

Technical and Bibliographic Notes / Notes techniques et bibliographiques

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

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

Coloured covers/
Couverture de couleur

Covers damaged/
Couverture endommagée

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

Cover title missing/
Le titre de couverture manque

Coloured maps/
Cartes géographiques en couleur

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

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

Bound with other material/
Relié avec d'autres documents

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

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

Coloured pages/
Pages de couleur

Pages damaged/
Pages endommagées

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

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

Pages detached/
Pages détachées

Showthrough/
Transparence

Quality of print varies/
Qualité inégale de l'impression

Continuous pagination/
Pagination continue

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

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

Title page of issue/
Page de titre de la livraison

Caption of issue/
Titre de départ de la livraison

Masthead/
Générique (périodiques) de la livraison

Additional comments: /
Commentaires supplémentaires:

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

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

ROYAL OIL CO.

TORONTO
and
MONTREAL

OILS

Raw Linseed Oil.
Boiled Linseed Oil.
Turpentine.

Write for Prices
and Samples.

DOMINION MANUFACTURER
AND INDUSTRIAL WORLD.
DEVOTED TO THE MANUFACTURING INTEREST OF THE DOMINION

Vol. 28.

TORONTO, AUGUST 17, 1894.

No. 4.

ESTABLISHED FIFTY-FIVE YEARS

THEO. H. EATON & SON
WINDSOR, ONT.

Importers and Manufacturers
OF

Dyewoods, Dyeing Drugs

ACIDS

PURE DYEWOOD EXTRACTS

CHEMICALS, ALKALI, ETC.

Sole Agents for

THE CROWN ANILINE DYES, ALIZARINES, ETC



Use ..

Mucklow's

Hematin Powder

For Wool Dyeing. The only perfect
substitute for logwood chips
in the market.

Dominion Dyewood & Chemical Co.

.. TORONTO ..

Sole Agents for Canada.

TO MANUFACTURERS

—BUY ONLY—

Dixon's Star Rivet

LEATHER BELTING

It is Unrivalled for Durability

First, in Efficiency

Last, in Wearing Out

.. THE ..

F.E. Dixon Belting Co.

(LIMITED)

70 King Street East - TORONTO

WRITE FOR DISCOUNTS

OAK TANNED BELTING

THE J. C. McLAREN BELTING CO.,

TORONTO and ...
.. MONTREAL

.. STICK FAST ..



BELT PRESERVATIVE

PREVENTS SLIPPING

INCREASES POWER

GIVES STEADY AND REGULAR MOTION
KEEPS BELTS PLIABLE AND STRONG

Dampness cannot affect
Belts protected by **Stick Fast**

HORACE R. RIDOUT

22 JOHN STREET, - - MONTREAL

Sole Mfr. for Dominion.

Send for Circular, Testimonials and Sample

THE GUTTA PERCHA & RUBBER CO.
HOWARREN, OF TORONTO LTD. CHANCELLER, SECTY.
PRESE & TRCAL.
BEARING PACKING CLOTHING ROSES
FACTORIES
AT PARKDALE.
WAREHOUSE & OFFICE. 61 & 63 FRONT ST. W. TORONTO.

JOHN BERTRAM & SONS

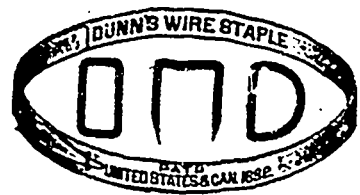
Canada Tool Works

DUNDAS, ONT.

See Advertisement, page 187

P. DUNN, Manufacturer

COTE ST. PAUL. - - Near Montreal.



All kinds of Wire Staples and Suspender Rings

Ridout & Maybee

J. C. RIDOUT, (Late O. E.)
Barrister, Solicitor, Etc.

J. EDW. MAYBEE,
Mech. Eng.

Solicitors of and Experts in
Pamphlet on Patents Sent Free

103 Bay Street, Toronto.

PATENTS

ROJLWR M-JJ MACT-ZUCKY HIGH CLASS

ENGINES,
BOILERS,
GRATE BARS,
SAW MILLS.

John Abell Engine and Machine Works Ltd.
TORONTO, ONT.

ROBT. S. FRASER
Commission Agent & Importer
MONTREAL, QUE.

Tetlow's English Card Clothing.
Patent White Belting.

ROOT & CO.,
Camel Hair, Wools & Tops
P. O. GAULKE & CO.,
Worsted and Mohair Fancy Yarns

FR. JAC. ANDERES
Egyptian and
Peruvian Cot-
ton.

IMPERIAL BANK OF CANADA

Capital Authorized \$2,000,000
Capital Paid-up 1,954,525
Reserve Account 1,152,252

Directors:

H. E. HOWLAND President
T. H. MERRITT, St. Catharines, Vice-Pres.
Wm. Ramsay, Hon. John Ferguson, Robt.
Jaffray, Hugh Ryan, T. Sutherland Stayner.
D. B. WILKIE, Cashier, H. Jennings, Asst.
Cashier, E. HAY, Inspector

Head Office, - TORONTO.

BRANCHES IN ONTARIO:

Essex Niagara Falls St. Thomas
Fergus Port Colborne Sault St. Marie
Galt St. Catharines Welland
Ingersoll Woodstock Hat Portage
Toronto, cor. Wellington St. and Lander Lane
cor. Yonge and Queen Streets
cor. Yonge and Bloor Streets

BRANCHES IN NORTH-WEST:

Winnipeg Brandon Portage la Prairie
Calgary Prince Albert Edmonton

Drafts on New York and Sterling Exchange
bought and sold. Deposits received and
interest allowed.

Prompt attention paid to collections.

Municipal Bonds and Debentures bought
and sold.

Agents in Canada for "Cheque Bank, Ltd."

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

**McARTHUR,
CORNEILLE & CO.**

Manufacturers and Importers.

310-316 St. Paul Street

AND

147-151 Commissioners Street

MONTREAL

OFFER AT CLOSEST PRICES

Pure Olive Oil, Winter Pro-
cessed Lard Oil, Extra File
Spindle Oil and a
Full Assortment
of Other
Lubricating Oils,
Greases, Mill Soaps, etc.
Also Chemicals, Dye Stuffs,
Dye Woods, Extracts, etc.

SOLE AGENTS IN CANADA FOR

St. Denis Dyestuff and Chemical Co.

PARIS,

A. POIRIER, PRESIDENT.

Aniline Colors, Archil Extract, Cachou de
Laval, Etc.

BRITISH ALIZARINE CO. LONDON

Paste and Dry
Alizarine

Boston Dyewood & Chemical Co. Boston

Dyewoods and
Extracts

COIGNET & CO., PARIS

Glues, Gelatines,
Etc.

Watson, Walker & Quickfall, Leeds

Indigo
Extracts

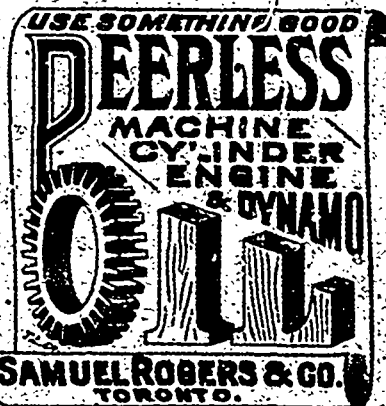
MILLERTON, TANNIN EXTRACT CO.

Hemlock
Extract

Maintain Large Stocks, fully assorted, and will
always be pleased to furnish
quotations and samples.

NORTHEY LIMITED
..TORONTO..

Duplex and Single
Steam and Power



Largest Manufacturers
of STEEL and BRASS
STAMPS in Canada

**PRITCHARD
& ANDREWS**

OTTAWA, ONT.

Rubber Stamps,
Stencils, Seals, Etc.

Send for Prices.



BEST

LEATHER BELTING

Always on Hand

Telephone 1300



ESTABLISHED IN 1890.

PUBLISHED ON THE FIRST AND THIRD FRIDAYS OF EACH MONTH

BY
The Canadian Manufacturer Publishing Company, Ltd.

Room 66 Canada Life Building, King St. W., Toronto.

FREDERIC NICHOLLS. - President and Treas.
J. J. CASSIDY, - - - - Vice-Pres. and Editor.
J. C. GARDNER, - - - - Managing Director.
GEO. F. MADDEN, - - - - Secretary.

L. M. PINOLET, Montreal - Representative in Province of Quebec.
J. B. DENBROEDER, 416 Exchange Building, Boston, Mass.,
Representative in New England States.

SUBSCRIPTION - - - - **\$1.00 per year.**

ADVERTISING RATES SENT ON APPLICATION.

OFFICERS OF

THE CANADIAN MANUFACTURERS' ASSOCIATION

President - - - - - **W. H. LAW.**
First Vice-President - - - - **GEO. E. DRUMMOND.**
Second Vice-President - - - - **WILLIAM CHAPLIN.**
Treasurer - - - - - **GEORGE BOOTH.**
Chairman Executive Committee - **FREDERIC NICHOLLS.**
Chairman Tariff Committee - - **R. W. ELLIOT.**
Secretary - - - - - **J. J. CASSIDY.**

SECRETARY'S OFFICE: Canada Life Building, King St. W.

WOOLEN MANUFACTURERS' ASSOCIATION

President - - - - - **B. ROSAMOND, M. P.**
Vice-President - - - - - **JAS. KENDRY.**
Secretary - - - - - **J. J. CASSIDY.**

KNIT GOODS MANUFACTURERS' ASSOCIATION

President - - - - - **JOHN PENMAN.**
Vice-President - - - - - **J. HEWTON.**
Secretary - - - - - **J. J. CASSIDY.**

CARPET MANUFACTURERS' ASSOCIATION

President - - - - - **JAMES P. MURRAY.**
Vice-President - - - - - **ROBERT DODDS.**
Secretary - - - - - **J. J. CASSIDY.**

GLOVE MANUFACTURERS' ASSOCIATION

President - - - - - **W. H. STOREY.**
First Vice-President - - - - - **JOHN MACLAREN.**
Second Vice-President - - - - - **A. R. CLARKE.**
Secretary - - - - - **J. J. CASSIDY.**

REPRESENTATIVES TO

TORONTO INDUSTRIAL EXHIBITION ASSOCIATION

R. W. ELLIOT. **GEORGE BOOTH.**
W. K. McNAUGHT. **SAMUEL MAY.**
J. CASSIDY.

THE TORONTO EXHIBITION.

The Toronto Industrial Exhibition Association have assigned the Canadian Manufacturers' Association their accustomed office room in the Press Building on the Fair Grounds, and I take pleasure in announcing that it will be thus occupied during the two weeks of the forthcoming Fair beginning on September 3. All members of the Manufacturers' Association will make this their head-

quarters during the Fair; and all Canadian manufacturers and American manufacturers, and all other manufacturers, and all their friends—their sisters and their cousins and their aunts are invited to make use of the accommodations which will be there provided. As usual, the latch string will hang on the outside of the door; and on the inside will be found conveniences which will be appreciated under the circumstances. The Fair promises to be exceedingly interesting to all concerned, and particularly so to manufacturers. The management are doing all within their power to make it thus, and they will undoubtedly succeed, as they always do. The Toronto Fair is always of great pecuniary advantage to exhibiting manufacturers.

J. J. CASSIDY, Secretary,
Canadian Manufacturers' Association.

THE TORONTO INDUSTRIAL FAIR.

The continued popularity of the Toronto Industrial Exhibition, which opens on the 3rd of September, is abundantly evidenced by the very large increase in the number of exhibits to be shown in all the departments. The display in the Main Building and Machinery Hall will be particularly full and varied, and notwithstanding the entire re-arrangement of the former building with the object of economizing space and showing the exhibits to the best advantage, the management anticipate some difficulty in meeting the greatly increased demands on that space. Among other changes in the internal arrangements, the fountain in the centre, long a familiar object to Fair visitors, has disappeared, being replaced by a band-stand, underneath which booths have been constructed for the sale of specialties. This is an improvement that will be welcomed by many exhibitors who do not approve of the sale of eatables and other articles in their immediate neighborhood. Henceforth all privileges to sell in the Main Building will be strictly confined to the particular location set apart therefor.

This journal has frequently called attention to the inadequate and defective accommodation afforded to exhibitors of machinery in operation in the building devoted to that purpose. We are pleased to learn that the enterprising management of the Fair fully realize the shortcomings of Machinery Hall, considered with relation to present day requirements, and intimate their purpose before long of replacing it by a new building better adapted in its construction and appointments for the display of heavy machinery. The large outlay involved by the building of the cattle sheds, stables and new grand stand last year, however, has necessitated a postponement of this much-needed improvement to a future date. When the work is undertaken the expectation of the manufacturers that their requirements and interests will be provided for as fully and with the same perfection of detail as those of the farmers and stock-breeders have been, will no doubt be entirely fulfilled. In the meantime such temporary repairs and alterations have been made in the present building as were urgently required. Changes have been made in the location of the engines and a portion of the floor has been re-laid with 3-inch planking.

The attention of inventors and mechanical experts has been of late directed towards the possibilities of electrical development. Recognizing this tendency and the interest

created by the practical application of this wonderful force, a great deal of space has been devoted to electrical exhibits and those interested will have an opportunity of familiarizing themselves with the latest discoveries and practical appliances in which electricity furnishes the motive power.

The Canadian Pacific Railway Co., with their usual enterprise, have for some years taken advantage of the opportunity presented by the Fair to familiarize the people of the older Provinces with the productive capacity of Manitoba and the great North-West by a large and well-arranged display of the agricultural produce of that region. This year this always interesting showing will be supplemented by a series of open-air addresses on the North-West illustrated with stereopticon views showing characteristic scenes and incidents. The Dominion experimental farm exhibit will also be a prominent feature of the agricultural display and afford an excellent idea of the results of scientific cultivation and the application of practical tests in the development of new varieties and the acclimatization of foreign species.

The programme of the fair just issued is remarkably full including a great variety of the special attractions and amusements which have so greatly conduced to the popularity of the exhibition. The desire for entertainment on the part of the many thousand visitors with whom a trip to the Fair is almost the only relaxation from toil during the course of the year is a perfectly natural and legitimate one. The management in catering to it have not in any respect detracted from the value and interest of the exhibition as a practical exemplification of the progress of the country from year to year in industrial and artistic development. The bill of fare provided includes trotting, running and hurdle races, bicycle contests, a match between trotting dogs, balloon ascensions, living pictures, the Kemp combination equestrian, and chariot racing specialties, Edison's kinetograph, organ recitals, concerts by the best musical organizations and every evening a brilliant pyrotechnic battle-piece entitled the "Siege of Algiers" in which over four hundred performers will be engaged.

It is not surprising that with such attractions, which are entirely unrivalled by an annual exhibition held on this continent, the attendance has been steadily increasing from year to year, and this season promises to be greater than ever. All the railways give reduced rates in addition to which arrangements have been made with many of the leading lines for running special cheap excursions. A notable feature of this year is likely to be the large number of Americans in attendance. Excursion trains will bring a host of visitors from the points along the leading lines of travel in the nearer States from places as far south as Washington, Baltimore and Cincinnati. An influx of this nature cannot fail to be of mutual benefit to us, and to our visitors, who will return to their homes with many misconceptions removed and with a better idea of the industrial progress and natural resources of our Dominion than they could gain by months of ordinary travel.

The success and prosperity of the Industrial Exhibition is a matter in which the manufacturing community of the Dominion are deeply concerned. Anything that arouses and stimulates the interest of the public in manufacturing

products and processes—that quickens observation and renders the people alive to the changes that are taking place around them, cannot fail to benefit the enterprising and alert manufacturer in placing his wares upon the market. The farmer who takes advantage of the trip to Toronto to acquaint himself with the best and latest improvements in agricultural implements; and the dealer in any line of goods who carefully scrutinizes the results of keen competition and adaptation to public tastes and requirements as seen in the varied displays, will be guided in his dealings by the results of his observations. New demands are created, new desires stimulated and fresh channels developed for production and commerce by the interchange of ideas at the numerous gatherings and conventions which are held during Fair time. No progressive manufacturer who desires to keep pace with public opinion and inform himself thoroughly as to the requirements of the class to which he caters can afford to ignore the opportunities presented by the annual recurrence of Toronto's Great Industrial Fair.

ARBITRATION.

One of the most noticeable features of the recent labor disturbances in the United States is that wherein a large number of the newspapers of that country, and of Canada also, express the opinion that Mr. Pullman should have agreed to submit the differences between his company and their employes, who had gone out on strike, to some sort of arbitration. The difference between the Pullman Company and their employes consisted in the fact that, owing to the existing condition of the country, an industrial and financial panic prevailing, the company felt compelled to either close their works and discharge all their employes, or to reduce their pay to a point where it would be possible to continue work. The company declared that even at the reduced rate of wages which they proposed to pay they would suffer a certain amount of loss upon such work as they might turn out, and that they could not consent to any arrangement which would be certain to entail any greater loss; and the employes declared that they would not accept the proposition of the company, insisting that the higher rate of pay that had prevailed before the panic should be what they were to receive for their services. When the Pullman Company absolutely refused to accede to this demand, their employes going out on strike, they were backed up by the American Railway Union, of which Mr. Debs was president, a result of which was the riots, bloodshed and destruction of property, that required the strong arm of the United States Government to suppress. During the existence of the disturbance the labor organizations, and many other unthinking ones, demanded that Mr. Pullman should agree to an arbitration for the settlement of the differences in dispute, which he persistently refused to do.

In alluding to the fact that so many journals laid blame upon Mr. Pullman for not assenting to arbitration, we are not surprised that certain political papers should assume such ground, for as a general thing such papers are instigated not so much by a love of justice as by a desire to make political capital out of any event that may come prominently before the public. But we are surprised to observe that some journals that profess to occupy high and unprejudiced ground in discussing important questions,

failed to comprehend that they were misled by analogies and captivated by pleasant sounding phrases. It is certainly meritorious in them to entertain the idea that, in the settlement of disputes, conciliation should be resorted to rather than force; but it is a mistake to suppose that if arbitration may be effective under a certain condition it should therefore be resorted to at all times and under all conditions. It is this thoughtlessness that impels the throwing up of hats and much exuberance of feeling at propositions to make laws to force arbitration upon such recalcitrant employers of labor as Mr. Pullman. It should not be supposed that because arbitration is often effective, and that the parties show wisdom in resorting to it, that it would be equally wise to submit to it matters that in their very nature cannot be settled in that way. It may be desirable to arbitrate disputes in events that have already occurred; but it seems impossible to arbitrate in events that have not yet transpired. There is a wide difference here observable. If there is a dispute as to the terms of a contract—if there is a misunderstanding as to the number of hours an employe is expected to labor, or as regards the pay for such labor—the difference might very properly be adjusted by arbitration; but we fail to observe any equity in a demand for arbitration which might require an employer to pay greater wages to his employe than he knows the circumstances of his business will permit. In the Pullman dispute the question was not whether the employes had been denied the wages for which they had labored, but whether the works should be kept in operation and such wages paid as were demanded, when it was evident that by doing so the concern would be plunged into a situation that would lead to financial ruin. The demand for arbitration meant that Mr. Pullman should submit to the decision of others, who could not possibly be as well qualified as he, the wages he should pay to his employes. As an answer to this demand it is evident Mr. Pullman, as an intelligent business man, could give no other answer than that he had nothing to arbitrate. He declared that he could not arbitrate the question whether he should operate his works at a loss. It was here he drew the line, feeling that he and only he should decide the point.

RIVALS OF THE STEAM ENGINE.

Ever since the discovery that steam could be harnessed and made subservient to the desires of man, all other sources of power have been considered of but secondary importance, and the steam engine has been made to render a service that until lately it was thought could not be equalled, not to say rivalled by any known power. We know that for centuries man has utilized the power of the winds, and also that the cascade and waterfall have been used to drive some sort of machinery; but the fickleness of the one, and the distance and inaccessibility of the other, in many instances, have tended to detract from any popularity that they might have otherwise enjoyed. Since the recent advent of the application of electricity for manufacturing and commercial purposes, however, the ingenuity of man has been keenly alive to the necessity of obtaining the cheapest power possible to be applied to dynamos for the generation of electrical energy. The steam engine having in the meantime arrived at such a high state of per-

fection, and presenting for many purposes the best and most available power for the purpose indicated, has been used almost exclusively for driving dynamos, the exception being in favor of places exceptionally tor the production of water power; and it is because of the cheap power afforded by falling water that many factories and workshops, and even towns and cities are supplied with electricity for heating, lighting and power purposes at greatly less cost than by any other known method. Under some circumstances, no doubt, wind engines will be used advantageously in storing up electrical energy to be used when wanted, and drawn from the storage batteries in manner similar to drawing water from a faucet, or turning on gas with a twist of the fingers; and no doubt the day is not far distant when not only the winds, but the waves of the sea also, will be harnessed and made to impart their power for generating electric energy for commercial purposes.

In a recent number of *Power* were two leading articles which dealt with the successful installation of rivals of the steam engine. In one case an electric station of considerable magnitude, that of the Danbury and Bethel (Conn.) Gas and Electric Light Co., was described as being operated by gas engines of 300 horse power; in the other a large cotton mill, that of the Columbia Cotton Co., at Columbia, S.C., was described as being driven by electric motors deriving their power from generators driven by water turbines somewhat removed from the mill itself. Speaking of these cases which are indicative of lines along which considerable development may be expected. *Power* says:

While the gas engine has been before the public for years it is only of late that we have heard of its use in the large sizes which would bring it into competition with mill and factory engines. It is now built in England up to six hundred horse-power. A considerable impetus has been given to its use through the development of "Dowson" or "producer" gas, made by forcing steam through a bed of incandescent fuel. This gas, while not nearly as rich as illuminating gas, makes a very economical fuel for the gas engine, and where the plant is large enough to warrant the operation of a producer, very satisfactory results have been attained, as low as three-quarters of a pound of coal per indicated horse-power per hour with a 280 horse-power engine. Very high efficiencies are obtained with small engines also, fifty horse-power engines running on a pound and a quarter. This fact might be made use of in subdividing power, using a multiplicity of small engines in a plant large enough to warrant a producer, and making up in the saving of transmission losses, independence of departments, etc., what loss of efficiency there might be from lack of aggregation.

It is stated that the electrically driven cotton mill in South Carolina is the only one of the kind in the United States, perhaps in the world, although there is in Connecticut a plant where a steam engine of about 300 horse-power has been displaced by motors deriving their power from a water plant some miles away. The success of the installation of the electric power plant at the South Carolina mills demonstrates the practicability of driving such large establishments by motors; and the distance of the original power from the point of application is a factor that is rapidly being solved by electricians and engineers.

ELECTRICITY IN BIBLE DAYS.

The wise man, Solomon, tells us that there is nothing new under the sun. He probably knew what he talked

about, and if the science of electricity, with which no doubt he was quite familiar, was not new in his day and generation, having been well known to Moses, all that the electricians of this century can boast of is that they have discovered a lost science.

A correspondent of the Savannah, Ga., Morning News, having studied his Bible, writes as follows :

There is nothing new on the face of the earth, and there is no doubt that electricity was well known to the Israelites and probably to the Phœnicians. The first record of electrical phenomena is as old as the Ten Commandments. Moses, when he received the stone tablets on which the Ten Commandments were written the second time, built a box out of fir, not the common cedar or any other native woods, but fir wood, which had to be imported by Phœnician merchants from the southern part of Europe. Was this choice accidental, on account of the great value of the resinous wood, or was it the choice of the best known non-conductor among the great number of various timbers ?

Moses had the fir box lined inside and outside with beaten gold, which converted the ark of the covenant into a very expensive but very perfect Leyden jar or storage battery for electricity. As gold is by 50 per cent. a better conductor of electricity than copper, was the choice of gold again on account of its value, or was it an inspiration or revelation ? So much is certain, that if Edison or Tesla had lived in those days they could not have improved on the choice of material, and the result was a powerful Leyden jar.

How was this Leyden jar charged ? was the next problem. A fire of material rich in carbon was kept burning on top of the ark of the covenant, and during day time a tall column of smoke guided the twelve tribes of Israel through their wanderings, and at night a tall flame was equally as well seen by them. Now carbon is a good conductor of electricity, and the particles of carbon floating in the smoke would conduct sufficient electricity to highly charge the Leyden jar. At least the current of electricity would be amply strong, so that if a hand were held toward the ark of the covenant sparks would result. That this was done by Moses at different times is a matter of record, and that he could always depend that his faithful Levites would obey his instructions to the letter, and have the jar always charged.

After Moses' death his brother Aaron took the matter in hand and greatly improved the electrical power of the storage battery. He had the ark of the covenant placed in the temple, he had it surrounded by poles 50 ells high, or 150 feet. These poles were covered with beaten gold and gold chains were hung from poles to the ark of the covenant which made a very expensive but very complete and powerful electrical connection. In a country where electrical storms are as frequent and as powerful as in Palestine at an elevation of 600 feet and a reach of 150 feet of the best conductor, an abundant supply of Franklin's electricity would necessarily always be on hand.

It is very likely that Aaron knew nothing of amperes, ohms or volts, otherwise his two sons never would have monkeyed with this powerful apparatus, and they would not have been killed by fire breaking out of the ark of the covenant and killing them without any wounds or burns appearing on their body.

Any coroner's jury of to-day, if it were to sit on an inquest over the body of Aaron's sons, would at once bring a verdict of death by a discharge of electricity.

Aaron knew this power, and to make it effective, all he had to do to deal death from this apparatus was to remove the costly camel's hair carpets, which are almost perfect non-conductors of electricity, and make the culprit stand on terra firma ; death would result instantly by fire breaking out and leave no wounds or burns to account for his death. That several members of revolting tribes of Israelites were thus electrocuted is also a matter of record in the Bible.

Solomon in building his temple advanced one step further ; he found that copper would do as well as gold. He had the temple covered with copper, and copper waterpipes led into the cisterns inside the temple. On the temple, or rather on its roof, a number of gilt spears were placed in vertical positions, ostensibly to scare off the birds, and to keep them from defiling the temple, but these spears, were several cords high, or from 16 to 24 feet. Such a height would hardly be necessary for scarecrows, but it was ample to load the roof, waterpipes, etc., with a powerful current of electricity.

Franklin, the electric chair in the State of New York, as well as the discovery of the Leyden jar itself in Leyden, Germany, are all back numbers. History only repeats itself whether recorded or not.

AS TO SCABS.

In these days when laboring men who affiliate with labor unions, of their own free will and accord or not, make use of the most bitter language towards all other laboring men who do not thus affiliate, they commonly denounce the other men as scabs. What is a scab ? Fred Woodrow, thus describes him :—

The scab is a man who chooses to work when others choose to strike. For this exercise of his personal liberty, and his own volition, he is anointed with an aromatic egg in the shape of an odious name being added to that given him by his mother. It is true that this scurrility makes no difference in his personal character. Putting a lion in a donkey's hide never yet changed the animal within, nor can mud thrown on a marble column make it other than it is. It is so with a man. Epithets cannot spoil him any more than a label on a bottle can make soda water of milk or brandy. The misfortune is, however, and it is just here where the cloven foot comes through the stocking, that the public do not always discern the distinction between an epithet and a man. This is human nature ; it will join the hounds every time in pursuit of a lamb or a hare. It was a mob of this kind that crucified Christ, and would be as ready to do it to-day as they were 1,800 years ago. A trickbat never stops to reason, nor does a bludgeon wait for a jury.

Here lies the venom and ferocity of vocal abuse. It has killed statesmen and ended the career of some of the best and wisest of men ; it has opposed reforms and bolstered up abuses, muzzled the mouth of truth and made music of lies. Rub this kind of garlic on preacher, prophet, statesman or public writer, and the usual ninety-nine fools in a hundred of population will hold their noses as the victim

passes by. Better a wooden leg or a glass eye than a bad name. It sticks closer than a porous plaster, and the victim, though innocent as Noah was of drowning his neighbors, is under a ban from which it is as impossible to escape as it would be to crawl out of his skin.

What is known as a scab in modern parlance, is not necessarily a scamp or a scoundrel. He may be as honest and manly as his neighbors, as true a citizen and as good a son, brother or husband as ever turned out of the divine workshop. What he eats he earns; what he buys he pays for, and no scurrility can make a dog of such a man as that. He has his personal liberties and rights, and they are his, as sacred and unassailable as those of any other men. A knife on the throat of these rights is social murder, whether committed by a spiteful neighbor or an industrial order. This is plain talking, but any man that can count his fingers can swear to its truthfulness.

If labor wishes to secure its own rights it must respect those of others, and if one can put on his coat and walk out of a workshop, another has an equal right to take off his coat and walk in. We recognize the value of unanimity in labor; we know that without cohesion it is powerless. We understand why men making a stand for what they honestly consider to be a just demand or remonstrance, are more or less frustrated, and in some cases excruciatingly irritated, by seeing others take up the hammer or the chisel they laid down; but with all this allowed, there can be no defence, either legal or moral, in denying another man his personal liberty or rights. Society would recoil from keeping a man out of a church door if he chooses to go in. We do not hang, burn or drown men nowadays for their religious opinions. We claim freedom at the ballot box, and punish the men who obstruct it; in fact, all men are conscious of the danger involved in interfering with personal rights. It must be so recognized in all labor struggles, and labor unions will never be what they can and ought to be so long as violence is done to the non-consenting. We do not say, nor do we wish to infer, that the majority of labor concurs in such methods, but we do say this, that it is one of the most urgent duties of labor organizations to say "Hands off!" and to say it earnestly. The sooner it is done by putting the guilty parties out of unions, the better for labor.

BOILER INSPECTION.

We have been shown a letter, the substance of which is here reproduced, which explains itself, and the importance of which must commend it to all steam users. It says:

At the works of a customer of ours a new boiler was recently injured in a manner which will probably interest you, and your knowing of it may prevent a similar injury to your boilers. The firm recently put in a number of new boilers, made of heavy steel plate, and all completed in first-class style. They own a large number of boilers and employ a staff of good engineers.

Their Chief Engineer, having charge of all their steam boilers and engines, had heard of black oil being used as a preventive of scale forming in boilers. He gave instructions to use it, and for a short time all appeared right, and it seemed as if the oil were to be successful. One day,

however, one of the new boilers was noticed to have a large bulge in the Lottom nearly over the furnace and a second one on the next plate. The boiler was stopped, and no heavy deposit or thick scale found, and indeed no appearance of anything on the plate sufficient to account for such a bulge. The plate was cut out and then examined by the writer, and only by applying a chisel to the inside surface was the explanation of the trouble found. It proved to be a layer of matter formed chiefly of the black oil, baked on the plate evenly, and not quite one-sixteenth of an inch thick.

This matter was a bad conductor of heat, and being between the steel plate and the water, the plate had overheated and bulged out of shape by the pressure of the steam. A second boiler in the battery was also found injured from same cause.

It was thought that the oil would float on the water or mix with it and prevent the scale from forming, but it was found as described.

We have known so many cases of boilers being seriously injured from oil or greasy matter getting in with the feed water, or being put in to remove scale, that we object to the use of anything of an oily or greasy nature inside of steam boilers.

Please caution your engineer on this subject, as a heavy lime scale half an inch thick will not do as much harm as will a greasy scale only one-sixteenth of an inch thick.

A boiler inspector, discussing the carelessness of some engineers, having charge of steam plants, and the necessity for unremitting vigilance in looking after them, says:

A case I want to mention relates to the overheating of the furnace plates of two boilers in this vicinity. They were each sixteen feet long and 60 inches in diameter, with 44 four-inch tubes, and a man-hole in the front head, under the tubes. These boilers had just been put in, and for ten days they were run very light. They were then started on the regular work, which did not by any means push them to their full capacity. They were run night and day, and their heaviest work was at night. One morning, after they had been running on regular work for about three weeks, they were both found to be badly bagged on the bottom, directly along the front line of the bridge-wall. The bags ran clear across the boilers, and two-thirds of the way up the water-lines. The bulges were greatest at the bottom where they amounted to about three inches. They extended forward from the bridge-wall for a distance of three or four feet, so that I estimated their area to be about sixteen square feet in each boiler. As soon as I was called on to make an inspection (about 10 a.m.), I went immediately to the boilers and found them in the condition I have described, a new bottom being required in each. One of them was still running, but the fire had been drawn from the other. I had them blow off the boiler that was out of use, so that I could see its condition, inside, just as it was, and before any washing was done. I found the bottom of the boiler heavily covered with a gummy, greasy sediment, about a quarter of an inch thick. It seemed to be organic in nature, and I concluded that it came from the radiators and piping, all of which were new. It would be impossible for any water to get through it, so as to come in contact with the sheets; and the heaviest or thickest part of it was

where the sheet was bagged the worst. In the rear part of the boiler, from the middle of the bridge-wall to the back head, there was a heavy coating of oil, both on the sheets and on the tubes.

It was easy to see the cause of all the trouble. The building was new and was heated from top to bottom by exhaust steam from the engines and pumps. They had flooded the engines and pumps with oil, and this oil had been carried all through the building by the exhaust steam, and had been emptied into the boilers together with the sand and other foreign materials contained in the radiators and pipes. (Of course there is always more or less oil and other matter in new work of this kind.) Their mistake was, in not passing all the returns into the sewer for about four weeks, and in being too lavish with oil in the engines and pumps. If they had opened the boilers a couple of weeks sooner, or if they had had their boilers properly inspected, their attention would have been called to the trouble before it was too late. An inspection would have been of especial value to them, as there are many things that may give trouble in starting a new plant. These people had all the best modern appliances, including water-filters and an oil separator; but these were not sufficient to prevent the accident I have described.

Another thing which I frequently notice in making calls in the way of external inspections, is the neglect of the water connections between the gauge-glass and the boiler. Every engineer is supposed to give his closest attention and care to these connections, but I find that they are sadly neglected by some of the oldest and most experienced engineers. I called at a plant a short time ago, where the engineer had had some years of experience. He had been in this plant for a year. I asked him to blow out the water glass; and after waiting some time for the water to return, I had concluded that it was not going to. Presently, however, it came in sight, and after a considerable time it came up to the proper height in the glass. I asked him to blow it out again, thoroughly; and with my watch in hand I timed its return. It took over five minutes for the water to come in sight. The connection between the boiler and the glass was of one-inch piping. I asked the engineer how large he thought the opening through this pipe was. He said he had not thought about that. It was plain that this trouble had been going on for weeks, and yet he had not discovered how long it took the water to get back into the glass, nor had he given the matter any thought or consideration. If the water only got back, that was sufficient. I told him the opening could not be much larger than a knitting needle, and then he began to get his thoughts together. They had an extra boiler, and the one thing on this engineer's mind, for a little while, was to get around fast enough, till he could get this extra boiler ready and shut the other one off and clean out the pipe connections to the water glass. Another case, very similar to this, came under my notice recently, except that it was worse. There were six boilers in this battery, and four of the six were in a condition fully as bad as that I have just described; yet the engineer in charge had been in this plant for years, and considered himself well up in engineering.

Another point I want to speak of, is the importance of

having the piping free, between the steam gauge and the boiler. Such pipes are often long and small, and with a number of elbows in them. I am frequently called upon to test steam gauges which are all right when the pipes are cleaned out.

EXPORTS AND DRAWBACKS.

We have knowledge that certain Canadian manufacturers have frequently endeavored to do an export business, and would have done so if they had been allowed by the Government to import the raw materials of which their products are made, paying full duty thereon, but allowed a refund of 90 per cent. of the amount thus paid upon exportation of the goods. This is allowable only in cases where the raw material is not produced in Canada.

In many cases where our manufacturers could do an export trade, the raw materials necessary in their business can be purchased cheaper abroad than at home, and this difference in cost is an element in the business that determines whether the export trade is possible or not. We emphasize this by showing that such steel as saws are made of, not being made in Canada, is admitted duty free, and therefore our saw manufacturers do a good business in exporting saws. But if any Canadian concern should begin the manufacture of saw plate steel, and the article should be made dutiable, as it would be, the export of saws would immediately cease simply because the saw manufacturers could not successfully compete in foreign markets if they were handicapped by having to pay full duty on their raw material. There is no duty imposed upon tin plates, and therefore if there was any foreign demand for goods made of tin plate our manufacturers would not be handicapped in their competition for the trade. But if black sheets of which tin plates are made were made in Canada, it would be impossible for our manufacturers to export any goods made of that article.

It is very different in the United States; for there the refund is 99 per cent. of the whole duty paid; and there is no restriction whatever as to whether the raw material is made in the country or not. This is illustrated by some of the recent decisions of the Treasury Department there. In one case the Collector of Customs at New York was instructed as follows:—

On the exportation of barb wire manufactured by the Consolidated Steel and Wire Company, (Iowa Barb Wire Department,) of Allantown, Pa., from steel billets made by the Maryland Steel Company, of Sparrow's Point, Md., from imported iron ore and imported ferromanganese, and delivered to the said Consolidated Steel and Wire Company during the period from July, 1892, to December, 1893, a drawback will be allowed equal to the duties paid on the imported materials used in the manufacture less the legal deduction of 1 per cent.

The quantity of imported materials used in the manufacture of the steel billets shall be determined by allowing for each ton (2,240 pounds) of such billets 4,618 pounds of imported ore and 28 pounds of imported ferromanganese.

The quantity of steel billets used in the manufacture of the barb wire shall be determined by allowing for each 100 pounds of the exported wire 170 pounds of said billets, and for every 100 pounds of wire exported 114 pounds of steel billets shall be checked from the record of such materials.

Another decision is as follows:—

On the exportation of band saws and band saw blanks manufactured by Joshua Oldham, of New York City, from imported steel plates, a drawback will be allowed equal in amount to the duty paid on the imported material used in the manufacture less the legal deduction of 1 per cent.

The different kinds of saws or blanks exported shall be separately described in the entry under which they are inspected and laden, by width, length, gauge, and weight, and the net weights shall be verified by the returns of a U. S. weigher.

The manufacturer's affidavit on the drawback entry must state the width, length, gauge, and weight of the imported bands or plates from which the exported articles were manufactured.

Of course we all know that barb wire, and saws also, and all of the materials entering into the manufacture of them, from the ore up, is produced in the United States, yet a large export business is done in such goods produced from imported materials; but under our existing laws no such export business can be done from Canada.

EDITORIAL NOTES.

Protection can only be justified when it can be shown that the country extending it derives as much benefit because of the protected article being manufactured in it as is equivalent to the greater cost of that production.

In Britain the sale of American Axminsters continues to increase. We have already described the characteristic of the moquette, or "American Axminster." The production of the article has been enormous, but the goods had not been sold in this country owing to an arrangement between the holders of the patent and certain firms in Kidderminster. Even now that the original patents are about to expire, the Alexander Smith Company (the name of the Yonkers firm producing the goods) possess advantages over rivals, inasmuch as they possess the exclusive control of patented improvements in the Skinner loom, made since the date of the original patent. The firm is not only a formidable competitor even in our free-trade market, because of their manufacturing skill, but they have returned to them 99 per cent. of the duty paid on any foreign wool entering into the composition of the carpets they export. Practically, therefore, they possess all the advantages of free wool; and during the first half of the present month nearly £4,900 worth of carpets were shipped from the United States to this country. Adding these figures to the £2,610 representing shipments for the preceding fortnight, we have a total of £7,500 for a month's trade, or at the rate of £90,000 a year. British carpet exports to the States at present are at nothing like this figure.—Manchester, Eng., Textile Mercury.

The boycott of Pullman cars is a blunder which the American Railway Union will regret. It is only another illustration of the vicious management under which labor-organizations so often make war upon the public, in the hope of coercing a particular employer. The thing is radically wrong, because the travelling public, which would suffer if the boycott should succeed, has not the slightest power to control the Pullman Company. It is equally

foolish, because the railroad companies which have contracted for the use of several thousand Pullman cars would be injured if not able to run those cars, while the Pullman Company would not be injured. The employees do not claim that the railroad companies have treated them unfairly. War is declared upon them and upon the unoffending public in order to force the Pullman Company to pay higher wages to the hands at its shop in Illinois. The merits of the controversy there need not be much discussed, because no conceivable injury to the employees in the shops would be an injury to the railway employees who received proper wages and treatment for their services.—New York Tribune.

One of the possibilities of such a strike as Debs inaugurated was suggested to the New York Tribune by a railway official of that city. "Suppose," said he, "a sudden war should spring up with a foreign power, and Mr. Debs, or some other person representing the so-called labor interests of the country, should decide that the contest was one in which his organization should not engage. Suppose that regiments were formed in different parts of the western and southern country, prepared to come east to defend the coast, and Mr. Debs should say: 'There must be a tie-up of all lines which attempt to move volunteers for the army in the east, because, in our judgment, the war is proper as made against the country!' Where would our power exist to get these men forward? They would simply have to march and by the time they reached the field of action they might be too late to render any service to the country."

A book entitled "How to Get Money," published way back in the 'fifties, contains the following on advertising:

Whatever your occupation or calling may be, if it needs support from the public, advertise it thoroughly and efficiently in some shape or other that will arrest public attention. I freely confess that what success I have had in life may be attributed more to the public press than to nearly all other causes combined. There may possibly be occupations that do not require advertising, but I cannot well conceive what they are. Men in business will sometimes tell you that they have tried advertising and it did not pay. This is only when advertising is done sparingly and grudgingly. Homœopathic doses of advertising will not pay, perhaps; it is like a portion of physic, making the patient sick but effecting nothing. Administer liberally, and the cure will be permanent. Some say they cannot afford to advertise. They mistake; they cannot afford not to advertise. In this country, where everybody reads the newspapers, it will be seen that these are the cheapest and best media through which persons can speak to the public, where they are to find their customers. Put on the appearance of business and generally the reality will follow. The farmer plants his seed and while he is sleeping his corn and potatoes are growing. So with advertising. While you are sleeping or eating or conversing with one of your customers, your advertisement is being read by hundreds and thousands of persons who never saw you or heard of your business, and never would, had it not been for your advertisement appearing in the newspapers.

Mr. Debs has been offered \$200 a night for two hundred lectures under the auspices of the U. S. lecture bureau. Bradstreet's estimate of the total cost of his strike is \$81,-

000,000. Should Mr. Debs accept the lecture proposition he will go on record as having had the costliest advertisement ever known, and which, moreover, other people paid for.—Montreal Gazette.

The McKinley bill was reported to the House on April 16, 1890, and was signed by the President on October 1. During the year 1890 the revenues exceeded the disbursements by \$99,400,000. In the year ended June 30, 1894, there was a deficit of \$73,500,000.

Under the guise of socialism and humanitarianism, the spirit of compulsion is in the air. The well-meaning everywhere are longing to see whether they are not, or can not command, a majority in order that they might begin to wield that compulsive power which it is one of the strange delusions of the modern world that majorities have a right to exercise in everything. Yet if one were to propose to put any one of these well-meaning persons under the absolute control of another well-meaning person, who should prescribe for him his comings and goings, decide for him what causes he should support, how much money he should give in charity and for what particular objects, how much wealth he should accumulate and at what point the fruits of his industry should pass over to the state, we greatly fear that well-meaning person number one would make strong objections. True, he wants, with the aid of those who agree with him in opinion, to settle these points for others; but he has never seriously considered what it would be like to part with his own liberty. Ordinary human beings require something more than an assurance of another person's good intentions before they are willing to make a surrender to him of any large measure of their freedom of action; and we imagine that many of those who to-day advocate an indefinite increase in the power of the state do so under a fond impression that their particular views and schemes, humanitarian or other, will always prevail. They, with the help of others like-minded, want to govern the world for its good. Well, what tyranny ever professed less? Good intentions are excellent things to have, but when they make alliance with the policeman's truncheon they become committed to many devious lines of policy, and quickly assume all the odious characteristics of tyranny.—Popular Science Monthly.

The actual length of the St. Clair tunnel, from portal to portal, is six thousand and twenty-six feet. Of this, two thousand three hundred and ten feet is under the river, one thousand nine hundred and eighty-two feet under dry ground on the Canada side, and seventeen hundred and thirty-four feet under dry ground on the United States side. The open excavation to reach the ground level on the Canadian side is three thousand and sixty-one feet, and on the United States side two thousand four hundred and sixty-six feet. The grade is one in fifty, except under the river, where it is practically level, only sufficient incline—one tenth per cent.—being given toward the Canadian side to provide for drainage. The depth of the lowest part under the mean level of the river is 77.83 feet. The minimum depth between the top of the tube and the bottom of the river is 66.22 feet, the average being twenty-five feet. It was

necessary to place it as far down as possible in the clay, consistent with the grade, so as to overcome the tendency of a tube filled with air to rise to the surface in water or mud. The bottom is about nine feet above the rock which underlies the clay. On the Canada side the bottom is sixty feet below the surface of the ground at the portal, on the United States side it is eight feet less. The bottom of the tunnel at its lowest point is one hundred feet below the railway track on the level, which indicates the total ascent and descent which trains have to make in passing through. Ventilation is secured by the motion of the trains, which is found to be ample for the purpose. The trains are drawn through the tunnel by powerful locomotives belonging to the tunnel company, specially built for the purpose. They take eighteen loaded cars at a trip.

The track in the tube is supported on solid brickwork. It was at first proposed to build the tunnel wide enough for two tracks, but it was found that two single-track tunnels would be cheaper, and one of them would sooner be available for traffic. Experience has proved that a second tunnel will not be required for a long time. The largest number of freight cars passed through in twenty-four hours during the two years the tunnel has been in use was one thousand and fifteen, while twenty-five hundred could be handled if occasion required. The average number is seven hundred in winter and five hundred in summer. This is in addition to passenger trains.—Popular Science Monthly.

Considering the remarkable favoritism shown by the Dominion Government towards the railroads, particularly where municipalities ask that the railroads be compelled to properly guard crossings where their tracks intersect streets, it is refreshing to observe that an American judge entertains the opinion that the people have some rights that the railroads are bound to respect. A few days ago Judge Gary, of Chicago, rendered an important decision on this point. Marie Ouska sued the Lake Shore and Michigan Southern Railway Company in the Circuit Court for \$5,000, the statutory limit of damages, for the death of her husband, who was killed by one of the defendant's trains in that city. A jury awarded the full sum, and the company appealed. Judge Gary dismissed the appeal in a decision which contains this brief but lucid statement of the law, applicable to nearly all grade-crossing fatalities:

"It may be urged that no man exercising ordinary care would attempt to cross that network of rails, but the appellant can claim no right to shut the citizen from the public street, and if the railway company makes the danger so imminent, nothing can prevent a jury from finding against it when injury follows."

This decision contains the wholesome principle that the public streets belong to the public and not to the railroads. It will no doubt be enforced in the United States, but not in Canada.

Reifsinder's Farm Machinery says that the area in the United States to be supplied with machinery is not increasing as rapidly as it has in the past. At the same time the value of agricultural products (measured in their power to support life and cater to man's wants) continues to increase at nearly or quite the same ratio. Intensive farming is

the order of the day. Men are beginning to seek specialties of product which will pay them as well or better than the so-called regular farming. Along this line, therefore, may be expected the greater number of desirable additions to the existing list of machinery to be handled for the immediate future. For 1895 there will probably be quite an addition to the relative importance accorded to small specialties, garden tools, drills, weeders, cultivators, potato, bean, peanut, and such machinery. Sprayers, piping, pumps, etc., will be more and more in demand in the fruit regions and the list of these small articles bids fair to become so extensive as to make it almost impossible for the regular retailer to ever keep samples in stock. This petty machinery (as it may seem to many) will have a very uncertain demand for the next few years, owing to the difficulties attending its introduction. The uncertainty, however, will fall much more largely upon the retailer than upon the manufacturer. The size of the tools, the comparative ease with which the patented feature of some of them may be evaded, the low cost of express or freight upon them to the consumer, all combine to make them an object of much solicitude to the retailer who may fear his customers will send their orders direct to competing manufacturers. Manufacturers can obviate this difficulty, and by so doing very materially increase the confidence of the trade in their goods by selling to dealers only and giving exclusive territory for reasonably large orders. An energetic, brisk, sunshiny campaign on the part of the manufacturer can instill in the retailer such a confidence in his house and his goods as will make the goods popular with the trade. First it was hand tools, then large machinery, now it seems to be a new era of small machinery to supplant the details of hand work on special crops and work; the new trade requires new methods. A garden drill or a spray pump can be sold by the same man who sells threshers, but he needs to adapt himself to the trade. The man who strikes the right method of introducing the new line of goods has added materially to his net profits and the number of his friends.

Aluminum is stepping right to the front as an article of commerce. The latest discovery of its value is likely to interest the mother of a numerous family. Aluminum can be used to heel and toe stockings as well as to strengthen knitted gloves and mittens. At least this is what an inventive Yankee genius claims. When Solomon said there was no new thing under the sun, he was not living in the nineteenth century. Every day the sun rises new things are brought up, some to live, others to perish. But as to metal stockings. The idea appears somewhat ludicrous, and none the less apparently ridiculous when we go further and make the statement that the hosiery is perfectly flexible. As yet the invention is not perfect from a practical point of view, but it looks as though we might be wearing metallic stockings purchased on the bargain counters within a few years.—The American Glover.

The decline in prices which has invaded all lines of business seems to have been particularly observable in the line of electrical supplies or else the reduction in the cost of production has been very rapid. An authority on elec-

trical matters states that 6 years ago the price for a complete equipment for a trolley car, including two motors, was about \$4,500. This price held for about 18 months and then dropped to \$3,850, \$3,500 and \$3,300, until two years ago it was about \$2,850. One year ago \$2,000 was the price of the same equipment, greatly improved in quality and efficiency, while to-day the average price is between \$1,000 and \$1,200. This authority tells of an electric railway manager who recently opened negotiations for the purchase of a single car equipment. The prices ranged from \$1,500 to \$600. This shows a decrease in actual selling prices from \$4,500 in 1888 to \$640 in 1894, a period of 6 years. In 1888 there were 7 electric railways in the United States. In January, 1890, there were 162 electric railways in operation and in process of construction. In January, 1891, this number had grown to 281, while to-day there are probably over 500 cities in the United States equipped with electric roads, many of them of great mileage. While this is undoubtedly a great drop in prices, there has of course been a very material reduction in the cost of manufacturing electrical supplies. The trade is a new one, and new methods are being constantly introduced. This line of manufacture seems to be attracting some of the best talent in the country, and new concerns are springing up at numerous points. It may be taken for granted that this process of reducing the cost of manufacture will continue for some years yet, and at present the general business depression brings reductions hardly warranted by improvements. It is very probable that the lowest figures mentioned in the foregoing do not leave anything like a fair margin of profit, because competition in times like these becomes ruinously close. However, the extension of electric roads depends very largely on the cheapening of material and equipment, for were prices anywhere near what they were a very few years ago electric lines would not be stretching out between country towns and villages as they are now.—American Manufacturer.

There is no tariff issue in the Northwest. We have got nearly all the concessions we asked for, and perhaps quite all we could reasonably claim. We have been given free lumber, and the duty on agricultural implements, binder twine and coal oil has been reduced. The tariff has been taken off the list of issues, so far as this portion of the country is concerned.—Winnipeg Nor'-Wester.

Mr. Edgar brought up in the House on Wednesday night the "sweating system of Toronto," for the purpose of driving at the National Policy. He described the sweating system as "a system of getting piece work done for starvation wages by setting one person's labor against another." He said the only way to prevent this state of things was to inaugurate a policy which would promote the welfare of the whole mass of the country. By which he meant such a measure of free trade as would permit the products of the sweating system of other countries to take the bread out of the mouths of the Canadian workers. If there is anything wrong with the factory system of working, as Mr. Coatsworth pointed out, Mr. Edgar should bring the matter before the Local Government who have taken control of the interests of employes in the matters complained

of. They have their factory inspectors regularly employed and all the legal authority and machinery for the righting of any wrongs that may exist. The General Government does all that it can do in providing "a policy" which is designed to ensure the Canadian market for the Canadian worker, but the particular social condition under which the work is performed in factories belongs to the Ontario Government and Legislature.—London Free Press.

The English royal family, it appears, takes a hereditary interest in the cotton trade, for it is a well-known fact that H.R.H. the Prince of Wales had several lessons in calico weaving in the exhibition of 1851, a Blackburn machinist, Henry Livesey, acting as his teacher. The prince, accompanied by his private tutor, used to go to the exhibition in the morning before it was open to the general public, and so got his lesson without the inconvenient crowding that would otherwise have resulted. We are not aware whether H.R.H. the Duke of York has handled the shuttle and the reed hook or not, but if not, for the honor of the thing we would suggest that he should keep the good record unbroken.—Textile Mercury.

At the annual meeting of the Canada Company, a London concern that holds a large quantity of land throughout Ontario, Sir Robert Gillespie, the chairman, in the course of his remarks mentioned that of lots valued in 1886 below the average estimate of 49s 9d an acre, 2,987 acres, valued then at 21s 10d an acre, realized 25s 10d an acre—an increase of 4s an acre, or 18 $\frac{2}{3}$ per cent. Of lots valued in 1886 above the average estimate of 49s 9d an acre, 1,599 $\frac{1}{4}$ acres, valued then at 83s 8d an acre, realized 88s 8d an acre, an increase of 5s an acre, or 6 per cent. In regard to lots redisposed of 1,863 acres reverted to the company at 116s 4d an acre, realized 132s 4d an acre—an increase of 16s an acre, or 13 $\frac{3}{4}$ per cent. Thus the general result is this: 6,449 $\frac{1}{4}$ acres disposed of at 72s 2d an acre—an increase of 7s 8d an acre, or 12 per cent. on the 1886 valuation. It was also reported that a large number of inferior lots in Eastern Ontario had been disposed of to farmers who wanted them for grazing purposes. Most of the sales had been at what were called good prices. Evidently the keen competition in agriculture is not making many abandoned farms in Ontario.—Montreal Gazette.

This Canada Company that holds such large bodies of land in Canada is composed of a gang of monopolists whose privileges it would be well to cancel. They have no interest in Canada whatever, further than to sit in their cushioned chairs in London and receive dividends upon the constantly increasing value of land upon which they have never spent a penny. It is quite time this land monopoly nuisance were abolished.

At a recent meeting of the American Institute of Electrical Engineers, in Philadelphia, Mr. W. W. Griscom read a paper dealing with the storage battery problem. After devoting a great deal of time to a recital of many phenomena which he had encountered in his study of the question, he said, "Perhaps the most striking peculiarity about the modern storage battery is the diversity of opinion among professional electricians as to its utility and commercial value. Men of the highest rank as electricians and engineers are ranged on either side of the question. Men of affairs, who have put them to a commercial test, exhibit a like divergence of views. Broadly stated, the European

consensus of opinion, both technical and commercial, may be said to be in favor of storage batteries. The American view until now has been mainly the opposite. What is the ground for this wide discrepancy? Why is cautious, conservative Europe so far ahead? Why is America a laggard in the running? The answer is not far to seek. Storage batteries are almost always an economical success abroad, while here they have been too often an economical failure in the past. And the reason is that the European always demands a margin for safety, while the American, with less capital and keener competition, is tempted to sail too close to the wind. A storage battery continually worked to its commercial rating is a commercial failure. A storage battery worked sufficiently within its capacity is invariably a commercial success."

United States Consul Tingle reports to the Department of State from Brunswick, Germany, calling the attention of manufacturers to the excellent opening for American vehicles in Germany, where, although the roads are the best in the world, even in remote districts, the wagons are the worst, and with magnificent roads and undersized horses the consul thinks it odd that the Germans have not evolved lighter work and pleasure wagons. This is a suggestion that Canadian manufacturers of wheel vehicles should heed.

The New York Times has of its own motion added a 45th State to the Union. The State of Havemeyer, The Times says, so far as its geography can be determined, "is bounded by four streets in the eastern district of Brooklyn, is of yellow brick, and is about ten storeys high." It has at least three Senators—Gorman, Brice and Smith—and there is no other State so well served by faithful and devoted Senators as the State of Havemeyer. This sketch of the power of the great sugar trust and its influence in national politics smacks more of the style of Washington Irving than anything in recent New York journalism.—Toronto Globe.

Similar circumstances to those that make the State of Havemeyer possible in the United States, prevail in Canada, probably with similar result. Our new province, which is already represented in the Canadian senate, is included in the city of Montreal.

The Scotch express dashed into St. Pancras station, London, in such a hurry that it ran over the end of the track and injured some passengers. Samuel Johnston declared that the finest prospect a Scotchman saw was the high road to England. If he were living now he would adduce the St. Pancras incident as an illustration of the Scotchman's extreme eagerness to get south.—The Empire.

The reason why the railway train alluded to dashed so unceremoniously into the London station was because the brakes on the train failed to operate at the critical time when they were needed. Railway cars are not equipped with brakes for ornament, but for emergencies, and if a brake is not useful in emergencies, it is a delusion and a snare. Effective brakes are, for obvious reasons, even more desirable, if possible, on electric cars than on ordinary railway trains, particularly where there are steep grades, as is the case on the Niagara Falls and Queenston road. If the leaving the wire by the trolley wheel and the failure of the brake to act, while on a steep descent should be con-

current circumstances, a result would probably be the destruction of many valuable lives. Such an event could not possibly be an accident, but a coroner's jury would probably attribute it to the Almighty.

The Act to authorize the granting of subsidies in aid of the construction of the lines of certain railways in Canada mentioned therein, passed by the Dominion Parliament and assented to July 23, appropriates \$4,661,154 for that purpose. This is a large amount to be added to the debt of Canada, but we fail to notice that even one dollar was voted by the Parliament to encourage the growing of sugar beets. Millions for railroads and not a cent for beet sugar.

It costs a great deal of money to teach some people that black is not white; in other words, to teach them that a wrong cannot be righted by another wrong. Eugene V. Debs has apparently been taught that two wrongs do not make a right. His method was to kick his mother because a Jew cheated him on a suit of clothes. He now says: "I will never again have any official connection with a strike," for he has but just learned that "the organized elements of society are opposed to strikes," and for the reason given above, though he does not admit it. He states that "General Miles went to Chicago to beat the strikers and not to preserve order." It would be interesting if Mr. Debs would inform the people how General Miles could preserve order without beating the strikers. The strikers were the disorder; beat them and order reigned in Chicago. There is a bigger fool than Debs in embryo and Uncle Sam should be prepared for him, and nip his budding genius before he gets a chance to stagnate the business of a nation.—Wade's Fibre and Fabric.

We are informed by the Electric Storage Battery Co., of Philadelphia, that they have just contracted to build a large storage battery installation for the power house of the New York Edison Electrical Illuminating Co., to consist of 150 elements of their chloride accumulators, Type G, 41 plates, having a capacity of 8,000 ampere hours at 150 volts, at normal rates, or a total capacity of 1,200 kilowatt hours. The installation is to be furnished with the most modern and complete appliances for the control and operation of what it is claimed will be the most modern and complete battery plant ever installed. Allusion is made to this matter in this place to emphasize the fact that that long looked for and hoped for desideratum—an electrical storage battery that will do what is claimed for it—is now a reality. It means that electrical energy may be stored up from any source of supply and distributed to users entirely away from and independent of wires extending from power houses. The New York Edison Co. already have a battery of 2,000 ampere hours capacity in use for more than a year, and have satisfied themselves that a storage battery installation is desirable.

Speaking of Coxeyism and the labor disturbances in this country, the London Spectator remarks that "no one political system more than another gives any help towards solution of the peremptory social problem"—the prevention of involuntary idleness and poverty among the people.

This is not the fact. The political system for which the Republican party stands has solved that problem. Coxeyism, with all that it represents, was never even heard of during the thirty years in which the Republican party ruled the country and kept in operation the system of protection to American industry. The only remedy for socialism, anarchism, and all the brood of isms born of discontent is to keep men busy at good wages. The protective policy aims to do this by developing old industries and building up new ones; and if it has failed in any particular, the failure has followed upon exhibitions of weakness in reducing duties when the duties should have been raised. Should we arrange to increase our domestic product by making here only half of the material which we buy from Europe there would not be an idle mill, nor need there be an idle man in the United States. There are turbulence, and uproar, and fierce outbursts of discontent just now, because the Democratic party has half-paralyzed the business of the country in an effort to arrange our tariff so that it will suit Europeans more than it will suit us. The Republican method is to have two jobs looking for a man. The Democratic method, and also the British method, is to have two men looking for a job; and that means misery and slavery for both men.—The Manufacturer, Philadelphia.

According to Indian Engineering, the utilization of the heat force of oil as a fuel is increasing, the reduced price of petroleum and the cheap carriage of it in tank steamers instead of barrels, greatly stimulating its use. As fuel for steam boilers at sea there are certain economies in the labor of stoking which encourage its use. But the choice depends on variable circumstances, such as the relative cost of oil and coal, at any particular place, the certainty of finding a store of oil ready at ports of call, and finally, in the absence of risk in the storage and use of oil. At present it is only at places such as the Caspian Sea, or on the Volga, where oil is cheap and coal very dear, that boilers are made for oil fuel exclusively. The explosive force of vaporized oil, without the inconvenience and waste of steam boilers, is more immediately interesting to engineers. During the last two or three years oil engines have been greatly improved, and are taking a more important position among motors which may be relied upon. Except in countries where import duties are imposed, the cost of petroleum has been brought down to a low price, and as the consumption in an oil engine only ranges from one-sixth of a gallon per effective horse-power per hour, the oil motors are cheap as well as convenient. Not only as fixed machines, but as motors for launches and tram cars, oil engines are likely in the future to compete with steam and electric engines.

The following is the text of the Act passed at the recent session of the Dominion Parliament to provide for the payment of bounties on iron and steel manufactured from Canadian ore.

Her Majesty, by and with the advice and consent of the Senate and House of Commons of Canada, enacts as follows:—

1. The Governor in Council may authorize the payment of a bounty of two dollars per ton on all pig iron made in Canada from Canadian ore, a bounty of two dol-

bars per ton on all iron puddled bars made in Canada from Canadian pig iron manufactured from Canadian ore; and a bounty of two dollars per ton on all steel billets manufactured in Canada from pig iron made in Canada from Canadian ore and such other ingredients as are necessary and usual in the manufacture of such steel billets, the proportion of such ingredients to be regulated by order of the Governor in Council: Provided, that in computing the bounty no payment shall be made with respect to foreign ores used in the products herein mentioned.

2. In the case of the products of furnaces now in operation the said bounties shall be applicable only to such products manufactured therein between the twenty-seventh day of March, one thousand eight hundred and ninety-four, and the twenty-sixth day of March, one thousand eight hundred and ninety-nine, both days included; and in the case of the products of any furnace which commences operations hereafter, but prior to the twenty-seventh day of March, one thousand eight hundred and ninety-nine, the said bounties shall be applicable to such products manufactured therein during a period of five years from the date of commencing operations.

3. The Governor in Council may make regulations in relation to the bounties hereinabove mentioned in order to prevent fraud and to ensure the good effect of this Act.

4. The said regulations shall be laid before Parliament within the first fifteen days of each session, with a statement of the moneys expended in payment of the said bounties, and of the persons to whom they have been paid, and the places at which the pig iron with respect to which they have been paid was manufactured, and such other particulars as tend to show the effect of the said bounties.

5. For the purposes of this Act, a steel billet shall mean the product of a steel ingot re-heated or rolled or hammered into flat slabs or square billets of any size.

On the banks of White Bear Lake, some fifteen miles from St. Paul, Minn., lies Dellwood, one of the numerous summer resorts of the Minnesota lakes. Between the railway station and one of the beautiful summer homes, a distance of about 600 feet, is what is no doubt the smallest electric railway known, capable of actually transporting passengers and freight. The entire road was built and equipped by Mr. A. M. P. Cowley, a St. Paul banker, for the amusement and instruction of his son, a bright lad of seven years, who acts as motorman, conductor and brakeman with all the dignity and capability of a veteran in the service, not only giving his sisters and playmates frequent excursions but also doing an extensive passenger, freight and express business between the two termini. The length of the road is a trifle over a tenth of a mile and the equipment consists of a motor car and two trailers, each car being five feet long by two feet wide. The gauge of the road is 14 inches, the rail being regular steel T rail, weighing 24 pounds per yard. The rails are laid on 2x4 inch pine ties and bonded with No. 14 copper wire. Instead of the overhead trolley, the third rail system is used, the third rail consisting of a flat iron strip $\frac{1}{8} \times 1$ inch nailed on a wooden strip between the two rails. The power house situated at the end of the line is a neat frame structure, containing the engine, generator and switchboard, as well as a fully equipped machine shop. The engine is a 2 h. p. Shipman petroleum engine and is belted to a 2 h. p. Perret compound wound generator, which when driven at a speed of 1,600 revolutions, gives a current of 15 amperes at a pressure of 110 volts. The engine runs at a speed of 375 revolutions per minute and, being

entirely automatic, it, as well as the generator, requires scarcely any attention or care. On one side of the engine room is the switchboard, containing all necessary appliances for the regulating, measuring and indicating of the current, such as rheostats, Weston volt and ampere meters, branch and main line switches, safety fuses and lightning arrester. From the switchboard the current is led by underground conductors to the rails and contact strip, and also to the owner's residence which is lighted throughout by incandescent lights. Adjoining the power-house is the car barn in which the cars are housed during the winter and at night. The motor car is equipped with a one horse power motor, transmitting power by double reduction gears to the car. The gears are cut from the solid and run practically noiselessly. A starting rheostat is conveniently placed at one end of the car, as well as a reversing switch and safety fuse. The road is practically straight, but has two rather steep grades of about 10 and 16 per cent. respectively. The motor car will haul the two trailers, each loaded with two adults and a child, up the steepest grade with ease. With the motor car and one trailer starting from the power house, the trip to the end of the line is made in 20 seconds.—Electrical Engineer.

The telephone is invading the field of the telegraph in railroad service. In France it is used on many of the main lines, and on the Vincennes road the telegraph wires are connected with the telephone when verbal communication is desired. There is no reason why the telephone cannot be employed to advantage. One objection, that in the event of misunderstanding, no record is available, is as applicable to the telegraph, for in both cases the message is received by sound. In the early days of telegraphy the tape register furnished evidence, from which there could be no appeal. But the register was discarded years ago, and, therefore, the telephone and the telegraph are on equal footing so far as records are concerned. There is nothing whatever to show what passes between the sending and the receiving operator. The same is true of the telephone. Probably the telegraph will not be superseded, but properly constructed telephone lines promise more satisfactory results in the transaction of certain kinds of business on railroads and have the advantage of being made available by employes not put through a long course of training. Only an expert can use the telegraph. Anybody able to speak distinctly and having ordinary hearing can manage a telephone.

In the Methodist Magazine for September the Editor describes, with nearly a score of engravings, sights and scenes in Damascus, the oldest and one of the most interesting cities in the world. Another beautifully illustrated paper is that by John Addington and Miss Symonds, on "Life and Adventure in the High Alps." It describes tobogganing and other exploits of thrilling interest. A valuable article on "The Reverend Dr. Ryerson," with fine frontispiece of statue, as it appears in Normal School grounds, is from the pen of John George Hodgins, LL.D. Of timely interest is an article by Dr. Schell, on "The Epworth League, its Possibilities and Dangers." A paper on mission work in New York, the illustrated story of "Spindles and Oars"—Life in a Parsonage, and a Cornish Story, with other papers of interest, make up a good number.

In all its history of sixty-four years, Godey's has never made a more radical or more welcome change than it has in its recent reduction in price to ten cents. The cover of the August number shows that clever and artistic innovations are to be made under the new regime. The contents are fully up to the standard. It is all readable and there is nothing too deep for the summer months. The Seward reminiscences are continued and there are finely illustrated articles upon

New York Roof Gardens, the Battlefield of Waterloo in 1894, and the Yale-Harvard boat race of 1894. A long list of fiction and the fashion department complete the number.

Heating and Ventilating.

The foremost heating and ventilating engineers and architects of to-day are unanimous in the statement that the fan system of heating and ventilating is, undoubtedly, the future one for large public buildings, audience halls, schools, theatres, factories, mills and the like. Nothing is more indicative of this than that during the present hard times, the well known manufacturers of this apparatus, the Buffalo Forge Co., Buffalo, N.Y., have been running their works full time in order to keep pace with orders. This method as applied to factories, has been more rapid in its growth than for other classes of buildings, but school boards and building committees of all similar structures are fast coming to realize the importance of positive ventilation; and as there has been comparatively little building going on among manufacturers, this fact is unmistakably substantiated by the orders now being executed by the above house which are largely from this source. The following are from a few recent pages of the Buffalo Forge Company's order books: - Ashland Ave. High School, Denver, Colo., requiring two fans, 130 inches and 100 inches, respectively, with heaters containing nearly 30,000 ft. of 1-inch pipe; Dartmouth St. School, Worcester, Mass.; Grammar Schools, Nos. 59 and 79, New York City, 120 inch and 130 inch fans, respectively; Oregon State Ag'l College; Penna. State College, State College, Pa.; several Detroit public schools; Eldora High School, Eldora, Iowa; Kirkwood Hall, Bloomington, Ind.; Mason City High School, Mason City, Iowa; Geo. W. Child's School, Philadelphia; 9th Ward School, Rutland, Vt.; Bank of Commerce, Buffalo, N.Y.; Erie County Penitentiary, Buffalo, N.Y.; Gallopolis Epileptic Asylum, Gallopolis, O., (nine buildings); Baltimore Music Hall, Baltimore, Md.; Denver State Capital, Denver, Colo.; National Union Bldg., Toledo, O.; Brooklyn High School, Brooklyn, N.Y.; Erskine Church, Montreal, Que.; Old Ladies' Home, Englewood, N.J.; South Carolina State Insane Asylum; Winnebago County Asylum, Wis.; Bay Shore School, Bay Shore, L.I. N.Y.; High School, Delevan, Wis.; 10th Ward Public School, Milwaukee, Wis.; Lancaster High School, Lancaster, Wis.; 5th Ward School, Milwaukee; Normal School, Pasadena, Cal.; Stevens Point Normal School, Stevens Point, Wis.; St. Louis University, Minneapolis, Minn.; Union Depot, St. Louis, Mo.

Chloride Accumulator.

The Electric Storage Battery Co., Philadelphia, Penna., have sent us a new catalogue just issued by them having reference to the chloride accumulator manufactured by them. In the July 20 issue of this journal was published an illustrated description of this accumulator, and we again allude to it to call attention to the character of the testimonials included in the catalogue.

Mr. Samuel R. Shipley, president of the Provident Life and Trust Co., Philadelphia, writing to Mr. Herbert Lloyd, general manager of the Electric Storage Battery Co., says:

Our experience has been this: During the months when we require any heat, we consume exactly the same amount of coal, now we are generating both our light and heat, that we did when we simply heated the building by live steam and bought our current. We are able to keep very close track of this, as we buy but one day's supply of coal at a time. During the summer months, when we require no heat, we also use very little light, and the amount of coal consumed is very small.

By the use of the Chloride Battery which you installed, in addition to the great advantage which we derive from having a plant which can never fail, we have light 24 hours a day weekdays and Sundays, and employ but one engineer.

Mr. C. M. Allen, superintendent of the Germantown (Penna.) Electric Light Co., referring to an enquiry from Mr. Lloyd as to the advantages of the use of storage batteries and as to how the battery installed for his company by the Electric Storage Battery Co. had worked, states as follows:

We take pleasure in saying that we have been very much gratified by the working of the battery and also at the results which we have obtained. I feel very sure from our experience, that in nearly all central stations using direct current for either light or power, a battery can be made a valuable adjunct.

In our case we find two distinct conditions where its adoption has been of very great value:

First, we found our load increasing to such an extent that during the winter months there are a few hours each night when the generating plant is loaded beyond its capacity, while in the summer months we are able to handle the load easily. Now, instead of going to the expense of a larger generating plant for a few months' use, we can use the battery to help us over the peak of the load, which you will readily see is a very great advantage.

EXCELLING ALL OTHERS

Canada's Great Industrial Exhibition

Toronto, Sept. 3rd to 15th, 1894.

MANUFACTURERS OF EVERY KIND

If you want to increase your business in dull times the only way is to advertise your goods, and you cannot do so more effectually or more economically than by making an

Exhibit At This Great Fair

NO CHARGE FOR SPACE AND ALL REQUIREMENTS PROVIDED

The Most Extensive Manufacturers are those who have exhibited at Toronto.

APPLICATIONS FOR SPACE SHOULD BE MADE AT ONCE

All Entries Must be Made Before August 11th.

FOR PRIZE LISTS, ENTRY FORMS AND ALL OTHER INFORMATION, Address

JNO. J WITTHROW, President

H. J. HILL, Manager, Toronto.

In the second place, we do not have sufficient day load to pay us to run an engine and two dynamos (we use the three-wire system) continuously, at the same time the business is sufficiently important to demand day current, and it is here the battery comes to our relief. Before we used the battery, the loss on our day circuits was most discouraging. By the use of the battery we have wiped out this loss and can show some profits besides. We now shut down the machinery in the early morning, and the battery carries the entire load until nearly dark; then, after midnight, while the load is light, but while we must still run our city lights, we charge the battery, and it is a fact noticed by our engineer, as shown on his reports, that he uses about the same quantity of coal on nights he does not charge the battery as when he does.

The plates of our cells are so large, and consequently so few in number that the care of the entire installation is reduced to a minimum. The solid construction of the elements makes short circuiting practically impossible. We have never seen a "buckled" or "short circuited" plate yet, and the general appearance now is fully as good as the day that the battery was installed. I note another advantage of the large plates and compact construction which I think is important that is the ability to discharge rapidly and above normal rates in an emergency without injury. We have frequently discharged at four times its normal rate for considerable periods with no injury whatever. On one occasion recently, owing to an unexpected stoppage in our machinery, the battery carried the whole three-wire load during the heaviest part of the evening.

So far as we are able to judge, we believe that all of the defects heretofore developed in connection with storage batteries are overcome, and that you have succeeded in producing a practically perfect battery that will do the work satisfactorily and can be relied upon under all circumstances.

The following is a letter from Prof. Edwin J. Houston, who is prominently known as the inventor (in conjunction with Prof. Thomson) of the Thomson-Houston System, and who is the President of the American Institute of Electrical Engineers:—

"Having recently had occasion from a theoretical standpoint to study the construction and operation of the Chloride Accumulator made by your company, I take pleasure in saying that I have been very favorably impressed with the same. The construction of your battery involves principles so radically different from that of other prior storage batteries as to cause its invention, in my judgment, to mark an era in the history of the art.

In connection with my partner, Mr. A.E. Kennelly, I am about to place a battery consisting of twenty elements of your type "E," five

plates, 100 ampere hour capacity cell, at actual work in our laboratory, and, when we have completed such use and tests in connection therewith, I will take pleasure in acquainting you with the results."

Mr. A.E. Kennelly, who was for years chief engineer for Mr. Edson, and is now associated with Professor Houston in the firm of Houston & Kennelly, Electrical Experts, with headquarters at Philadelphia, and who is also a vice-president of the American Institute of Electrical Engineers, says:

"Having recently had occasion to study the manufacture of your chloride storage cell, I beg to say that I consider that the principles embodied in its construction make it superior to any storage battery that has yet been placed upon the market in this country. From what I have seen of the behavior of your battery in the hands of others, I have been confirmed in this view. Prof. Houston and I intend to place one of your batteries under careful test at our laboratory, and we will have pleasure in notifying you concerning its behavior under our own supervision in due time."

Other testimonials, (the reproduction of which we cannot make at this time) are from Mr. Hugh L. Callendar, assistant mechanical superintendent at Montreal of the Grand Trunk Railway Co., Prof.

Second-Hand ENGINES

In Good Condition, for sale low.

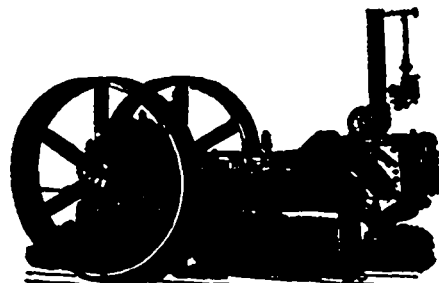
- 50 H.P. Corliss.
- 50 H.P. Automatic Ball (American.)
- 60 H.P. Automatic Leonard-Ball.
- 50 H.P. Automatic Armington & Sims.
- 25 H.P. Automatic Westinghouse.

Replaced by Robb-Armstrong Engines

Robb Engineering Co., Ltd., Amherst, N. S.

Armington & Sims

AUTOMATIC HIGH SPEED ENGINES



—FOR—
ELECTRIC LIGHTING
—AND—
GENERAL FACTORY PURPOSES
Perfect Regulation and Highest Economy.
—AND—
Steam Pumps
SHAFTING, PULLEYS
—AND—
General Machinery

Nie & Whitfield - HAMILTON, ONT.

EAGLE FOUNDRY † Established 1820.

...GEORGE BRUSH...

14 to 34 King and Queen Streets, - Montreal

.. Maker of ..

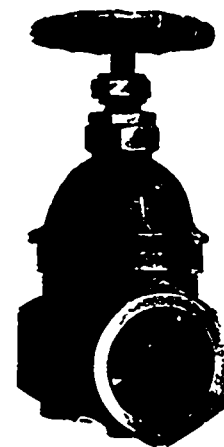
STEAM ENGINES, STEAM BOILERS,
HOISTING ENGINES, STEAM PUMPS,

Circular Saw Mills, Bark Mills, Shingle Mills, Ore Crushers, Mill Gearing, Shafting Hangers and Pulleys.

Safety Elevators and Hoists for Warehouses, Etc.

HEINE SAFETY STEAM BOILERS...

Blake "Challenge" Stone Breaker.



THE WEBBER PATENT
Straitway Valve

FOR
STEAM, WATER OR GAS
EVERY VALVE TESTED

THE KERR ENGINE CO. (LTD.)
WALKERVILLE, ONT.

Sole Manufacturers for Canada

Send for Price List

E. LEONARD & SONS

LONDON - - - CANADA
MANUFACTURERS OF

ENGINES AND BOILERS

(NEW DESIGNS)

STEAM PLANTS EQUIPPED FOR ALL PURPOSES

Highest Economy, Regulation Perfect. Send for Circular. Interviews Desired.

THOS NOPPER, - - - Sales Agent

79 YORK STREET, TORONTO, ONT.

George F. Barker, of the University of Pennsylvania; Mr. W. K. L. Dickinson, electrician of Mr. Thomas A. Edison's laboratory at Orange, N.J., and others.

Accumulators for Traction Work.

The advantageous use of the Chloride Accumulators for tramway purposes can not be demonstrated in a more positive manner than by giving a short description of the electrical cars which have now been running in Paris for over two years, the results being eminently satisfactory, and greatly in advance of those obtained on other lines where similar means of traction by use of accumulators have been tried.

There are two lines running from Paris into the suburb of St. Denis their lengths being, respectively, about 5¼ and 5¾ miles.

A large charging station and depot has been erected and fully equipped at the St. Denis terminus of the line, the generating plant, which consists of three 150 horse-power boilers, and three 150 indicated horse power engines, drives a number of dynamos, each having an output of 250 volts and about 300 amperes. At the depot the most complete arrangements exist to ensure satisfactory working, and all the details of the appliances for removing the cells from the cars, for charging and inspecting, have been worked out in a careful and most practical manner.

The Tramway Company owns 25 cars, each fitted up complete with 108 chloride cells of the new protected type especially designed for traction purposes. The life of this latest type of cells when employed for traction has not as yet been ascertained, but sufficient experience has been gained to prove that it exceeds 12,000 car miles. This protected type was perfected by The Electric Storage Battery Co. (the American Co.), and we have no doubt when its life has been fully ascertained, when employed for traction purposes under like conditions, that it will exceed 20,000 car miles. Each cell is fitted with 11 plates, and 52 batteries are in use on the line, giving a total of 5,616 cells and 61,776 plates, from which it will be seen that the undertaking is one of considerable magnitude, and designed on such a basis that all statistics obtained may be taken to represent the average results obtainable.

The work that has to be performed is severe, the gradients being as much as 1 in 25 for considerable distances, while 1 in 40 and 1 in 50 are of frequent occurrence. There are also many curves of 70 and 80 feet radius. The cars are of a heavy type, with inside and outside seats, and constructed to carry 50 passengers, their total weight with full load being about 14 tons. The weight of a battery of 108 cells, with which each car is fitted, is approximately two and a half tons complete with all accessories, acid and boxes, and the capacity of the same is such as to be sufficient to run the car for a distance of

about 40 miles under the severe conditions of gradients and curves which occur on this line.

With all types of cells, however, it is found that the best results in efficiency and life, are not obtained when the battery is drawn upon to an extent nearly equal to its total capacity, and, accordingly, on economical grounds, twenty-five to thirty miles is the distance usually run before the car is returned to the depot for the cells to be recharged.

The work performed per day upon the lines is equivalent to 1,550 car miles, and the total mileage run since accumulators supplied the motive power has now attained, May 1, 1894, the large figure of one million car miles; and it will be seen by all acquainted with this class of work that the extent of this undertaking is of such a nature as to enable the greatest reliance to be placed upon all figures and statistics that have been obtained from such a source.

On these two lines the number of accumulator Cars were gradually increased, until on the 1st of October, 1893, horse traction was entirely superseded, and the great success which has attended the working of the whole plant has inspired such confidence in this mode of traction that a third line, having a length of about 3½ miles, and running from the Saint-Ouen Town Hall to Neuilly, is now being provided with accumulator cars, which will shortly be in regular use, and this fact alone is sufficient to demonstrate the reliable nature of the Chloride Accumulator employed on a large scale for traction purposes.

These chloride accumulators are manufactured in the United States by the Electric Storage Battery Co., Philadelphia.

Pneumatic Tires of Paper.

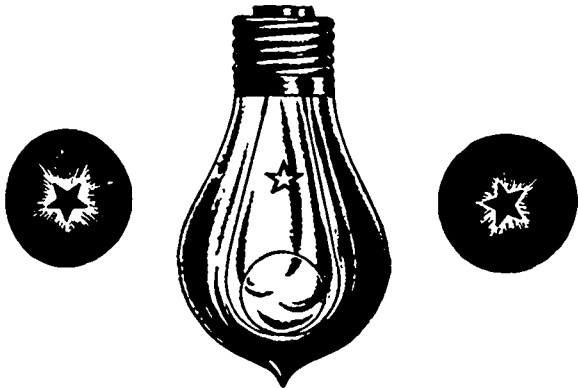
From a report in the Paper Trade Journal, it appears that there are certain experiments being made with the object of determining the possibility of using a pneumatic paper tire on bicycle wheels, and thus displacing or diminishing the use of the pneumatic rubber tire.

As the subject is one in which the whole rubber trade is interested, the writer has endeavored to obtain both the available information as to the actual facts, and the opinions of competent men, with regard to the theoretical side of the question. The rubber trade knows of no similar attempts in the past. Up to date, says Victor Yarris in the India Rubber World, paper was not thought of as a possible rival of rubber in the tire line, and if anything new and unexpected is coming the trade wants to know the nature and extent of the revolution.

There are said to be several reasons why attempts should be made to supplant the rubber tire, if possible, but the principal reasons are these: The cost, and the liability to puncture. With regard to the former, it is claimed that bicycles are too expensive and that the use

"STARR"

Incandescent Lamps . .



Full Candle Power. Long Life. Low Price.

Made of any Candle-Power and Voltage, and with bases to suit the different sockets in use.

Unrivalled Quality. :- High Efficiency.

Write for Quotations, stating Voltage and Base used.

JOHN STARR, SON & CO.
(LIMITED)

... Halifax, N. S. ...

Illustrated Catalogue of Electrical Supplies on Application.

The Packard Transformer

The Transformer can be cut out of circuit and a burned out fuse replaced without the use of any tool whatever.



Packard Transformer Fuse Box Complete (1 Size)

Packard Lamp Co., Ltd. :- Montreal
Makers of Packard Lamp and Transformers.

of the pneumatic rubber tire adds about \$20 to the cost of the wheel. Now the average clerk or workman would gladly buy a machine if he could get one at a reasonable price, but \$100 or even \$65 is beyond his financial power. The inventors and champions of the paper pneumatic tire claim that a saving of \$12 will be effected by substituting the paper for the rubber tire, a pair of the former costing only \$8. So far as this reason goes, it is clear that the relation between the premises and the conclusion irrepressively recalls the saying about the mountain laboring and bringing forth a mouse. If the new dispensation will no more do for the poor workman, at present vainly yearning for a machine, than reduce the price by the sum of \$12, it is much feared that no boom in the bicycle trade will take place. The man who can pay \$88 can pay \$100; conversely, the man who cannot pay \$100 cannot pay \$88.

Still, in this hard world, and particularly in dull times, \$12 is a sum not to be despised, and if a paper tire costing that much less will do the work as well as the rubber tire, there is evidently money in the new invention. And this brings us to the second reason for the attempt to substitute paper for rubber. It is claimed that paper will do more and better work than rubber; that, whereas the life of a rubber tire is two seasons, the life of the paper tire will be five years or even more; that in point of elasticity it will not prove inferior to rubber; and that in some respects it will be actually superior.

The conclusion is that the paper tire must prove more durable, and be less affected by friction and running over cobble stones, mud, etc. While the rubber tire, through the constant squeezing together, compression and inflation, is liable to fracture, the paper tire, less yielding, is not subject to the wear and tear in the same degree.

The objection to this reasoning, as stated by the rubber men, is that any diminution in the degree of the "sinking" of the tire is necessarily achieved at the expense of its elasticity, resistency and flexibility—the very qualities which give the pneumatic tire its value and excellence and on which speed depends. A steel tire will not sink at all—as far as the human eye can see, at least—and hence ought to be preferred to all flexible and yielding tires. But it is not, because resistency is the very thing sought after. The projectors of the paper tire say that the ingredients which they mean to put into the

paper stock will make it not only firm and durable so as to be water and mud proof, but elastic as well. Manifestly, however, they cannot make it as elastic as rubber, while resiliency seems to be out of the question altogether.

The details of the process are withheld for the present. The method of drawing out a paper tube is old and well known to paper manufacturers. The operation of uniting the two ends is new, but scarcely interesting to rubber men. The hair used instead of interior linings and air is forced into the hollow of the tube before the union is made. To make the packing uniform a special instrument is used.

As already hinted above, the rubber trade, while interested in this development, is indisposed to "take much stock" in the invention. Those who have been made acquainted with the facts so far made public do not believe there is much chance of success, but they are willing to be convinced and will await the practical test of the paper tire with interest. One thing, however, seems clear, that the paper tire described is in no proper sense a pneumatic tire, as it has none of the true pneumatic features. It is really a kind of cushion tire with the differences that the shoe or curve is to be of paper rather than of rubber. It is, therefore, misleading to compare it with the pneumatic rubber tire, either in respect of cost or any other. Even if it should prove successful, and as good as, or even better than a rubber cushion tire, it would not in any way be a rival of the rubber pneumatic tire.

While the tire above described is not a pneumatic tire, having no air tube, the successful use of paper for the shoe or cover might lead to the use of paper for the covers of true pneumatic tires. The tire of this company is so constructed that the resiliency, speed and elasticity do not at all depend on the cover, and any durable material could be used in making it. All makers of tires, like the makers of bicycles, are trying to reduce the weight of the tire. Lightness is the cry everywhere, and tire manufacturers recognize the necessity of doing everything possible to meet the demand. Now a rubber cover cannot be made thinner than at present without increased liability to accident. But paper would weigh less than rubber and hence lighter tires could be made if paper could be used instead of rubber for the shoe.—The Wheel.

VALVES and - Pipe :: Fittings

Write for Latest Prices.

RICE LEWIS AND SON (LIMITED)

Cor. King and Victoria Sts. - TORONTO.

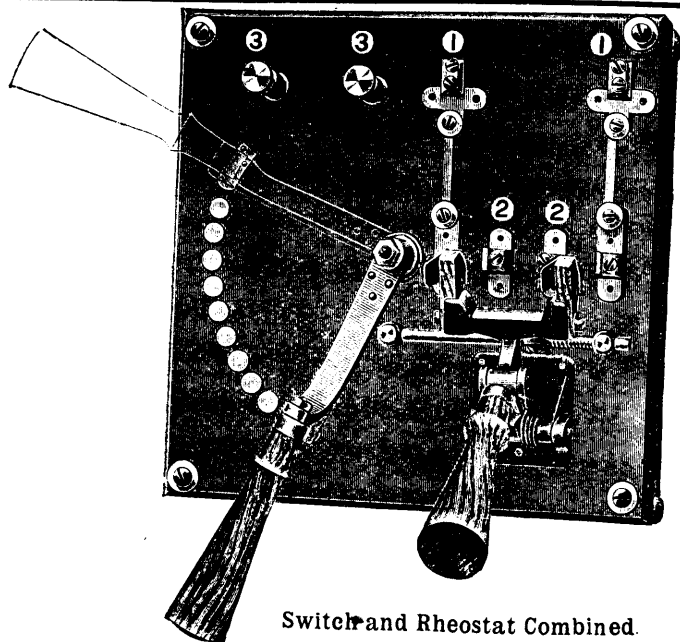
Black Sheet Iron, all sizes.
Sheet Steel, Ordinary & Dead Flat.
Russia Iron, Genuine and Imitation.

M. & L. SAMUEL, BENJAMIN AND CO.

30 Front Street West, Toronto

ENGLISH HOUSE:
SAMUEL, SONS & BENJAMIN
164 FENCHURCH ST., LONDON, E. C.

SHIPPING OFFICE
1 RUMFORD PLACE, LIVERPOOL



Switch and Rheostat Combined.

PROTECT YOUR MOTORS

...By using the....

HILL PATENT Self-Locking Starting Switch

...No possible chance for an accident as the Switch cannot be closed until the resistance is all in.

CHEAP • COMPACT • DURABLE

...Made only by the....

W. S. HILL ELECTRIC CO.

133 Oliver St., Boston, Mass.

SEND FOR CIRCULAR AND PRICE LIST.

NEW YORK
Elson & Brewster, 143 Liberty St.

CHICAGO
Central Electric Co.

It has puzzled many people to know why the horse should prove a much easier victim to an electric current than is man. The Lancet offers this explanation. The hoof, and more particularly its crust and sole, is a good insulator, but the shoe presents to the ground a large metallic contact, and this contact is in connection with metallic conductors in the shape of nails, which pierce the strongest part of the insulation, and afford an easy electrical path into the body. The contact with earth is further improved by the great superincumbent weight of the animal, and it may often happen that in passing over wet ground the external surface of the hoof and the wet fetlock, especially in the case of untrimmed horses, may become sufficiently wet to form a good surface conductor, and so carry a current directly from the earth to the upper part of the body. In this way the safety of the natural "resistance" of the hoof is neutralized. A horse, too, covers more ground than a man, and runs greater risk from being in contact with points of ground farther apart.

CAPTAINS OF INDUSTRY.

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.

Montreal Cold Storage and Freezing Co. are putting in a large Northey duplex steam pump.

Mr. James McDonald will build a planing mill and sash and door factory at Tilbury Centre, Ont.

During the month ending June 30, 1894, the imports of bicycles, tricycles and parts into Canada were valued at \$44,133.

The Montreal Cotton Co., Valleyfield, Que., have installed in their mills a very heavy duplex power pump of the Northey make.

Mr. W. B. Kelley's large saw mill at Bridgenorth, near Peterborough, Ont., was destroyed by fire, August 2, loss about \$6,000.

Fire in the rendering works and tallow factory of Mr. Wm. Harris, Toronto, on August 3, did damage to the extent of about \$3,000.

The Horton Fire Ladder Co., Halifax, N.S., heretofore alluded to in these pages, has been incorporated with a capital stock of \$6,000. Mr. John Starr, of the John Starr, Son & Co., is one of the incorporators.

The Gordon Bridge at Belleville, Ont., is to be rebuilt at a cost of some \$15,000.

The grain elevator of the Forest Elevator and Milling Co., at Forest, Ont., was destroyed by fire Aug. 10, loss about \$2,000.

The saw mill, planing mill and sash and door factory of W. C. Harrison at Norwood, Ont., were destroyed by fire Aug. 10, loss about \$11,000.

The Gananoque Buggy Co., Gananoque, Ont., is applying for incorporation with a capital stock of \$50,000 to manufacture vehicles of all descriptions.

The Georgian Bay Cement Co., with head office at Owen Sound, Ont., is applying for incorporation with a capital stock of \$95,000 to manufacture cement, etc.

It is said that Messrs. Hartt, King & Co. boot and shoe manufacturers, Tarrytown, N.Y., will establish a branch factory at Fredericton, N.B., to give employment to 200 hands.

The Hovey Bros' Packing Co., with headquarters at Sherbrooke, Que., is being incorporated with a capital stock of \$25,000 to carry on the business of slaughtering animals and packing and curing meats.

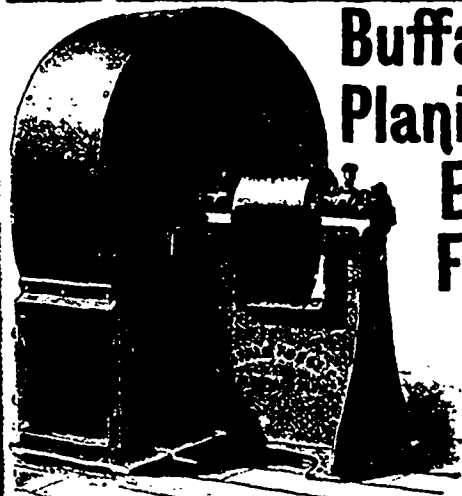
An aerial bridge is to be built connecting Rat Portage, Ont., with Coney Island, at a cost of \$5,000.—The Canadian Engineer. We are glad to know that this is not to be a surface bridge, nor a submarine bridge, nor even a tunnel bridge.

The Southampton Lumber Co., with headquarters at Southampton, Ont., is applying for incorporation with a capital stock of \$10,000 to manufacture lumber, shingles, laths, etc. Mr. Charles M. Bowman, Southampton, is one of the incorporators.

Messrs. E.D. Davison & Sons, and associates, Bridgewater, N.S., are applying for incorporation under the name of E. D. Davison & Sons, to carry on the business of manufacturing lumber, paper pulp, paper, wooden goods, etc., with a capital stock of \$250,000.

The Department of Public Works have called for tenders for the construction of a new steel dredge for salt water service. The appropriation for the vessel is \$40,000. Her hull is to be built entirely of steel, the first of the kind to be constructed for the Dominion Government.

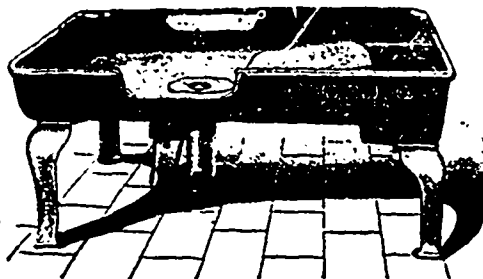
The Niagara Falls and Port Dalhousie Electric Railway Co., with head office at Toronto, is applying for incorporation with a capital stock of \$300,000 to construct an electric railway connecting Niagara Falls and Port Dalhousie, Ont., passing through the intervening municipalities of Stamford, Thorold, Merriton and St. Catharines.



**Buffalo
Planing Mill
Exhaust
Fans**

EFFICIENCY
UNEQUALLED
DURABILITY
UNSURPASSED
SMOOTH
RUNNING
INCOM-
PARABLE

THE LARGEST
FORGE
in the World



Thirty-Eight Other
Designs of
Portable and Stationary Types.

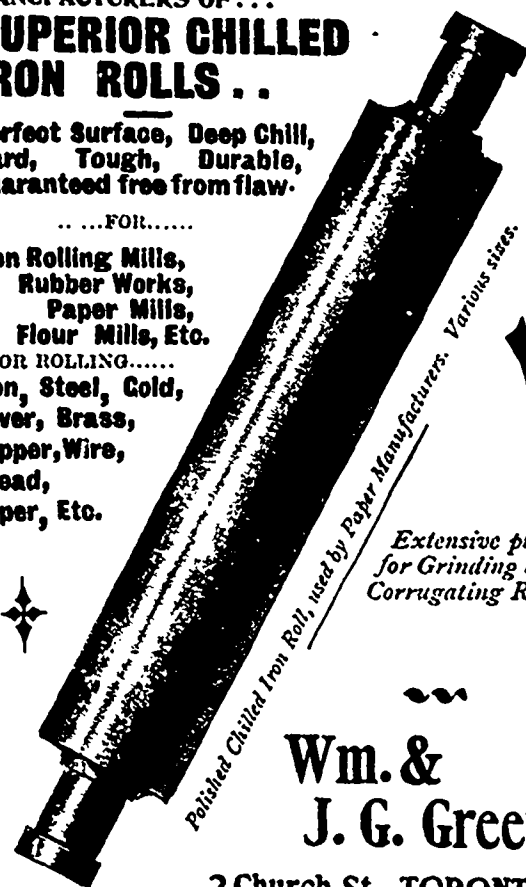
BUFFALO LUMBER DRY KILNS
Blowers, Blacksmiths' Tools, etc.

H. W. PETRIE, Toronto Representative, Toronto, Ont.
CANADIAN MACHINERY & SUPPLY CO., Brantford,
Chicago Office:—22 & 24 Randolph St.

MANUFACTURERS OF . . .
**SUPERIOR CHILLED
IRON ROLLS . .**

Perfect Surface, Deep Chill,
Hard, Tough, Durable,
Guaranteed free from flaw.

FOR ROLLING.....
Iron Rolling Mills,
Rubber Works,
Paper Mills,
Flour Mills, Etc.
FOR ROLLING.....
Iron, Steel, Gold,
Silver, Brass,
Copper, Wire,
Lead,
Paper, Etc.



Extensive plant
for Grinding and
Corrugating Rolls

**Wm. &
J. G. Greey,**
2 Church St., TORONTO.

The barreling houses, agitator tanks, bleacher and some of the out-houses of the Canadian Oil Co., at Petrolea, Ont., were destroyed by fire August 2, loss about \$17,000.

It is stated that Mr. J. R. Booth, whose immense lumber mills at the Chaudiere Falls, Hull, Que., were recently destroyed by fire, has definitely decided not to rebuild. An export duty upon saw logs would probably have influenced the continuance of an industry in Canada that gave employment to several hundred men.

The Niagara Falls, Ont., Street Railway Co., have sold their franchise for \$25,000 to a syndicate of capitalists who will immediately convert the road to the electric system. The ultimate intention is to extend the road to Chippewa thus making a connecting link between the Grand Trunk Railway from the station at Niagara Falls to Chippewa and thence by boat to Buffalo. This will be an important addition to the competing routes between Toronto, the Falls and Buffalo.

Mr. George Sleeman, who owns and operates a large brewery at Guelph, Ont., has entered into an agreement with the authorities of that city, whereby he undertakes to construct and operate an electric street railway there in consideration of a 30 years' franchise. The construction of the road will be done as early next year as possible after the necessary legislative sanction has been secured. Mr. Sleeman is abundantly able, financially, to perform this undertaking, and his well-known energy and business ability is a guarantee that it will be made a success.

The Tanite Co., manufacturers of emery wheels, abrasive materials, grinding machinery, etc., whose factory and head office is at Stroudsburg, Penna., with branches in New York and Cincinnati, have sent us their new 1894 catalogue having reference to their products. The book is of size to be carried in the pocket, and in addition to the price lists of the goods and illustrations of the machinery, contains a vast amount of information which cannot but be very valuable to all who make use of emery and emery goods in any shape. Included in this information are many practical hints about emery wheels which it would be well to remember; and suggestions are made as to the style

and quality of wheels most effective in doing any particular class of work. Reference is made in the book to Tanite Mills emery, which is put up in kegs, half kegs, quarter kegs and fifty pound tins, also in ten pound packages packed ten in a case. These bear a handsome lithographed label, and are attractive goods for hardware dealers. Tanite polishing paste, for use on brass, nickel, tin, etc., and for the hot metal of fire and steam engines, is put up in quarter pound and one pound tins, packed in convenient cases. Tanite liquid polish, for use on fire engines, steam engines, launches, yachts, etc., put up in half gallon and one gallon tins, conveniently packed, contains nothing that can injure flesh or fabric. Alluding to some of the conditions of use of emery wheels, a paragraph of the book says:—It is a common custom of wheel users to attribute all wheel failures to defect in the wheel and to make no allowance for the conditions of use. So common is the custom, that the man who would be ashamed to return a worn-out shoe to its maker thinks nothing of sending back a worn-out emery wheel, without pay, simply saying that it does not suit him. Some firms openly boast that they can get all the "trial wheels" they want and don't need to buy any. It is a common thing to find wheels run under the most improper conditions. Wheels are burst by being run above the standard speed and also by being run so slowly that excessive pressure over-heats them. The users of over-hard wheels apply the same pressure to better wheels and then condemn them as too soft. They allow them to get out of round and then complain that they won't cut. They mount them on rickety machines and shaky floors and then grumble at the wheel, while the real trouble is that the grinder cannot keep his work and wheel in contact. They use such loose and narrow belts that the wheel runs at half speed, and then they declare that the emery wheel is not what it is cracked up to be. They buy over-hard wheels, under the mistaken notion that durability is the prime requisite in an emery wheel, and then let their men hack and chip away the wheel substance in their attempt to keep it rough enough to cut. They buy wheels which glaze over with metal, and then dress them so often with the diamond tool that they never get a proper cutting surface.

Kay Electric Co'y

MANUFACTURERS OF

DYNAMOS

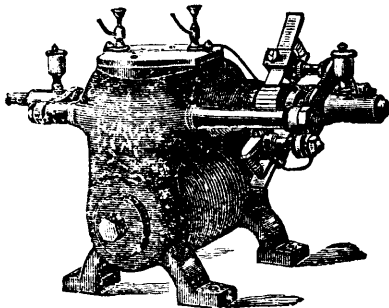
FOR

ARC AND INCANDESCENT LIGHTING,

Plating Machines,
Medical Batteries

AND ALL KINDS OF

ELECTRIC APPLIANCES



HAMILTON, ONTARIO

THE PETERBOROUGH

CARBON AND PORCELAIN CO.

LIMITED

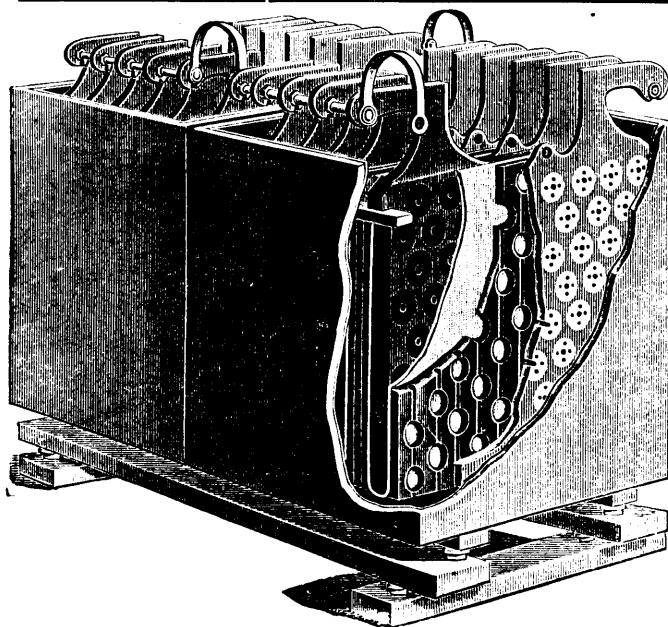
MANUFACTURERS OF

Carbon Points for All
Systems of Arc Lights

BATTERY PLATES, CARBON BRUSHES, and all kinds of PORCELAIN
for Electrical and Hardware Lines.

All goods guaranteed equal in quality to the best manufacturers
in the world.

PETERBOROUGH, - - ONTARIO



THE CHLORIDE ACCUMULATOR

The Electric Storage Battery Co.

SOLE AMERICAN MANUFACTURERS OF

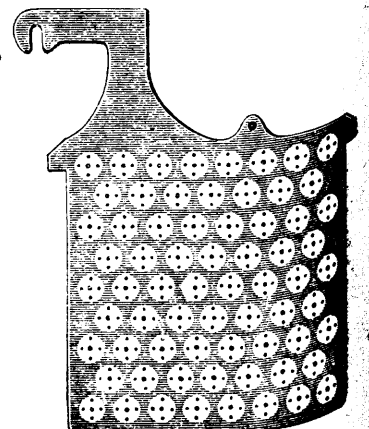
The Chloride Accumulator

Elements of all sizes, from 100
to 1,000 Watt-hours
capacity each.

Traction Cells a Specialty

Electric Launch Equipment, Telegraph
Phonograph, Surgical and all
Special Cells.

Drexel Building - Philadelphia



Messrs. Dickson Bros., Cambellford, Ont., will erect an iron foundry of brick, 70x60 feet.

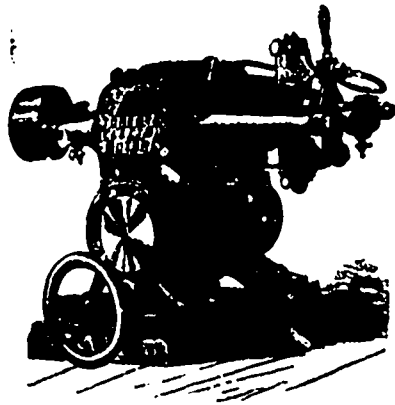
The John Abell Engine and Machine Works Company, Toronto, have closed the following roller mill contracts:—The Vinden Milling Co., Varden, Man., 50 bbl. mill; The York Milling Co., York, Ont., 40 bbl. mill; The Caledon East, Ont., mill.

Mr. W.A. Fraser, of Toronto, who has charge of the Dominion Petroleum borings in the Athabasca region, is in town. By the next train will come four car loads of machinery and Dr. Selwyn, the chief of the geological survey. The test will be thorough, and will be made in accordance with the results of the geological surveys, but for the general good, and not to boom private speculation. — The Edmonton, N.W.T. Times.

Mr. Drury will build a flour mill at Port Colborne, Ont., at a cost of about \$13,000.

A by-law will be submitted to the citizens of Aymer, Que., to authorize the borrowing of \$33,000, with a view of placing a waterworks system in the village.

An offer has been made to the Amherstburg council by George Middleditch to re-open his machine shop on Dalhousie street, Amherstburg, and employ as many men as work can be found for. He will agree to put in a new boiler and engine, two lathes, an iron planer two upright drills and other machinery. He will also, if business warrants, equip his foundry and make iron and brass castings. As an inducement, he asks for free water and ten years' exemption from taxation.



No Equal or No Sale

If you require a Motor to drive your works, or a Dynamo to light your factory, we can supply the best and simplest in the market, satisfaction guaranteed. Our record is not equalled by any firm, large or small, in Canada.

Call or Write for particulars.

Toronto Electric Motor Co., 107 Adelaide St. West Toronto, Ont.

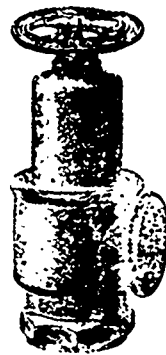
Don't Miss Sending for Quotations

New Railway Generators and Station Equipments. Complete Railway Car Equipments. Direct Current Lighting Dynamos. Direct Current Power Motors.

Alternating Single and Two Phase Current Generators, for Lighting and Power.

Full Lines of Lamps, Cut Outs Sockets and Switches
Before purchasing elsewhere, write us.

M. D. BARR & CO.,
56½ King St. East, Toronto, Ont.



CROSBY Steam Gage & Valve Co.

Sole Proprietors and Manufacturers of

Crosby Pop Safety Valves, for all kinds of boilers
Water Relief Valves, including the Underwriter, which is fully approved by the Associated Factory Mutual Ins. Cos.; Crosby Steam Engine Indicators, with Sargent's Electrical Attachment; Crosby Improved Steam Gages and Patent Gage Testers; The Original Single Bell Chime Whistles.

All kinds of Pressure and Vacuum Gages used in the various arts.

UNDERWRITER
Solo Agents for
Clark's Linen Fire Hose and Adjustable Couplings.
Gold Medal, Paris Exposition, 1889. Ten Highest awards, Columbian Expo., 1893.
Branch Offices at New York, Chicago and London, Eng.
Main Office and Works, **BOSTON, MASS., U.S.**

Low Rates for Insurance on Mills and Factories

I PROFESS TO DO BETTER

Than is commonly done with such risks situated in Ontario or Quebec.

Write for particulars,
Mentioning this paper.

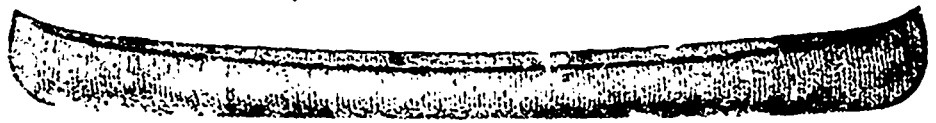
C. R. G. JOHNSON
FIRE INSURANCE BROKER

42 St. John Street,
MONTREAL.

A Reliable Audit . .
Cannot be expected unless the Auditor has acquired the knack for detecting errors, which comes of long experience with accounts. I solicit your next appointment.
A. G. NEFF, Chartered Accountant, Auditor, Assignee, etc.
32 Church St., TORONTO

The Canadian Canoe Co., Ltd.

BOX 107, : PETERBORO, ONT.



We build Canoes of CEDAR, BUTTERNUT, BASSWOOD and other woods, for Paddling, Sailing, Racing, Fishing, Etc. Skiffs of all sizes.
STEAM LAUNCHES to carry six persons, from \$175 up.
...WRITE FOR CATALOGUE...

The town of Regina, N. W. T., which is to have the territorial exhibition there next year, has appropriated \$10,000 for the erection of the necessary buildings.

Mr. W. J. Bell has assumed the management of the Bell Organ and Piano Co.'s business here. Ever since the severance of the connection of Mr. A. W. Alexander with the company the directorate has made frequent attempts to induce Mr. W. J. Bell to take control. None of the overtures thus made was successful until on Saturday afternoon an understanding was arrived at and Mr. Bell agreed to accept the position. Any change in the management of this large concern is of deep interest to the people of Guelph, for in a very material degree is the prosperity of the city dependent on the success of its premier manufacturing industry. Mr. Bell will be welcomed back to Guelph and the management of the factories and the hope will be universally entertained that under his regime the enterprise may experience nothing but increasing prosperity—Guelph Herald.

Perforated Metals

...IN...

STEEL... .. IRON
 ZINC
 COPPER... .. BRASS
 TIN

The B. Greening Wire Co.
 LIMITED

HAMILTON - - CAN.

We issue a Special Catalogue for this line with full-size cuts of perforations.



Send to
NORTON EMERY WHEEL CO.
 WORCESTER, MASS.
 FOR ILLUSTRATED CATALOGUE OF
EMERY & CORUNDUM WHEELS.
Emery Wheel Machinery ETC.
ORDER SPECIALLY FOR NEW & EXPERIMENTAL WORK

Emery Wheels AND MACHINERY

Standard Emery Wheel Co., Albany, N.Y.

Our Motto on EMERY WHEELS

“LARGE CONTRACTS, QUICK SALES and SMALL PROFITS”

For an A NO. 1 Wheel

ALSO THE LARGEST and BEST LINE OF EMERY WHEEL MACHINERY in the U.S.
 Catalogue furnished upon application.

The Springfield Emery Wheel Co. - - - Bridgeport, Conn.



TANITE MILLS

**Emery, Emery Wheels,
 Grinding Machines, Polishes, Etc.**

Quick Process and Large Stock.

Special Inducements suited to our Stock and the Times

THE TANITE COMPANY, STROUDSBURG, Monroe Co., Pa.
 NEW YORK, 161 Washington Street.
 CINCINNATI, 1 West Pearl Street.

Thos. Davidson & Co., Montreal, have just placed in their factory a Northey Underwriter fire pump of 750 gal. per minute capacity.

The W. A. Freeman Co., Hamilton, Ont., is being incorporated with a capital stock of \$40,000 to manufacture agricultural fertilizers, etc.

The Merchants' Manufacturing Company, Montreal, have installed a Northey Underwriter pump in their mills, with capacity of 1,000 gallons per minute.

The Northey Mfg. Co., Toronto, are supplying the mills of the Rosamond Woolen Co., Almonte, Ont., with a complete system of pumps, hydrants, pipes, valves, etc.

The New Glasgow Coal, Iron & Ry. Co., Ferrona, N. S., have given a second order to the Northey Mfg. Co., Toronto, for one of their outside packed plunger mining pumps.

The Montmorency Cotton Mills Co., Montmorency Falls, Que., have put in a Northey Underwriter pump of capacity to deliver 1,000 gals. per minute; also a triplex power pump for boiler feed.

The Sissiboo Falls Pulp Co., with chief place of business at Weymouth Bridge, Digby County, N.S., is applying for incorporation with a capital stock of \$30,000 to manufacture paper pulp, etc.

Application is being made to incorporate the Mattawa Electric Light and Power Co. with a capital stock of \$10,000 with head office at Mattawa, Ont., to generate and supply electricity for commercial purposes.

The Toronto Railway Co. have ordered from the Northey Mfg. Co., Toronto, an outside packed plunger pump for boiler feed, also one upright independent twin condenser to take care of boiler aggregating 1,600 h.p. capacity.

Mr. Charles Green, a woolen manufacturer of Newport, Maine, informs us that he has in operation in his mill an apparatus supplied to him by Mr. A. P. Mende, 14 Water Street, New York, for recovering the fats and oils from the refuse water discharged from his scouring and finishing room. He says that this apparatus is so simple that any inexperienced help can operate it, and that it is so efficient in its operation that at least 75 per cent. of the fats and oils is recovered.

Manning's flour mill at Stonewall, Man., was destroyed by fire Aug. 5, loss about \$8,000.

Rice Lewis, of Toronto, have put in a Northey electric triplex power pump for their elevators.

Fire in the works of the Maritime Lead and Saw Works, St. John, N.B., Aug. 6, did damage to the extent of about \$2,000.

The Morden Office File Co., of Toronto, has been incorporated with a capital stock of \$12,000 to manufacture office fixtures, etc.

The Young & Bro. Co., Hamilton, Ont., has been incorporated with a capital stock of \$150,000 to manufacture plumbers' and steam fitters' supplies, etc.

The John Abell Engine and Machine Works Co. say that they would rather make good boilers than bad debts anyday, therefore for cash they will quote low.

The Hamilton Boat Propeller Co. is being incorporated at Hamilton, Ont., with a capital stock of \$40,000 to manufacture small boats to be propelled by a newly-patented apparatus.

Mr. William Miller, late superintendent for the Chatham, Ont., Manufacturing Co., has obtained a suitable building in London, Ont., where he will engage in the manufacture of wagons, etc.

The Collingwood Meat Co., Collingwood, Ont., are erecting buildings at that place suitable for the purposes of their business at a cost of some \$50,000. It is claimed that this will be one of the most complete meat curing and packing establishments in Canada.

The Intercolonial Coal Mining Co., Westvale, N.S., have just received from the Northey Mfg. Co., Toronto, a large compound condensing mine pump, weighing some 7 tons, which is to be placed at the bottom of a 3,000-foot slope, and which will lift water 600 feet vertically. They have also put in a Northey duplex outside packed plunger for boiler feed.

Messrs. Darling Bros., Montreal, advise us that they have recently made shipments of the following special machines: 1 Webster Heater and Pumper, for Messrs. Robin & Sadler's new factory, Montreal, for heating the feed water for boiler and to work in connection with the exhaust steam for heating the building; 1 7-inch Webster oil extractor and 1 4-inch Webster live steam separator to Acadia Coal Co., Stellarton, N.S.; 1 4-inch oil extractor to General Mining Co., Cape Breton, N.S.; 1 Nordberg automatic governor to N. Neuger & Bros., Ayton, Ont.; 1 hand power elevator to Henderson & Potts, Halifax, N.S.; 1 hand power elevator to Amherst Boot and Shoe Co., Amherst, N.S.; 3 hydraulic elevators to Montreal Cold Storage and Freezing Co., Montreal.

IMPORTANT TO LIGHTING STATIONS

= = OUR NEW = =

Alternating Current Indicators

Are now ready. Before purchasing elsewhere send for our New Catalogue, which contains the prices and description of the above instruments, and also a list and prices of other new instruments of our manufacture.

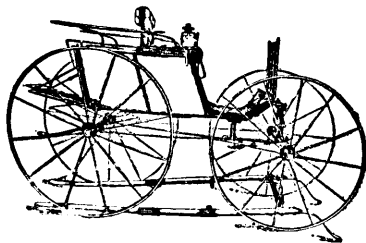
WHITNEY ELECTRICAL INSTRUMENT CO'Y.
 Sherbrooke, P.Q., Canada. Penacook, N.H., U.S.

... AGENTS ...

Henry F. Kellogg, General Selling Agent.

- | | |
|---|---|
| BOSTON, MASS., W. S. Hill. | NEW YORK CITY, Geo. L. Colgate, 136 Liberty Street. |
| BALTIMORE, M.D., The Poole Electric Co. | SAN FRANCISCO, CAL., California Electrical Works. |
| CHICAGO, ILL., Electric Appliance Co. | TORONTO, ONT., Toronto Electrical Works. |
| CINCINNATI, O., Nowotny Electric Co. | |
| HALIFAX, N.S., John Starr, Son & Co. Ltd. | |

Armstrong's Adjustable Seat Surrey



FOR FALL EXHIBITIONS.

Every Carriage Maker should show one.
 A sure Prize Taker for completeness and novelty.
A SURE SELLER : SO STYLISH : SO LIGHT RUNNING
 SO REASONABLE IN PRICE.
 Ask for particulars.

J. B. ARMSTRONG MFG. CO., LTD. GUELPH, CAN.

The Unexpected Generally Happens.

Have your boiler inspected and insured, it pays to know that you are right.

Don't Trust to Luck. Will Your Boiler Stand the Pressure at its Weakest Point? Can you Judge It? Are the Safety Valves and Steam Gauges Right? It is your duty to take every precaution. Inspection makes you safe. Insurance indemnifies you against loss.



- DIRECTORS -

- | | |
|------------------------------------|-----------------|
| E. JONES PARKE, Q. C. | President. |
| F. A. FITZGERALD, ESQ., | Vice-President. |
| HON. DAVID MILLS, M. P., | |
| JOHN MORISON, ESQ., | |
| T. H. PURDOM, ESQ., | |
| JAMES LAUT, Manager | |
| J. H. KILLEY, Consulting Engineer. | |
| JOHN FAIRGRIEVE, Chief Inspector. | |

Steam Boiler and Plate Glass Insurance Co
 .. OF CANADA ..

Head Office - - - LONDON, ONT.

The Largest Radiator Manufacturers Under the British Flag

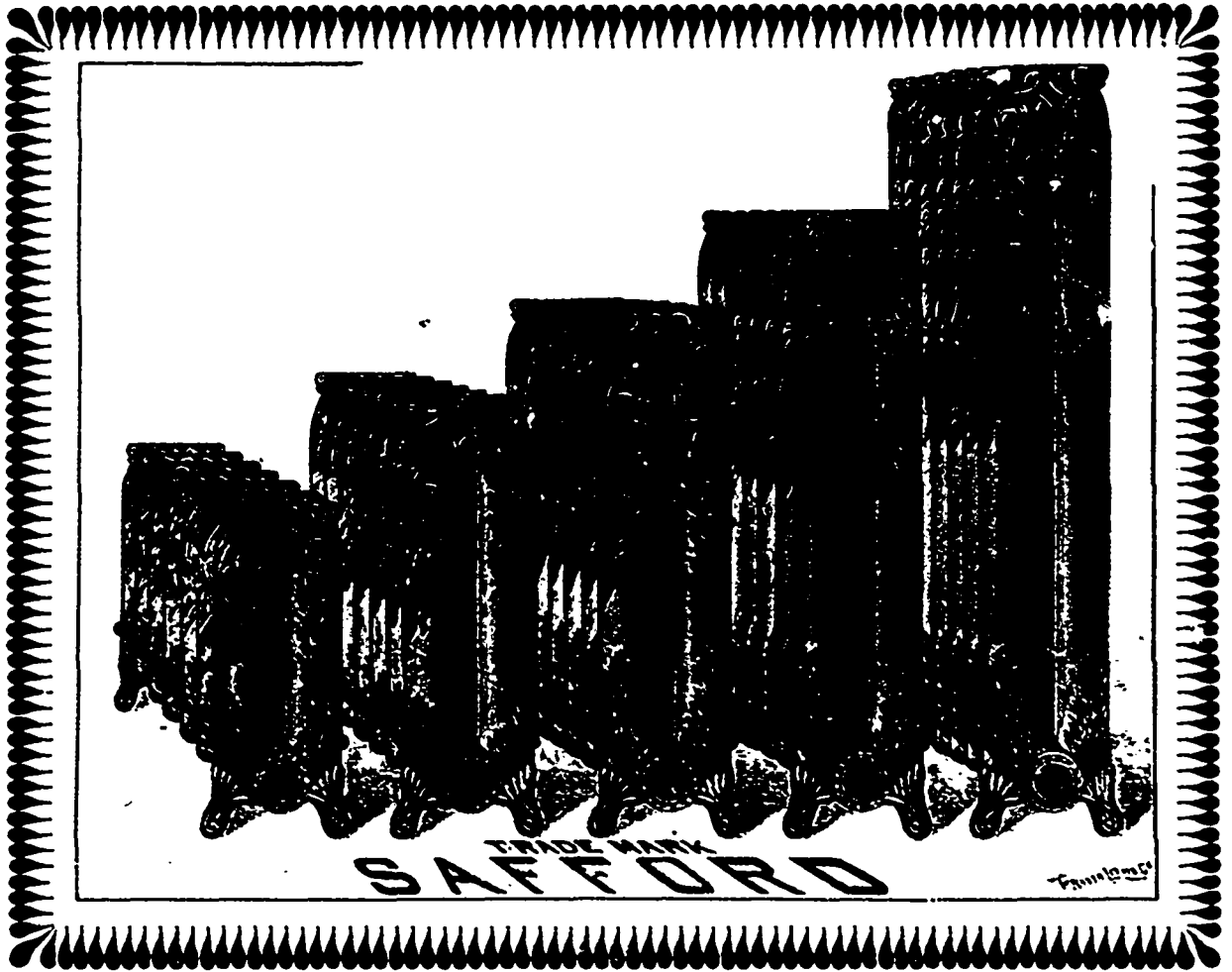
Safford Patent Radiators

For HOT WATER AND STEAM HEATING.

No Wrought Iron Bolts
PACKING
Leaky Joints



MOST EFFICIENT BEST CONSTRUCTION
ALL IRON TO IRON SCREWED JOINTS
LARGEST VARIETY



The Largest and Most Prominent Buildings in Canada are Heated with "Safford Radiators."

WE MANUFACTURE NOTHING BUT
RADIATORS

Made only by...

The **TORONTO RADIATOR MFG. CO., Ltd.**

...Branches...

MONTREAL . QUEBEC . ST. JOHN, N.B. . HAMILTON . WINNIPEG . VICTORIA, B.C.

Peter McLaren's saw mill at McLeod, N.W.T., was destroyed by fire Aug. 5, loss about \$12,000.

The Citizens' Light & Power Co., Montreal, are erecting a new station at St. Henri, which is to be operated by steam power. The steam plant is to consist of two 320 h. p. compound, condensing Westinghouse engines and Manning vertical boilers with mechanical draft.

The building which contained the generator and other electrical appliances of the Port Arthur (Ont.) Water, Light and Power Co. was destroyed by fire Aug. 13, and now that place is without electric power for any purpose. The station is to be re-equipped without delay.

Messrs. T. A. Morrison & Co., Montreal, inform us that they have been awarded the contracts for supplying 800,000 Laprairie pressed bricks for the new Montreal incinerator; olive green Miramichi stone for the new building for the Merchant's Bank of Halifax branch on Notre Dame street, Montreal; Ornamental terra cotta for Montreal Street Railway Co.'s offices, and 300,000 Laprairie pressed bricks for Messrs. Robin & Sadler's new factory, Montreal.

The Dodge Wood Split Pulley Co., Toronto, have introduced an improvement in small split pulleys, and now make all small pulleys from 3 to 8 inches in diameter, with bolt and nut fastening, doing away with the Wedge style.

Messrs. Jacob Y. Shantz & Son, Berlin, Ont., and associates have formed themselves into a stock company and are applying for incorporation with a capital of \$140,000 to take over the plant and business of the firm and continue the manufacture of buttons, ornaments, etc.

The Temple Electric Co., Montreal, has secured a centrally located property on Chenneville St., that city, which is being fitted up as an electric light and power station. The new station is to have double the capacity of the present one, and is to be completed about the end of September.

The large planing mill at Port Arthur, Ont., owned by Mr. James Connee and operated by Messrs. Vigars Bros., was destroyed by fire Aug. 13. The building and machinery were valued at \$18,000. The dynamo of the Port Arthur Water, Light and Power Co. was in the building, and was also destroyed.

... JOHN McDougall ...

Caledonian Iron Works, for BOILERS, - ENGINES, - PUMPS. Gearing, Hangers, Shafting, etc.

Office: WILLIAM Cor. SEIGNEURS ST., MONTREAL.

CASSIDY, BONNER & CO. 128 Queen Street, - - Montreal, Que. MANUFACTURERS OF LEATHER

BELTING

Lace Leather, Etc., Loom Strapping and Mill Supplies.

Leather Belting...

Our "STANDARD" Belting is the BEST made in Canada and SUPERIOR to most imported..... WRITE FOR PRICES

J. L. GOODHUE & CO. - - DANVILLE, QUE.

HENRY PORTER Oak Leather Tanner and Manufacturer of

PURE OAK TANNED

BELTING

Lace Leather, Goodyear Welting, Bag and Colored Shoe Leather, Carriage, Furniture and Patent Leather, Oak, Sole, and Harness Leather.

434 to 442 Visitation St., MONTREAL, Que.

REDDAWAY'S PATENT.



BREAKING STRAIN 6 IN. CAMEL HAIR BELT—14,181 lbs 6 IN. DOUBLE OAK LEATHER—7,522'

W.A. FLEMING.

SOLE AGENT FOR CANADA.

57, ST. FRAS. XAVIER ST. (24 FRONT ST. E.) VICTORIA CHAMBERS MONTREAL. (TORONTO.) OTTAWA.

MANUFACTURERS OF

Robin & Sadler, Leather Belting, Oak Tanned Montreal & Toronto.

We make BELTING FOR ALL KINDS OF WORK. When ordering state where BELTS ARE TO RUN.

The Dodge Wood Split Pulley Co., Toronto, are out with a new catalogue covering their new split friction clutch and cut-off coupling, which was recently patented in Canada. The prominent feature of this new clutch is that it is a split clutch in all respects like the Dodge pulley. From all accounts The Dodge Co. will get their share of the clutch trade.

Messrs. Shaw, Cassils & Co., have recently started up their new sole leather tannery at Poquiock, near Fredericton, N.B. regarding which the Gleaser says:—The output of the tannery amounts to two tons daily. The tannery at the present time employs about 25 hands, besides those employed in peeling the bark. The company have a rotary saw-mill in connection with the tannery. They are building a present three new houses. A new engine has just been set up, and the company are putting in an electric light plant to light the tannery and all the houses as well.

W.W. Altemus & Son, 2816 N. Fourth Street, Philadelphia, are receiving many inquiries about their new patent bobbin winder with a patented variable motion and friction guide. On this they can wind direct from the small spools and put the yarn of two of them in one shuttle bobbin, this doing away with the spinning frame and giving a good hard bobbin with greater production. Said Mr. J. K. Altemus, of the firm, recently: "We can wind from 70 to 100 pounds per day according to the number of the yarn, and nothing can equal the quality of the bobbins as wound by us. We can wind the softest yarns and get the same results. To enable us to do this we have invented a new friction guide as mentioned above, which is so sensitive that it can be adjusted for soft or coarse yarns and prevents the friction upon the end as it is passing to the bobbin. This guide is one of the greatest and simplest achievements of our machine worthy of recognition."—American Carpet & Upholstery Trade.

The Frosell Safety Scaffold Co., Montreal, are applying for incorporation with capital stock of \$50,000 to manufacture the Frosell Safety moveable scaffold and traveling platform.

The British Columbia Automatic Lighting and Oil Co., with head office at Vancouver, B.C., is being incorporated with a capital stock of \$250,000 to manufacture lamps and other lighting apparatus, and to develop a patent lighting system.

The property of the Midland & North Shore Lumber Co. at Parry Sound, Ont., has recently been sold to Mr. Wm. Peter, of Bay City, Michigan, who is now engaged in repairing the machinery of the mill preparatory to cutting last season's supply of logs, after which the mill will be fitted up almost throughout with new machinery. It is Mr. Peter's intention to establish mills for the manufacture of the refuse that now goes to waste in the other two mills. The opening of these enterprises in Parry Sound should mean an addition to the population of that town of, at least, 400 people.

CANADIAN PATENTS.

The following patents have been issued from the Canadian Patent Office, from June 1 to June 11, 1894, inclusive.

Information regarding any of these patents may be had on application as follows:—

- Fetherstonhaugh & Co., Bank of Commerce Building, Toronto.
- Ridout & Maybee, 103 Bay street, Toronto.
- A. Harvey, Central Chambers, Ottawa.
- J. A. Grenier, Imperial Building, Montreal.

R. C. Jamieson A. T. Higginson
R. C. JAMIESON & CO.
 MANUFACTURERS OF
Varnishes and Japans
 Importers of Oils, Paints, Colors, Turpentine, Shellacs, Rosins, Glues, Gold Leaf, Bronze, Etc., Etc.
 Office, 13 St. John Street, Factory and Warehouse, 23 to 29 St. Thomas St. **MONTREAL**

WM. BARBER & BROS.
 GEORGETOWN - - ONT.
 Manufacturers of **Book and Fine Papers**

TIMCLEY & STEWART MFG CO.
RUBBER STAMPS, SEALS,
 Steel Stamps, Stencils, Brands, Etc.
10 KING STREET WEST, Up-Stairs, TORONTO.

For all kinds of **Electric Supplies** & **Construction Work**
 Write.....**LOWE & FARRELL,**
38 James Street South, Hamilton, Ont.

FIRSTBROOK BROS.
Mnfrs of Dovetail and Packing Boxes
 Top-Pins, Side Blocks and Cross Arms. Wood Printers, Etc.
CIGAR BOXES, SHIPPING CASES.
TORONTO : : : ONT.

R. SPENCE & CO.
 BEACH FILEWORKS
 Hamilton : : : Ont.
 Manufacturers of
FILES and RASPS
 Recutting in all Branches

LAMKIN PATENT


Steam Pipe and Boiler Coverings
ASBESTOS GOODS COTTON WASTE **STEAM PACKINGS GASKETS, Etc., Etc.**
Largest and Best Assortment in Canada.
Canadian Mineral Wool Co., Ltd. ::= 122 Bay St., Toronto.
TELEPHONE 2376.

WHEN WERE
 YOUR
Boilers
 LAST
 INSPECTED

CONSULTING ENGINEERS:
G. C. ROBB, Chief Engineer
A. FRASER, Secretary-Treasurer

JOHN L. BLAKIE Esq. PRES. **EW. RATHBUN Esq. VICE-PRES.**

THE BOILER INSPECTION & INSURANCE CO. OF CANADA



ARE YOU
 SURE
 THEY ARE
SAFE
 AND
 IN GOOD
 CONDITION?

Head Office: **TORONTO**

Copies of American patents corresponding to Canadian patents can be procured from either of these attorneys for the sum of twenty-five cents each.

- 46,194 Combined harrow and scarifier, C. A. E. W. Clark, Welland Ont., June 1.
- 46,195 Potato digger, Alfred Olmsted, Byron, N.Y., June 1.
- 46,196 Take-up for shoe-sewing machines, The Goodyear Shoe Machinery Co., Portland; Me., June 1.
- 46,197 Steam engine, Fredric C. Weir, Cincinnati, O., June 1.
- 46,198 Track-sanding apparatus, Henry L. Leach, Cambridge, Mass., June 1.
- 46,199 Friction clutch pulley, William W. Wallace, Willoughby, O., June 1.
- 46,200 Dress plaquet fastener, George M. Treat, Hamilton, Ont., June 1.
- 46,201 Cleats for supporting conducting wires for electrical circuits, Horace B. Wyman, Slingerlands, and Albert C. Goodwin, Albany, N.Y., June 1.
- 46,202 Process of making compound ingots, Alfred H. Moore, and George Whitlock, Brooklyn, N.Y., June 1.
- 46,203 Hoof expander, Ezra B. Chadwick, Bristol, R.I., June 1.
- 46,204 Transfer ticket, John H. Cairncross, Toronto, Ont., June 1.
- 46,205 Camera, Theodore M. Clark, Newton, Mass., June 1.
- 46,206 Apparatus for the manufacture of carbon brushes, John W. Taylor, Peterborough, Ont., June 1.
- 46,207 Car coupling, Henry K. Knox, Yevay, Ind., June 1.
- 46,208 Smoke purifier and draught increaser, Edwin Wardle, and Joseph H. Evers, Leeds, England, June 1.
- 46,209 Storage electric battery, Alfred Oblasser, Paris, and Charles Theryc, Marseilles, France, June 1.
- 46,210 Telephone transmitter, William H. Eckert, New York, N.Y., June 1.
- 46,211 Governor for seed pumps, Joshua Thomas, Cleveland, O., June 1.
- 46,212 Histological case, William Autenrieth, Cincinnati, O., June 1.
- 46,213 Anti-spattering guards, Caleb Swayze, Welland, Ont., June 1.
- 46,214 Paper pulp refining engine, David Pearson Redcliffe, England, and David N. Bertram, Edinburgh, Scotland, June 1.

- 46,215 Electrical annunciator, Franklin S. Carter, Burlington, N.J., June 1.
- 46,216 Air-brake hose coupling, Beery Valve Co., Chicago, Ill., June 2.
- 46,217 Line reel fastener and tightener, Charles Wagoner and Melvin H. Nichols, Worcester, N.Y., June 2.
- 46,218 Wire fence machine, William N. Parrish and Charles F. Peelle, Richmond, Ind., June 2.
- 46,219 Hydraulic dredging machine, John M. Robbins and Hattie M. Pendery, Fort Worth, Texas, June 2.
- 46,220 Vehicle hub, Henry W. Broesquin, St. Louis, Mo., June 2.
- 46,221 Cover for cans, Alfred A. Ainsworth, New York, N. Y., June 2.
- 46,222 Controller for electric motors, The Canadian General Electric Co., Toronto, Ont., June 2.
- 46,223 Manufacture of sugar, Caleb H. Jackson, New York, N. Y., June 2.
- 46,224 Time chart, Alexander Gleason, Buffalo, N.Y., June 2.

NEW YORK AND BOSTON DYEWOOD COMPANY

.....MANUFACTURERS OF.....

Dyewood • Extracts

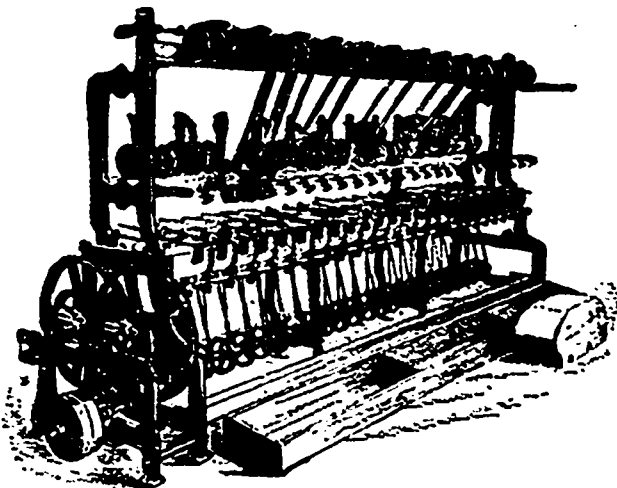
....Selling Agents for the United States and Canada for the....

ACTIEN-GESELLSCHAFT FÜR ANILIN-FABRIKATION
Berlin, Germany.

NEW YORK, 55 Beekman St.
BOSTON, 106 and 108 Milk St.
PHILADELPHIA, 122 and 124 Arch St.

A. W. LEITCH, 16 Hughson St. South, HAMILTON, ONT.

MEDAL AWARDED AT WORLD'S FAIR



Patent Bobbin Winding Machine, for Worsted or Cotton Yarns
Pat. Nov. 22nd, 1857, with variable motion. Pat. Aug. 5th, 1853.

The Only Successful Skein Winder

Variable Motion, patented Aug. 30th, 1867, and Sept. 5th, 1863.

W. W. ALTEMUS & SON

... Textile Machinery ...

2816 North 4th Street : : : Philadelphia, Pa.

... Builders of ...

Cop and Bobbin Winders Chenille Cutters
Spoolers, Warp Mills Beaming, Carpet Rolling
Machines, Reels, Etc.

ESTABLISHED 20 YEARS

A. Klipstien & Company

122 PEARL ST., NEW YORK

Anilines, Dyestuffs . . .

. . . and Chemicals

of every variety, of the best quality and at the lowest prices. Delivery made at New York, Montreal or Hamilton.

WRIGHT & DALLYN

AGENTS

HAMILTON, ONT.

St. Charles & Pringle

BELLEVILLE, ONT.

Manufacturers of

Electric ..

Cable ...

and Horse

STREET CARS



. Omnibuses, Horse Wagons and Vehicles of All Description.

- 46,225 Brake, John T. Shepard, et al, Jackson, Mich., June 2.
 46,226 Drawer guide, David M. Estey, et al, Owosso, Mich., June 2.
 46,227 Steering gear for vessels, Ralph H. Chase and John J. Daly, Jacksonville, Florida, June 4.
 46,228 Machine for holding boots and shoes while being operated upon, George H. Clark, Boston, Mass., June 4.
 46,229 Machine for excavating, Charles R. Seales, Parish of Hillsboro', N.B., June 4.
 46,230 Mining tool, Martin Hardsocg, Ottumwa, Ia., June 4.
 46,231 Tank for hydrocarbon burners, Joseph H. Matthews, Canton, O., June 4.
 46,232 Apparatus for lowering ice, Charles I. Foster, Meridan, Conn., June 4.
 46,233 Apparatus for effecting combustion, William Smith and Benjamin Frigon, Montreal, Que., June 4.
 46,234 Last, Edward J. Howard, Boston, Mass., June 4.
 46,235 Automatic time dating stamp, Warren B. Martindale and Lyman M. Brackett, Rochester, Ind., June 4.
 46,236 Hydrocarbon vaporizer and burner, Joseph H. Matthews, Canton, O., June 4.
 46,237 Governor, George J. Atham, Swansea, Mass., June 4.
 46,238 Letter-file, Ezra H. Stafford and Frank Field, Grand Rapids, Mich., June 4.
 46,239 Wood polishing machine, James L. Perry, Chicago, Ill., June 4.
 46,240 Water closet ventilator, Arthur Turgeon, Quebec, Que., June 4.
 46,241 Elevated trolley carrier, Owen O. Jones, Poultney, Vt., June 4.
 46,242 Tie holder, Henry M. O'Reilly, Almonte, Ont., June 4.
 46,243 Agraffe, Fridolin Schillmel and Searick F. Nelson, Faribault, Minn., June 4.
 46,244 Device for preserving tea from air and moisture, Charles W. Lutes, Winnipeg, Man., June 4.
 46,245 Label holding cabinet, Thomas McCabe, Ottawa, Ont., June 4.
 46,246 Umbrella, Robert F. Johnston, Detroit, Mich., June 4.
 46,247 Sash fastener, John S. Coey, Newark, N.J., June 5.
 46,248 Safety money drawer, Michael R. Daley, Fall River, Mass., June 5.
 46,249 System of indexing boots, Emil Lefebvre, Fairfax, La., June 5.
 46,250 Money changer for fare boxes, Charles W. Muth, and Henry Martin, New Coryden, Ind., June 5.
 46,251 Lock for metallic shingles, Hugh D. Walker, Smithville, Ont., June 5.
 46,252 Nut lock, Julius Schirra, Pittsburg, Christian Thiers and William Sang, Braddock, Pa., June 5.
 46,253 Closet flushing attachments, Louis M. Hooper, Rutherford, N.J., June 5.
 46,254 Harrow, Andrew Lefleur, North Bay, Ont., June 5.
 46,255 Coal chute, Henry A. Ainsworth, Moline, Ill., June 5.
 46,256 Pump, Elijah Neff, Milford, Ind., June 5.
 46,257 Stove, The H. Frank Steel Range Co., Cleveland, O., June 5.
 46,258 Combined churn and butter worker, John S. Elliott, Cornwall, Ont., and Thomas Fraser, Montreal, Que., June 5.

SOLICITOR OF PATENTS

J. A. GRENIER, C.E., - - Imperial Building, Room 83, MONTREAL.

Patents, Trade Marks, Industrial Designs, Caveats, etc., for Canada, United States, and all Foreign Countries. Hydraulic Engineering a Specialty. Send for Book of Instructions to Inventors. '92

FETHERSTONHAUGH & CO.

Patent Barristers and Solicitors
Electrical and Mechanical Experts and Draughtsmen

Cable Address "Invention, Toronto."

Telephone 2589

PATENTS Procured in Canada and all Foreign Countries

Head Office: Canadian Bank of Commerce Bldg., TORONTO

PATENTS

Caveats, Trade Marks, Designs, Etc.

We possess unsurpassed facilities for procuring patents in Canada, United States and all foreign countries. Moderate terms. Report us to patentability of invention Free of charge. No one applying for patent writes us for circular. All information and advice free. Rejected applications a specialty.

GLASCOCK & CO., 605 F St. N. W., Washington, D.C.

Established 1881 with Twenty Years' Professional Experience in Canada, England and Germany.

A. HARVEY, C.E.

PATENT ATTORNEY

Ottawa, Canada

Offices: Rooms 33 and 34 Central Chambers

Address: Postal Box 1071

TELEPHONE

Send for Circular 48a "How to Obtain a Patent."

Asbestos Mill Board and Friction Pulley Board

ROOFING, SHEATHING, AND FLOORING FELTS

The Dominion Leather Board Company

Proprietors of Sault au Recollet Paper Mills

MONTREAL

ECO MAGNETO

Watchman's Electric Clock

... WITHOUT BATTERIES ...



Write for Descriptive Circular to

..Eco Magneto Clock Co...

ROOM 71 : : 620 ATLANTIC AVE.
BOSTON, MASS.MONTREAL ELECTRIC CO., Agents for Province of Quebec
302 ST. JAMES STREETJohn Starr, Son & Co., Ltd. — Halifax, N.S.
Agents for the Maritime Provinces.

WE MANUFACTURE

THE MOST PERFECT

...Watchman's Clock...

IN THE MARKET.

Send for full information and prices to

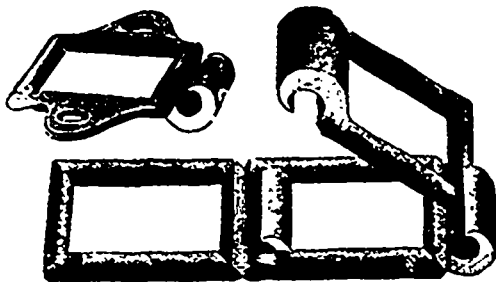
The E. Howard Watch and Clock Co.,

MANUFACTURERS : 383 Washington St., Boston, Mass.
FINE WATCHES & CLOCKS : 41 Maiden Lane, New York, N.Y.
34 Washington St., Chicago, Ill.SAMUEL LITTLE, Pres. RUPP'S B. CARL, Gen. Mgr.
ARTHUR M. LITTLE, Treas.

- 46,250 Conveyor, Daniel M. Maxon and James Griffin, Bay City, Mich., June 5.
- 46,260 Grate, The H. Frank Steel Range Co., Cleveland, O., June 5.
- 46,261 Wire fence, George Lehberger, Newburgh, N. Y., June 5.
- 46,262 Elevator bucket, Timothy Long and The Excelsior Iron Works Co., Cleveland, O., June 6.
- 46,263 Monument, Alonzo Russell, Atkins, Ark., June 6.
- 46,264 Addressing machine, Eldridge D. Hanna, Clifton, W. Va., June 6.
- 46,265 Hasp for doors, &c., Thomas Mounce, Toronto, Ont., June 6.
- 46,266 Wrench, Christian Black, Green Co. Springs, Florida, June 6.
- 46,267 Trace, Ernest S. Saettler, Giddings, Texas., June 6.
- 46,268 Masher for vegetables, &c., George H. Zane, Philadelphia, Pa., June 6.
- 46,269 Liquid glue, Gustav E. Wiese, Hamburg, German Empire, June 6.
- 46,270 Governor for gas burners, The Buffalo Gas Saving Co., Buffalo, N. Y., June 6.
- 46,271 Draw-bar mechanism, Perry Brown, Wilmington, Del., June 6.
- 46,272 Hay fork, George Beatty, Fergus, Ont., June 6.
- 46,273 Knob or button for marking animals, Walther Kewert, Altenfelde, East Prussia, Germany, June 6.
- 46,274 Buffer, Hermann Sichelshmidt, Brochum, Dortmund, Germany, June 6.
- 46,275 Bundling machine, The International Wood Working Machine Co., Passaic, N. J., June 6.
- 46,276 Halter ring, Johann W. Ziellenbach, Creffeld, Germany, June 6.
- 46,277 Apparatus for steam cultivation, Robert H. Fowler, et al, Leeds, County of York, England, June 6.
- 46,278 Trolley wheel, Robert S. Galbraith, Toronto, Ont., June 6.
- 46,279 Automatic stock feeding device, James H. Carpenter, et al, Louisville, Ky., June 7.
- 46,280 Machine die, Aime Vullier, Millis, Mass., June 7.
- 46,281 Drying apparatus, Fredrick Hiorth, Christiania, Norway, June 7.

- 46,282 Valve, James Morrison, Toronto, Ont., June 7.
- 46,283 Attachment for boilers, Edward B. Parkhurst, Woburn, Mass., June 7.
- 46,284 Metallic cross tie, Albert G. Budington, Austin, Texas, June 7.
- 46,285 Flour sifter, Donald McKenzie, and Samuel W. Roberts, Cleveland, O., June 7.
- 46,286 Hoisting apparatus, George F. Jennings, Fall River, Mass., June 7.
- 46,287 Railway switch, William H. Bird, St. Thomas, Ont., June 7.
- 46,288 Process for compressing fodder into blocks, Mark K. Westcott, Melbourne, Colony of Victoria, June 7.
- 46,289 Permutation lock, Josiah J. Deal, Canton, O., June 7.
- 46,290 Cinder sifter, John L. Jones, Toronto, Ont., June 7.
- 46,291 Soldering stove, Edward T. Burgess, Columbus, O., June 7.
- 46,292 Machine for oiling pistons rods, Joseph Le Blanc, Montreal, Que., June 7.
- 46,293 Apparatus for adjusting the position of sashes in railway carriages, &c., David T. Seymour, Glenrosa, Brisbane, Queensland June 7.
- 46,294 Fire escape, Nazaire Bouvier and Isaac Belair, Montreal, Que., June 8.
- 46,295 Electrolytic trough or cell, Hermann Thofschrn, Paris, France, June 8.
- 46,296 Lawn rake, Lewis Gibbs, Canton, O., June 8.
- 46,297 Injector, James Morrison, Toronto, Ont., June 8.
- 46,298 Heating apparatus, Roland H. Stubbs, Waterford, N. Y., June 8.
- 46,299 Combination hair brush and comb, Cornelius De Nyse Hongland, New York, N. Y., June 8.
- 46,300 Vehicle running gear, Garland B. St. John, Kalamazoo, Mich., June 8.
- 46,301 Wire fence, Elliott D. Barling, Pontiac, Mich., June 9.
- 46,302 Car axle box, James L. Kinsell and Fenner A. Leavens, Fel's Plaine, Ia., June 9.
- 46,303 Stump extractor, Jerome Abbee, Reno, Nev., June 9.
- 46,304 Force pump, John Condon, Peterboro', Ont., June 9.

EWART LINK CHAIN BELTING



Attachments and Sprocket Wheels. Large stock always on hand
 —Special Agents—
W.H. & J.G. GREY, 2 Church St., Toronto
 Also complete stock of General Mill Supplies and Furnishings.
 Orders Filled Promptly.

REGISTERED BRAND

.. Sampson ..

Portland Cement

Equal to the Best English and German Brands

.....MANUFACTURED BY.....

THE OWEN SOUND PORTLAND CEMENT CO., LTD
OWEN SOUND, ONTARIO

Its use is authorized by the Toronto City Engineer and Engineers of other Public Works.

QUALITY GUARANTEED

.....Write for Prices, Tests and Samples.

JOHN LUCAS, 377 Spadina Ave. Representative for Toronto.

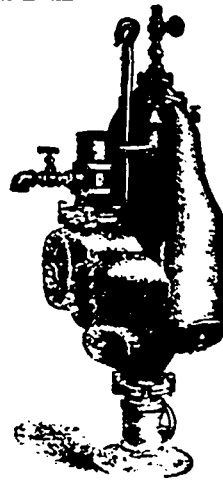
THE PULSOMETER
STEAM PUMP

Often Imitated, but Never Equalled

—O—
 The handiest, simplest, and most efficient steam pump for general Mining, Quarrying, and Contractors' purposes.

—O—
MUDDY OR GRITTY LIQUIDS
 HANDLED WITHOUT WEAR

Descriptive Catalogue, with Prices, Furnished on Application



Pulsometer Steam Pump Co
NEW YORK, U.S.A.

A. R. WILLIAMS, Toronto and Montreal, Selling Agent for Ca

Fire Bricks :-

Cement

:- Drainpipes

AT LOWEST PRICES

F. Hyde & Co., 31 Wellington St.

.....MONTREAL.....

- 46,305 Lime kiln, James O'Connell, New York, and George Sniffin, Tuckahoe, N. Y., June 9.
- 46,306 Wire and slat weaving machine, Walter C. Pratt and John C. French, Lansing, Mich., June 9.
- 46,307 Nut-lock, Nicholas E. Lister, Westfield, and Wellington Le-Baron Hannor, St. John, N.B., June 9.
- 46,308 Fluid ejector, Philip Braender, New York, N.Y., June 9.
- 46,309 Coat lock, John S. Barney and George Forrest, Brooklyn N.Y., June 11.
- 6,310 Fruit pitter, James L. Hall, Kingston, Mass., and Frank H. Chase, Grand Rivers, N.Y., June 11.
- 46,311 Crank shaft for threshing machines, John P. McCloskey, Sarnia, Ont., June 11.
- 46,312 Ash sifter, Agnes E. Bennett, Toronto, Ont., June 11.
- 46,313 Irrigating plough, Joseph W. Askew, Baileyville, Texas, June 11.
- Anchor box, Henry A. Goetz, Albany, Ind., June 11.
- Sash fastener, James Paul et al, Edinburgh, Scotland, June 11.

- 46,316 Method of forming glass articles, Wilhelm Jarskow, and Frank G. Farnham, White Mills, Pa., June 11.
- 46,317 String-clamp for musical instruments, Edward L. Gosse and Joseph H. Simms, Kansas City, Mo., June 11.

UNITED STATES PATENTS.

GRANTED TO CANADIAN INVENTORS.

The following patents were issued from the United States Patent Office, on July 24, 1894, and reported especially for the CANADIAN MANUFACTURER by Glascock & Co., patent attorneys, Washington, D. C. Printed copies of these patents can be obtained from them for 25 cents each.

- Thomas H. Bell, Brampton, Ont., fruit cleaning machine, granted July 31, 1894.
- Richard T. Brooke, Paris, Ont., boiler tube cleaner.
- Colin C. McPhee and F.E. Prock, Chatham, Ont., chair cot.

**THE PAUL FRIND
Woolen Machinery Company, Ltd.**

.....TORONTO.....

Dealers in and Manufacturers of
WOOLEN MACHINERY. MILL SUPPLIES.

Specialties:

- English H & T Steel Card Clothing.
- Williams' Heddles, Shuttles, Reeds, Heddle-frames, Loom Repairs.
- DODGE WOOD SPLIT PULLEYS**
- Best Oak Tanned Belting and Lace Leather.

Jas. A. Cantlie & Co.

**GENERAL MERCHANTS AND
MANUFACTURERS' AGENTS**

ESTABLISHED 22 YEARS

- COTTONS**—Grey Sheetings, Checked Shirtings, Denhams, Cottonades, Tickings, Bags, Yarn, Twine, etc.
- TWEEDS**—Fine, Medium and Low Priced Tweeds, Serges, Cassimeres, Doeskins, Etoffes, Kerseys, etc.
- FLANNELS**—Plain and Fancy Flannels, Overcoat Linings, Plain and Fancy Dress Goods, etc.
- KNITTED GOODS**—Shirts, Drawers, Hosiery, etc.
- BLANKETS**—White, Grey and Colored Blankets.

WHOLESALE TRADE ONLY SUPPLIED

ALBERT BUILDING, 290 ST. JAMES STREET, - - MONTREAL
20 WELLINGTON STREET WEST, - - - - TORONTO

Advances made on Consignments. Correspondence Solicited.

BRUNNER, MOND & CO., LTD., NORTHWICH, ENG.

Manufacturers of **PURE ALKALI** Guaranteed 56 Degrees.

The Strongest and Purest Form of SODA ASH in the Market, and the Most Economical Form of SODA for the Manufacture of



GLASS, PAPER, WOOD PULP, SOAP AND STARCH

ALSO FOR PRINTERS, BLEACHERS AND COLORS

WINN & HOLLAND, Montreal

Sole Agents for the Dominion of Canada

.. Coignet & Cie ..

.. PARIS and LYONS ..

The Largest and Oldest Manufacturers of
French Medal

GLUES

.. IN THE WORLD ..

Orders booked for Import Only

Canadian Agents
ARTHUR P. TIPPET & CO. and at Toronto and
30 St. Francois Xavier St., Montreal. St. John, N.B.

**CRYSTAL..
CARBONATE..**

The Cheapest and Purest form of

Washing Soda

ORDERS BOOKED FOR IMPORT ONLY

Sole Manufacturers
UNITED ALKALI CO. Ltd.

Sole Agents

Arthur P. Tippet & Co.
30 St. Francois Xavier Street, Montreal.

CANADA CHEMICAL MANUFACTURING CO.

MANUFACTURERS OF

Sulphuric, Nitric and Muriatic Acids, Commercial and Chemically Pure. Mixed Acids for Explosives, Liquid Ammonia, Glauber Salts.

Copperas, Muriate Tin, Tin Crystals, Acetic Acid, Nitrate Iron, Bisulphite Soda, Acid Phosphate for Baking Powders and General Chemicals. Fertilizers, Etc.

LONDON, : : : ONTARIO.

Wm. J. Matheson & Co. Limited

423-425 ST. PAUL ST., MONTREAL

ALSO AT

NEW YORK, BOSTON, PHILADELPHIA, AND PROVIDENCE, U.S.A.

IMPORTERS AND MANUFACTURERS OF

DYE STUFFS NATURAL AND ARTIFICIAL

Works: Long Island City, Port of New York
Main Office: 178 Front Street, New York

OUR

Diamine
Dyes . . .



- Have the Singular Merit of Dyeing Cotton, Wool and Silk in an Alkaline Bath, in one operation, without a mordant, hence their great importance for Mixed Fabrics. Some of the shades produced are faster than Alizarine.

DOMINION SUSPENDER CO.

Canada NIAGARA FALLS United States

Trade D Mark

The largest, oldest and most progressive Manufacturers of Suspenders and all kinds of Elastic Goods.

Toronto Office: E. Stovel, 45 Canada Life Bld'g; Montreal Office: Phillip De Gruchy, 162 St. James Street.

WRITE TO THE

Paton Manufacturing Co'y

SHERBROOKE, QUE., for

WORSTED • KNITTING
AND FINGERING YARN

JOHN HEARD & CO.
ST. THOMAS, - - ONT.

Manufacturers of

Spokes and all kinds of Bent Goods

For Carriages, Buggies, Wagons, Sleighs, Cutters, etc.



For Iron Fencing, Bank and Office Railings and all kind of Ironwork, address Toronto Fence and Ornamental Works, 73 Adelaide St. West, Toronto.

The Bell Telephone Company Of Canada

MANUFACTURERS AND DEALERS IN

Telegraph and Electrical Instruments

Electro-Medical Apparatus, Fire Alarm Apparatus, Electrical Gas-Lighting Apparatus, Magnets for Mills, Burglar Alarms, Hotel and House Annunciators, Electric Call Bells, etc.

FOR FURTHER PARTICULARS APPLY TO

NO. 12 HOSPITAL STREET, MONTREAL.

.....THE.....

Goldie & McCulloch Co., Ltd., Galt, Ont.

..... MANUFACTURERS OF.....

STEAM ENGINES = BOILERS = WATER WHEELS,

Steam Engines, Boilers;

Fire and Burglar-Proof Safes, Vault Doors;

Water Wheels, Flouring and Saw Mill

Wood Rim Split Pulleys, Friction Pulleys,

Machinery, Wood Working Machinery,

Friction Clutch, Couplings, etc., etc.

Wool Machinery;

"Dumfries Foundry," Galt, Ont., Canada.

TORONTO CARPET MNFG. CO., Ltd.**TORONTO**

Were awarded Gold Medals at the World's Columbian Exhibition, Chicago, for their

INGRAIN

and --

"Imperatrix" Axminster**CARPETS**

SEVEN QUALITIES OF INGRAINS

Kensington Art Squares, Axminster Flats, Rugs,
Squares, Body Border and Stairs.

Esplanade and Jarvis Sts., - Toronto

The Canadian Colored Cotton Mills Co.

FALL 1894

Cinghams, Zephyrs, Cheviot Suitings, Flannelettes,
Dress Goods, Skirtings, Oxfords, Shirtings,
Cottonades, Awnings, Tickings, etc.

NOW READY SEE SAMPLES IN WHOLESALE HOUSES

D. Morrice, Sons & Co.

... AGENTS ...

MONTREAL and TORONTO.

HAMILTON COTTON CO.

Hamilton, Ontario

DYERS, BLEACHERS

AND MANUFACTURERS OF

Warp Yarn, in Beam, Chain or Skein, White or Colored.
Single and Double Yarns, Cop Yarn, Single and
Double Hosiery Yarn in all Colors, including genuine
"Fast Black."**PAUL FRIND & CO., - TORONTO**

Selling Agents for Beam Warps

S. LENNARD & SONS

DUNDAS, ONTARIO

Patentee of "ELYSIAN" SEAMLESS HOSIERY and LADIES'
NURSING VESTS

MANUFACTURERS OF

Plain and Fancy Hosiery

Caps, Toques, Sashes

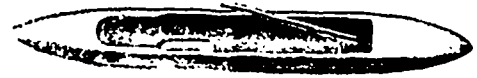
AND LADIES' NATURAL WOOL AND SUMMER UNDERWEAR

Represented in Eastern Ontario, Quebec, Nova Scotia, and New Brun-
swick by

ANDREW BELL, Montreal

WOONSOCKET SHUTTLE CO., 157 North Main St.
WOONSOCKET R.I.

Manufacturers of

Power and
Hand Loom ..
SHUTTLES

Of Every Description.

Write us.

NEW One Dip Black for Wool
One Dip Black for Cotton

SUITABLE FOR RAW STOCK, YARN AND PIECE GOODS

These Blacks deepen in the atmosphere and in fulling, and dye very economically. Man-
ufacturers and Dyers will do well to send for a sample hbl. of each.

ALEX. P. MENDE, 14 Water Street, NEW YORK

GEO. D. ROSS & CO.**Woolen Commission Merchants**
MONTREAL and TORONTO

Advances Made on Consignments. Correspondence Solicited

FERGUSON & PATTINSON

PRESTON : : : ONT.

Manufacturers of....

Fine and Medium **TWEEDS.****BRODIE & CO.**

Hespeler : : Ont.

Mfrs of **FLANNELS, TWEEDS and SERGES**

Selling Agents, Millichamp, Coyle & Co., Montreal and Toronto.

Penman Manufacturing Co., Ltd.
.... PARIS, ONT.

Manufacturers of...

Hosiery, Shirts, Drawers
Glove Linings and Yarns

Selling Agents: D. MORRICE, SONS & CO., Montreal and Toronto.

ROSAMOND WOOLEN CO.

... ALMONTE, ONT. ...

Fine Tweeds, Cassimeres and Fancy Worsted Suitings
and Trouserings.**Guelph Woolen Mill Co., Ltd.**

GUELPH - - - ONTARIO

Manufacturers of

UNDERWEAR, HOSIERY, WHEELING, FINGERING and WORSTED YARNS
EIDERDOWN FLANNEL, Etc.

Selling Agents: DONALD FRASER, MONTREAL: E. H. WALSH & Co., TORONTO

T. A. MORRISON & CO. 118 St. Peter Street,
...MONTREAL.**Building Materials!**Red and Buff Pressed Bricks, and Ornamen-
tal Terr. Cotta - Building and Sewer Bricks -
Porcus Terra Co ta Fireproofing, Building
Stones, Metal Lath, Etc.**AUBURN WOOLEN CO.**

PETERBOROUGH, ONT.

MANUFACTURERS OF

FANCY TWEEDS, ETC.

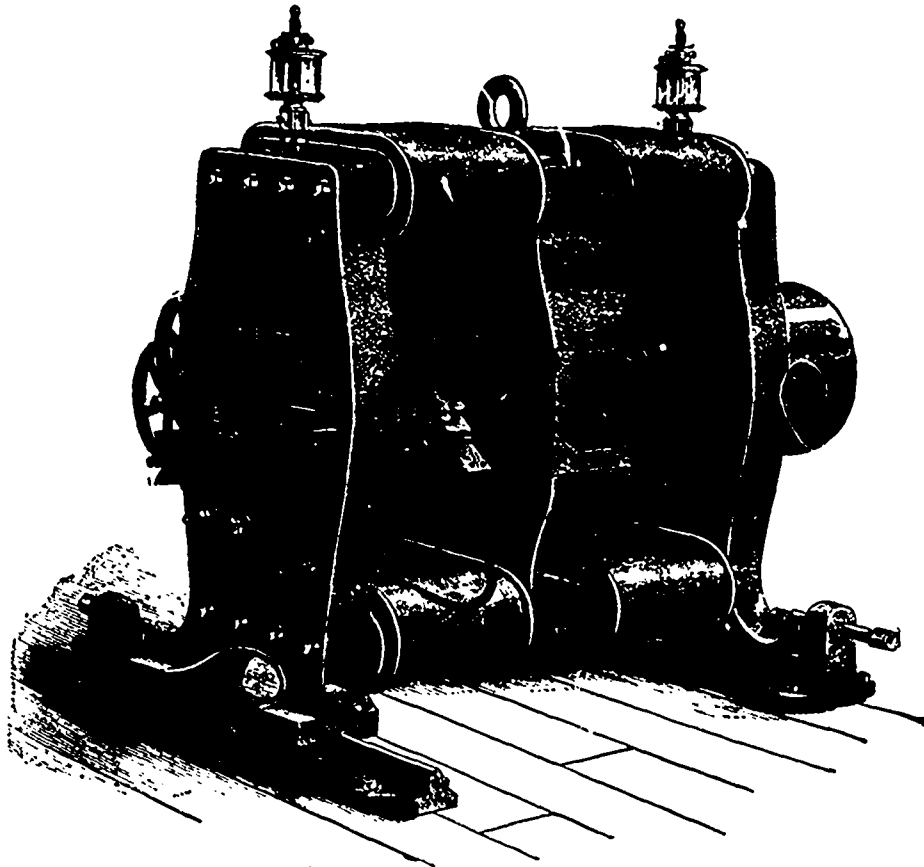
Selling Agents, D. MORRICE, SONS & CO., Montreal and Toronto.

....THE....

CANADIAN GENERAL ELECTRIC COMPANY LIMITED.

Head Office: 65 to 71 FRONT ST. WEST, TORONTO, ONT.

CAPITAL, : : \$1,500,000.



Factories: PETERBOROUGH, ONT.

Branch Offices and Warerooms:

- | | | |
|-------------------------|-----|-----------------|
| 138 Hollis Street, | - - | HALIFAX, N. S. |
| 1802 Notre Dame Street, | - - | MONTREAL, QUE. |
| 350 Main Street, | - - | WINNIPEG, MAN. |
| Granville Street, | - - | VANCOUVER, B.C. |

ELECTRIC LIGHT FOR MILLS AND FACTORIES !

Manufacturers can Save Money by installing their own
Electric Lighting Apparatus.

**We manufacture the Most Modern and Perfect Machinery for
this Purpose, and our Standard of Workmanship
is of the Highest**

We Will be glad to Furnish Estimates of Cost upon Application.

LAMPS..

Do You Ever Use Incandescent Lamps?

If so, do you know what a good Lamp is? We can give you Lamps at all prices, and have the best Lamp made in the world; namely: the genuine "EDISWAN," in any candle power, from one to two thousand; to fit any base. Don't buy lamps until you get our quotations.

Frosted Lamps - Colored Lamps - Mogul Lamps

SEND US THAT RUSH ORDER

**John Forman : 650 Craig Street,
.....MONTREAL.....**

Agents...
Edison & Swan United Electric Co., and Hungarian Incandescent Lamp Co.

ELECTRICAL SUPPLIES

Do not fail to write for Prices and Quotations on all kinds of Electrical Supplies.

We carry the largest stock of high-class fittings for Electrical Work in Canada.

Fancy Porcelain Cut-Outs, Rosettes, Wall Plugs, Switches, Brackets, Etc.

Have you tried the I.R.G.P. Wire? We guarantee our wire to have a higher insulation resistance than any wire in Canada.

Write for Prices on all Supplies required.

Send us that "rush" order.

**John Forman
650 Craig Street • Montreal**

Agent....
For Crompton Howell Battery Co., Ediswan United Electric Co., and the India Rubber, Gutta Percha and Telegraph Works Co.

A. & E. LOIGNON

CIVIL ENGINEERS

And Builders of

BRIDGES AND IRON BUILDINGS

FOR MANUFACTURING PURPOSES

Structural Iron Material Kept In Stock

DESIGNS, ESTIMATES and SPECIFICATIONS . . .

7 PLACE D'ARMES, MONTREAL

FOR Railway and Contractors'

SUPPLIES

SEND TO **C. & J. BROWN MFG. CO. (Ltd.)**
BELLEVILLE, ONT.

Bridge Builders, Engineers, Boiler Makers, Machinists and Foundrymen

MANUFACTURERS OF

Frogs Diamond Crossings, Switches, Hand Cars, Lorries, Velocipede Cars, Jim Crows, Track Drills, Semaphores, Rail Cars, Double and Single Drum Hoists, Etc.

The Canadian Rand Drill Co., AIR COMPRESSORS

SHERBROOKE,
QUE.

Of the Most Efficient and Economical Type—
Straight Line,
Duplex, Compound and
Condensing



Duplex Compound Steam Air Compressor with Hal-sey's Mechanical Valves

The Rand "Slugger" and "Giant" Air Drills
For Mines and Quarry Work.

AGENCIES :

632 CORDOVA STREET, VICTORIA, B. C.

SEND FOR CATALOGUE

16 VICTORIA SQUARE, MONTREAL
HALIFAX HOTEL, HALIFAX, N. S.

If Contemplating transmission of power any considerable distance write to us for estimates.

Wm. Hendrie,
President.

.. THE ..
Hamilton Bridge Company

J. A. McNicol,
Engineer and
Manager.

John S. Hendrie,
Vice-President.

(LIMITED.)

Cable Address: "HENDRIE"

G. Teiper,
Consulting
Engineer.

Thomas Meeton
Sec'y-Treasurer.

Hamilton : Canada.

Constructors of

Railway and Highway Bridges

of Every Size and Design, and all kinds of

Structural Work in steel and iron.

Observation and Water Towers.

Tanks, Caissons, Piers, Turntables,

Boilers, Buoys, Roofs, Girders

and Columns for Buildings, Inclines.



Every Facility for the Construction and Launching of
Steel and Iron Ships.



.. REFERENCES ..

Grand Trunk Railway Co.

Canadian Pacific Railway Co.

Dominion and Ontario Governments,

and nearly all Municipalities and Contractors in the Dominion.

Dominion Bridge Co.

LIMITED

MONTREAL and LACHINE LOCKS, P.Q.



Steel Bridges for Railways and Highways

Steel Piers and Trestles

Steel Water Towers and Tanks

Steel Roofs, Girders, Beams,

Columns for Buildings

A large stock of



ROLLED STEEL BEAMS, JOISTS, GIRDERS,
CHANNELS, ANGLES, TIES, Z BARS,
AND PLATES

Always on hand

IN LENGTHS TO THIRTY-FIVE FEET



Tables, giving sizes and strength of Rolled Steel Beams, on application.
Post Office Address, Montreal.

J. H. MCGREGOR

AGENT

85 York Street

Toronto, Ont.

THE CENTRAL BRIDGE AND ENGINEERING COMPANY, Ltd.,

Capital Stock

PETERBOROUGH, ONT.

\$200,000.00.



MANUFACTURERS
OF

Bridges, Roofs, Viaducts, Piers, Girders, Turntables,
Architectural Work, Forgings, and all kinds of General
Engineering Work; also Law's Patent Surface Cattle
Guards, and Law's Patent "Optimates" Power Hammers.

W. H. LAW, - - Engineer and Man. Director

THE LONDONDERRY IRON CO., Ltd.

A. T. PATERSON,
President and Man. Dir.

JAS. PHYMISTER,
Secretary.

MANUFACTURERS OF

PIC IRON, PUDDLED BARS
BAR IRON, NAIL PLATES,
WATER PIPES, ETC.

OFFICE **MONTREAL** WORKS **LONDONDERRY, NOVA SCOTIA**

Canada Iron Furnace Co., Ltd.

MONTREAL, RADNOR and THREE RIVERS

Manufacturers of the well-known

"C.I.F." Three Rivers Charcoal Pig Iron

Suitable for Car Wheels, Cylinders and Fine Castings where the utmost strength is required.

Unsurpassed in Strength by Swedish, Russian, or American Charcoal Iron

Offices: New York Life Insurance Building, Montreal

Nova Scotia Steel & Forge Co. Offer Bright Compressed Steel Shafting as per Following List

PRICE LIST. BRIGHT COMPRESSED STEEL SHAFTING. Every Bar Guaranteed Straight and True to Size within 1/1000 of an inch.

Nominal Size of Shaft	Actual Size of Shaft	Weight per ft.	Price per lb.	Nominal Size of Shaft	Actual Size of Shaft	Weight per ft.	Price per lb.
1 1/4	1 1/4	4.13	4 1/2 cts.	2 3/4	2 1/2	18.91	4 cts.
1 3/8	1 3/8	5.01	"	3	2 7/8	22.59	"
1 1/2	1 1/2	5.94	"	3 1/4	3 1/8	26.60	"
1 3/4	1 3/4	7.46	"	3 1/2	3 1/4	30.94	"
2	1 7/8	9.83	4 cts.	4	4	42.33	5 cts.
2 1/4	2 1/8	12.53	"	4 1/2	4 1/2	53.57	"
2 1/2	2 1/8	15.55	"	5	5	66.13	"

NOTE--Shafting as per Actual Size Column, up to 3 in. dia., always kept in stock.

BOXING EXTRA AT COST.

Stock Lengths 12, 14, 16 and 18 feet.

On orders from stock cut to other lengths, we charge for length from which we cut.

Prices for Special Sizes, varying from list of actual sizes given above, will be furnished upon application.

All orders filled as per Actual Size column unless otherwise specified.

Prices Subject to Change Without Notice.

This is not Hot Polished or Cold Rolled Steel, and will not spring when keyseated. If your Wholesale Hardware Firm cannot supply you write direct to the Works, - **New Glasgow, Nova Scotia.**

PICTOU CHARCOAL IRON CO. Ltd.

BRIDGEVILLE, NOVA SCOTIA

WORKS:

Bridgeville, N. S.

HEAD OFFICE:

New Glasgow, N. S.

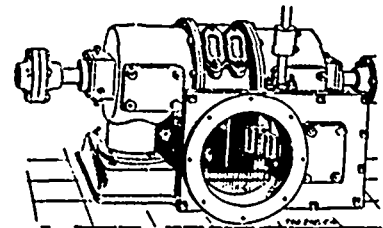
Manufacturers of all grades of

Charcoal Pig Iron

SUITABLE FOR

CAR WHEELS, CYLINDERS, Etc,

"Little Giant" Turbine Water Wheels



HORIZONTAL TYPE

For All Purposes, **HORIZONTAL and VERTICAL.**

..... Makers of.....

The Improved **Walsh Double Acting Water Wheel Governor** Machines Dressed Gearing, Pulleys, Shafting, Bearings, Etc.

Write for Catalogue and Gear List.

J. C. WILSON & CO., ; ; **Glenora, Ont.**

Drummond-McCall Pipe Foundry Co. Limited

Manufacturers of



"SPECIALS," HYDRANTS, VALVES, ETC.

Offices, - NEW YORK LIFE BUILDING, MONTREAL
Works, Lachine, Quebec.

The LONDON MACHINE TOOL CO. .. LONDON ONT., CANADA ..

MANUFACTURERS OF

MACHINE-SHOP EQUIPMENTS

Lathes, Planers, Drills, Column, Radial and Suspension Shapers, Slotters, Bolt Cutters, Milling Machines, Turret Lathes, Automatic Gear Cutters and Cutting-off Machines, Boring and Turning Mills (up to 20 feet swing), Driving-wheel Lathes, Tire-boring and Turning Mills, Cylinder Boring Machines, Frame Slotters, Slab Millers,

... BOILER EQUIPMENTS ...

Punches and Shears, Binding Rolls, Straightening Rolls, Lathe Planers, Multiple Drills, BRASS FINISHERS' EQUIPMENTS, Fox Monitor Lathes, Plain Turret Lathes, Valve Millers, Vertical Milling Machines, Valve Chuck, Box Chucks, etc., for cutting and stamping and drawing tin and metal tools up to the heaviest work required.

... GENERAL AGENT FOR THE DOMINION ...

A. R. WILLIAMS, - = = Toronto, Ont.

THE CANADA PIPE & FOUNDRY CO.

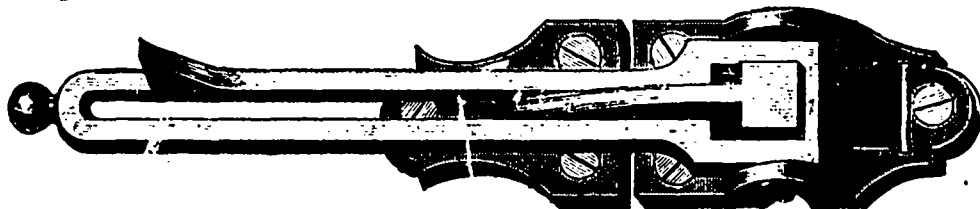
MONTREAL

Manufacturers

CAST IRON WATER and GAS PIPES

SPECIAL CASTINGS

The "Safety" Door and Transom Lock and Ventilator Combined.



This is an invention that takes the place of the Bolt and Chain for Doors, and supersedes and is safer than any device ever invented for a Transom Lint, as it is impossible for anyone to effect an entrance from the outside in the case of either door or transom. It permits a door to be opened a few inches, thus enabling the person inside to see who is outside before admitting them. The person inside has full control of the door, either to open or lock it, as they may see fit. There is no swinging chain to deface the door or jam. It is positive in its action, neat in appearance, and easily attached to the door or transom. It is the only fastener ever invented that will hold a door both open and shut. It must be seen to be appreciated. It is made of the best malleable iron, and is strong, durable, reliable and cheap. It is finished both in Japan and Nickel.

Retail Price of Japanned, 30c.

Retail Price of Nickeled, 50c.

Handsome Discounts to the trade.

For sale at all Hardware and House Furnishing Stores.

The St. Lawrence Steel and Wire Co., Gananoque, Ont. Sole Manufacturers for Canada.

GALT MACHINE KNIFE WORKS

Planing ..
Machine ..
Knives ...



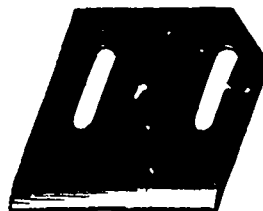
Stave Cutter Knives



Stave Jointer Knives

Send for Price List

All Work Warranted



Moulding,
Tenoning,
Mitreing

Shingle - - - -
Jointer - - - -

AND OTHER IRREGULAR SHAPES

Cheese-box and Vencer, Paper Cutting, Leather Splitting, and any special Knife made to order.

PETER HAY, - - GALT, ONT.

Established 1848

SINGER, NIMICK & CO.
LIMITED
PITTSBURGH, Pa., U.S.A.

MANUFACTURERS OF
Tool Steel—Steel for Surgical Instruments, Etc.

Bicycle steel for All Parts.
Steel for all Electrical Purposes.

Sheet Steel, Hot Rolled, Bes. O.H. and Crucible, for Stamping, Drawing, Cupping. Fine Tools of all kinds, and for all purposes, where a good quality is required.

Bright Cold Rolled Steel for all purposes.

Plow Steel Harrow Discs

MR. HUGH RUSSEL
Temple Building
185 St. James Street MONTREAL

STEEL STEEL

LaBelle Steel Co.
PITTSBURGH, Pa.

Manufacturers of . . .
CRUCIBLE, SOFT CENTRE and SOLID

STEEL

For Plows and Agricultural Implements of all kinds

Harrow Discs (plain and finished), Machinery Steel, Tool Steel, Axe Steel, Rake Teeth, and Miscellaneous Steel of all descriptions. For prices write to

W. G BLYTH
CANADIAN AGENT
34 YONGE STREET TORONTO

FOUNDRY ::= **FACINGS**

Core Compound, Ceylon Plumbago Foundry Supplies and Moulding Sand.

CANADIAN AGENTS FOR
Root's Positive Blower
Colliau Cupola Furnace

Hamilton Facing Mill Co.
HAMILTON . . . Ontario

GAUTIER STEEL DEPARTMENT OF CAMBRIA IRON CO.
JOHNSTOWN, PA.

Manufacturers of
MERCHANT BAR STEEL . . .
Including Tire, Toe Calk, Machinery, Carriage Spring, Railroad Spring, Hoe, Rake, Fork, Etc.

AGRICULTURAL STEEL AND SHAPES . . .
Finger Bars, Knife Backs, Rake Teeth, Bundle Carrier Teeth, Tedder Forks and Springs, Spring Harrow Teeth, Harrow (Drag) Teeth, Seat Springs, Etc.

PLOW STEEL . . .
Flat and Finished Plow Shapes, Digger Blades, Slabs, (Penn and Pernot), Hammered Lay, Rolled Lay, Etc.

COLD ROLLED STEEL SHAFTING. STEEL HARROW DISCS.
: : Cambria Link Barb Wire. : :

New York Office, 102 Chambers St. Philadelphia Office, S. W. Cor. 5th and Commerce Sts. Chicago Office, 209 Phenix Building. Southern Office, Chattanooga, Tenn.

STEEL CASTINGS

From 1 to 40,000 pounds weight, of Open Hearth, Chester or Bessemer Steel.

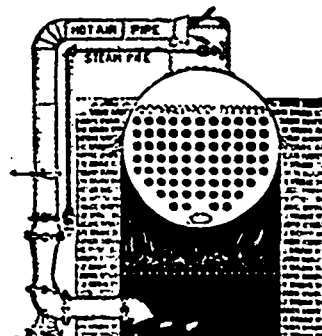
TRUE TO PATTERN. SOUND. SOLID.
Gearings of all kinds, Crank Shafts, Knuckles for Car Couplers, Cross-Heads, Rockers, Piston Heads, etc., etc Locomotives. Steel Castings of every description.

CHESTER STEEL CASTINGS CO.
Works: Chester, Pa. Office: 487 Library St., PHILADELPHIA, Pa

Locomotive Tires, Axles, Crank-Pins,
Cast Steel Driving Wheel Centres,
Steel-Tired Wheels,

STEEL FORGINGS
... UP TO SEVENTY TONS ...

Jas. W. PYKE & Co., 35 St. Francois Xavier St., Montreal
—Sole Canadian Representatives of—
FRIED KRUPP, Essen and Cruson, Germany.



EARLE'S
Steam and Air Injectors, Exhausters, etc.

For burning hard and soft coal screenings, run mine and lump coal under steam boilers, exhausting air, and vapors from buildings, ventilating ships, mines, etc.

Highest Medal and Diplomas given at the World's Columbian Exposition, Chicago, 1893.

The Best Blower in the market for Steam Boilers.

Send for Illustrated Catalogue to
S. R. EARLE - - Belleville, Ont.



BUY A
PENBERTHY AUTOMATIC INJECTOR..

Recommended by 75,000 Engineers

Send for Circular and Price List. WHO KNOW WHEREOF THEY SPEAK

PENBERTHY INJECTOR CO.
Detroit, Mich.

BRANCH FACTORY AT WINDSOR, ONT.

PATENT

Rock Emery Millstones

Made of BLOCKS of Emery usually set in bronze.

DURABLE.

Because Emery is HARDER than anything except the Diamond.

RAPID GRINDERS.

Because Emery CUTS all substances with unexampled rapidity and the Emery face never GLAZES; also, because they run so CONTINUOUSLY, requiring little attention.



ECONOMICAL.

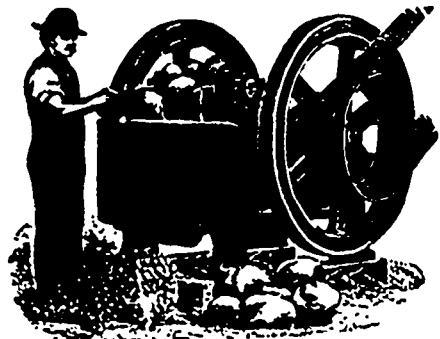
Because not expensive, and they last as much longer than other stones as they surpass them in HARDNESS, and because they soon SAVE their COST in DRESSING, the EMERY FACE never requiring it--Always Sharp.

Our \$400 VERTICAL MILL Frame with Rock Emery Millstones will do More Work than any \$2,000 Iron Mill! and at much less cost.

Send for Circular to

STURTEVANT MILL COMPANY, Boston, Mass.

Stone and Ore Crushers



(Blake-Morse) Crushers, sizes 10x4 to 30x15

WE MANUFACTURE
The "GRIFFIN MILL"
Hoisting Engines, Power Plants and
.. BOILERS ..

..... Correspondence Solicited.....

The JENCKES MACHINE CO.

SHERBROOKE, QUE.

Montreal Branch: 18 Victoria Square.

... WE MANUFACTURE ...

FANS FOR NOTHING

But hard work, and having had twenty years experience we know how to get steam out of
Dye Houses and the largest possible product from **Dry Rooms**

OUR COMPOUND WHEEL is the most powerful in the world, and if we can't be of actual value to you we don't want your money. No CUSTOMS DUTIES on our Fans.

Send for Circular and information **Barney Ventilating Fan Co., 54 Oliver St., Boston, Mass., U.S.**

McLaughlin Bros.

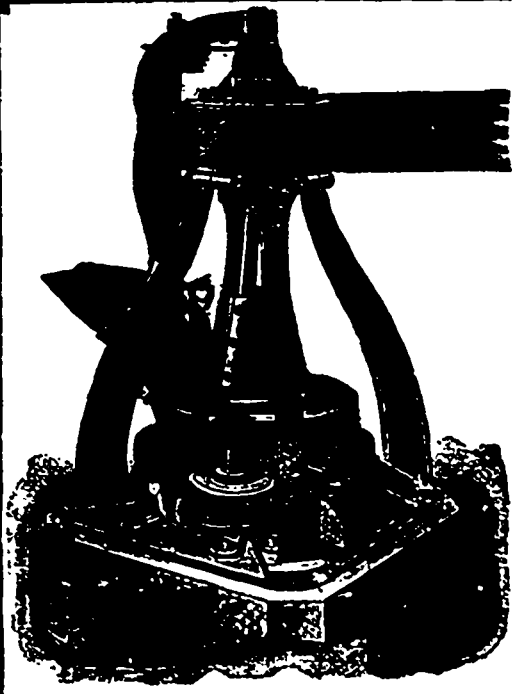
Teasels

Skaneateles Falls, N. Y.

Business Established in 1832.

NOTICE

NOTICE IS HEREBY GIVEN to all persons who may desire to manufacture an improvement in Car Brakes, for which certain letters patent of the Dominion of Canada were granted to me, on July 13th, 1882; to wit., patent numbers 31,363, that I am prepared to grant licenses upon reasonable terms under the said patent, and to otherwise place the said patent invention in possession of the public in accordance with law. J. J. Cassiday, Canada Life Building, Toronto.



THE GRIFFIN MILL

The Only Perfect Pulverizer of all Refractory Substances.

Will work either wet or dry, and deliver a finished product. Capacity, 3 to 4 tons per hour on Phosphate Rock; 1½ to 2 tons per hour on Portland Cement, Quartz, or Ores, depending on hardness of material to be pulverized and fineness of product. Grinds from 30 to 250 Mesh with equal facility.

NO JOURNALS IN GRINDING CHAMBER. BALL RING ON SHAFT HAVING DIRECT POSITIVE ACTION ON MATERIAL. MAXIMUM POWER PRODUCES MAXIMUM AMOUNT OF PRODUCT. IT IS ABSOLUTELY GUARANTEED IN EVERY RESPECT, BOTH AS TO CONSTRUCTION AND CAPACITY. CHEAPEST COST, WEAR, AND OPERATING EXPENSE MUCH LESS THAN STAMP MILLS. LARGE NUMBER OF MILLS IN USE ON DIFFERENT MATERIALS WITH POSITIVE SUCCESS IN EVERY INSTANCE.

Correspondence solicited, and illustrated descriptive pamphlet furnished on application to

BRADLEY PULVERIZER CO., 92 STATE STREET, BOSTON.

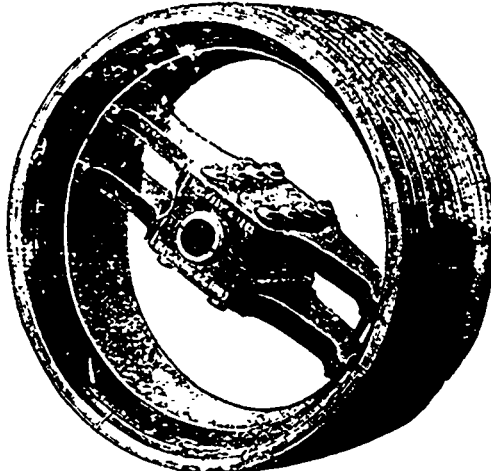
...THE...

Dodge Pat. Wood Split Pulley

...WITH INTERCHANGEABLE BUSHING...

The Only Perfect Wood Split Pulley.

.. GUARANTEED ..
FOR HEAVIEST MILL WORK.
All sizes in stock.



In use in all the Leading Mills.
Beware of Imitators.

.. We have the Most Extensive Pulley Works in Canada ..

SEND FOR NEW PRICE-LIST

Dodge Patent Wood Split Pulley Co.

Office:
68 KING ST. WEST

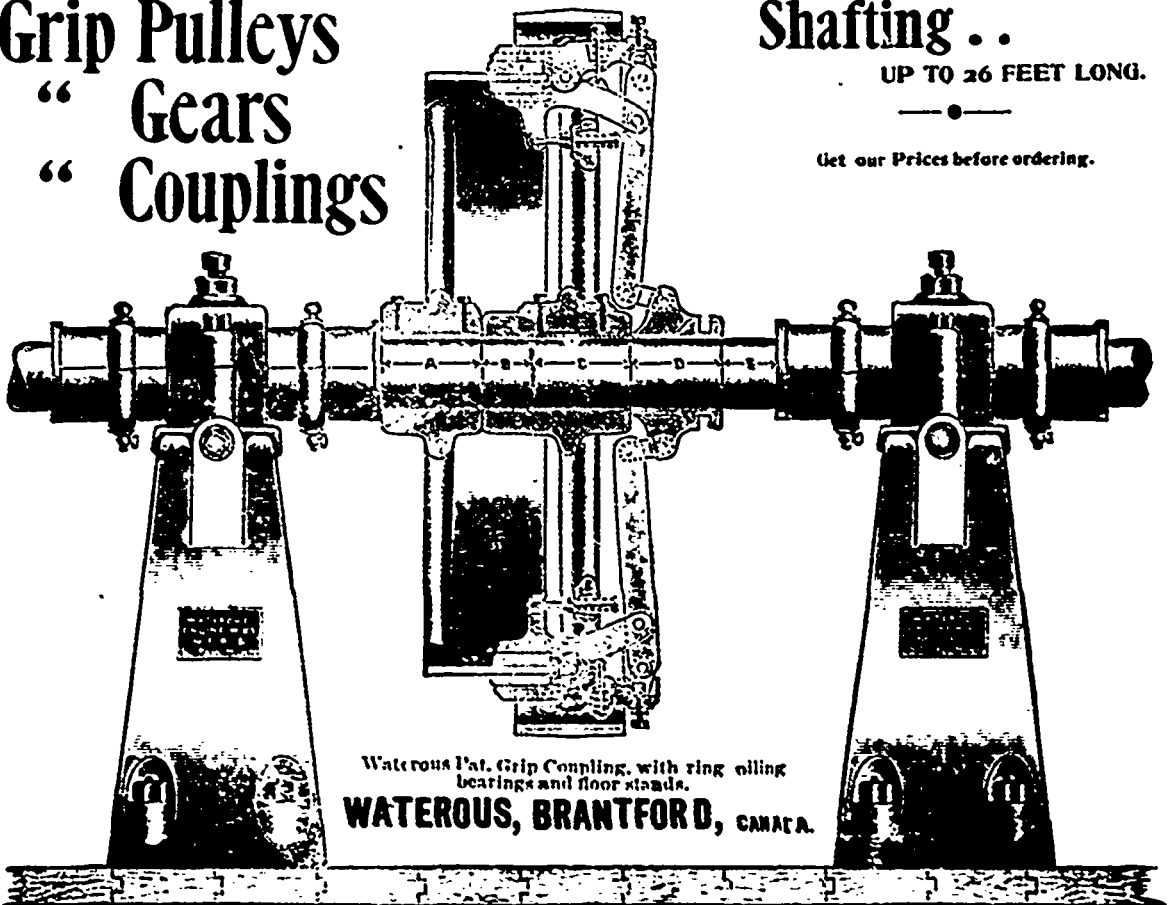
TORONTO.

Works:
TORONTO JUNCTION

Grip Pulleys
“ Gears
“ Couplings

Shafting ..
UP TO 26 FEET LONG.

Get our Prices before ordering.



Waterous Pat. Grip Coupling, with ring oiling bearings and floor stands.

WATEROUS, BRANTFORD, CANADA.

ROLPH, SMITH & CO.

Engravers, Lithographers,
Stationers, Die-Sinkers & Embossers

Bill Heads, Envelopes, Note Paper,
Show Cards, Calendars, Business
Cards, Cheques, Stock Certifi-
cates, Seals, Pamphlets, Circulars,
Notes, Drafts, Maps, Plans, Medal
Dies, Book Plates, Folders,
Hangers, Letter Heads, Debentures,

OFFICE SUPPLIES.
MONUMENTAL BRASS PLATES.

Bonds, Invitation Cards, Visiting
Cards, - Labels, - Posters.

49 Wellington St. West,
...TORONTO...

Send for Catalogue and Price List to

Mfrs. of Set, Cap and Special
rocks, Studs, Finished Nuts, &c.

HACKNEY POWER HAMMERS

Are superior in many respects to most
in the market. Made by

STEVENS, HAMILTON & CO.
GALT : : ONT.

Leitch & Turnbull,

CANADA ELEVATOR WORKS,
QUEEN AND PETER STS., HAMILTON, ONT.

Patent Safety Hydraulic Hand and
POWER ELEVATORS.

Telephone connection.

..A. LEOFRED..

Graduate of Laval and McGill

Mining Engineer

MAIN OFFICE, - CITY OF QUEBEC.

BRANCH OFFICES
Sherbrooke,
Montreal, 17 Place d'Arms Hill

MINES, MINERAL PRODUCTS.

Calcined



Plaster

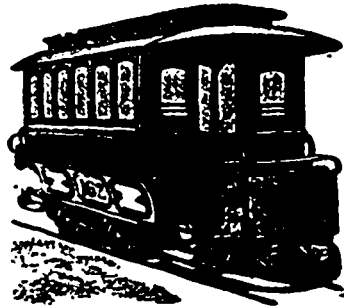
MANUFACTURED BY

MANUFACTURED BY

ALBERT MANUFACTURING CO.
HILLSBOROUGH, N.B.

PATTERSON & CORBIN

FINE
**ELECTRIC
CARS**



OUR SPECIALTY

St. Catharines, Ont.

MANUFACTURERS OF

Horse and Trail Cars

---OF---

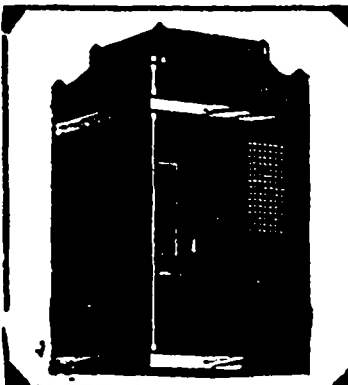
Every Description

CANADIAN OFFICE & SCHOOL FURNITURE @ Ltd
PRESTON, ONT.

FINE
BANK, OFFICE,
COURT HOUSE &
DRUG STORE FITTINGS

OFFICE, SCHOOL,
CHURCH & LODGE FURNITURE

SEND FOR CATALOGUE.



ELEVATORS

**FENSOM ELEVATOR
WORKS**
52-54-56 DUKE ST
TORONTO.

ELECTRIC HYDRAULIC
STEAM & HAND-POWER
PASSENGER & GOODS
ELEVATORS. DUMB WAITERS

The Largest Factory of the kind in the Dominion

Lion "L" Brand

PURE GOODS

HONEY GOODS



REGISTERED
TRADE
MARK

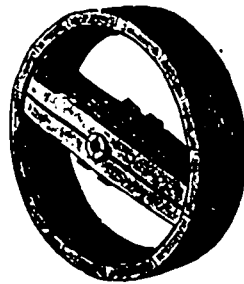
Leading Dealers from Ocean to
Ocean handle these Goods

Lion "L" Brand.

Pure Vinegars, Mixed Pickles, Jams,
Jellies and Preserves.

MICHEL LEFEBVRE & CO.
Manufs., Montreal, Que.

Also, **BEST SUGAR** Manufacturers, at Berthier-
ville, Que. Established 1849. 20 First Prizes
Gold, Silver and Bronze Medals.



**Wood
Split..
Pulleys**

"The Reeves" is the
Lightest and Strongest Wood
Split Pulley on
the market.

If you use Pulleys and want the
BEST, write us.

REEVES PULLEY CO.
.. 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, Ltd.

Wellington Mills, Westminster Bridge Road
London, Eng.

Enquiries should be addressed to

JOHN FORMAN,
650 Craig St., Montreal.

**The Economizing of
Fuel and Water..**

IN ANY STEAM PLANT
MEANS SIMPLY ADDED
EARNING POWER, AND
THIS WE GUARANTEE
WITH..

**The Webster Vacuum Feed Water
Heater and Purifier...**

Recent orders received for Webster Heaters, Steam Separators and Oil Extractors
Halifax Gas and Light Co., Halifax,
Acadia Coal Co., Stellarton,
General Mining Co., Cape Breton,
Robin & Sadler, Montreal.

... **DARLING BROTHERS** ...

Sole Manufacturers for Canada.

"Reliance Works" - - - MONTREAL

**HARD-MOUTHED HORSES
AND PULLERS CONTROLLED WITH ABSOLUTE EASE.
RUNAWAYS IMPOSSIBLE.**

This statement is now repeated by thousands who have purchased

BRITT'S AUTOMATIC SAFETY BIT.

SAFETY
GUARANTEED



This Bit, by an automatic device, closes the horse's nostrils.
HE CANNOT BREATHE, AND MUST STOP.

**SAFETY FROM RUNAWAYS
ABSOLUTELY GUARANTEED WITH THIS BIT.**

Any horse is liable to run, and should be driven
with it. By its use ladies and children drive horses
men could not hold with the old style bits.

Gold Medal,
Paris, 1889.

Send for illustrated pamphlet containing testi-
monials from all parts of the world, and earnest
and candid expressions about the **BRITT AUTO-
MATIC SAFETY BIT** and its resistless but harmless and humane power
in subduing the most vicious horses and controlling the most stubborn pullers and
chronic runaways.

The only bit in the world that is endorsed, advocated, used and sold by the Society
for the Prevention of Cruelty to Animals, *The Highest Authority.*

DR. L. P. BRITT, 37 COLLEGE PLACE, NEW YORK.

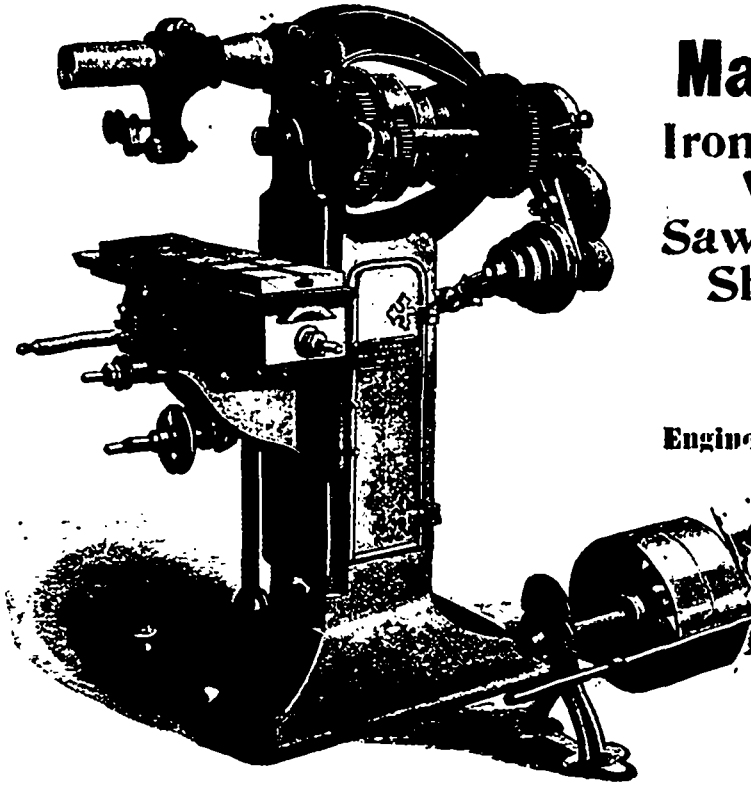
WOOL

A. T. Paterson & Co.
MERCHANTS

35 St. Francois Xavier St.
MONTREAL

REPRESENTED BY... **MR. DAVID CUTRER.**

A. R. WILLIAMS,



Manufacturer of and Dealer in

Machinery and Power
Iron Working Machinery.
Wood Working Machinery.
Saw Mill Machinery.
Shingle Mill Machinery.
Veneer Mill Machinery.
Mining Machinery.

Engines and Boilers, Motors and Dynamos, Fans,
Blowers and Dry-Kilns.

MILL SUPPLIES OF EVERY DESCRIPTION

Office and Works:

Soho Machine Works, TORONTO, Ont

Branch Warehouse

305 St. James St., MONTREAL, Que.

John Bertram & Sons

CANADA TOOL WORKS

Dundas = = Ont.

.. Manufacturers of ..

MACHINE TOOLS

Radial Drills.

Vertical Drills.

Suspension Drills.

Turret Boring Machines.

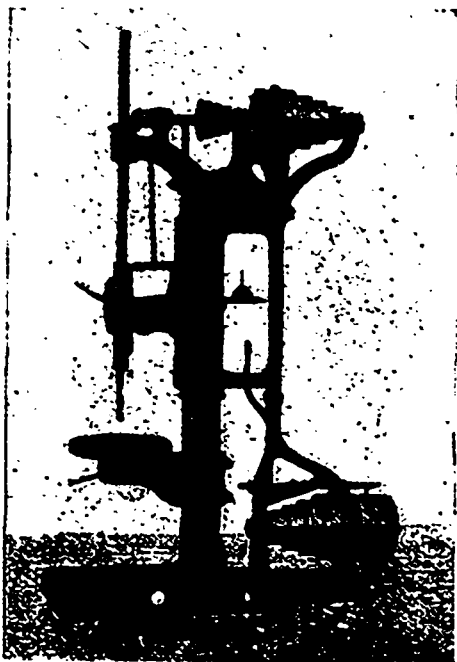
Multiple Spindle Drills.

Horizontal Boring Machines.

Cylinder Boring Machines.

Turning and Boring Mills.

.. **Special Machinery** ..



20 Inch Drilling Machine.

Intending purchasers should write us for prices.
Correspondence Solicited.

**THE
Imperial Oil Co.
(LIMITED)**

Highest Awards at the World's Fair, Chicago.
—UPON—

**Lubricating,
W.W. Illuminating Oils,
Paraffine Wax, Etc.**

WE MANUFACTURE

All Grades of Oils, Greases,
Soap Stocks, Candles, Wool
Stocks, Leather and
Tanners' Oils, Fuel Gas,
Machinery, Cylinder Oils
and solicit opportunity to
compete against any Oil
on the market.

✉ Write for Prices and Samples.

—THE—
**IMPERIAL OIL CO.,
(Limited)**

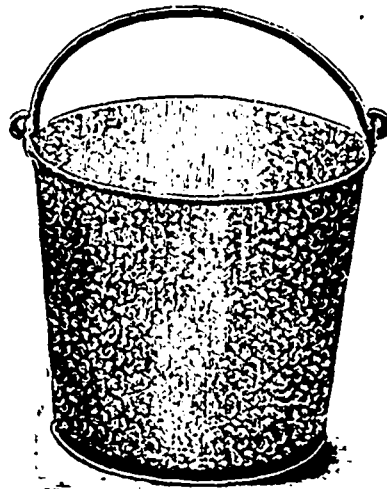
Head Office:

Petrolea, Canada.

BRANCHES

Halifax, N.S.	—	Hamilton, Ont.
St. John, N.B.	—	Guelph, Ont.
Moncton, N.B.	—	Stratford, Ont.
Quebec, Que.	—	London, Ont.
Montreal, Que.	—	Chatham, Ont.
Kingston, Ont.	—	Windsor, Ont.
Toronto, Ont.	—	Winnipeg, Man.
Peterborough, Ont.	—	Vancouver, B.C.

**Galvanized . .
Steel . . .
Buckets....**



Improved Pattern

Something entirely new, and superior to the old style buckets, made in three sizes.
They are superior to the ordinary flaring English bucket, being of greater capacity.
They are stronger in shape, consequently more durable.
They will not slop over, nor tip over, owing to the wide bottom.
They nest very close and firm, which protects them in shipping.
The rim is in one piece with the body, consequently cannot get knocked off.
They are galvanized, and not lead coated.

FOR SALE BY ALL WHOLESALE HARDWARE AND TINWARE HOUSES

**Kemp Mf'g Co.
Toronto, Ont.**

KERR & MORGAN

Montreal, Que.

MANUFACTURERS OF

ELEVATORS

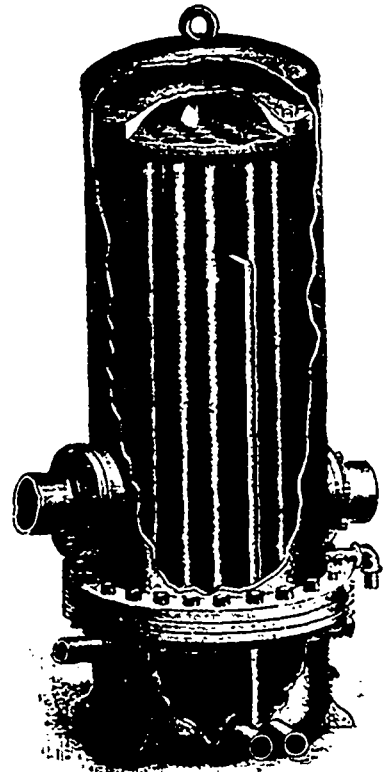
HYDRAULIC,
BELT POWER,
ELECTRIC

.. and ..
HAND ELEVATORS

.. For ..
Passenger and Freight Service
.. and ..

**General . .
. . Machinery**

**The Jacobs Patent Water Tube
Feed Water Heater and Purifier.**



**GREAT EFFICIENCY, SIMPLICITY
OF CONSTRUCTION and LOW COST.**
Has a Cast Iron shell, which will never wear out, with seamless drawn brass tubes expanded into tube-plates at top and bottom, with double blow-off.

The tubes being surmounted by a cap forming a chamber at the top, and being fastened rigidly only to the lower tube plate, free play is given for expansion, thereby preventing rupture and leakage of joints.
CHAS. JACOBS & CO.
47 Oliver Street, Boston, Mass

**==EAGLE BRAND THE BEST==
ROOFING**

It is superior to any other Roofing, and unequalled for House, Barn, Factory, or Out-Buildings; it costs half the price of shingles, tin or iron; it is ready for use, and easily applied by anyone; it is the best Roofing in the market, in durability, to all others.
Send for estimates, and state size of roof.

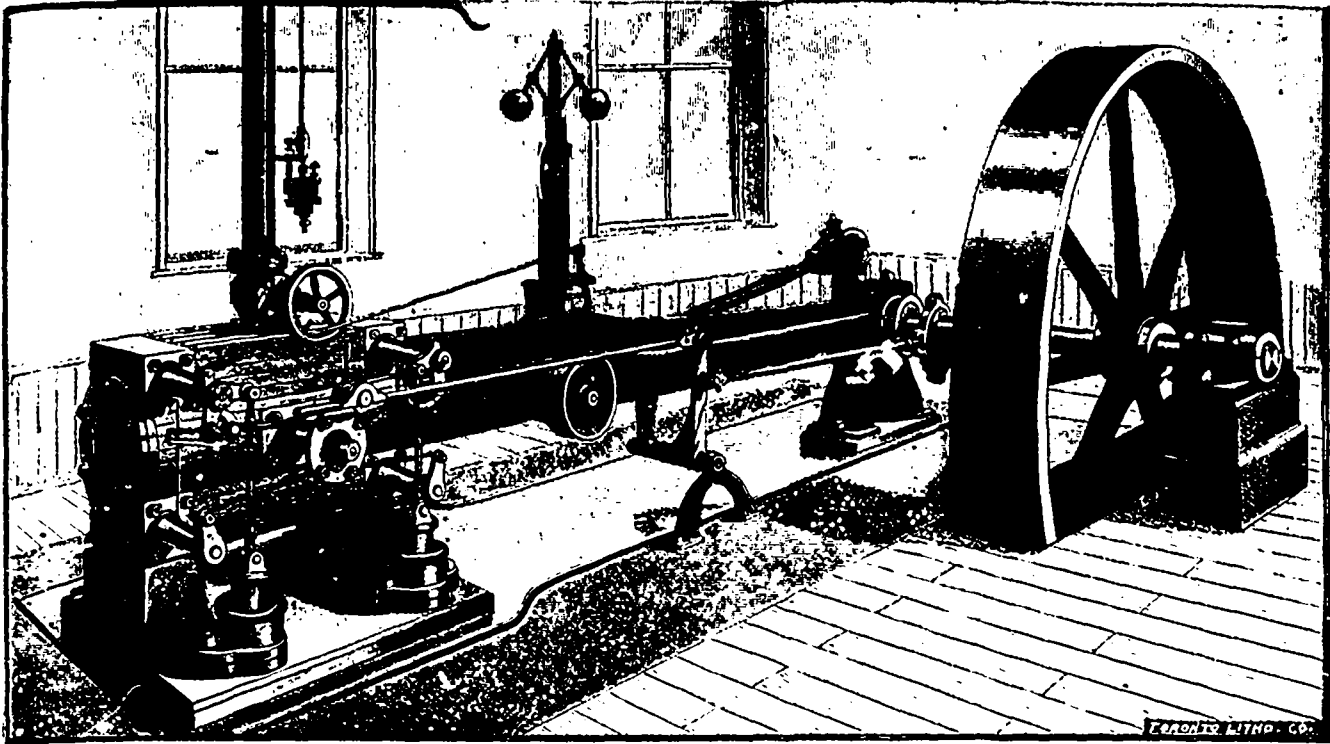
... RUBBER PAINT ...

The best known Paint in the world for Tin, Iron, or Shingle Roofs, Fences, Sides of Barns and Out-Buildings. It costs only 60 cents per gallon, in barrel lots, or \$1.50 for a 5 gallon tub. Color dark red. It will stop leaks in tin or iron roofs that will last for years. It is guaranteed not to peel, crack, scale, nor wash off, and is fire-proof against sparks. TRY IT.

... SHEATHING PAPER ...

200 square feet, \$3; Keeps building cool in summer, warm in winter

EXCELSIOR PAINT AND ROOFING CO., 155 and 157 DUANE ST,
NEW YORK, N. Y.



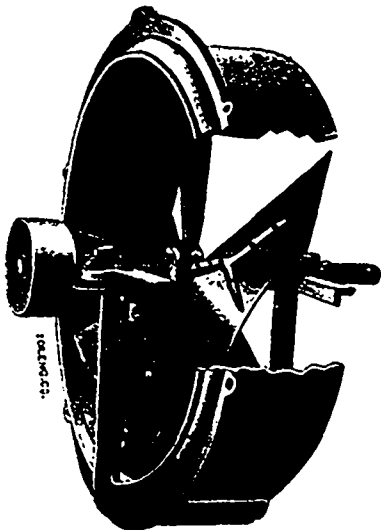
COWAN & CO., - GALT, ONT.

Manufacturers of..... Corless Engines, Slide Valve Engines.
Boilers and Wood-Working Machinery of Every Description.
Send for Our Illustrated Catalogue.

McEachren's Improved Fan

PATENTED 1893

For Ventilating, Heating, Drying, Etc.



Specially adapted to
HEAVY WORK

Will handle more air
at a *GIVEN PRESSURE* with a *GIVEN POWER* than any
other Fan in the
market.

For particulars address

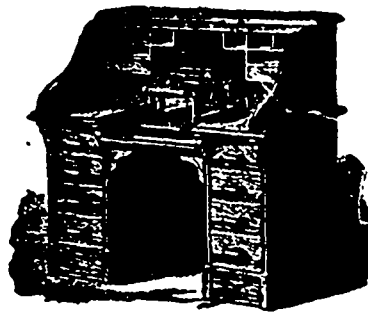
J. D. McEACHREN - GALT, Ont.

Rockwood, March 16th, 1893.

Mr. J. D. McEachren, Galt.

Dear Sir - In reference to the Drying and Ventilating Fans that you put in last fall they are working well, keeping the rooms dry and comfortable. The wool dries with cold water coil; is drying 500 to 600 lbs. of wool per day WITHOUT HYDRO EXTRACTOR, on 6 x 12 feet of netting. If the room was larger we are sure that the capacity would be much increased. The Fan in end of dye house keeps the steam well drawn off, and the alterations on cloth drier have enabled us to dry more than double the goods than we could formerly. We would make special note of the small amount of power required.

Yours truly, HARRIS & Co.



REMINGTON

TYPEWRITER

Simple,
Rapid,
Durable

COPYING AND REPORTING
EXECUTED PROMPTLY.

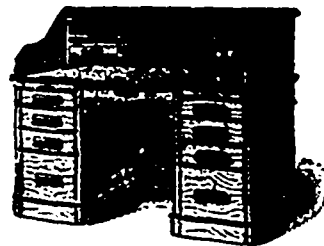
Attention of Manufacturers called to our process for Duplicating Letters Circulars, etc., either in long hand or type writing.

GEORGE BENGOUGH,

Telephone 1207 . . .

45 Adelaide Street East

Church, School and Office Furnishings, Business and Library Desks
Office Chairs, Revolving Book Cases



SHANNON
LETTER FILING
CABINETS

RAPID ROLLER COPIERS . . .

Schlicht's Standard Ledger Index

All Kinds Labor-Saving
Office Devices.

OFFICE DESKS - FORTY STYLES

OFFICE SPECIALTY M'FG CO.

118 Bay Street, Toronto.

IN METALLIC VAULT
FURNITURE WE LEAD.

Write us for Catalogues of our goods
State your needs.

IT LEADS THEM ALL

**THE OLDEST
THE LARGEST**

**THE SAFEST
THE CHEAPEST**

Canadian Life Assurance Co. is

The CANADA LIFE ASSURANCE CO.

Capital and Funds over \$13,000,000

WRITE FOR PROSPECTUS

A. G. RAMSAY,
President.

GEO. A. & E. W. COX,
M'grs for Toronto and Eastern Ont.

Established 1872

... THE ...

Accident Insurance Company

OF NORTH AMERICA

NEW FEATURE...

...JOINT INSURANCE FOR PARTNERSHIPS

Important to Manufacturing Firms

MEDLAND & JONES, General Agents

MAIL BUILDING, TORONTO.

Brains and Capital

In every partnership there are two factors of great importance: the managing brain and the capital employed, and if death removes either the business must suffer. It often happens that the brains belong to one man and the capital to another. If the manager dies the capital is worth less than before; if the capitalist dies and his capital is withdrawn, the manager is crippled. It is clear that each has an insurable interest in the life of the other because the profits of each depend in part upon the life of both. The firm should, therefore, take one of the Unconditional Policies of the Manufacturers Life, which are free from all restrictions as to travel, residence or occupation, and are *absolutely indisputable on any ground whatever after the FIRST YEAR.* Get rates and all particulars from any of the Company's Agents, or from Head Office.

**Manufacturers Life Insurance Company,
TORONTO, CANADA.**

W. H. STOREY & SON
ACTON, ONT.
Manufacturers of Fine Gloves and Mitts
In every variety and style. Moccasins

CORRUGATED IRON

ILLUSTRATED CATALOGUE FREE
METALLIC ROOFING CO.
MANUFACTURERS TORONTO

The Toronto Paper Mfg. 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.

WELLAND VALE MANUFACTURING CO
LOCK No. 2, ST. CATHARINES, Ont.
Manufacturers of
**Axes, Scythes, Forks, Hoes,
Rakes and Edge Tools.**

BROWN & CO.



MANUFACTURERS OF
Square and Hexagon
HOT PRESSED NUTS
Paris, Ont.

The Paris Electro Plating Co.
Manufacturers of
STOVE TRIMMINGS
and Novelties. Orders Solicited.
PARIS STATION - - ONT.

F. W. HORE'S SONS
Hamilton - - Ont.
Manufacturers of
Wheels, Wheel Materials, Shafts, &c.

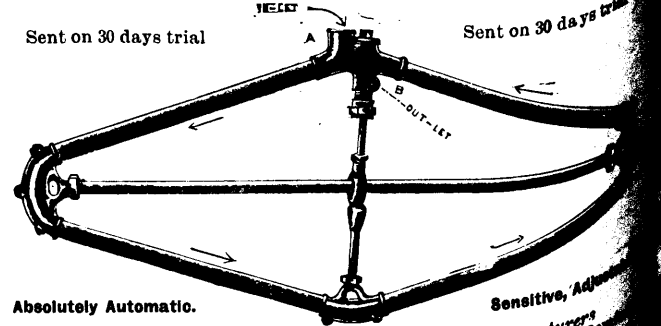
SMITH & CO.
219 FRONT STREET EAST,
Manufacturers and Dealers in
Wool Stock, Shoddies, Etc.
Wool Pickings, Woollen and Cotton Rags, bought, or worked up and returned. Carbonizing and Neutralizing a specialty.

C. G. ELRICK & CO.
Factory: Sheppard Street, Toronto
Montreal Office: Fraser Building
MANUFACTURERS OF
HORN AND RUBBER COMBS, ETC.



THE STANDARD DRAIN PIPE CO., St. John's, P.Q.
Manufacturers of Salt Glazed Vitrified Sewer Pipes, Double Strength Railway Culvert Pipes, Inverts, Vents, and all kinds of Fire Clay Goods.
The Standard Drain Pipe Co., of St. John's, P.Q., (Ltd.) W. C. TROTTER, President

REHM'S DUPLEX STEAM TRAP



Sent on 30 days trial
Absolutely Automatic.
THOS. DOWN & CO.
28 AND 30 DALHOUSIE ST., TORONTO, ONT.
FINE BRASS CASTINGS.
Sensitive, Adjustable
Sole Manufacturers for the Dominion
A Trial Order Solicited

There is no Business so small that advertising will not help it, none so prosperous that it can afford to ignore its aid!

FUEL OIL APPLIANCES

IMPROVED DUPLEX SYSTEM, for
 Annealing, Forging, Enamelling, Welding, Melting, Brazing and Heating Generally
 ... WITH FUEL OIL ...

FURNACES DESIGNED AND BUILT FOR EVERY PURPOSE. ESTIMATES MADE, AND WORKS EQUIPPED COMPLETE.

W. S. ROCKWELL, Constructing Engineer
 81 Centre Street, New York

THE BELL ORGAN AND PIANO Co., LIMITED.

CABINET
 and CHURCH
 Pipe Organs

... MANUFACTURERS OF ...
 THE CELEBRATED

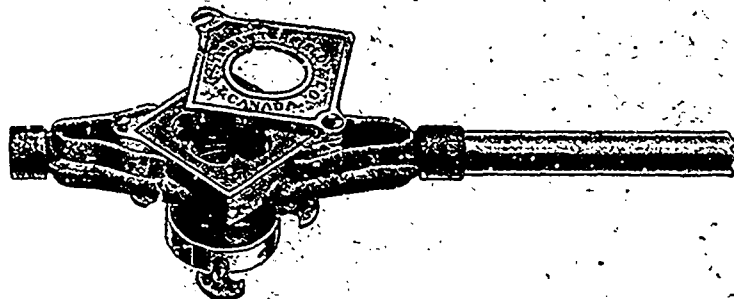
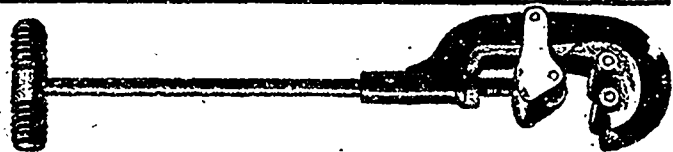
BELL

UPRIGHT
 Grand
 Pianos

Factories and Offices: GUELPH, ONT. Send for Catalogues

Butterfield & Co.

ROCK ISLAND - - - QUE.



MANUFACTURERS OF ...
 Stocks and Dies.
 Solid Die Plates.
 Reece's New Screw Plates.
 Taps and Dies for all uses.
 Young Axle Cutter and Tools for Engineers and
 Steam Fitter's use.

The CANADIAN MANUFACTURERS' ASSOCIATION

W. H. LAW, President. GEORGE BOOTH, Treasurer. J. J. CASSIDY, Secretary.

Office, Room 66 Canada-Life Building

KING STREET WEST, TORONTO TELEPHONE 177

THE OBJECTS OF THIS ASSOCIATION ARE

To secure by all legitimate means the aid of both Public Opinion and Governmental Policy in favor of the development of home industry and the promotion of Canadian manufacturing enterprises.
 To enable those in all branches of manufacturing enterprises to act in concert as a united body whenever action in behalf of any particular industry, or of the whole body, is necessary.
 To maintain Canada for Canadians.
 Any person directly interested in any Canadian manufacturing industry is eligible for membership.
 Manufacturers desiring to hold meetings for the promotion of their business are invited to avail themselves of the Board Room of the Association for the purpose, which is offered to them free of charge.

J. J. CASSIDY, Secretary.



The PRESTIGE

which Wide and Well-directed Advertising

GIVES TO A BUSINESS HOUSE IS A FACTOR WHICH HAS A MATERIAL BEARING UPON ITS CREDIT. . . .

HOW TO GET THE MOST FROM INVESTING type retain their supremacy as the business man's best coadjutors

Once mastered it is a valuable addition to his capital.

THE SHORT CUT which underlies successful advertising can be earned by every intelligent business man

HOBBS MANUFACTURING CO.

London,
Ont.

OUR...
SPECIALTIES

CYLINDER OIL,
COTTON WASTE,
COTTON WIPERS.

JAMES LESLIE
428 St. PAUL STREET
MONTREAL.

Send for
Special
Prices.
Of Every Description.
Quality Guaranteed

CARD CLOTHING

Bellhouse, Dillon & Co.

30 ST. FRANCOIS XAVIER ST.
MONTREAL

CHEMICALS
DYE STUFFS
... ACIDS

AGENTS FOR
The UNITED ALKALI Co's
VARIOUS BRANDS OF
BLEACHING POWDER
ALSO
The Badische Anilin, Soda-Fabrik,
.. ALIZARINES ..
ANILINES AND COLORS.



**The Ontario
Malleable Iron Co.**
Limited

MANUFACTURERS OF
**MALLEABLE
IRON** Castings to
Order for all
Kinds of
**AGRICULTURAL
IMPLEMENTS:**

—AND—
Miscellaneous
Purposes : : : : :

OSHAWA - - - ONT.

SCALES

PLATFORM,
DORMANT,
ROLLING MILL
HOPPER,
COAL,
Track Scales,
Etc., Etc.

MANUFACTURED BY
The Gurney Scale Co.
HAMILTON, ONT.

Write for Illustrated Catalogue.

BRISTOL'S PATENT
Steel Belt Lacing

... 100 SIZES ...



READY TO APPLY FINISHED JOINT

Greatly Reduced Prices

Is a grand success. Try it and see
for yourself.

Saves Time, Saves Belts, Saves Money
SAMPLES SENT FREE

The BRISTOL CO.
Waterbury, Conn.

SMITH'S FALLS

Malleable ..
Iron
Works ..

Capacity
2,000 Tons..

WILLIAM H. FROST
Proprietor

SMITH'S FALLS : Ontario, Can.

Consumers' Cordage Co.
(LIMITED)

... MANUFACTURERS OF ...

MANILLA, SISAL, JUTE and RUSSIAN

:: CORDAGE ::

Binder Twine, Jute and Cotton Bags

HEAD OFFICE:

New York Life Insurance Company's Building, Montreal

- THE ASBESTOS WAREHOUSE -

Magnesia and Asbestos Removable Covering, Asbestos, Mill Beard, Glass
Packing and Building Felt, Cotton Waste, Oils and Lubricating Compounds
WM. SGLATER & CO., 42, 44, 46 FOUNDLING ST., MONTREAL

