000 miles of railroads has not got any steel rail plant at all.

Nor will she ever have unless the industry is protected. When the United States determined to become a country of railroads, foreseeing that there would be an enormous demand for steel rails, and that there were no steel rail plants there, a large duty was imposed upon foreign rails, which were at that time worth about \$160 a ton there. Under this protection many rail plants immediately sprang into existence, and now, contrary to all Free Trade arguments, the price of steel rails in the United States, manufactured under a protective duty of \$17 a ton, are as cheap as steel rails manufactured in Great Britain, where there is no protection. In fact, as we have shown, thousands of tons of steel rails now in use on the Canadian Pacific railroad were bought in the United States.

There is no more favorable country in the world for the manufacture of steel rails than Canada. Canadian iron mine owners tell us that Bessemer ores in abundance can be produced at a profit at \$1 a ton, while American consumers have to pay from \$6 to \$7 a ton for similar ores at Cleveland. All the coke used in the immense steel plants in Chicago is hauled from Connellsville, Pennsylvania; and the distance from the ovens there to Toronto is less than it is to Chicago. There is no element that would enter into the cost of production of steel rails at Toronto that would exceed in cost that obtaining at Chicago. Why is it that the Canadian Government cannot see the necessity of having steel plants in Canada? With such a duty as exists in the United States we would soon be able to make all our own rails. The nation that manufactures steel rails for itself, prospers.

#### SPREAD THE LIGHT.

THIS journal has frequently called the attention of Canadian manufacturers, and of all who approve of the National Policy of tariff protection to Canadian industries, to the necessity of publishing and disseminating among all the voting classes of the Dominion such literature as will enlighten and strengthen them in that theory of government. This is a perfectly fair and legitimate mode of extending knowledge on a given topic, and one that is practised to a much greater extent in some other countries than it is in Canada. In Great Britain, pending the efforts that were being made to repeal the Corn Laws,

the Cobden Club, of which Mr. Richard Cobden was the life and spirit, was particularly active in disseminating its views by means of printed matter, in which all the strong arguments of the party with which the club was affiliated were set forth in the form of short and tersely written pamphlets and tracts; and it is to be noticed that, although Mr. Cobden has long since passed away, the Cobden Club still exists, and is as active as ever in promulgating Free Trade views. This club is maintained at large expense chiefly by British manufacturers and their political sympathizers; and they spend hundreds of thousands of pounds in directions where it will "do the most good" in endeavoring to convince the world that Great Britain should be the destination of all the raw material produced in the world, and the source of all products manufactured from them. There is no doubt that the Cobden Club, whose headquarters are in London, have spent probably millions of dollars in trying to influence elections and legislation in the United States; and it is known that many of the anti-Protection politicians of that country, including ex-President Cleveland, are members of that club. This same influence is as surely at work in Canada, and the effects of that work are constantly seen in the inspired speeches of members of Parliament and the editorial utterances of the Opposition Press, where all phases of the question are discussed, ranging from the soft and seductive phrases of the more polished and courteous to the brusque and brutal fulminations of the other extreme.

In Britain the opposition to Free Trade is developing into a strong organization which sends out accomplished orators and popular speakers into all doubtful constituencies, who show the inconsistencies of the policy that has for so many years held undisputed sway in that country, and who explain how much the laboring classes of all conditions are being oppressed by that policy, and how much they would be benefited by a change of the Government's fiscal policy. It costs time, brains and money in Britain to contend against the Free Trade sentiment prevailing there, but the promoters of the antagonizing policy consider that these expenditures are well invested, and they are gratified at the returns, although they show that but little headway as yet is being made in their favor. They understand that if Protection is a good thing, and they think it will be when they get it, it can only be attained at the cost of these expenditures, and they very consistently contribute whatever may be necessary to attain it. In addition to sending out their orators and popular speakers, they have established a literary bureau, and are publishing a large variety of tracts, bearing on all phases of the subject, and which appeal to all classes of voters, all with a view to educating the voting masses in the desired direction.

So, too, in the United States, and it is probable that this method of disseminating political arguments is better systematized there than in any other country. There are a number of clubs and associations organized, for this special purpose, and their methods are so well organized, and so complete in every detail, that, pending a general election there, there is no Congressional District in any State in which the approximate number of voters is not known, and the classes of employments in which they are engaged. This information is of the greatest importance, for in the distribution of literature there is no unnecessary waste, as would occur if reading matter

specially intended for people engaged in manufacturing industries was supplied to agriculturists, or *vice versa*. This literature is written by the best and ablest political writers of the country, and the subjects discussed are viewed from every available standpoint; and it is printed in different languages, so as the more readily to reach the comprehension of those for whom it is intended. Of course all this costs money, and that in no stinted supply; but it is understood that without these bureaux of information but little headway could be made in a political canvas; and that if a cause is worth contending for the contention must be paid for.

We know that similar organizations are at work in Canada, but, unfortunately, not in the interest of our National Policy. There is every reason for believing that the Cobden Club is quite as active in promulgating their political arguments in Canada as they are in the United States; and that money is spent freely for this purpose. We know that the opponents of the N.P. are organized, and are educating orators and speakers to go upon the hustings to use their persuasive powers to dislodge the existing Government and return the Opposition to power whenever an election occurs. We know that extracts from speeches of members of the Dominion Parliament, and the letters and addresses of leading men, both of this country and the United States, are being prepared for use whenever the occasion may arise; and that this literature, served in a great variety of style, is being made ready to be spread broadcast throughout the land. It is legitimate political warfare, but the perniciousness of it is exceedingly great.

We regret that the advocates of tariff protection to Canadian industries are not up and doing something of the kind themselves. But they are not at work. They are seemingly in a happy go lucky mood that promises no good to them. They may do something by-and-by when the emergency presses hard upon them, but at present they are, Sampson like, dallying in the bowers of contentment, confident that their strength will be sufficient for the contest whenever it may come, oblivious to the fact that a treacherous Delilah opposition is shearing them of their strength, and that when the cry is made, "Behold the Philistines of Free Trade be upon thee," they will be led away captives to their conquerors. It will not then avail them in the least that in the downfall of Canada's industrial greatness they are engulfed with their foes. The destruction will be complete.

It is but too evident that a great necessity of Canadian manufacturers is a thorough and complete organization of a literary bureau, with all necessary adjuncts thereto, by and through which the voting population of the Dominion may be kept supplied with tariff arguments, and answers to the pernicious literature that the Opposition are now so assiduously distributing. The harvest is ripe, but there are no workers in it.

THE Minister of Injustice, in complying with the silly demands of the Knights of Labor, has not done anything that will benefit them. Actuated by a desire to have a whack at the manufacturers, the Knights forced the Minister to make a spiteful, silly and mischievous law which will not benefit them any more than it will injure the manufacturers. Why should the Minister alienate the respect of a respectable element for the sake of obtaining the beslobberment of the Knights of Labor?

## WHAT THE BRITISH WORKMAN WANTS.

ACCORDING to Mr. H. H. Champion, in the *Nineteenth Century*, what the British workman really needs to better his condition is protection from outside labor competition. He adduces as evidence, the fact that when some months ago the journeymen bakers obtained a reduction in the hours of work, and the masters, to recoup themselves, put a halfpenny on the price of the loaf, there went up no shriek from the Cobden Club, no cry that the sanctity of cheap bread was being violated, nor was there heard any outcry from the slums of London. If it is argued that the conditions under which the baker worked were inhuman, then the state of the agricultural laborer is much the same. Therefore, if you protect the baker why not the agricultural laborer? But the workmen are consumers. Ah! "But," says Mr. Champion, "they are so only to a small extent. They consume very little, and produce a great deal. But I will answer for them that, as consumers, they will cheerfully pay a halfpenny more for their loaves if they are thereby relieved of competition, as producers, so that they can get two shillings more wages a week." The great majority of people think that Free Trade is an excellent thing—for other people; but they invariably have a liking for a little Protection on their own account.

The *Manufacturer*, of London, discussing the overcrowding of the British labor market with the pauper labor of other countries, says: "If any one wants an argument against Free Trade, they will find one ready to their hand by reading the last Parliamentary return of emigration and immigration from and to this country. Let any shrewd observer go to any of our large ports—say Liverpool—and notice the number of splendid fellows leaving this country, because it is no longer able to support them. The wanderers are all able-bodied men of excellent physique, and generally cultivated intelligence. Now go to one of the ports where the vessels from the Continent put in, and notice what is going on there. You will see ship after ship landing droves of wretched, wholly destitute, emaciated, filthily dirty Poles, German Jews, and the residuum population of the worst Continental cities. These creatures, driven out of their own country by the prospect of gradual starvation, come here and find their way into our large centres of trade; they filter down until they are to be found dotted all about our towns and cities. In Glasgow, Birmingham, Liverpool and other places they abound; and the most significant sign—as it is the most depressing—is to be found in the colony of Polish Jews in the East End of London. These people are gradually absorbing the very vitals of the country which befriends them; they work for wages upon which it is absolutely impossible for them to live decently; and the sanitary inspector is the best witness as to their unhealthy modes of life. Observe: in one direction we are yearly sending forth our best blood which goes to help our various colonies; in another, we are daily injecting the very poorest material into our veins. We may be proud of our Colonies, but the process cannot endure indefinitely. No less than eleven million acres of good land are now out of cultivation, which formerly yielded fair returns, and the agricultural laborer crowds into our already congested towns, augmenting the ranks of the unskilled workers to a still further extent. These are grave questions, and we do not find them handled in

the serious way they deserve; nay, it is becoming every day more convenient to ignore hard and unpleasant facts."

## EDITORIAL NOTES.

THE nation that manufactures steel for carriage goods, springs, etc., for itself, prospers.

UNSTINTED and vulgar abuse of Canada's National Policy of Protection to Canadian manufacturing industries and of Canadian manufacturers is not accepted as arguments against the one or as the proper treatment by legislators of a class that has made Canada what she is to-day.

NOBILITY of character and a burning love for British justice are painfully absent from Parliamentary debates when participants shield themselves behind their prerogative as Members of the House of Commons when using language about Canadian manufacturers that they would not speak with equal distinctness to their faces on the public streets.

THE CANADIAN MANUFACTURER was the only paper in Canada that published in full, from the official reports, the tariff budget as brought down to the Dominion House of Commons by Finance Minister Foster. Some of the daily papers made an effort in that direction, but emasculated it to greater or less extent; and no trade paper than this attempted it. The importance of the information is unquestioned; and our issue containing it in full is specially valuable on that account.

AT the meeting of Maritime Stove Founders' Association, held in Halifax, N.S., April 2nd, the foundries represented were those of Sackville, N.B.; Yarmouth, Windsor, Amherst, Londonderry, Halifax and Berwick, N.S. Matters connected with the trade were generally discussed, and it was agreed to advance the price of stoves seven and a half per cent. D. W. Robb, of Amherst, was elected President; F. H. Wilson, Yarmouth, Vice-President; Charles Fawcett, Sackville, N.B., Treasurer; S. S. Kirkpatrick, Sackville, N.B., Secretary.

SHAKESPEARE suggested that the thief who stole a purse might obtain nothing but trash, but that he who stole another's good name took that which could not enrich him, but would make the loser "poor indeed." In the amendment to the criminal law the Minister of Injustice seems to have had in view the robbery from the manufacturers of their "good name," in that he positively refused to consent to have the law operate on any other class of employers of female labor. The Knights of Labor demanded that it should read that way, and they got what they wanted.

ONE of the effects of the proposed changes in the tariff would be to force importers of brandy in glass to pay duty on a quart where the bottle was supposed to hold a quart, instead of upon the actual contents. It is well known that bottles in which such liquors are usually imported contain only one-sixth of a gallon each instead of one-fourth; but when the consumer buys the bottle he is told that it contains a quart, and has to

pay accordingly. The proposed change was a good one, as it would afford some protection to the consumer, but the importers seem to have persuaded the Minister to let the duty remain as it was.

AMONG the exports to the United States from Sherbrooke, Que., during the quarter ending with March 31, 1890 were

Asbestos, tons, 710½, value.....	\$56,116
Hemlock bark, cords, 405, value.....	2,355
Spruce gum, pounds, 1,956, value.....	1,294
Lime, bushels, 28,200, value.....	5,772
Lumber, value.....	120,876
Wood pulp, pounds, 540,000, value.....	13,500

The total value of all exports aggregated \$213,022 against \$177,278 during the corresponding quarter of last year.

OPPONENTS of tariff protection are publishing a pamphlet containing extracts from speeches of Mr. Erastus Wiman on the subject of "Unrestricted Reciprocity" between Canada and the United States, 50,000 copies of which are to be sent free to farmers in all parts of the Dominion, the names being selected by Opposition members of Parliament at Ottawa, from the list of voters in their constituencies. What are the adherents of the N.P. doing in this direction? The Opposition are exceedingly active in disseminating their political heresies broadcast throughout the land, while the supporters of the Government are doing—nothing.

It is well known that large and valuable deposits of peat exist in many parts of Canada, particularly in the Province of Quebec. According to the Sherbrooke, Que. *Gazette*, Mr. D. Aikman, of Montreal, has perfected an apparatus for carbonizing peat, manufacturing it into fuel at a cost of about fifty cents a ton. Already American capitalists have organized a company at Sherbrooke for the purpose of engaging in this business, and another company is being formed at Montreal. "As this carbonized peat," says the *Gazette*, "is especially valuable for smelting iron, of which large deposits are known to exist in this locality, the importance of this discovery cannot be overestimated."

A CITIZEN of Richmond purchased three tubs of good butter at eleven cents per pound from a Montreal commission merchant on Monday. The market is glutted with good butter and prices are one hundred per cent. less than those promised by the politicians who were to create a "home market" as an offset to the protection so freely given to a favored few manufacturers.—*Richmond, Que. Times*.

THE *Times* when it has nothing to say should keep quiet; but being inclined to open its mouth incontinently puts its hind foot into it. Will the *Times* inform us how eleven cents a pound for butter can be one hundred per cent. less than any price promised by politicians or anyone else. Take pencil and paper and figure it out.

THE *Empire*, speaking of the distribution of Mr. Wiman's speeches on Unrestricted Reciprocity to the farmers of Canada, calls it a part of a "plot" to annex Canada to the United States. Perhaps it is, but it is in itself fair and legitimate political warfare against the other party. If it were not, then the Conservative party would engage in a "plot" also if they published literature antagonizing the Wiman fad, as they should do. One way for the patriotic loyal men of Canada to be on their guard against any organized efforts to surrender

their country to a political enemy or a foreign power, is to themselves make organized efforts to protect their country from such disasters. The way to do this is—to do it—not to howl and growl at the other fellows.

THE rapid increase in the wealth, business and prosperity of the United States during the last ten years is simply marvellous. The total wealth of the country is now \$71,459,000,000, equal to nearly \$1,000 per head. This is an increase in ten years of \$18,000,000,000 or forty-two per cent. England's wealth in 1885 is given as \$50,000,000,000, giving an average wealth per head of \$1,545. The average in Scotland is \$1,215 per head, and in Ireland \$565. The total wealth of France is estimated at \$36,000,000,000. England exacts in taxes \$20 per head of population, while each individual in the United States pays but \$12.50. America will produce 9,000,000 tons of iron this year, while England's greatest production is 8,600,000 tons.—*New York Commercial*.

The United States attained this marvellous prosperity under Protection, which will acquire the same result for Canada.

A FEW days ago, according to a telegram in the *Empire* from Ottawa, a return was brought down to the House of Commons showing that during the past three years fifty reapers and 136 mowers had been exported from Canada. The entire unreliability of this "return" is shown in a note to the *Empire* from the Massey Manufacturing Company of this city, in which they say that that Company alone last year exported over 1,500 machines, saying nothing of their large shipments in previous years. It was recently shown in these pages that the foreign shipments from the town of Brantford, Ont., last year, nearly all of which were agricultural implements, were valued at nearly \$4,000,000. The man whose duty it is to "bring down" returns to the Dominion Parliament ought to post himself by reading this journal.

ANY ship sailing under a British register and flying the British flag can come into Canadian waters and freely engage in Canadian coastwise or lake traffic, without the payment of any fee or license more than any Canadian ship would be subjected to. But if a Canadian invests his money in that ship, and, surrendering his British register, takes out a Canadian register, his ship is liable to a duty. It may be that under existing laws there is no remedy for the anomaly; but what Canada needs and must have is the entire control of her Maritime interests. No foreign vessel can engage in the coastwise or lake trade of the United States; and Canada should be in a position to make and enforce a similar condition. Canada can subject British goods to the payment of tariff duties, but she can not prevent British ships from engaging in her inter-provincial trade.

THE tonnage of vessels passing through the Sault Ste. Marie Canal is remarkable, and as compared with that passing through the Suez Canal, phenomenal. In 1888, the tonnage passing through the Sault was 5,130,659 tons against 7,221,935 tons in 1889: while that passing through the Suez in the former year was 6,640,834 tons against 6,783,187 tons in the latter. Passage through the Sault is possible during only about six months in the year, while the Suez is open for traffic all the time. The traffic through the Suez is open for the ships of all nations, while that of the Sault is confined chiefly to American vessels, the exception being only in favor of a small percentage

of Canadian vessels. The fact that nearly 10,000 vessels passed through the Sault in 1889 shows the extent of a part only of the American lake trade. The increase of tonnage passing through the Suez in 1889 was only two per cent. over that of the previous year; while the increase as regards the Sault in the same time was forty-one per cent.

THE mileage of all the railroads in Canada having traffic connections with American roads is as follows:

Canadian Pacific Railway	4,813 miles.
Grand Trunk Railway	3,127 "
Canada Southern	385 "
Canada Atlantic Railway	128 "
Intercolonial Railway	905 "
Quebec Central Railroad	161 "
Central Ontario Railway	104 "
Central Vermont Railroad	66 "
Northern Pacific & Manitoba Railway	67 "
New Brunswick Railway	412 "
Total	10,168 miles.

The total mileage of railroads in operation in Canada on January 1, 1889, was 12,163 miles; and it will be seen by the above table that all but 1,995 miles of all the railroads in Canada have direct traffic connections with American roads. It might be said also that these 1,995 miles of Canadian roads are connected with the other Canadian roads which have American connection.

THE following is a statement of merchandise exported from Canada during March, 1890:

Produce of the mine	\$277,883
Produce of the fisheries	330,765
Produce of the forest	433,663
Animals and their produce	796,057
Agricultural products	942,745
Manufactures	461,230
Miscellaneous articles	36,838
Coin and bullion	30,000
Grand total	\$3,309,181

Included in the foregoing are goods not the produce of Canada, valued at \$239,480. The importations for home consumption in March were valued at \$8,783,219, and the duty collected \$2,046,837. Compared with the corresponding month last year both imports and exports show a falling off, the decrease in exports being due to the fact that over \$1,000,000 worth of bullion passed through Canada. The exports for the nine months of the current fiscal year reach the total of \$73,208,731 as compared with \$65,541,095 in the previous year, showing the grand increase of \$7,667,636. The value of the imports was \$82,552,887 as against \$72,246,110, or an increase of \$10,306,777. The duty collected amounts to \$17,494,499, as against \$17,151,007 last year.

KEY WEST, Fla., turns out 700,000,000 cigars yearly. It pays \$5,000,000 in wages and supports 25,000 people. Why cannot Wilmington manufacture cigars as well as Key West? Here is another industry that might be developed if the Radical tariff does not kill the prospects.—*Wilmington N.C. Messenger.*

This item is the outcome of the densest ignorance supplemented by the grossest prejudice, and reminds forcibly of the similar arguments (?) advanced by Canadian Free Traders. Key West is only a few hours sail from the Island of Cuba, and, until the manufacture of cigars was begun there, was only an insignificant and unimportant Florida settlement. The

American duty on imported cigars is heavy, but upon unmanufactured tobacco it is quite light. To evade the heavier duty the manufacture of cigars from Cuba tobacco was begun some years ago at Key West, and the business has assumed very large and valuable proportions, as is shown in the item above quoted. About all the employes engaged in this business are Cubans; and it is plain that in this instance alone the American tariff is to be credited with having increased the population of the United States 25,000 people who earn \$5,000,000 in wages annually. Wilmington N.C., is well adapted by natural and commercial advantages to become an important point for the manufacture of cigars from Cuban tobacco, but there are those there who to some extent control the destiny of the place, who would rather see the old town continue in the condition of stagnation that has always characterized it, and enjoy the privilege of denouncing Protection, than to see it prosper as Key West has done and is doing under that benign influence.

If the rich Protectionists will be as zealous for the diffusion of reliable statistics as the rich Free Traders are in the dissemination of false figures the American farmer would know certain things to be true before he votes at the next Presidential election. He will know that American railways carry his crops at a less cost per ton per mile than British railways carry the crops of British farmers. He will know that he buys his farm implements at a less cost than the British farmer buys his. He will know that his shoes cost less than those of the British farmer; that his shirtings and calicoes often cost less than the tariff duty upon them, and never more than like qualities of goods are sold for in Europe. He will know that such woolen clothing as he generally wears is as cheap in Chicago as it is in Liverpool. And he will know that the beet root industry will diversify his products and increase his income.—*Chicago Inter Ocean.*

Why can't Canadian Protectionists take this suggestion to themselves? The facts as applied to American Protectionists commend themselves with equal force and importance to Canadian Protectionists. These latter gentlemen stand supinely by, even at this time when an election is pending for members of the Ontario Legislature, and see it going by default in favor of a party that, in Dominion affairs is avowedly declared as hostile to our Canadian National Policy. There is no good reason why the Conservatives should not win the day in the approaching Provincial election, but the Protectionists of Ontario do not seem to be alive or awake to the importance of transferring the government of the Province to the party whose accord with the Conservatives of Canada, as represented in the Dominion Government, would make assurance doubly assured in the perpetuation of Protection to Canadian manufacturing industries.

So far as the Brantford manufacturers are concerned, we feel convinced they are quite confident of holding their own in any fair competition with the Americans. They are doing so to day in markets thousands of miles away, and why need they fear competition nearer home? Most of them would be quite content to return to the old tariff, or, for that matter, to go in for unrestricted reciprocity.—*Brantford Expositor.*

The same remarks hold good of progressive London Manufacturers. At present the great drawback to success in manufacturing lies in the heavy taxes on raw material and the altogether unnecessary duty on coal.—*London Advertiser.*

It is a fact that Canadian Manufacturers, especially of agricultural implements and farm machinery, hold their own

in competition with American manufacturers "in markets thousands of miles away," say in Australia; and the same may also be said of manufacturers of organs, pianos, wheel vehicles and other specialties. But our Brantford and London contemporaries should not be blind to the fact that while the competition may be equal in Australia, where these industries do not exist, it would not be fair to Canadian manufacturers in the United States, where these industries now occupy the home market to the exclusion of all foreign importations. It is doubted that any Canadian manufacturers would be willing to "return to the old tariff," or to go in for "unrestricted reciprocity." It was at their demand that the "old tariff" was abandoned, else they would never have been able to compete with the American manufacturers in Australia; and as to the "heavy taxes on raw materials," they know they are allowed a drawback on whatever duties they may pay on imported materials entering into the construction of products which they ship to foreign countries.

VICE-PRESIDENT HOLMES, of the Saginaw Steamship Company, of New York, says the company is building two steamers of steel which will likely run from the port of Baltimore with coal. Work on the hulls is being done at Bay City, on Lake Michigan, and on the machinery at Detroit. The ships will be completed at Bay City, and will have double steel bottoms, water ballast, and fitted with hoisting machinery, steam windlasses, steam steering gear, steam capstans, steel masts and deck-houses. They will be 3,500 tons capacity each, 270 feet long and 285 feet over all; 41 feet 6 inches beam, 25 feet 6 inches hold. The fact that all the large steel-boat builders are crowded with work makes necessary the building of these steamers on the lakes. F. W. Wheeler & Co. are the builders, though their shipyard is now, Mr. Holmes says, in possession of an English syndicate. When the steamers are finished, the first of which the *Mackinaw*, is to be delivered on July 15th and the second, which is to be called the *Keweenaw*, a few weeks later, they will steam down to Buffalo, where they will be cut in two so as to permit their passage through the locks of the Welland canal. When the two sections of a steamer reach Montreal they will be re-riveted together, and under their own steam go on their various courses. When the steamers are cut in half the break will be made just forward of the boilers. If the experiment proves satisfactory other steamers will be built by the company. The two now under way will be used in the coast trade, and it is expected by the company that they will do considerable coal carrying business from the port of Baltimore.—*Bulletin*.

If any Canadian desires to have a so called Canadian built steamer, it can only be by sending abroad for the different parts, assembling them in some building yard, and riveting them together. Why? Because the N. P. does not sufficiently encourage the establishment of Canadian works for the manufacture of ore into iron, of iron into steel, of steel into sheets, bars and angles, and the conversion of these materials into shapes for shipbuilding. In this respect our N. P. is n. g.

RECENTLY in discussing the Administrative Tariff Bill passed by the American Congress, the New York *Evening Post* said:—

"The brutal McKinley administrative Bill has so angered the French people that it is doubtful whether any kind of tariff we might adopt on works of art would have any mollifying influence."

A salient feature of this Bill is to suppress and prevent frauds upon the customs, and the Bill is clearly in the interest of honesty and justice. But it was to be expected that the opponents of the tariff would denounce it; and such denuncia-

tions as that above quoted, reminds strongly of similar denunciations hurled at Canadian laws passed for like purposes by Canadian papers opposed to our tariff. Our Philadelphia contemporary, *The Manufacturer*, however, becomes indignant at the idea of the American people caring a snap of the fingers whether other people like their laws or not, and expresses itself as follows:—

"But when did it become the practice of this nation to shape its fiscal legislation with respect to its possible effect upon the feelings of Europeans? Of what use is it to consider whether Frenchmen shall laugh or cry over an American tariff? And what difference does it make to us if every inhabitant of France and of Europe regards the proposed law with anger? France makes her tariffs to suit herself, and she has actually imposed prohibitory duties upon many articles (quinine, for example), the domestic manufacture of which she desired especially to encourage. We may not have liked some of the clauses in her tariff, but we fully recognize her right to do as she pleases in such a matter, and we intend to do as we please. The Administrative Tariff Bill is intended to prevent Frenchmen and other foreigners from cheating us out of customs duties. It menaces no honest man's business. The Free-Traders notion is that if a Frenchman gets angry with us he will not buy from us; but Frenchmen are just like other people in their propensity to buy where they can get the best bargains. They are not such fools as to let their anger close their eyes to the advantages we offer in certain of our commodities; nor are they such fools as to buy of us upon the ground that they have a special affection for us if our commodities are dearer than those of other people. An American Free Trader (being much more European than American in sentiment) is always fretting himself lest Europeans may not think well of us but the mass of Americans are absolutely indifferent as to what Europeans think of them.

THE CANADIAN MANUFACTURER was so delighted with the action of the Government in piling on another half million of dollars or so of new taxes that it presented its readers with a picture. The most conspicuous object in it is a sort of mound, resembling a piece of the justly celebrated "Dome Black Lead," and marked "profits." Elsewhere this object is stated to be a pie. Two boys, wearing a lean and hungry look are stationed near the pie. Labels on their hats inform us that they are a Canadian farmer and a Canadian mechanic. The mechanic who is evidently accustomed to carving in stone, has succeeded in chiselling off two pieces of the pie. They have a mottled appearance like pudding stone. The Canadian mechanic's face wears an expression of anguish and discouragement. His portion of the pie is wedged in between his jaws, but he has made no impression on it. The Canadian farmer holds his unscathed pie in his right hand. He has evidently abandoned the attempt to eat it, and is watching the mechanic's struggles with a pitying smile. The wall which prevents these lads from escaping is marked National Policy. Over the wall three long-nosed men are watching the boys. As there are no labels on their hats we are left to conjecture that they are highly-protected manufacturers, who suspect that the good-natured looking girl marked Canada has, contrary to orders, inserted some edible substance into the pie. We hope THE MANUFACTURER will publish some more pictures.—*Toronto Globe*.

The *Globe* has been studying our object lesson, but it is plain it has not "caught on" to the spirit of it. It has not viewed the beauties of our allegorical picture from the right side of the fence, and evidently it is a case of sour grapes. If the *Globe* would stand on the hither side of the National Policy wall, it would observe that the "profits" the Canadian boys are enjoying are not a dome of lead at all, but really what we represented it to be, the fruits of a bounteous system that enriches Canada and that fills the stomachs of the hungry, and houses, clothes

and warms those who would otherwise be out in the cold. "The boys enjoy it" as the legend to our picture indicates, and the beautiful maiden, representing our glorious Dominion, is happy in seeing the boys happy. Indeed she is so much gratified with the result of the policy that keeps the long-nosed men away from them that she is seen in the act of crowning these boys with wreaths of May-day flowers as an additional reward for assisting in keeping up the N.P. wall. Then the *Globe* is mistaken in supposing that the long-nosed men are highly protected Canadian manufacturers. Do they look like such Canadian manufacturers as those whose likenesses were displayed in these pages some months ago? Not much they don't. Canadian manufacturers don't wear such looks—nor such hats. As we remark, the *Globe* don't view this picture from the Canadian standpoint. It views it from the thither side of the N.P. wall; and it is evident that all its sympathies are with that element represented by the long-nosed men. The *Globe's* sympathies are not with Canada nor Canadians, but with the long-nosed manufacturers elsewhere than in Canada, hence the sour grapes. The profits of Protection may be "dome lead" and exceedingly distasteful and indigestible to the *Globe* and these foreign manufacturers, but as we before remarked, the Canadian boys enjoy it. We will publish more pictures soon for the benefit of the *Globe*.

## SPECIAL ADVERTISEMENTS.

Advertisements will be accepted for this location at the rate of two cents a word for the first insertion, and one cent for each subsequent insertion.

**TISDALE'S BRANTFORD IRON STABLE FITTINGS.**—We lose no job we can figure upon. Catalogue sent free. The B. G. Tisdale Co., Brantford, Canada.

**A DYER**—Blue vats and fancy colors in wool and piece. Fast carriage green cloths, tricots, flannels, etc., etc. Am at present engaged in the States, but desirous of coming to Canada. Address, GUBELINUS, this paper.

**FOR SALE.**—In town east of Toronto, Two Set Woolen Mill fully equipped and in good running order; never-failing water-power, main building stone, 50x150 feet, three stories; picker house, brick, 24x30, two stories; railway and water convenient for shipping, will sell with or without machinery. For further particulars, address this office.

**FACTORY TO LET.**—Ten years lease; containing about 11,000 feet of floor space, fitted up complete with engine, boilers, shafting, steam heating, gas light and water service fixtures throughout; adjoining building can be had if desired; five floors, each 30x110, with hoist. Apply to Samuel May & Co., 111 Adelaide Street west, Toronto.

**FOR SALE** in Kent County, Michigan, the Buchanan Mill property consisting of a first class lumbering mill the extensive water power in connection with it including the entire power furnished by the river with real estate on both sides of sixteen acres, situate one mile from Main Street of Lowell, a

rich farming country surrounding an excellent location for paper mill, furniture factory, woolen mill and the many uses that require power. Also a splendid home and farm of 87½ acres with buildings, fruit, evergreens etc. For further information call at the premises of JAS. R. BUCHANAN, Lowell, Michigan.

*Santa Claus*, that bright and entertaining juvenile magazine, is printing a series of articles about Columbus, that in the current number relating to the boyhood of the great discoverer. Of course we are all interested in anything concerning C.C., and we wish him well, though we fear he will have a rough time of it when Chicago gets hold of him a couple of years hence. *Santa Claus* is published weekly at 1,113 Market Street, Philadelphia, at \$2 a year.

*Our Little Ones*, that elegant monthly magazine published by the Russell Publishing Company, Boston, Mass., comes to us this month smelling of May flowers and bright with happy thoughts for the little folks. There are a large number of articles relating to different subjects, each one of which cannot but be of wonderful interest to the small people, and every one of which is beautifully illustrated. Every family where there are wee ones should have this magazine, the price of which is only \$1.50 a year.

MR. ROBERT BARBER, Inspector of Factories of the Western District of Ontario, has sent us the Second Annual Report of the Inspectors' of Factories for the Province of Ontario for 1889. These reports possess much interest for manufacturers, and should be attentively read by them. They are written with much care, indicating that the inspectors are conscientiously discharging their duties, and that good is resulting from their appointment. These reports can be had free on application to Mr. Charles Drury, Minister of Agriculture, Toronto.

THIS is about the time of the year the dweller in the large city turns his attention to dreams of a cottage in the country. Women whose thoughts are meandering in this pleasant channel would do well to read the article in the *Illustrated American* on the "House That Jill Built," and carefully study the ground plans and interior decorations which illustrates it. It was, by the way, after Jack had tried to build his country house and failed that Jill built this one. The *Illustrated American* is one of the most elegant publications issued in any country. It is for sale at all book and news' stands. Published weekly by the Illustrated American Publishing Company Bible House, New York City; \$10 a year.

WE are under obligations to Mr. Edward A. Moseley, Secretary, Washington, D.C., for the Third Annual Report of the Interstate Commerce Commission of the United States. This book possesses much interest to Canadians in that the matter of Canadian railroads, particularly the Canadian Pacific, and their effect upon American roads, is exhaustively examined and discussed; and the matter of Canadian canals and the privileges of conveyance to American carriers through them is also alluded to. Reference to the index shows that allusions to Canadian roads and canals, etc., occupy a very considerable portion of the book, showing the importance of those institutions and their influence upon American interstate traffic.

*Good Housekeeping* closes its tenth volume with the number for April 26th, and the publishers may not only congratulate themselves over the success attained and the national standing of the magazine, but that this success and standing have been won by the public recognition of the merits of the publication. There are in this issue the usual papers regarding the house and its care, but they are never commonplace or hackneyed, largely because a great many skillful writers are employed to give variety and zest to the topics treated. All the departments of the magazine are complete and attractive, and every family ought at least to inspect a sample copy, which will be sent on application by Clark W. Bryan & Co., Publishers, Springfield, Mass.

MESSRS. GAST & ATCHISON, Toronto, have sent us a pamphlet relating to "The Uses of Mineral Wool in Architecture, Car Building and Steam Engineering." A chapter is devoted to explaining what mineral wool is and how it is manufactured; another to explaining its properties in protecting against frost, for fire proofing, for insulation of sound and protection against vermin; another to describing some of the uses to which it is put, as in packing houses, cold storage, breweries, tanneries, hospitals, school houses, public halls, etc., and another describes the mode of application in all the different uses to which it is put. Instructions are given how to estimate for the desired quantity for different purposes. Reference is also made to the improved mineral wool sectional covering

for steam pipes and boilers; and there are a large number of letters from persons who have used this covering attesting its merits.

YACHTSMEN owe much to Mr. F. C. Sunichrast for the interest he displays in noting the record of every British yacht of mark, and *Outing* deserves credit for keeping them in touch with this important section of aquatic life. Mr. Sunichrast's second paper of the year in *Outing* for the current month on "Yacht Racing in Great Britain in 1889," has illustrations by Cozzen's of five of the English flyers. An interesting feature of aquatic life to Canadians is canoeing, and what canoeists does not want to know the last, most and best he can learn on the great questions of his immediate future—"the deck seat" and "the perfect sail." In the May number of *Outing* he will find these questions answered. Mr. Vaux's paper, "The Canoeing of To-Day," is opportune to the canoeist and a pleasant record for the layman. As usual this delightful magazine is filled with most timely and readable articles. For sale everywhere. Published by the *Outing* Company, 239 Fifth Avenue, New York City; \$3 a year.

*Upon the Origin of Alpine and Italian Lakes; and upon Glacial Erosion.*—A series of papers by Sir A. C. Ramsay, F.R.S., President of the Geological Society. John Ball, M.R.I.A., F.L.S., etc. Sir Roderick Murchison, F.R.S., D.C.L., President of the Royal Geographical Society; Prof. B. Studer, of Berne; Prof. A. Favre, of Geneva; Edward Whymper. With an Introduction and Notes upon the Origin and History of the Great Lakes of North America by Prof. J. W. Spencer, State Geologist of Georgia. The Humboldt Publishing Co., 28 Lafayette Place, New York. The rapid progress of the science of geology at the present day justifies the reproduction in "The Humboldt Library" of this series of papers contributed at various times by the distinguished writers whose names are given above. No one desirous of being well informed can afford to neglect this important study of geology, which many scientists claim disproves the Mosaic cosmogony. The present work is in two parts—a double number and a single number. Price for both, forty-five cents.

In the issue of the *Dominion Illustrated* for April 19th, our readers will find much to interest them. Norway House, Kakabeka Falls, C.P.R. Elevators at Fort William and the Gate of the Selkirks, are all characteristic scenes from our Great West. The famous falls on the Kaministiquia are pronounced by the Rev. Dr. Grant to have no superior on this continent. The view of Fort William shows very clearly how the old order has passed away and the sort of dispensation that has succeeded it. The Gate of the Selkirk's is one of the grandest examples of Canadian mountain scenery. Paradise Grove, Niagara, gives a glimpse of a spot that is not unworthy of its name. In the way of portraits, Mr. James Johnson, Commissioner of Customs, Ottawa, the Canadian R.E. Graduates at Chatham, England, the Board of the Toronto Public Library, and the Highland Cadets at drill (this last engraving illustrating a new and important movement in the way of military training), take up several pages. The R.E. Graduates are an honor to Canada. Address: *The Dominion Illustrated*, 73 St. James Street, Montreal.

*The May Wide Awake* opens with a frontispiece that all young people will hail with pleasure—a portrait of Miss Charlotte M. Yonge; farther on, Mr. Oscar Fay Adams describes his visits with her at Otterbourne. Following comes a humorous story by Louise Stockton, the sister of Mr. Frank Stockton, entitled "The Baby's Masquerade." "Apple Blossoms" is a unique little story. "A Long Horror" is a true story of a young French count and his wife. "The Monitor of Grammar School II," and the "Cow Bells of Grand Pré," are both dramatic tales. The illustrated papers are very interesting; "The Aprons of Paris," and "The Upper Ten," have a dozen "taking" pictures from prints and photographs. "Japanese Kites" has some very quaint pictures. Mrs. White's paper on "Stenographers and Type-Writers" will interest many young women. A paper on "Spelling," by one of the masters of the Boston Public schools, gives matter for serious consideration. "Men and Things" is delightfully readable. The poems of the number are "Victor Hugo and the Mouse," "What Baby Knows," "The Unbidden Guest," and "The Fairy Prince." *Wide Awake* is \$2.40 a year. D. Lothrop Company, Publishers, Boston.

"A History and Description of Billiards and its Sanitary Advantages; with Instructions How to Play the Game, and all Rules Relating to Billiards and Pool," published by Samuel May, billiard table manufacturer, Toronto. This is an exceedingly interesting handbook of nearly 100 pages, bound in stiff cloth, well printed and fully illustrated. In alluding to the origin of the game, showing it to be of great antiquity, we are told that some historians suppose it to have been imported from the Persians during the consulship of the Roman Lucullus, while others assign it to the time of

the Emperor Caligula. After speaking of the origin of the game, and of the emperors, kings, queens and princes who have enjoyed it, the philosophy of it is discussed and its sanitary advantages, and a description of the game and the players in which rules are given which, if observed, will save much time of laborious investigation and experiment. All the modern rules are given for playing the American game, the three-ball French game, the English game, cushion corners balk-line game, fifteen-ball pool. Boston pool, pyramids and all the other popular games. Valuable chapters are those relating to American ten-pins, in which the rules of the National Bowling Association are given; and to the game of bowls, or bowling on the green; and important hints and suggestions are given to room-keepers for taking care of billiard tables and their appurtenances.

#### CANADIAN FARMERS.

MR. GEORGE HAGUE, the General Manager of the Merchants Bank of Canada, is entitled to the thanks of the people of Canada for making public the reports received by him on the condition of agriculture in the Provinces of Quebec, Ontario and Manitoba. These reports were obtained by him in reply to a circular sent to each of the local managers of the Bank, and were procured for the purpose of ascertaining, in a reliable manner, the actual condition of the farmers in the localities in which the Merchants Bank has its agencies. The general result has been to show that while the farmers of Canada have experienced the effects of the bad harvests and the low prices of produce which have existed, they have, nevertheless, not been placed in any worse position than those of other countries, in all of which similar drawbacks have prevailed. In fact a careful study of these reports reveals the fact, and facts are what the people want, that the Canadian farmers have in comparison with others of the same culling elsewhere held their own. The attractions of the Canadian North-West have induced some of our farmers to settle there, and their former holdings have passed into other hands, who have, in some instances, mortgaged their previous holdings in order to buy the new. But the cry that has been attempted to be raised that the farmers of Canada are mortgaged to the muzzle is not borne out. In many cases the farmers have money deposited in the Banks to their credit, and almost everywhere the thrifty man who is abreast of the times and keeping so is doing well. With farming it is the same as with other occupations, men must keep up with the Age. The old-fashioned farmer cannot expect to keep pace with the one who takes advantage of the improvements which are brought under his notice. The blue ruin of which we have heard so much lately in the look-to-Washington corporal's guard that haunts the House of Parliament, is to be found only in the disappointed expectations of those who cannot brook the apathy of the people which keep them shivering in the comfortless Opposition, instead of allowing them to engineer the road which would lead to a return of that wretched policy which almost ruined Canada from 1874 to 1878, the accomplishment of which was only averted by hurling them from their position and introducing the National Policy.—*The Shareholder*.

#### GREATEST WATERWAY ON THE GLOBE.

MR. GEORGE H. ELY, of Cleveland, who has for several years past successfully fought all efforts to bridge the Detroit river, at Detroit, has just finished a revision of his argument before the House committee on commerce last spring in opposition to the bridge, and will have it printed in pamphlet form for general distribution. Mr. Ely has been engaged in this work simply through a spirit of pride in the growing commerce of the lakes, and the extent to which he has gone into statistics in support of a free channel at Detroit is wonderful. Mr. Ely shows, by a fair estimate of the carrying capacity of the boats passing the city of Detroit during the 234 days of navigation in 1889, that the aggregate was 36,203,606 tons. He then makes the following comparison:

The total tonnage entries, registered, in the foreign trade at the port of New York for the year ending June 30, 1889, were 5,596,821 tons; the total clearances in the foreign trade at the same port, for the same year, 5,454,415; total, 11,051,236 tons. The total tonnage entries at all seaports in the United States, for the year ending June 30, 1889, were, 13,311,652 tons; the total clearances at all seaports in the United States, for the year ending June 30, 1889, were 13,671,661 tons; total, 26,983,313 tons. The total entries at the port of Liverpool for the year ending December, 1888, in the foreign trade, were 5,278,529 tons; clearances, in the foreign trade, were 4,799,968; total, 10,078,497; coastwise, for same period,

4,096,703; total, 14,175,200. The total entries at the port of London in the foreign trade for the year ending December, 1888, were 7,291,825; total clearances, for the year ending December, 1888, were 4,618,993; total, 11,910,818; coastwise, for same period, 7,334,599; total, 19,245,417.

It will thus be seen that the volume of the tonnage movement through the Detroit river in 1889, was at least ten million tons above the total registered entries and clearances at all the sea ports of the United States. It was three million tons above the combined foreign and coastwise, registered tonnage of the ports of Liverpool and London.

Mr. Ely presents many interesting groups of figures showing the extent of the Sault Ste Marie canal traffic and the ore, grain, lumber and coal trade. One interesting feature is the comparison of the cost of rail and water transportation, incorporated in the argument since it was presented in Washington. In this regard Mr. Ely says: "The freight charges per ton per mile on eighteen trunk railroads of the United States in 1887—officially reported—were 9.74 mills. At the hearing at Detroit, April 1889, a representative of the Michigan Central Railroad stated that the average rate of that company on through east and west bound freight, per ton per mile, for 1888 was five mills. This extremely low rate, however, due partly, also, to the competition of the water way, effectually disposes of the persistent claim of that company, that its business suffers for lack of better facilities for transit at the Detroit river. These alleged disabilities certainly do not appear in these traffic rates for 1888—about one-half the average rates of the eighteen trunk lines reported for the same year. But compare, now, this cost of transportation with the cost of movement by the water way. General Poe reports that 6,411,423 tons passed the lock at the Sault in 1888. This tonnage was carried an average distance of 806.9 miles. The aggregate of freight charges on it was \$7,883,079.40, the cost being 1.2 mills per ton per mile. If this tonnage had been moved by rail at the rate reported by the Michigan Central Company, for the same year, at five mills per ton per mile, the freight charges on it would have been \$26,276,923—the lakes thus saving the country \$18,393,846. Some of these products could never have reached their distant markets on wheels. No possible rail rates could have moved them.

On the tonnage through the Detroit river of 1889, as estimated, 36,203,606 tons, the freight by rail at five mills per ton, per mile, would have been \$148,378,820; on the same tonnage the freight by the water way at the rate of one and a half mills per ton, per mile, would have been \$44,513,646, a saving to the producer and consumers of \$103,865,174. And yet we talk about bridge piers in such a channel; at the very spot where the entire traffic of this continental water system concentrates; when the tonnage movement during the season of navigation, seven months and a half of the year, is larger, by several million tons, than the total tonnage at all the sea ports of the United States; when the tonnage movement is larger than that of any harbor or port in the world.

### THE ST. CLAIR TUNNEL.

The construction of the great tunnel under the St. Clair River, between Sarnia and Port Huron, is attracting much interest among the great trade carriers between the West and East, and, as the work has already made such progress that its completion seems assured, it is only a matter of a short time when the heavy freight will be making rapid transit under the river instead of by the old and unsatisfactory makeshift of steamboat transfers. The present state of the work is interesting to the owners, the builders and the public. It is about entering under the river from each side passing through the brick shafts which were sunk by the tunnel company on the banks of the river, which are exactly on the tunnel line.

The completed tunnel will be over one mile in length, 2,310 feet being under the river, 1,810 feet under dry ground on the Michigan side, and about 2,000 feet on the Canadian side. Fifteen hundred feet of the portion under the river will be almost level, falling eastward slightly, to cause any water that may get into the tunnel to run to the Canadian side. The total length of the ascent on the Michigan side will be about 4,900 feet, and on the Canadian side about the same. The length of the open cutting at the Michigan end will be 2,820 feet, and at the Canadian side about 3,200 feet.

The depth of the lowest part of the tunnel from the mean level of the river will be eighty-one feet, which is much higher than at first anticipated, but the borings showed such good material that it was decided that the tunnel could be built so much higher. The minimum depth of the top of the tunnel below the bed of the river

will be about fifteen feet. It will have a clear internal diameter of twenty feet, and will have a single track. It was at first proposed to construct a two-track tunnel, but careful estimates of the cost having been made, it appeared that two single-track tunnels could be built more cheaply than one double-track tunnel. If this tunnel is a success and the traffic demands it, the Company intend to build a second one alongside. The Michigan portal of the tunnel will be about two miles from the centre of Port Huron, and some change will be necessary in the running of the trains. The Canadian portal of the tunnel is within the corporation of the town of Sarnia.

The work is being pushed ahead day and night. The shield is the tunnel digger, and weighs about eighty tons. It is driven by twenty-four hydraulic jacks of 125 tons pressure each, but half the capacity has never yet been required to move the shield. The shield is moved ahead by pumping water into the jacks and forcing the rams out against the tunnel walls with sufficient power to move the shield. The desired distance required, about eighteen inches, having been obtained, the jacks are then sent home the same way. A ring of iron is then put up, the lower half with block and tackle, the upper half with a crane, which is attached to the rear of the shield and operated with a crank by four or five men. A key is put into the crown of the arch and the ring is finished. Preparations are then made for another advance.

In the meantime the diggers (about twenty-five men) are in the shield and ahead of the shield, busy making room for another advance. The clay is all passed through the shield and loaded on small cars, which are hauled to the portal by horses, hoisted up by derricks and dumped on flat cars to be taken away. The shield is about three inches larger than the tunnel, and as the shield is being pushed ahead the vacancy which it leaves between the iron lining and the surrounding clay is filled with cement grout, to prevent any movement of the tunnel. There are two tracks of narrow gauge in the tunnel for convenience in hauling material, and both tracks are kept quite busy. Switches are put in at about every 300 feet; track is lengthened and planked; bolts, castings and all material is being constantly brought in and out, so that about seventy-five men are kept busily engaged continuously. The pressure pipes and fresh air pipes are lengthened daily. All repairs are done on the premises by carpenters, machinists and blacksmiths. The whole works are lighted with electric lights, the incandescent system being used.

The doubt may be expressed about the possibility of making the two shields meet truly in line, but those concerned have no anxiety on this point, feeling confident that the work is in good hands. Mr. Hillman, the engineer in charge of the construction of the tunnel, takes lines and measurements every day and prepares a diagram therefrom, showing the location of the shields, which is handed to the workmen in the shield, and the shield is shifted according to the diagram by using jacks more or less on either side, or at the top or bottom, as may be required to keep the true line. When the clay is very soft it is more difficult to keep the shield in line, but so far the clay has been fairly good. The material has been a little easier to remove on the Canadian side, which accounts for the somewhat better time made lately on that end. Signals are given to the engineer of the hydraulic pump by means of an electric bell. There are three gangs of diggers in the shield. Each gang works eight hours out of the twenty four. All the other men work twelve hours—from seven until seven. There is a man in the shield boring with a clay auger ahead of the diggers, and a map, or diagram, is daily prepared showing the kind of material and where located. Each 100 feet is numbered, and a record is kept of the kind of material found at every numbering, etc.

Over twelve feet of tunnel have been made some days at the Canadian side. This figure has never been reached on the American side. However, the average is from seven to nine feet per day. It is the intention to push on the work at the approaches at once. Very heavy retaining walls of the best masonry will be built in the open cuts and probably some overhead bridges will be erected. The whole will give employment to several hundred additional men.

Preparations are being made at present for using compressed air under the river. It is thought, however, that very low pressure will be sufficient, so that fair progress can be made under the river.

The completion of the St. Clair tunnel will have an important effect upon transportation between the Western and Eastern States, and also between Canada and the growing West, as the route by way of St. Clair River to and between Detroit and Buffalo or Toronto will be only eight miles longer than the direct route across the river at Detroit and Windsor, and the extra distance will be more than made up by the saving of time in running through the tunnel instead of crossing the trains by the car ferry.

# Manufacturing.

*This department of the "Canadian Manufacturer" is considered of special value to our readers because of the information contained therein. With a view to sustaining its interesting features, friends are invited to contribute any items of information coming to their knowledge regarding any Canadian manufacturing enterprises. Be concise and explicit. State facts clearly, giving correct name and address of person or firm alluded to, and nature of business.*

A FORTY-TWO foot bed of coal is said to have been recently discovered at Ashcroft, B.C.

MR. FRED MORRIS, Victoria, B.C., is establishing an extensive trunk and box factory in that city.

MR. JACOB BINGAY'S steam saw mill at Porter's Lake, near Halifax, N.S., was destroyed by fire, April 16th.; loss about \$9,000.

THE name of the Osborne-Killey Manufacturing Company, of Hamilton, has been changed to the Osborne-Worswick Company.

THE Brockville Wringer Company, Brockville, Ont., will be incorporated with a capital stock of \$50,000 for the manufacture of wringers, etc.

WORK is being pushed on the flouring mill and warehouses of the Mount Royal Milling Company, at Victoria, B.C., the cost of which will be about \$50,000.

THE Wilson Manufacturing Company, Hamilton, Ont., has been incorporated with a capital stock of \$30,000 for the manufacture of agricultural implements.

THE Queen City Manufacturing Company of Ontario will be incorporated with a capital stock of \$50,000 for the manufacture of furniture, specialties, etc.

MESSRS. JOHNSTON, WALKER & FLETT, of the Queen City Planing Mills, Victoria, B.C., have ordered an engine, 100 horse-power, also a new set of saw mill machinery.

MESSRS. S. R. FOSTER & SON, St. John, N.B., are adding a spike machine and several wire nail machines to their nail factory, where they have forty-five machines in operation.

THE Consumers' Cordage Company, with a capital stock of \$1,000,000, and the Dominion Cordage Company, with a capital stock of \$1,000,000, both with headquarters at Montreal, applied for incorporation.

MESSRS. C. C. RICHARDS & Co., Yarmouth, N.S., manufacturers of Minard's Liniment, are working up a large business, particularly in Ontario. Their laboratory is a building 60x30 feet, and their output is about 10,000 bottles a week.

MR. R. WHITELAW, of Woodstock, Ont., will build a new roller flour mill at Pilot Mound, Man. Mr. Whitelaw owns an oatmeal mill at St. Leon, Man., and a flour mill at Darlingford, Man., both of which will be removed to Pilot Mound.

A LAND and money bonus has been offered to the Dominion Organ and Piano Company, who now have a large and valuable plant at Bowmanville, Ont., to remove their works to Mimico, one of the suburbs of Toronto, a few miles west of this city.

MESSRS. DUNCAN, BATCHELOR & Co. are building a new salmon cannery near English's Landing, on the Fraser River, B.C., which it is expected will be ready for operation sometime this month. The machinery will cost \$10,000, and the capacity of the works 20,000 cases.

THE main building of the new flour mill of Messrs. Preston & McKay, at Boissevain, Man., is 48x30 feet, fifty feet high from the basement, built of stone, the engine room being 30x20 feet, also of stone. This is said to be one of the finest and best equipped mills in Manitoba.

THE Hastings saw mill, Vancouver, B.C., has closed down and will now undergo the extensive re-modelling contemplated for some time. Nearly all the present machinery will be taken out and replaced by new machinery. The capacity will be increased to about 150,000 feet per day.

MESSRS. MANCHESTER, ROBERTSON & ALLISON have, in addition to their straw hat factory, a shirt and underwear factory, from which

they turn out every description of men's shirts and women's under-clothing; also a woolen mill for the manufacture of blanketing, camp spreads, horse clothing, flannels and yarns.—Halifax, N.S., *Critic*.

THE employees of the McClary Manufacturing Company, London, Ont., have organized the "McClary Club" to supply meals to members at a low figure, to provide suitable periodicals and papers, and also all kinds of games and music. It is proposed to have separate dining and sitting rooms for the ladies, also smoking and bathrooms for the men, and a school of instruction in cookery is suggested.

THE Nova Scotia Steel and Iron Company, New Glasgow, N.S., operating under a new charter granted by the Legislature of Nova Scotia, have issued a prospectus relating to their business. The authorized capital is \$2,000,000. The Company are now employing about 450 men, and look to increasing the number as soon as they get to work building their blast furnace, etc., which will be immediately.

WE recently stated that the pottery works of Messrs. Keller & Burns, near Victoria, B.C., had been destroyed by fire. The works have been rebuilt and equipped with the best machinery and appliances, and are again in operation. The force of workmen is to be largely increased, the expectation of the firm being to turn out all kinds of tiles, flower pots, etc. The engines, machinery, etc., were supplied by the Albion Iron Works of Victoria.

ABOUT a year ago the Amherst Electric Street Railway Company, Amherst, N.S., was incorporated with a capital stock of \$50,000. This amount is to be largely increased, and work is to be begun immediately in the construction of the road, which, at the first, will be about two miles long. The road is to be operated by an overhead wire system. It is intended to begin operations with two motor cars, each of which will carry a thirty-horse power motor and would be able to draw an extra freight or passage car.

JOHN WILSON, manager for J. R. Booth, the famous lumberman of Ottawa, and who is also the largest individual lumber limit owner in Canada is at present in Westminster looking up a site for another large saw mill to be erected by Mr. Booth in this vicinity. It is known that the gentleman named is the owner of extensive limits in this Province, and that the erection of a great mill by him here has been in contemplation for some time. The machinery will be of Eastern manufacture. It is not yet announced when work will be begun on the concern.—Westminster, B.C., *Columbian*.

THE authorities of London, Ont., have granted exemption from taxation for ten years to the Canada Featherbill Company in consideration of their moving their business to that city and employing for the term of ten years at least fifty hands. This concern was recently known as the St. Thomas Featherbone Company, of St. Thomas, Ont., which was unsuccessful, and which passed into the hands of Messrs. Reid Bros., of London, as was alluded to in these pages at the time. Messrs. Reid Bros., who are promoting and will manage the new company, are successful business men, having built up a fine trade in London in the manufacture of paper boxes, and under whose management the new business will undoubtedly prove an equal success.

THE Waterous Engine Works Company, Brantford, Ont., are meeting with immense success with their steam fire engines. During the month of March they sold three of their No. 5, city size, to the City of St. Paul, Minn., and one of a smaller size to a New York house. In April they sold a large No. 5 to the City of Buffalo, N.Y.; a No. 2 to Fairfax, Minn.; a No. 2 to Madison, Minn., and a No. 2 to Appleton, Minn.; with a No. 1 hose cart to the Michigan State Penitentiary at Marquette. The following No. 1 hose carts have been placed in Canada within a year: two each to Simcoe and Lakefield, one each to Bobcaygeon, Teeswater, Nanaimo, B.C., Shelburne, Carleton Place, Aylmer, Parry Sound, Winnipeg, Man., and Collingwood. The town of Simcoe has two No. 2 engines; Lakefield, Bobcaygeon and Parry Sound, each one.

W. P. SAYWARD'S saw mill, which has been closed down for some weeks undergoing repairs and improvements, was yesterday started up after having been thoroughly overhauled. A new and powerful engine has been put in, more than doubling the output of the mill, which will now turn out 75,000 feet of lumber per day; the two engines combined are now 250 h.p. New pulleys, and in fact all the machinery of the mill has been completely renovated. A new sawdust burner and furnace has been built, and Sayward's mill now ranks among the best on the coast. The present mill was started by Mr. Sayward in 1878, when 20,000 feet was considered a good day's output, which is very small when the present capacity of the mill is considered. The increasing demand for lumber has necessitated the

improved changes in the machinery, which include steam saw filers and every other convenience.—Victoria, B. C., *Colonist*.

THE Ontario Canoe Company, Peterboro', Ont., manufacturers of all sorts of canoes, duck boats, skiffs, row boats, etc., inform us that they have just shipped to Trenton, N. J., one of their thirty-foot war canoes, and are now building similar canoes for Washington, D. C., and Montreal, with several inquiries from other places. These war canoes are after the style of the one built by this company last year for Toronto parties, and which excited so much interest every time it made its appearance on the water. The company now have in course of construction some large nineteen feet canoes for surveyors, and some skiffs to go to Newfoundland, and others to go to Rat Portage, Man., for the Hudson Bay Company. They are also building canoes for Albany, Newburg and New York city and other places in the United States; also sailing canoes for Toronto and Montreal, a single hander for Lake St. John, and open canoes for other parts of Canada.

It is stated elsewhere that the Ontario Canoe Company of Peterboro', Ont., had recently built a war canoe for a boating club at Trenton, N. J. A recent issue of the *True American*, of that city, has this to say regarding it:—"The war canoe which the Trenton canoeists purchased arrived yesterday afternoon, and the paddlers were wild with joy. Most of them were so eager to see it that they walked away up the track beyond the Reading freight depot to view the boat. It was taken to the club house in the latter part of the afternoon and the boys could not resist the temptation to try her, and they took a short paddle. The canoe is thirty feet long and fifty inches wide at the broadest point. Eighteen paddlers can work at a time, including the bow and stern paddlers. This is the first canoe of the kind ever brought to the United States. She was made by the Ontario Canoe Company, at Peterborough, Canada. Her name is 'Wah-Wah-Tay See.' Four or five passengers can go in her besides the paddlers. It is proposed to use the canoe chiefly for attending meetings and for state occasions."

THE new steel car ferry steamer, *Canadian*, built at Owen Sound by the Polson Iron Works Company, made a successful trial trip last week and has gone to Windsor, Ont., from which place she is to ply across the Detroit river to Detroit, Mich. This vessel is said to be the largest and heaviest boat now on any of the Canadian lakes. Her dimensions are: Length, 297 feet; breadth of beam, 41 feet; width over guards, 71 feet; draught, 9½ feet. She is built of steel throughout, and is equipped with the most powerful engines of any vessel on inland waters. She is a side-wheeler and each wheel is driven by a separate engine, the two combined developing 3,000 horse power. The cylinders of the engines are 50 inches in diameter and the stroke 114 inches. These are fed with steam from four boilers, each 13 feet 3 inches in diameter and 14 feet long, built to carry 95 pounds of steam-working pressure. The paddle wheels weigh 50 tons each, and are sheathed with steel to break the ice when necessary, and it is believed that no delay will ever occur from this cause, owing to the heavy construction of the vessel and her enormous engine power. The contract for the construction of the vessel was given by the Canadian Pacific Railway Company to the Polson Iron Work Company a year ago. There is 1,200 tons weight of steel plates in the vessel. The engines and boilers were built at the Polson works in Toronto, and all other parts of construction were carried out at the shipyard at Owen Sound. The cost of the vessel complete will be in the neighborhood of a quarter of a million dollars. She is built with two car tracks and takes sixteen cars at a load. Her route will be from Windsor to Detroit, she being part of the service in connection with the C. P. R.'s western extension from London, between the C. P. R. and the Wabash system. She is expected to commence work early in May.

For the expenditure of two, or at the most three cents, in kerosene oil, a comfortable meal for a family of six persons can readily be prepared by the means of a two-wicked stove. For example, first heat until boiling a large kettle of water; then remove and in its stead place a smaller covered kettle or pot, in which is the proper quantity of lamb for stew or pot-pie. Cover this with some of the water previously heated: later add your potatoes, onions, tomatoes, thickening and whatever your taste may desire. This cooked it will remain hot in the pot long enough to allow for the frying of other meat or fish, or some other one thing such as oyster stew or clam soup. It will also give you ample time to make tea or coffee. To this bill of fare may be added lettuce or other salad, with which you would have crackers and cheese, and with a dessert, previously made or gotten from the bakeshop, and fruit you will have a very appetizing meal, and a little thought can insure the production of a tempting and varied dinner daily, cooked without other agency than

this one small stove. While eating, a large pail of water should be heating for the dishes and other purposes. This done the fire may be put out. A stove of this character is one of the essentials for country use. A lady once taking it will never try vacation time again without it. When packing, you will find it easy to stow away, and with it should go an iron, a tin pail and a funnel—the latter for the purpose of pouring the oil through. So often country rooms, even in good-sized hotels, are not heated, and by means of the drum, which is a part of the stove, you are independent of other fire. Also frequently when away from home, hot water is needed for lemonade, medical or other purposes, and at such times the little stove will prove a perfect boon. Besides, it is sometimes pleasant to entertain our summer friends and give a five-o'clock tea in our own apartments. At such seasons what a blessing to be independent and to be able to make our own tea, which will taste all the better in our dainty cups, because our own hands did it all. And believe me, the stove will be found far more reliable than a large proportion of the average hotel waiters.—*Good Housekeeping*.

THE new four-mast schooner *Minedosa*, belonging to the Montreal Transportation Company, was launched at Kingston, Ont., April 27th. Her dimensions are as follows: Length of keel, 242 feet; length over all, 250 feet; breadth of beam, 38 feet; depth of hold, 17 feet; built altogether of oak except her deck and cabin. She is steel strapped, having a steel plate 18 inches wide by ¾ inch thick, all around the frame at the top height from the stem on each side to the quarter timber with double butt straps, and from the steel plate diagonal braces run down around the bilge, running on the floor frame a distance of 2½ feet. These diagonal braces cross each other on the side of the vessel three times, making what is called a six-foot square. The steel used for the diagonal braces is 4½ inches wide by ¾ inch thick, and well bolted throughout. Her frame is of clear white oak from 7½ inch flitch. Her centres are 19½ inches; depth of frame at floor, 17 inches; depth at bilge, 15 inches; depth of top timbers 8 inches. Her rail is 18 inches wide by 5 inches thick. Her planking outside from the top of the bilge to the covering board is 5 inches thick, except three streaks, which are 5½ inches thick. The planking will average 50 feet long. Her outside bilge is 6 inches thick; her bottom plank 5 inches thick. She has two streaks of garboards on each side of the keel 7½ inches thick, scarphed and edge-bolted between every frame. Her inside bilge is 8 inches thick and scarphed. Her clamps and ceiling are 6 inches thick and scarphed. From the bottom of the bilge to the top of the clamps, between every frame on each plank, she is edge-bolted with ¾-inch iron. Her main keelson consists of sticks of oak 14 inches square, bolted with 1½-inch iron. Besides the main keelson she has assistant keelsons 14 inches square. She is a double-decker. She has 140 hanging iron knees, weighing 400 lbs. each. Her fastenings consist of hand made spikes, two in each plank and frame and two through bolts through each plank and frame from stem to stern, besides the edge-bolting. She has a steam windlass and capstan. Her steering gear, which is the latest improved, came from Boston. She has a steam winch, and the boiler to supply the steam was built in the Kingston foundry. The steam winch will be used in making sail, weighing anchor and for other purposes. She has a very handsome roomy cabin, constructed in the most modern style. The vessel will class A1\* for ten years, and will carry 90,000 bushels of wheat at a draught of 16 feet of water.

#### ROPE DRIVING IN COTTON MILLS.

*Engineering*, describing a pair of horizontal compound condensing engines of 300 h.p. recently erected by Messrs. Goodfellow, of Hyde, at a cotton mill at Hyde Junction, near Manchester, England, says the power of these engines is transmitted from the flywheel to the line shafting by means of round ropes. This system of driving undoubtedly possesses several important advantages, especially in cases such as the one we now refer to, in which the speed of the driven shaft is required to be rapid.

In cotton mills it is essential that the turning of the shafting shall be as even and as smooth as it is possible to be, in order to obtain the best results from the spinning machinery. The steadier the turning the greater may be the speed of the spindles, and when this is a matter of thousands of revolutions per minute, and the perfection of the thread or yarn and the quantity produced depends on the regularity of the speed as well as upon the other perfections of the machinery suited for the high speed, then the importance of steady communication of motion must be evident. In the case under notice the engines run at fifty revolutions per minute, while the spindles run about 5000.

The driving drum is the flywheel twenty-two feet in diameter, grooved to receive twelve two-inch ropes. The speed of the ropes

**IT PAYS**  
TO KEEP YOUR  
**BELTS**  
FROM  
**SLIPPING.**  
IT SAVES  
**POWER, FRICTION,**  
**WEAR ON**  
**ENGINE AND**  
**MACHINERY.**  
—USE—

**HAWORTH'S**  
**LEATHER BELT**  
**DRESSING**

PUT UP IN 5 AND 10 GALLON TINS.

—  
**IT IS EFFECTIVE**

AND

EASILY APPLIED.

—  
**GEO. F. HAWORTH & CO.**

11 JORDAN STREET,

**TORONTO, ONT.**

being about 3,450 feet per minute, shows that the pull on each rope is about 258 lbs., or a very moderate strain for a two-inch hemp rope such as is used. The breaking strain of two-inch rope is 36,000 lbs., and under these speeds and strains the ropes were showing no signs of wear or distress at the time of our visit, when they had been running for some ten or eleven months.

Before the use of ropes for this mill was determined upon, a calculation was prepared for driving by leather belts instead, but the estimated price of the belts themselves was so great (viz., \$1,620,) that the idea of their use was abandoned in favor of the ropes, the total cost of which was only \$365.

The simplicity of this method of driving, as compared with any arrangement of wheel gearing and intermediate shafting for carrying it, is very evident.

## PATENTS

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

Trade Marks, Designs and Copyrights Registered.

Examinations and Reports as to Validity. Searches made. Infringements investigated. Assignments and Agreements drawn. Advice on Patent Laws, etc.

**PETHERSTONHAUGH & CO.**, Solicitors of Patents and Experts in Patent Causes  
Canadian Bank of Commerce Building (2nd floor),  
TORONTO.



## TENDERS.

SEALED TENDERS marked "For Mounted Police Provisions and Light Supplies," and addressed to the Honorable the Minister of Railways and Canals, Ottawa, will be received up to noon on Tuesday, June 3, 1890.

Printed forms of tender, containing full information as to the articles and approximate quantities required, may be had on application at any of the Mounted Police Posts in the North-West, or at the office of the undersigned.

No tender will be received unless made on such printed forms. The lowest or any tender not necessarily accepted. Each tender must be accompanied by an accepted Canadian bank cheque for an amount equal to ten per cent. of the total value of the articles tendered for, which will be forfeited if the party declines to enter into a contract when called upon to do so, or if he fails to complete the service contracted for. If the tender be not accepted the cheque will be returned. No payment will be made to newspapers inserting this advertisement without authority having been first obtained.

FRED. WHITE,  
Comptroller N.W.M. Police.

Ottawa, April 22, 1890.

## Good Manufacturing Site,

ON THE NORTH SIDE OF MILL ST.

Near Don Station, between the C.P.R. & G.T.R.

IN THE CITY OF TORONTO.

150x90 feet to a Good Lane,

About 75 ft. from each line of Railroad.

WILL SELL OR LEASE FOR  
TWENTY-ONE YEARS, RENEWABLE

Apply to **BOSWELL & KENNEDY, Owners,**  
31 Adelaide St. E., Toronto  
Telephone No. 2134.

## WESTERN ELECTRICIAN

Published Weekly at 6 Lakeside Building,  
CHICAGO, ILL.

\$3.00 per Year; \$1.50 for Six Months.

THE BRIGHTEST; THE HANDSOMEST;  
THE BEST ELECTRICAL JOURNAL PUBLISHED.

Its descriptive articles and illustrations cover the new Electrical Inventions of America and Europe. It is replete with the electrical news of the day. No intelligent reader who desires to keep up with the advance of the great Science of Electricity can afford to be without it.

Sample copy, ten cents.



## ONTARIO CANOE CO'Y, Ltd.

PETERBOROUGH, ONTARIO.

PETERBOROUGH CANOES.

OPEN CANOES, SKIFFS,  
DECKED CANOES, ROW BOATS,  
SAILING CANOES, SINGLE HUNTERS,  
STEAM LAUNCHES.

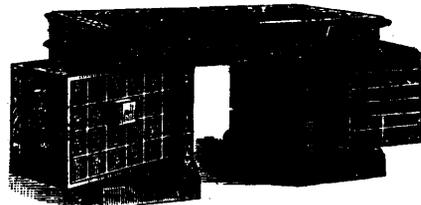
Tents and Camp Furniture. SEND THREE-CENT STAMP FOR CATALOGUE.

## W. STAHLSCHMIDT & CO.

PRESTON, ONT.

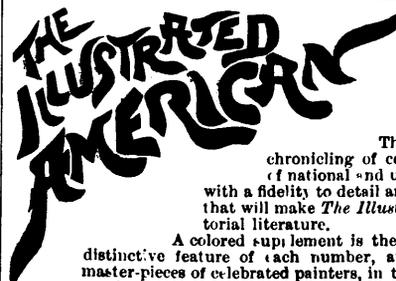
— MANUFACTURERS OF —

School, Office, Church and Lodge Furniture.



Rotary Desk No. 50.

SEND FOR CIRCULARS AND PRICE LIST. - - Name this Paper.



The Illustrated American Publishing Company are issuing a Weekly News Magazine, which in excellence rivals the most artistic periodicals of England, France, and Germany, and surpassing any produced in the United States.

The illustrations are the picturesque chronicling of contemporaneous history; and events of national and universal interest will be represented with a fidelity to detail and a perfection of artistic treatment that will make *The Illustrated American* a revelation of pictorial literature.

A colored supplement is the most conspicuous but not the most distinctive feature of each number, and facsimile reproductions of the master-pieces of celebrated painters, in the preparation of which the marvelous discoveries of the art are being employed for the first time in this country. The *Illustrated American* is designed for the home. In its literary character it is clean, unsectarian, and free from political discussion and heavy debate. The serial novels and short stories are amply illustrated; and all other matter is selected to afford amusement, entertainment and valuable information.

The *Illustrated American* consists of not less than 24 pages (16 x 12), and colored cover, printed in large type on heavy paper. Subscription, \$10 a year; single copies, 25 cents.

ILLUSTRATED AMERICAN PUBLISHING CO.

Bible House, New York.

142 Dearborn Street, Chicago.

## WEST TORONTO JUNCTION FACTORY SITES

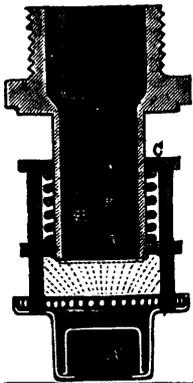
Can now be obtained under most desirable terms, at mere nominal prices, while other advantages can be obtained as to water and taxes.

The land is situated close to the Grand Trunk and the Canadian Pacific, within three minutes of the Grand Trunk Station, Carlton, and five to the C.P.R. These sites form part of one of the most beautiful estates yet offered for sale.

Call and see plan of same without delay at my Office, 28½ Victoria Street, Toronto.

**WILLIAM MEDLAND,**  
*Pioneer Agent.*

## FIRE PROTECTION.



BUILDINGS EQUIPPED  
WITH  
**AUTOMATIC  
SPRINKLERS**  
BY  
**ROBERT MITCHELL & CO.**

MONTREAL BRASS WORKS,  
Write for estimates MONTREAL

## NAPANEE CEMENT CO'Y

(LIMITED.)

**NAPANEE MILLS, - ONTARIO.**

MANUFACTURERS OF

### HYDRAULIC CEMENT

*Warranted equal, if not superior, to  
any native cement,  
and as good, for most uses, as Portland.*

Full particulars of strength, tests, etc., furnished on application.  
Endorsed by leading Cities, Engineers, Railways and others.

**ROACH LIME.** Particularly adapted for paper manufacturers  
gas purifying, etc.

## To Prevent Boiler Explosions

And other accidents to Steam Boilers and to secure economy  
in their working, insure with

**THE BOILER INSPECTION AND INSURANCE CO.  
OF CANADA**

Consulting Engineers and Solicitors of Patents

SIR ALEXANDER CAMPBELL, K.C.M.G.,  
*Lieut. Governor of Ontario, PRESIDENT.*  
JOHN L. BLAIKIE, ESQ., VICE-PRESIDENT.  
GEO. C. ROBB, CHIEF ENGINEER. ALEX. FRASER, SEC'Y-TREAS.  
**Head Office: 2 Toronto St., TORONTO.**

## THE WELLINGTON MILLS LONDON, ENGLAND, GENUINE EMERY

**OAKEY'S Flexible Twilled Emery Cloth.**  
**OAKEY'S Flint Paper and Glass Paper.**  
**OAKEY'S Emery Paper, Black Lead, etc.**

Prize Medal and Highest Award, Philadelphia, 1876, for Superiority of Quality, Skillful  
Manufacture, Sharpness, Durability, and Uniformity of Grain.

Manufacturers: **JOHN OAKEY & SONS, Wellington Mills,**  
Westminster Bridge Road, London, Eng.

Enquiries should be addressed to

**JOHN FORMAN, 467 St. Paul St., MONTREAL.**

## The Barber & Ellis Comp'y,

NOS. 43, 45, 47, 49 BAY ST.

• **ACCOUNT BOOKS** •

MADE TO ORDER IN FIRST-CLASS STYLE.

### PAPER BOXES MADE FOR ALL CLASSES OF GOODS

*Correspondence Solicited.*

**TORONTO, - ONTARIO.**

## The Standard Drain Pipe Co.

OF ST. JOHNS, P.Q. (Ltd.)

MANUFACTURERS OF SALT GLAZED, VITRIFIED,

### FIRE CLAY SEWER PIPES AND CONNECTIONS.

*Culvert Pipes (double strength), Smoke Jacks for Locomotive Round-  
Houses, Inverts for Brick Sewers, Garden Vases, Chimney  
Tops, and all kinds of Fire Clay Goods. Send  
for Price Lists and Circulars.*

**ROBERT CARROLL, Agent, - TORONTO.**

EVERY REPUTABLE DEALER KEEPS  
THEM.



Insist on having the Genuine, and see  
that they bear our name.

**W. H. STOREY & SON, ACTON, ONT.**

GEO. W. SADLER, Proprietor.

**ROBIN & SADLER**  
**MANUFACTURERS OF**  
**LEATHER -**  
**- BELTING**

129 BAY STREET, **TORONTO.** *and* NOTRE DAME ST. **MONTREAL.**

Lace Leather, Loom Strapping, Cotton and Rubber Belting  
 and General Mill Supplies.

C. C. CLEVELAND.

C. F. CLEVELAND.

**J. L. GOODHUE & CO.**

MANUFACTURERS OF SUPERIOR QUALITY

**LEATHER BELTING**

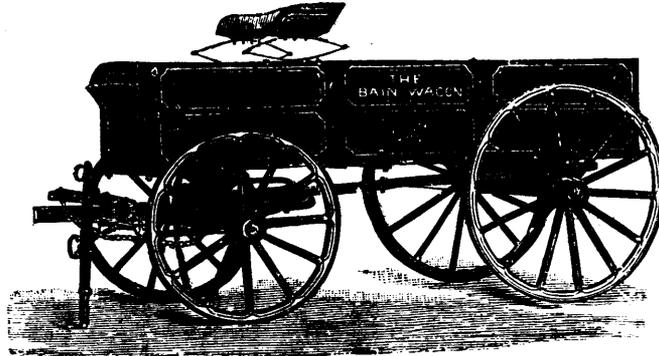
**DANVILLE, - QUE.**

As Saw Mill work is the hardest that Belting has to do, we refer  
*by Permission to*

Messrs. Gilmour & Co., Trenton, Ont.; The Rathbun Co., Deseronto, Ont.; Messrs. Boyd Caldwell & Son, Carleton Place, Ont.; The E. B. Eddy Manfg. Co., Hull, Que.; Messrs. Beck & Co., Penetanguishene, Ont.; Messrs. Flatt & Bradley, Casselman, Ont.; Messrs. Hall, Neilson & Co., Three Rivers, Que.; Cookshire Mills Co., Sawyerville, Que.; The Bennett Saw Mill Co., New Westminster, B.C.; The Waterous Engine Works Co., Brantford, Ont.; The Wm. Hamilton Manfg. Co., Peterborough, Ont.

# BAIN WAGON CO.

— MANUFACTURERS OF —



LIGHT RUNNING

**FARM, SPRING AND FREIGHT WAGONS**

Also Heavy Sleighs and Steel Skein Log Trucks.

SEND FOR PRICES TO

**BAIN WAGON CO. - Woodstock, Ont.**

25 YEARS EXPERIENCE.

# BELL ❖ PIANOS.

HIGH CLASS ONLY.

Pure, Sweet Tone,

Elegant in Appearance, and

DURABLE THROUGHOUT.

In Constant Use in the Toronto Conservatory of Music and Toronto College of Music. The Professors in each of these Institutions Highly Recommend them.

SEND FOR CATALOGUE TO

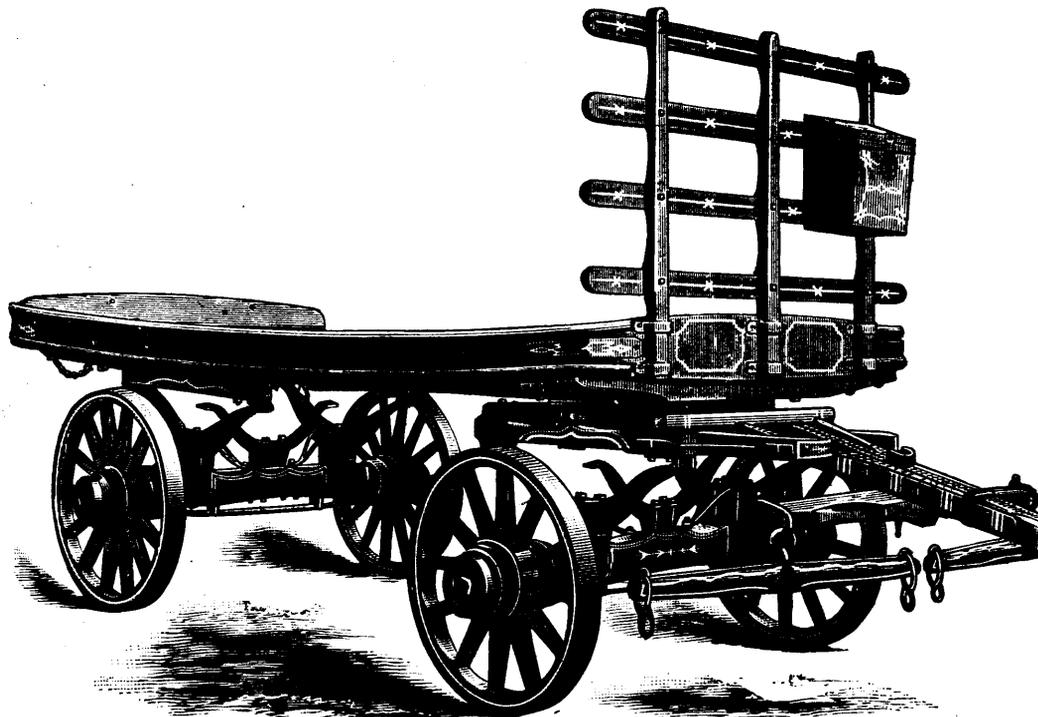
**W. BELL & COMPANY, - - GUELPH, ONTARIO.**

Warerooms at Toronto, Hamilton, and St. Thomas, Ontario.

# The Chatham Manufacturing Co., Ltd., Chatham, Ont.

MANUFACTURERS NOT ONLY OF

SHIP PLANK AND HARDWOOD LUMBER.



THE CHATHAM WAGON,

CUT OF

One and Two-Horse

# LORRIES

With and Without Springs.

Of a two horse, the above is a faithful cut Found to be as durable, and the greatest carrier and easiest running Lorry made in Canada. At greatly reduced prices.

Correspondence solicited

THE CHATHAM TWO-HORSE SPRING LORRY. 4 in. arms, 4 x 1/2 inch tire; capacity, 4 tons. The best and easiest running Lorry made in Canada.

## Millers' and Manufacturers' INSURANCE COMPANY.

STOCK AND MUTUAL.

### OBJECTS.

1. To prevent by all possible means the occurrence of avoidable fires.
2. To obviate heavy losses from the fires that are unavoidable by the nature of the work done in mills and factories.
3. To reduce the cost of insurance to the lowest point consistent with the safe conduct of the business.

### METHODS.

All risks will be inspected by a competent officer of the company, who will make such suggestions as to improvements required for safety against fires, as may be for the mutual interests of all concerned.

Much dependence will be placed upon the obligation of members to keep up such a system of discipline, order, and cleanliness in the premises insured as will conduce to safety.

As no agents are employed and the company deals only with the principals of the establishments insured by it, conditions and exceptions which are so apt to mislead the insured and promote controversy and litigation in the settlement of losses will thus be avoided.

The most perfect method of insurance must, in the nature of things, be one in which the self-interest of the insured and the underwriters are identical, and this has been the object aimed at by the organizers of this company.

**W. H. HOWLAND,** Vice-President. **JAMES GOLDIE,** President.

**HUGH SCOTT,** Managing Director.

Applicants for Insurance and other information desired, please address **MILLERS' AND MANUFACTURERS' INSURANCE COMPANY** No. 24 Church Street, Toronto.

## THE MANUFACTURERS'

# Life and Accident Insurance Co's

HEAD OFFICE:

83 KING STREET WEST

TORONTO, ONT.

Issues Life Policies upon approved plans.

Issues Accident Policies containing all modern features.

### AUTHORIZED CAPITAL:

Life Company,	\$2,000,000.00
Accident Company,	1,000,000.00

### OFFICERS:

SIR JOHN A. MACDONALD, P.C., G.C.B. - - PRESIDENT.

### VICE-PRESIDENTS:

GEORGE GOODERHAM, Esq., President Bank of Toronto. WILLIAM BELL, Esq. Organ Mnfr, Guelph.

D. PARKES FACKLER, New York, Consulting Actuary.

JNO. F. ELLIS, - Managing Director.

A. E. CARPENTER, Pres. J. H. NEW, Vice-Pres. HENRY NEW, Sec.-Treas.



THE HAMILTON AND TORONTO,

SEWER PIPE CO'Y,

(LIMITED,)

HAMILTON, CANADA.

SUCCESSORS TO

The Campbell Sewer Pipe Co. and  
The Hamilton Sewer Pipe Co.

— MANUFACTURERS OF —

STEAM-PRESSED, SALT-GLAZED

VITRIFIED

SEWER PIPE,

FLUE PIPES, CHIMNEY TOPS and  
SMOKE PREVENTIVES.

Established 1860.



Canadian Rubber Co.

Cor. Front & Yonge Sts., Toronto.

MANUFACTURERS OF

RUBBER SHOES & FELT BOOTS,

Patent Pressed Double Strip Rubber Belting,

RUBBER  
ENGINE,  
HYDRANT,  
SUCTION,  
STEAM,  
BREWERS'  
and FIRE  
HOSE.  
HORSE  
CLOTHING  
STEAM  
PACKING.



RUBBER  
VALVES.  
CAR  
SPRINGS.  
WRINGER  
ROLLS.  
CARRIAGE  
CLOTHS  
BLANKETS.  
STOPPLES  
etc., etc.

Mould Goods of Every Description.

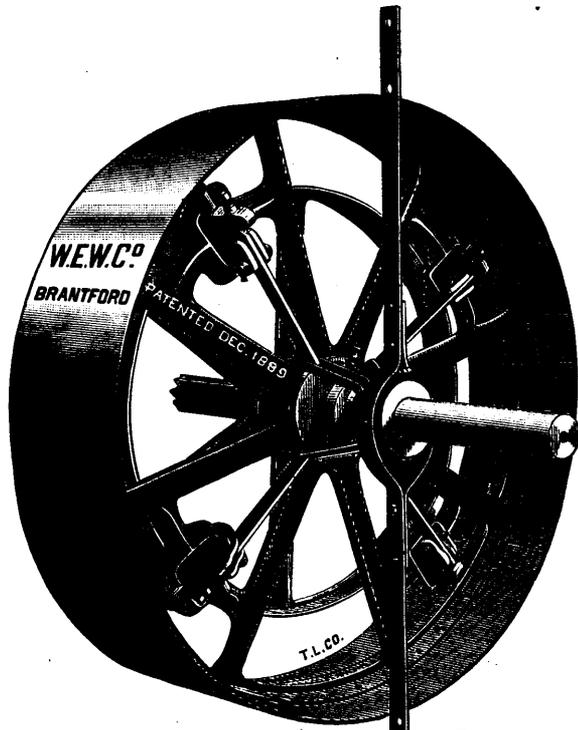
LADIES' & GENTLEMEN'S TWEED and GOSSAMER CLOTHING

OUR RUBBER GARDEN HOSE IS THE  
BEST IN THE MARKET.

J. H. WALKER, - Manager.

"LA GRIPPE" PERFECTION  
FRICTION GRIP PULLEY.

Patented Feb. 4, 1890.



Pulleys run on an Improved Sleeve or Bush  
with an excellent self-oiling device.  
Made Single, Double and Treble Armed.  
ALSO SPLIT PULLEYS.

Steel Rim can be applied to old pulleys. Pulleys furnished for any work and guaranteed.

Send for price of any pulley or cutoff coupling you may need, giving dimensions of pulley and shaft and work to be done.

Waterous Engine Works Co., Brantford, Canada.

GOLDIE & McCULLOCH

GALT, ONT.

Have the following SECOND-HAND MACHINERY, which  
they offer cheap and on reasonable terms.

- Iron Turning Lathe, 18 feet bed, 32 inch swing.
- 80 H. P. Automatic Cut-off Engine.
- 80 H. P. Ingles & Hunter Engine.
- 80 H. P. Dickey, Neill & Co. Engine.
- 50 H. P. Slide Valve Engine, our own make.
- 35 H. P. Kelley & Co. Engine.
- 40 H. P. Corless Engine and 50 H. P. Boiler, only a short time in use.
- 30 H. P. Slide Valve Engine, our own make.
- 25 H. P. Kelley & Co. Engine.
- 30 H. P. Brown Engine.
- 20 H. P. Beckett Engine.
- 25 H. P. Westinghouse Engine.
- 20 H. P. Slide Valve Engine, at D. Morton & Sons, Hamilton, being replaced by a Wheelock Engine.

A great many second-hand Boilers, all thoroughly tested, and complete with all mountings, from 50 H. P., down; also several second-hand Planers and Matchers, Moulding Machines and other Wood Working Machines. For particulars address

Goldie & McCulloch,

GALT, ONT.

**THE CANADIAN LOCOMOTIVE & ENGINE CO., Ltd.**  
**KINGSTON, + ONTARIO.**  
 MANUFACTURERS OF  
**Locomotive, Marine & Stationary Engines.**  
**BOILERS OF ALL DESCRIPTIONS.**

Sole Licensees and Manufacturers for Canada of Armington & Sims' High Speed Engines, The "Cycle" Gas Engine, Atkinson's Patent, The "Hazelton" Boiler.

DESCRIPTIVE CATALOGUES OF THE ABOVE ON APPLICATION.

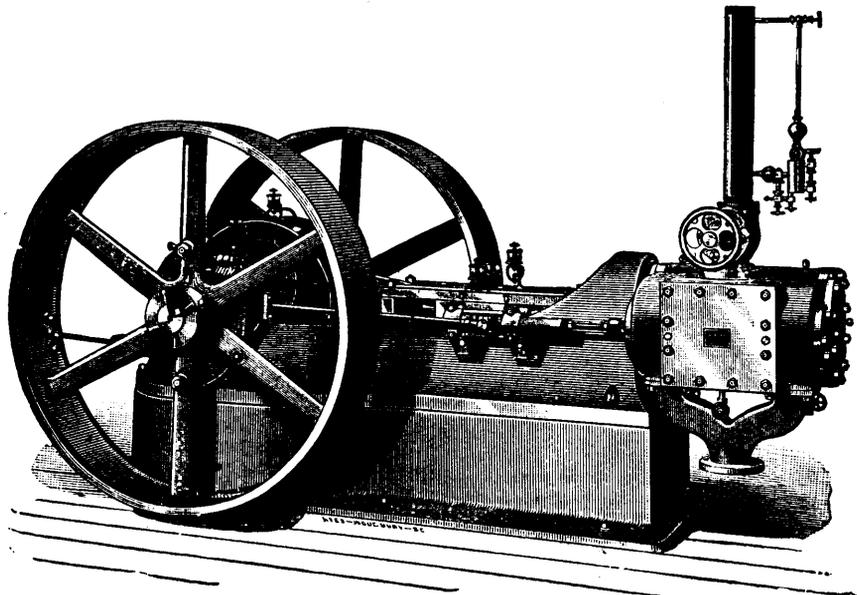
**NOTICE.**

The Canadian Locomotive & Engine Co., Limited, of Kingston, Ontario, have the Exclusive License for building our Improved Patent High Speed Engine for the Dominion of Canada, and are furnished by us with Drawings of our Latest Improvements.

(Signed),

**ARMINGTON & SIMS.**

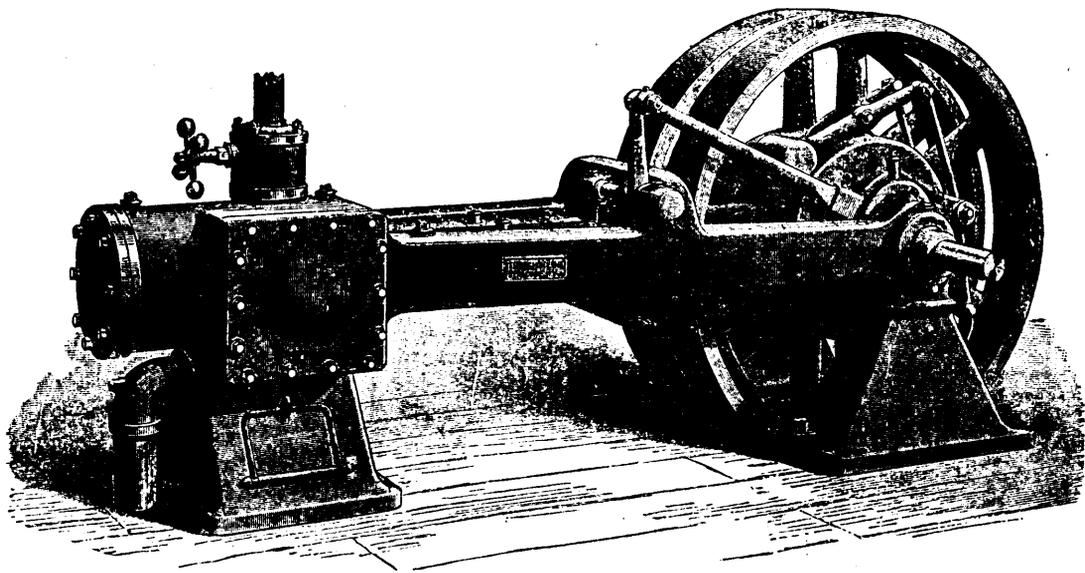
PROVIDENCE, R.I., Nov. 18, 1889.



ARMINGTON AND SIMS' HIGH SPEED ENGINE FOR ELECTRIC LIGHT PLANT, &c.

**The Straight Line Engine**

Single and Double Valve, and Compound. Thirty to Two Hundred and Fifty H.P.



**Williams & Potter, Gen'l Agents,**

**15 Cortlandt Street,**

**NEW YORK CITY, U.S.A.**

## Industrial and Trade DIRECTORY.

### Acids and Aniline Dyes.

**THEO. H. EATON & SON**, Windsor, Ont.; Detroit, U. S. A.—Importers of every Description **Pure Aniline Dyes** for Cotton and Woolen Manufacturers. **Dyed Samples** furnished on application. Address all correspondence to Head Office, Detroit, Mich

**DOMINION DYEWOOD & CHEMICAL CO.**, sole agents in Canada for Farbenfabriken, vormals Friedr. Bayer & Co., Elberfeld, Germany, and Read, Halliday & Sons, Huddersfield, England.—All shades for woolen, cotton, leather, and paper manufacturers. Latest information on dyeing as well as dyed samples on application.

**MCARTHUR, CORNEILLE & CO.** (successors to 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, etc. Are sole agents in Canada for the celebrated aniline dyes of A. Porrier, Paris.

**MIDDLETON & MEREDITH**, Montreal, Aniline Dyes, Benzidine Colors, Dyewoods, Extracts, Chemicals.

### Agricultural Implements and Parts.

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

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

### Bridge Builders.

**DOMINION BRIDGE CO. (Limited)**,—Shops at Toronto, Ontario, and Lachine, Quebec. Builders of Steel and Iron Railway and Highway Bridges.

### Chemicals and Dye Stuffs.

**MCARTHUR, CORNEILLE & CO.** (successors to John McArthur & Son), Montreal.—Offer at closest figures chemicals required by soap-boilers, oil refiners, paper-makers, and manufacturers of woollens, cottons, leather, &c.

**THEO. H. EATON & SON**, Windsor, Ont.; Detroit, U. S. A.—Carry full line of Pure Dyeing Drugs, Dye Woods and Extracts adapted for the requirements of Woolen and Cotton Manufacturers.

**DOMINION DYEWOOD & CHEMICAL CO.**, sole agents in Canada for Mucklow & Co's celebrated English Dyewoods and Dye-wood Extracts, Indigo Extract, Cudbear, and all chemicals used in dyeing. Stocks kept in Montreal and Toronto.

**MIDDLETON & MEREDITH**, Montreal: Agents for the Berlin Aniline Co., Berlin, Pure Aniline Dyes: The Stamford Manufacturing Co., New York, Dyewoods and Dye-wood Extracts: James Musprat & Sons, Liverpool, Soda Ash, Bleaching Powders, etc. Specialties for Cotton, Woolen and Leather Colors.

### Edge Tools, Saws and Hardware.

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

### Gloves.

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

### Hoists and Elevators.

**LEITCH & TURNBULL**, Canada Elevator Works, cor. Queen and Peter Streets, Hamilton, Ont.—Patent Safety Hydraulic, Hand and Power Elevators. Telephone connection.

### Hubs, Spokes, Handles, Etc.

**F. W. HORE & SON**, Hamilton, Ont.—Manufacturers of wheels, wheel material, shafts, poles, etc.

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

### Knit Goods.

**S. LENNARD & SONS**, Dundas—Manufacturers of plain and fancy hosiery.

### Machine Tools.

**JOHN BERTRAM & SONS**, Dundas.—Machine tools and wood working machinery—Toronto wareroom, 58 Yonge St. Agents—The Polson Iron Works Co. Montreal ware-room, Craig St. Agents for Quebec—The Machinery Supply Association, Montreal.

### Malleable Iron.

**THE OSHAWA MALLEABLE IRON CO.**, Oshawa, Ont.—Manufacturers of malleable iron castings, to order, for all kinds of Agricultural Implements and miscellaneous purposes.

## WEBSTER'S

# "Vacuum" Exhaust Steam Economizer

Is the Most Improved and Modern Appliance for the Economical Use of Exhaust Steam. Saves the Heat in Exhaust Steam which would otherwise go to Waste.

Utilizes the exhaust steam for heating buildings, etc., returning the condensation to boiler, and for making hot and purified water for boiler feeding and other purposes, and the combined advantages as enumerated in our pamphlet. Orders solicited on trial for acceptance.

We refer to the largest firms in the U. S. and Canada, who have adopted it and duplicated their orders after most exhaustive tests.

**JAS. B. ANNETT, 372 Sackville St., Toronto, Ont.**

CANADIAN LICENSEE for WARREN, WEBSTER & CO.

## NEWLANDS & CO.

GALT, CANADA.

MANUFACTURERS OF

# GLOVE AND SHOE LININGS

SASKATCHEWAN BUFFALO ROBES.

BUFFALO FUR CLOTH COATS.

BLACK DOG SKIN CLOTH COATS.

SEND FOR PRICE LISTS.

## JUTE, LINEN or COTTON BAGS

For FLOUR, OATS, POTATOES, FEED, etc.

Every Quality, Weight and Size kept. The largest and best-assortment in Canada. Daily out-turn, THIRTY THOUSAND BAGS.

**BAG PRINTING in COLORS** a speciality.

**HESSIANS, BURLAPS AND HOP SACKING,**

A splendid stock kept. Plain and Striped. Every quality, width and weight.

**TWINES**—We keep the best stock in Canada.

**CANADA JUTE CO'Y (Ltd.), STARK BROS., Agts.**  
MONTREAL. 62 FRONT ST. EAST, TORONTO.

**S. LENNARD & SONS,**  
DUNDAS, ONT.,

PATENTEES OF THE "ELYSIAN" SEAMLESS HOSIERY,  
MANUFACTURERS OF PLAIN AND FANCY HOSIERY, CAPS, TUQUES,  
SASHES, ETC., ETC., ETC.

TO THE WHOLESALE TRADE ONLY.

Represented in Eastern Ontario, Quebec, Nova Scotia and New Brunswick, by

**DUNCAN BELL, Montreal.**

In British Columbia by

**E. G. ANDERSON, Victoria, B.C.**

In Western Ontario by

**S. LENNARD, Senior Member of the Firm.**

**SMITH'S FALLS MALLEABLE IRON WORKS**, Smith's Falls, Ont. Manufacturers to order of refined malleable iron castings. Agricultural and other castings a specialty. Carriage castings in stock.

**Oils**

**MCARTHUR, CORNEILLE & Co** (successors to 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.

**Paper Manufacturers.**

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

**THE TORONTO PAPER MANUFACTURING CO.**, Cornwall, Ont.—Manufacturers of engine sized superfine papers, white and tinted book papers, blue and cream laid and wove foolscaps, account book, envelope and lithographic papers, etc., etc.

**Tanners' Supplies.**

**THEO. H. EATON & SON**, Windsor, Ont.; Detroit, U.S.A.—Supply at lowest prices all Chemicals used by Tanners and Wool Pullers. Special Anilines for Sheep Skin Dyers, Wool Mat Manufacturers, etc., etc. Address correspondence to Head Office, Detroit, Mich.

**DOMINION DYEWOOD & CHEMICAL CO.**—Quercitron Bark and Quercitron Bark

Extract. Solid and liquid Dyewoods and Anilines, specially adapted for dyeing leather. Alum, acids, tin, crystals, etc., at lowest prices.

**Wire Works**

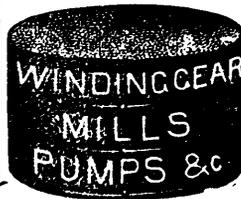
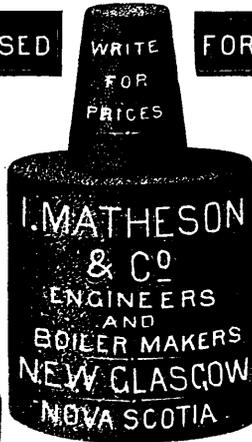
**THE B. GREENING WIRE CO., Ltd.**, Hamilton, Ont.—Perforators of zinc, iron and steel; manufacturers of wire cloth all grades, wire ropes, bank and office railings, etc.

**TIMOTHY GREENING & SONS**, Dundas, Ont.—Wire manufacturers and metal perforators, wire cloth all grades, perforated sheet metals of every description all kinds of special perforating and indenting to order.

SPECIAL MIXTURE USED

WRITE FOR PRICES

FOR SHOES & DIES

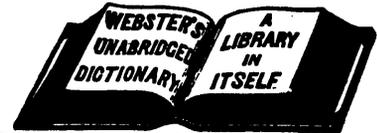


**THE B. GREENING WIRE CO. LTD.**  
**HAMILTON, ONT.**  
**WIRE CLOTH**  
**ALL GRADES**  
**WIRE ROPE,**  
**PERFORATED SHEET METALS**  
**GALVANIZED POULTRY NETTING**  
**SOFA & CHAIR SPRINGS**

ALSO MANUFACTURERS OF  
**GENERAL WIRE WORK.**  
 Window Guards,  
 Stable Fixtures,  
**RAILINGS.**  
 Sand Screens  
 Coal Screens  
 Etc.

**WEBSTER**

THE BEST INVESTMENT for the Family, School, or Professional Library.



Besides many other valuable features, it comprises  
**A Dictionary of the Language** containing 118,000 Words and 3000 Engravings,  
**A Dictionary of Biography** giving facts about nearly 10,000 Noted Persons,  
**A Dictionary of Geography** locating and briefly describing 25,000 Places,  
**A Dictionary of Fiction** found only in Webster's Unabridged,  
**All in One Book.**

3000 more Words and nearly 2000 more Illustrations than any other American Dictionary.

**WEBSTER IS THE STANDARD**

Authority in the Gov't Printing Office, and with the U. S. Supreme Court. It is recommended by the State Sup'ts of Schools of 36 States, and by leading College Pres'ts of the U. S. and Canada.

**The London Times** says: It is the best Dictionary of the English language.

**The Toronto Globe** says: Its place is in the very highest rank.

**The Toronto Week** says: It is the one final authority safely to be relied on.

**The Montreal Herald** says: Its use is becoming universal in Canada.

**The Canada Educational Monthly** says: No teacher can afford to be without it.

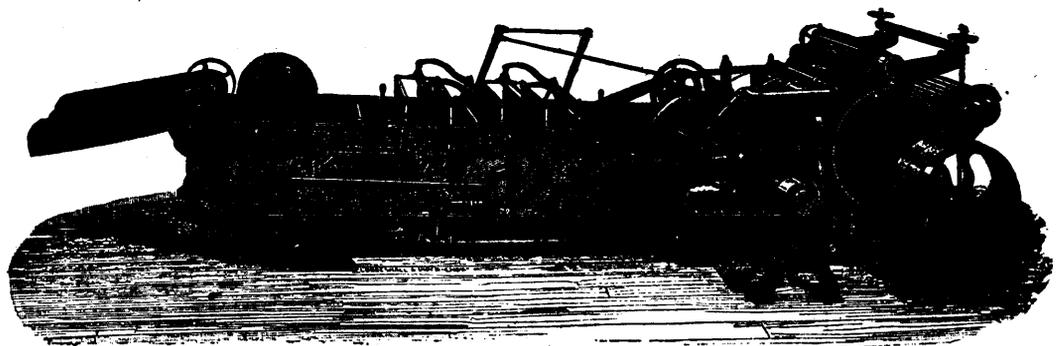
**The New York Tribune** says: It is recognized as the most useful existing "word-book" of the English language all over the world.

Sold by all Booksellers. Pamphlet free.  
**G. & C. MERRIAM & CO., Publishers,**  
 Springfield, Mass., U. S. A.

**IMPROVED WOOL WASHER**

- BUILT BY  
**C. G. Sargent's Sons**  
 Graniteville, Mass.,  
 U. S. A.

Builders of Wool Washers,  
 Burr Pickers, Wool  
 Dryers, etc.



The above represents our New Hydraulic Wool Washer, superior to Rake Machine. Send for Illustrated Catalogue.

## MACHINE BRUSHES

*All kinds, Made to Order.*

Highest Quality of Work Guaranteed.

SEND FULL PARTICULARS OF DIMENSIONS AND QUALITY WHEN ORDERING.

Old Rollers or Blocks Re-filled with special care.

CHAS. BOECKH & SONS,

MANUFACTURERS.

Office and Warerooms: 80 York St.

Factory: 142 to 150 Adelaide St. W.

TORONTO, CANADA.

## G. & J. BROWN M'F'G CO.

(LIMITED.)

BELLEVILLE, ONT.

Engineers, Boiler Makers,  
Machinists, Foundry-  
men and Bridge  
Builders.

Railway and Contractors' Supplies a Speciality

FROGS, DIAMOND CROSSINGS,

SWITCHES, HAND CARS,

LORRIES, VELOCIPED CARS,

JIM CROWS, TRACK DRILLS,

SEMAPHORES, RAIL CARS,

DOUBLE AND SINGLE DRUM HOISTS, ETC., ETC.

Established 1828.

## J. HARRIS & CO.

(Formerly Harris & Allan).

New Brunswick Foundry

RAILWAY CAR WORKS,  
Paradise Row.

PORTLAND ROLLING MILLS,  
Strait Shore.

PORTLAND, ST. JOHN, N.B.

Railway Cars of all descriptions. Chilled Car Wheels, "Washburn Peerless" Steel Car Wheels Car, Machine, Mill, Ship and all kinds of castings. Steam Engines, Mill and other Machinery. Nail Plate, Bar Iron, Street and Mine Rails, Ships' Iron Knees, Hammered Car Axles, Shafting and Shapes.

## Porous Terra Cotta

### Fireproofing.

See it in use in new Bank of Commerce Building, Toronto; new Royal Insurance Company Building, Montreal; Imperial Fire Insurance Company Building, Montreal; St. Lawrence Sugar Refinery, Montreal.

The finest thing for suburban cottages. Excludes heat and cold, is cheap and durable.

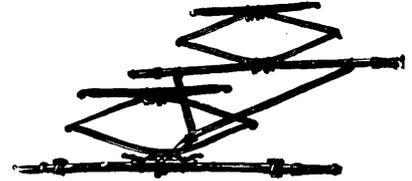
Try our improved Cedar Oil for cleaning boilers. We guarantee it to satisfy or no pay.

ADDRESS

The Rathbun Company,  
DESERONTO, ONT.

ARMSTRONG'S

## Boss Elliptic Spring Gear



Our new improved Single and Two-plate Springs are, without exception, the lightest and strongest for their carrying capacity on the world's markets.

Price Lower than any other Good Spring.

Gold Medal, Australia, 1888, and many other equal awards. Send for circular describing same. See they are on your Buggies and Wagons. All Carriage Makers should be handling them.

J. B. Armstrong Mfg. Co., Ltd.  
Guelph, Canada.

## CANTLIE, EWAN & CO.

GENERAL MERCHANTS

AND

Manufacturers' Agents.

LEACHED SHIRTINGS,

GREY SHEETINGS, TICKINGS.

WHITE, GREY AND

COLORLED BLANKETS,

FINE AND MEDIUM

TWEEDS, KNITTED GOODS

PLAIN AND FANCY FLANNEL,

LOW TWEEDS, ETOFFES, ETC.

Wholesale Trade Only Supplied.

15 VICTORIA SQUARE, MONTREAL,  
20 WELLINGTON ST. E., TORONTO.

## 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 ST., MONTREAL.

Established 1872.

## - THE ACCIDENT - Insurance Co'y of North America.

NEW FEATURE,

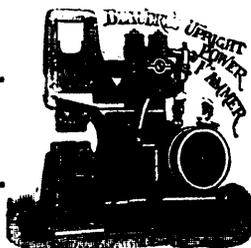
JOINT INSURANCE  
FOR PARTNERSHIPS

IMPORTANT TO MANUFACTURING FIRMS.

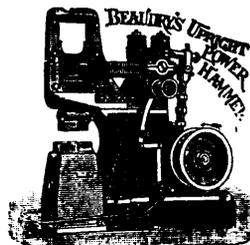
MEDLAND & JONES, Gen'l Agents,  
Cor. Adelaide and Victoria Sts., TORONTO.



SIMPLE;



PRACTICAL

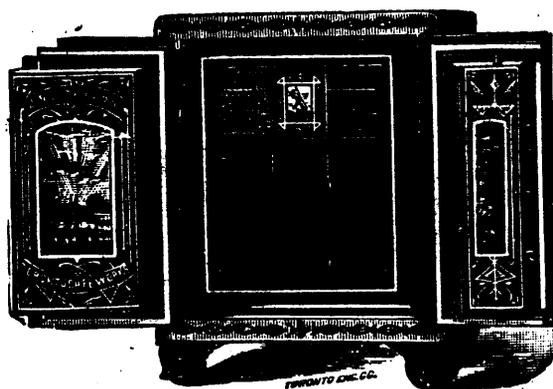


AND BEST.

## BEAUDRY UPRIGHT CUSHIONED POWER HAMMER

The most handy, compact, and above all, the most efficient tool ever invented for Manufacturers of all descriptions, Railroad Shops, Steel and Machine Forgers, File and Vice Makers, Knife and Cutlery Makers, Axle, Edge Tool and Agricultural Implement Manufacturers, Carriage Builders and, in fact, all others who need a first-class Hammer, and one of extraordinary capacity and adaptability. Correspondence solicited. Can be seen at Permanent Exhibition, Toronto.

**MILLER BROS. & MITCHELL,** Sole Makers for Canada, **MONTREAL.**



**J. & J. TAYLOR'S**  
*Double Tongue and Groove*  
**FIRE-PROOF SAFES** (Patented January 14th, 1886.)  
 Established 33 years.

All our new style Fire-proof Safes are fitted with **TWO COMPLETE TONGUES AND TWO GROOVES** on both the door and door frames, which effectually prevent the heat from passing between the door and frame into the interior of the safe.  
 They are also fitted with **CHILLED CHROME STEEL PLATES** under the Lock and Bolt Spindles to prevent drilling; and have **DRY AIR-CHAMBER** inside to prevent dampness to papers.  
 Catalogues and Prices on application.

**J. & J. TAYLOR, Toronto Safe Works**

## INTERCOLONIAL RAILWAY OF CANADA.

The direct route between the West and all points on the Lower St. Lawrence and Baie des Chaleur, Province of Quebec; also for New Brunswick, Nova Scotia, Prince Edward, and Cape Breton Islands, Newfoundland and St. Pierre.

Express trains leave Montreal and Halifax daily (Sunday excepted) and run through without change between these points in 30 hours.

The through express train cars of the Intercolonial Railway are brilliantly lighted by electricity and heated by steam from the locomotive, thus greatly increasing the comfort and safety of travelers

New and elegant Buffet sleeping and day cars are run on all through express trains.

### Canadian-European Mail and Passenger Route.

Passengers for Great Britain or the Continent, leaving Montreal on Friday morning, will join outward Mail Steamer at Halifax on Saturday.

The attention of shippers is directed to the superior facilities offered by this route for the transport of flour and general merchandise intended for the Eastern Provinces and Newfoundland; also for shipments of grain and produce intended for the European market.

TICKETS may be obtained, and all information about the Route; also **FREIGHT and PASSENGER RATES**, on application to

**D. FOTTINGER,**  
 Chief Superintendent

RAILWAY OFFICE, MONCTON, N. B., 2nd July, 1889.

**N. WEATHERSTON,**  
 Western Freight and Passenger Agent, 93 Rossin House Block,  
 York Street, TORONTO.

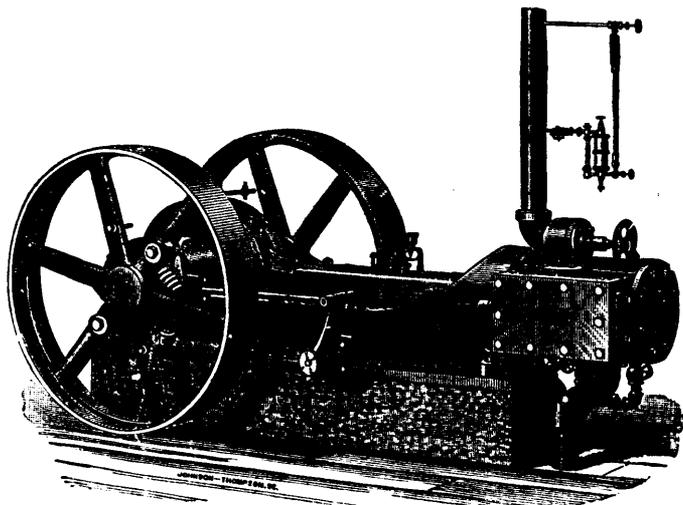
**TORONTO LITHOGRAPHING CO.**  
 Globe Building, Toronto  
 MAKE SPECIALTY OF  
**Fine Color Work**  
 CHROMO ADVERTISING  
 CARDS and NOVELTIES  
 also a Superior Class of Wood Engraving

**BINGHAM & WEBBER** 

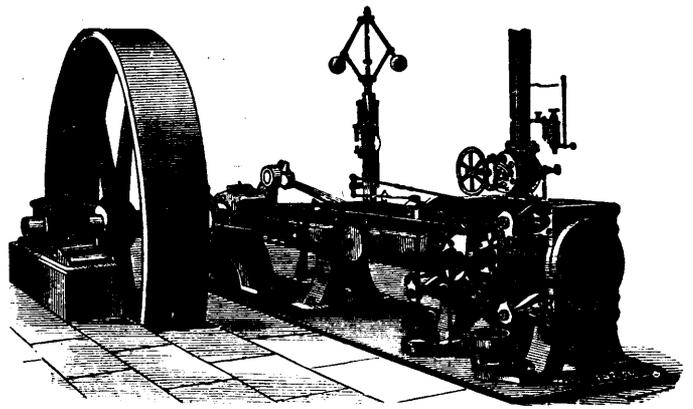
"Their Work Speaks Their Worth."  
 Their Telephone No. is 50  
 Their Office is in the Lake-side Court.

**PREMIER CATALOGUE PRINTERS**  
 OF CANADA

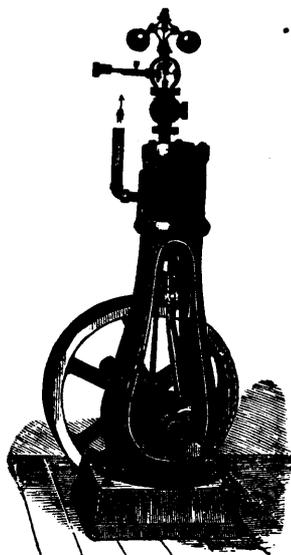
::::: 25 1/2 Adelaide Street East :::::  
**Toronto**



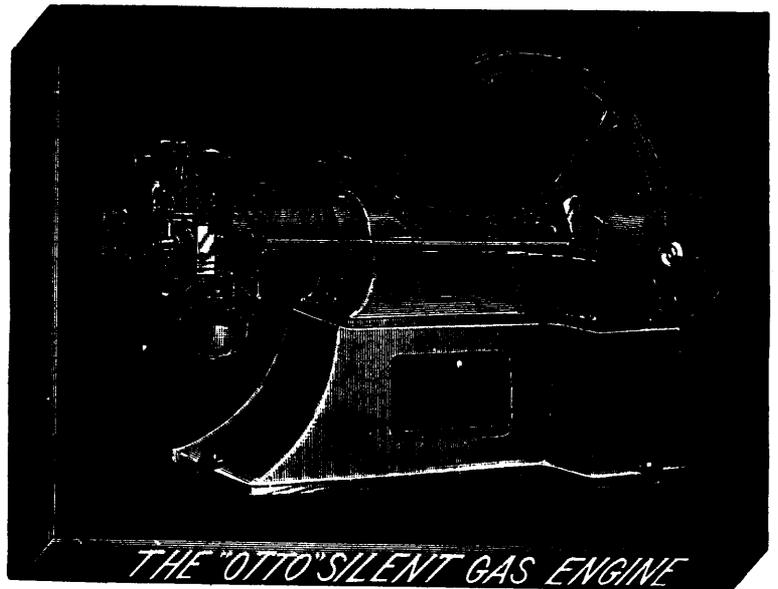
Armington & Sims Electric Light Engines.



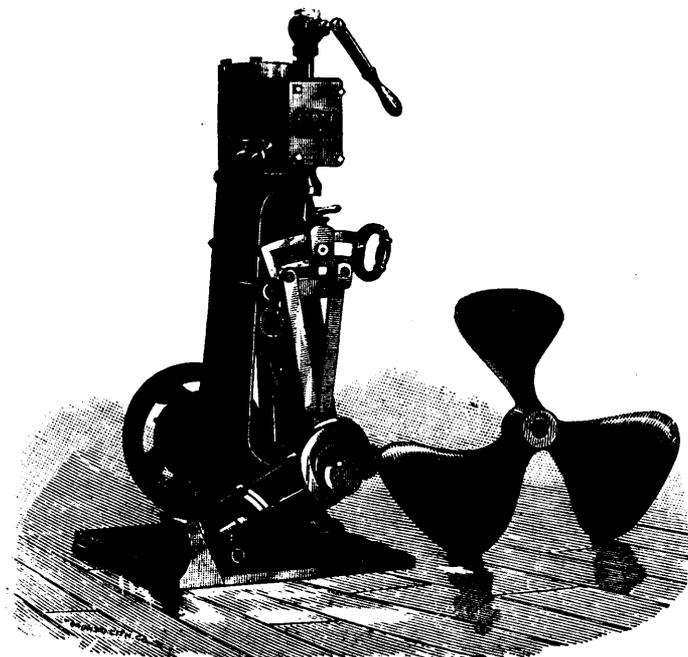
Reynolds-Corliss Engine.



Vertical Engines.



THE "OTTO" SILENT GAS ENGINE



Yacht Engines.

# John Doty Engine Co.

TORONTO, ONT.

MANUFACTURERS OF

# Engines & Boilers

OF EVERY DESCRIPTION.

SEND FOR CATALOGUES.

# The DODGE "INDEPENDENCE" WOOD SPLIT PULLEYS



**WITH PATENT BUSHING SYSTEM**

*Best Belt Surface, Lightest, Strongest, Best Balanced, and Most Convenient Pulley in the World.*

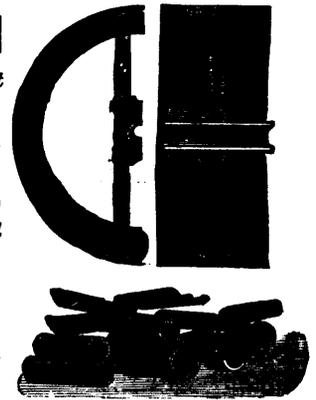
**EVERY PULLEY A SPLIT PULLEY.**

*The hole in every pulley can be readily bushed to fit any sized shaft. Bushings furnished with each pulley. Guaranteed to give from*

**30 TO 60 PER CENT MORE POWER THAN ANY IRON PULLEY.**

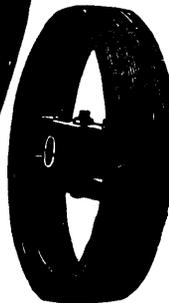
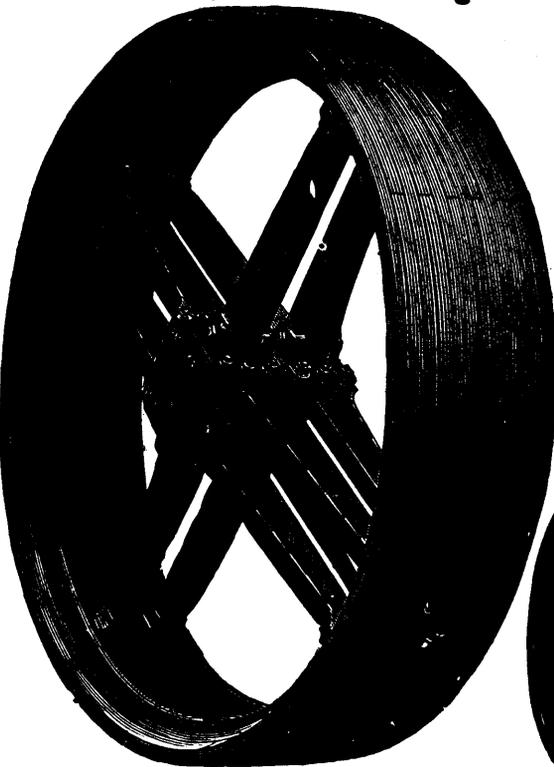
*Strong enough for any power required. Made in any size and width, from twelve inches to sixteen feet diameter.*

**EVERY PULLEY WARRANTED.**



*We will furnish a Pulley for any service for 30 days free of charge, if it does not meet the warranty. Prices as low as any other good Pulley. Send for Catalogue, Price List & Guarantee*

**70 PER CENT. LIGHTER THAN CAST IRON**  
*And 50 per cent. Lighter than Wrought Iron or Steel Pulleys.*



## READ THE FOLLOWING.

**NORTHWESTERN MANUFACTURING & CAR COMPANY,**  
 SHATTO & DENNIS, MINNEAPOLIS, MINN. STILLWATER, MINN., August 15, 1884.  
*Gentlemen:* You ask why we use the Dodge Patent Pulley. I answer because we consider them the cheapest, most convenient and satisfactory in all particulars.  
 Yours truly,  
 S. R. STIMSON, General Manager.

**OFFICE OF NEWTON WAGON CO.,**  
 C. L. RICE, AGENT, CHICAGO, ILL. BATAVIA, ILL., Feb. 17, 1886.  
*Dear Sir:* Replying to your favor, will say that after using the Dodge Wood Split Pulley for a year or more we are satisfied they are a good thing, if not the best Pulley made, and shall use them hereafter in preference to any other we know of.  
 Yours truly,  
 NEWTON WAGON CO.

We have sold these pulleys for one year, and they have been put to every kind of service, and their popularity is wonderful. We refer to the following users for proof of the above statements: Pillsbury & Hulbert Elevator Co., Minneapolis; R. M. Pratt & Co., Elevators; Northern Pacific Elevator Co.; The Pacific Elevator Co.; Minneapolis Harvester Works; Minneapolis School Furniture Co.; M. & St. L. R. R. Co.; Willford & Northway; Washburn, Crosby & Co.; St. Paul Electric Light Co.; St. Paul Roller Mill Co.; Minneapolis Brick Co.; N. W. Mfg. & Car Co., Stillwater, Minn., and very many others.  
 SHATTO & DENNIS, MINNEAPOLIS, MINN.

**THE WORLD'S INDUSTRIAL AND COTTON CENTENNIAL EXPOSITION,**  
 W. H. DODGE, PREST. DODGE MFG. CO., MISHAWAKA, IND. NEW ORLEANS, March 19, 1885.  
*Dear Sir:* I have a number of your Patent Wood Split Pulleys in use here at the Worlds Fair and Cotton Centennial Exposition, driving Dynamos for Electric Lighting. They are doing heavy work, and are held upon the shaft by the compression of wood on iron. They hold firmly, and do not slip. I have watched with a great deal of interest the many Pulleys of your make running at this Exposition; and I think them the best Pulley I have ever seen. I believe them to possess the following points of merit over any other Pulley: All Pulleys being split or in halves; best belt surface; best shaft fastening; best method of utilizing Pulleys to shafts of different sizes; best balance; lightest on the shaft; strong, and I believe durable. I heartily recommend them.  
 Yours very truly,  
 S. H. GILMAN,  
 Chief Consulting Engineer.

## Waste of Power.

According to the best scientific authority it costs one horse power to keep in motion one ton of metal or weight; thus for every unnecessary 2,000 pounds weight on your line shaft, cost you one horse power. To maintain a horse power costs from \$25 to \$125 per year. Any manufacturer who will take the pains to investigate the unnecessary weight by Heavy Iron Pulleys, too tight belts, etc., will be surprised to find the enormous waste of power consumed in this manner. 60,000 Dodge Patent Wood Split Pulleys now in use. Our capacity being now equal to 100 Pulleys per day, we shall hereafter keep in stock for immediate shipment all sizes.

*Send for Illustrated Circular and Reference List.*

**THE DODGE WOOD SPLIT PULLEY CO.,**  
**TORONTO.**

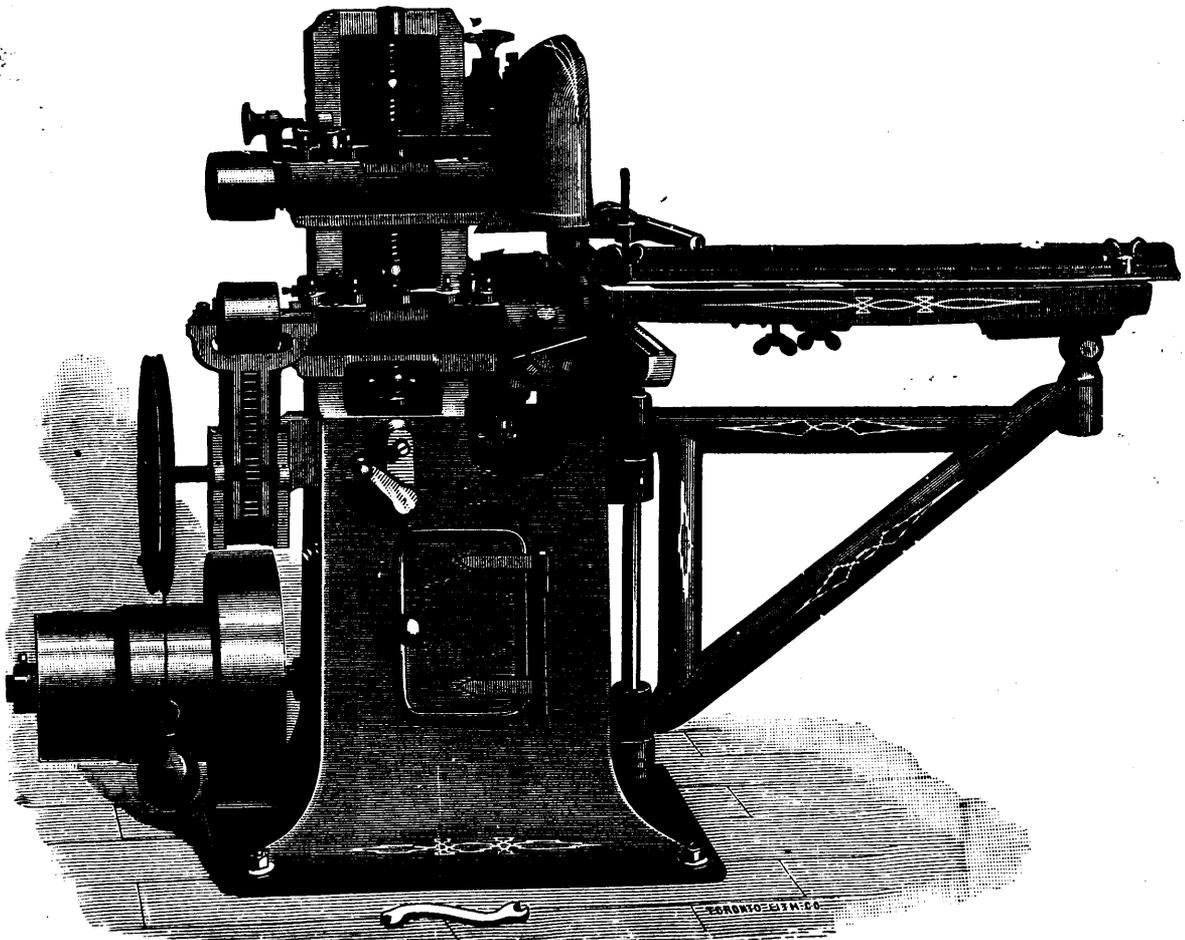
P. O. BOX 333.

TELEPHONE 2080.

**TAKE NOTICE:---Our List of Prices for the DODGE PATENT WOOD SPLIT PULLEYS is for ALL SPLIT-PULLEYS.**

**We beg you will note this fact when comparing our List with others which are for SOLID RIM, and NOT for Pulleys in HALVES.**

# NEW AND IMPROVED *Pedestal Tenon Machine.*



This is an entirely new style of Tenon Machine. The frame is cast in one piece, and the working parts stand solidly on a pedestal, avoiding all vibration.

The Cutter and Cope Heads are connected and are moved all together, or separately, as required. The Upper Head and Boxes also adjust horizontally to suit shoulder of tenon, the Cope Knives moving with the Heads to prevent re-adjustment.

A special feature in this machine is the Bed, or Carriage, which is at once light and strong. The outer end works on rollers and is moved very easily.

In cutting the tenon the Bed and Carriage move entirely past the Heads and Cutters, the operator having full control of the work. It has also the advantage of leaving the Heads and Cope Knives clear, and of ready access by the operator.

The Carriage is so arranged that it cannot tip over the Slides nor be thrown into the Cutters, and is also supplied with extension bar for long stuff, as in all Tenoning Machines.

This Machine is supplied with single or double Copes, as ordered, and for furniture work it is without Copes, and with an adjustable cut-off Saw.

## COWAN & CO.

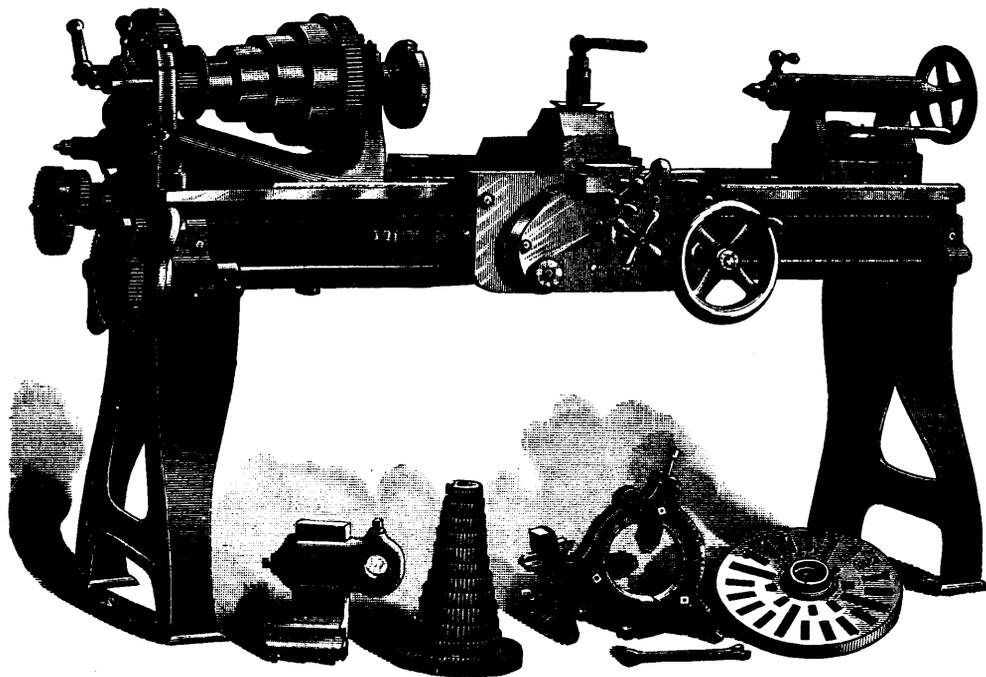
**"Galt Foundry" Engine and Machine Works, GALT, ONTARIO, CANADA.**

*Corlis and Slide Valve Engines, Boilers, and Wood-Working Machinery, all kinds New Patterns, Highly Finished.*

Canada Tool Works,

# John Bertram & Sons,

DUNDAS, ONT.



16-in. LATHE.

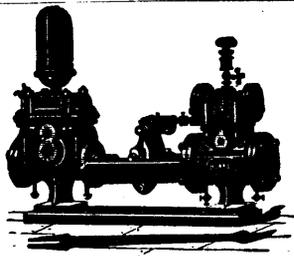
Manufacturers of  
**Machinists' Tools**  
and  
**Woodworking Machinery.**

- LATHES,
- PLANERS,
- DRILLS,
- MILLING MACHINES,
- PUNCHES,
- SHEARS.
- BOLT CUTTERS
- SLOTTING MACHINES,
- MATCHERS
- MOULDERS,
- TENONERS
- BAND SAWS,
- MORTICERS,
- SAW BENCHES

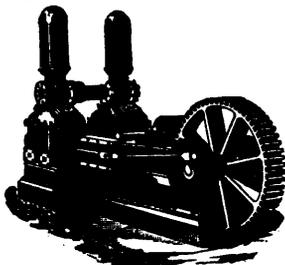
Locomotive and Car Machinery, Special Machinery, Price List and Photographs on application.

Warerooms: Permanent Exhibition, Toronto; Polson Engine Co, 38 Yonge St.; Machinery Supply Ass'n, Montreal.

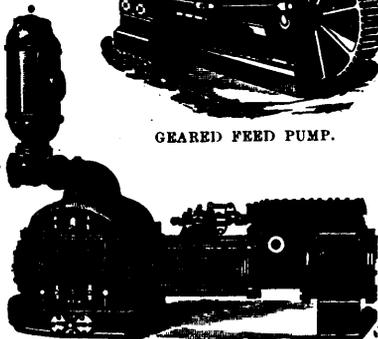
## Geo. F. Blake Manufacturing Co.,



BOILER FEED PUMP.



GEARED FEED PUMP.



DUPLEX COMPOUND ENGINE

BUILDERS OF

SINGLE AND DUPLEX

Steam and Power

### Pumping Machinery



**BOSTON.**

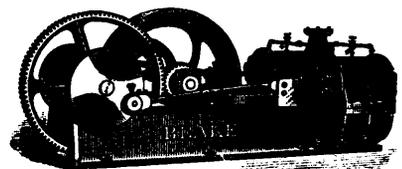
111 FEDERAL STREET

**NEW YORK**

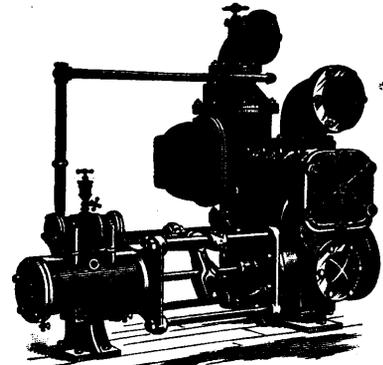
95 & 97 LIBERTY STREET.

SEND FOR ILLUSTRATED CATALOGUE.

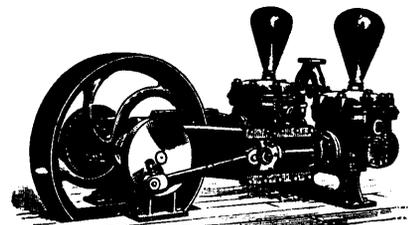
These goods may be seen at the Permanent Exhibition 63 to 69 Front Street West, Toronto.



AIR COMPRESSOR.



AIR PUMP AND CONDENSOR.



BELT PUMP.

# *Nova Scotia Steel Co., Limited,*

NEW GLASGOW, NOVA SCOTIA

(Only Steel Works in Canada),

MANUFACTURERS OF

## **Hammered *and* Rolled Steel**

MADE BY THE

**SIEMENS-MARTIN (OPEN HEARTH) PROCESS.**

ROUND MACHINERY STEEL for Shafting, Spindles, etc. MILD STEEL for Rivets, Bolts  
Thresher Teeth and many purposes where Norway Iron is now used.

SPECIAL SECTION PLOW BEAMS, MILD STEEL CENTRE AND SOLID MOULD BOARDS,  
COULTER STEEL HARROW DISCS,  
AGRICULTURAL STEEL CUT TO PATTERN, SPRING, SLEIGH SHOE, TYRE, TOE CALK AND CROSS BAR STEEL  
STEEL NAIL PLATE.

□□ *Binder Bars, Z and other Special Sections.*

STEEL MOWER BARS.

Particular attention given to the manufacture of Rake, Cultivator and Harrow Teeth, and other  
Agricultural Spring Steel Forgings.



**113 FEDERAL STREET, BOSTON.**

**93 Liberty St., New York.**

**Warren, Mass.**

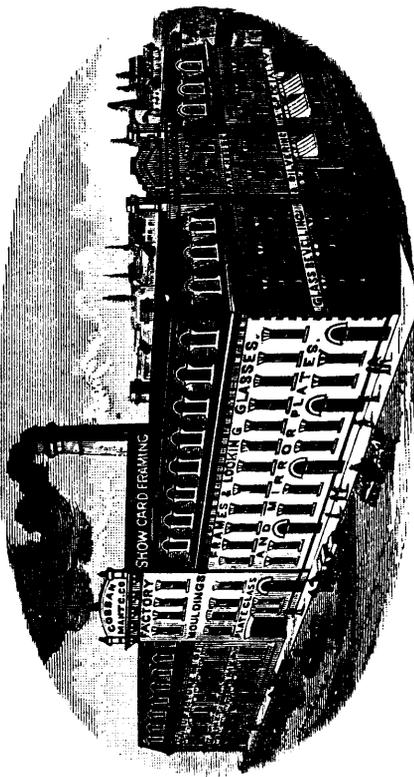
FOR SALE BY THE

**Polson Iron Works Company, 38 Yonge Street, Toronto, Ontario.**

WHERE MANY SIZES MAY BE SEEN IN STOCK.

SEND FOR ILLUSTRATED CATALOGUE.

**Cobban Manufacturing Co'y** Factory & Head Office: Toronto.  
 Branch: 148 McGill Street, Montreal.

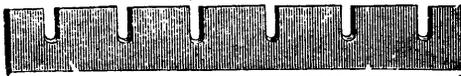


MANUFACTURERS OF  
 Mantles, Over Mantles and Mirrors in Finest Hardwoods. Mouldings, Picture  
 Frames and Looking Glasses. Mirror Plates: British, French, German,  
 Shocks. Plate Glass Beveling and Silvering a Specialty  
**CLOSE PRICES. LIBERAL TERMS.**

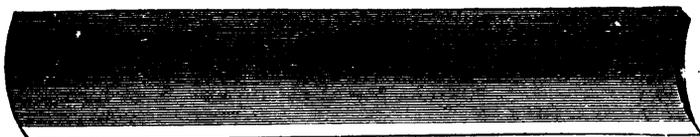
**TORONTO.**  
**MONTREAL.**

**GALT MACHINE KNIFE WORKS.**

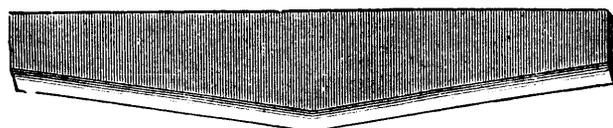
PLANING MACHINE  
 KNIVES.



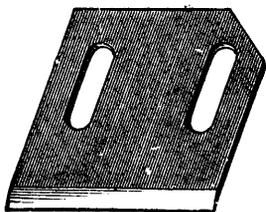
STAVE CUTTER KNIVES.



STAVE JOINTER KNIVES.



MOULDING, TENONING,  
 MITREING,  
 SHINGLE JOINTER,



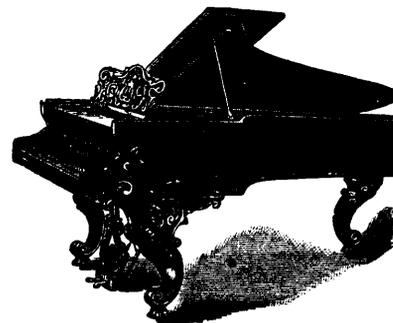
And other irregular shapes.

Cheese-box and Veneer, Paper Cutting, Leather Splitting and any special knife made  
 to order. SEND FOR PRICE LIST. ALL WORK WARRANTED.

PETER HAY, - - - GALT, ONT.

**HEINTZMAN & CO.**

MANUFACTURERS OF



GRAND,  
 SQUARE,  
 AND UPRIGHT  
**PIANOFORTES.**

SEND FOR ILLUSTRATED CATALOGUE.

Warerooms, - 117 King St. West,  
**TORONTO.**

**HAMILTON  
 COTTON COMPANY,**

MANUFACTURERS OF

**THE STAR BRAND**

COTTONADES, DENIMS, TICKINGS

- Star Brand—BEAM WARP.
- „ HOSIERY YARN
- „ BUNDLE YARN.
- „ CARPET WARP.
- „ BALLED KNITTING YARN.

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

General Agents,—

**F. McELDERY & CO.**

204 MCGILL STREET, MONTREAL.

22 & 24 COLBORNE ST., TORONTO.

# For Sale Cheap.

WE OFFER THE FOLLOWING  
**ELECTRIC - LIGHT - PLANT**

FOR SALE AT LOW PRICE:

All in good order, but recently replaced by the  
**RELIANCE SYSTEM.**

Two 25-Light Ball Dynamos, Mica  
Insulation. Almost as good as new!  
One 15-Light American Dynamo, in  
good order.

One 10-Light Royal Dynamo, with 10  
lamps, in first class condition.

One 40-Light Royal Dynamo, with 5  
lamps, with new armature.

Apply for the above or for new plant to

**THE RELIANCE ELECTRIC MFG CO., Ltd.**  
WATERFORD, ONT.



# THE OSHAWA Malleable Iron Co.

MANUFACTURERS OF

## MALLEABLE IRON

### CASTINGS TO ORDER

FOR ALL KINDS OF

## Agricultural Implements

AND

### MISCELLANEOUS PURPOSES.

Oshawa, Canada.



## HICKORY PULLEYS.

We make only hardwood bent  
rim spoked arm split pulley; only  
small split pulley; only split loose  
pulley with oilless bearings; only  
wooden hangers, in the market.



Send for discounts and circulars.

**Menasha Wood Split Pulley Co.**

MENASHA, Wis.

## SMITH'S FALLS MALLEABLE IRON WORKS WM. H. FROST

MANUFACTURER TO ORDER OF

### Malleable Iron Castings

FOR

### Agricultural Implements

AND OTHER PURPOSES.

Also CARRIAGE HARDWARE.

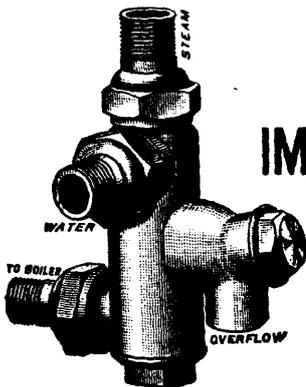
**SMITH'S FALLS,**

Ontario, Canada.

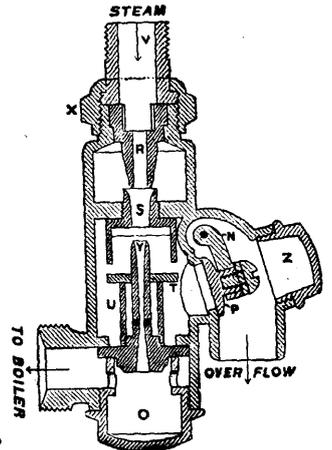


This Space for Sale.

## FEED YOUR BOILER WITH A PENBERTHY IMPROVED AUTOMATIC INJECTOR. 10,000 IN USE IN CANADA.



Cheaper than a Pump, takes up Less Room and  
Feeds the Boiler with Water at  
nearly Boiling Point.



## SIMPLE, ECONOMICAL AND DURABLE.

And the Only Absolutely Automatic Injector in the Dominion.

**PROMINENT FEATURES ARE:** They start at about 25 lbs. steam pressure and work to 150 lbs. Lift water up to 20 feet, and work from a head as well. They require little watching, as, being automatic, they restart if feed to boiler is broken by air or sudden jarring. The parts are interchangeable and can be removed without uncoupling machine. Send for pamphlet to **PENBERTHY INJECTOR CO., Detroit, Mich.** Factory at Windsor, Ont. Handled largely also by Waterous Engine Works Co., Limited, Brantford; J. H. Taylor, Montreal; S. J. Shaw, Quebec; Park Bros., Chatham; McDonald & Co., Limited, Halifax, N.S.; A. R. Williams, Toronto.