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VOL. 38.

TORONTO, FEBRUARY 17, 1899.

No. 4.

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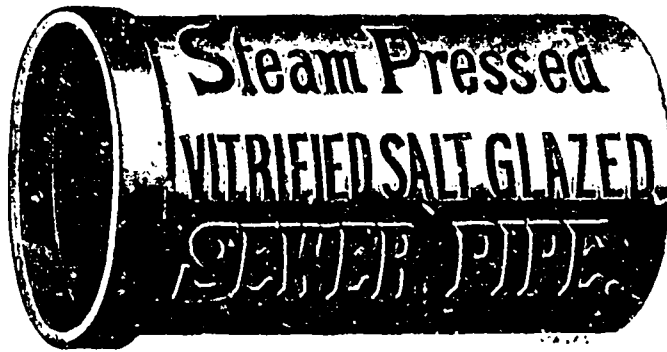
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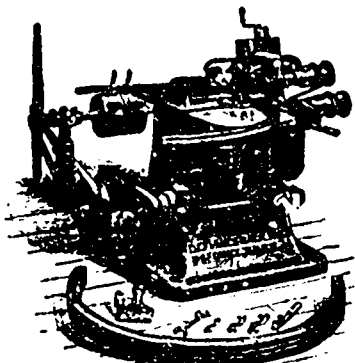
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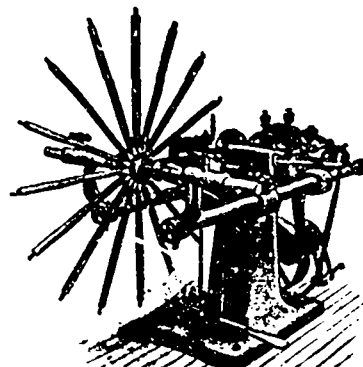
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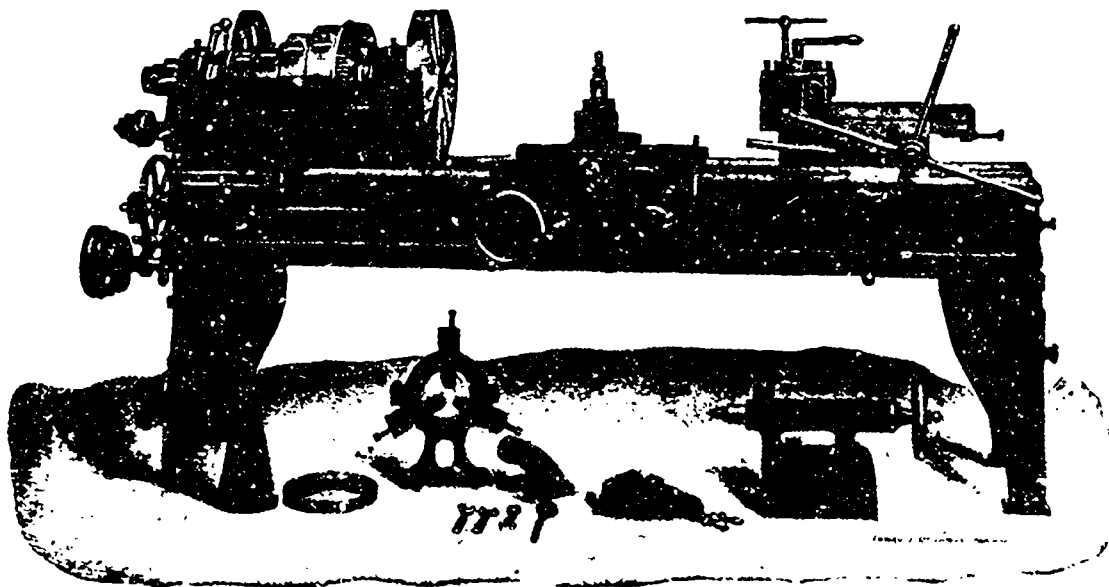
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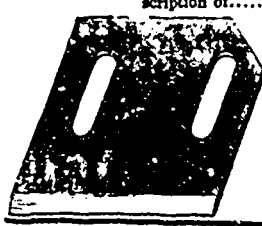
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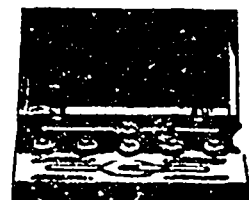
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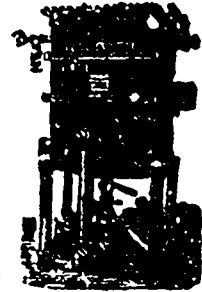
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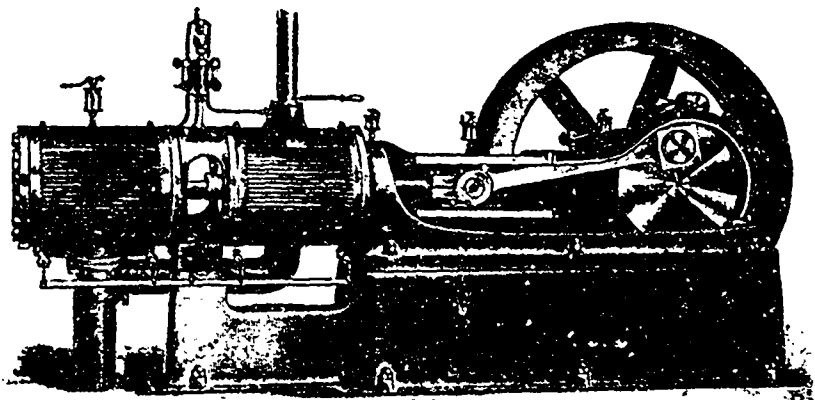
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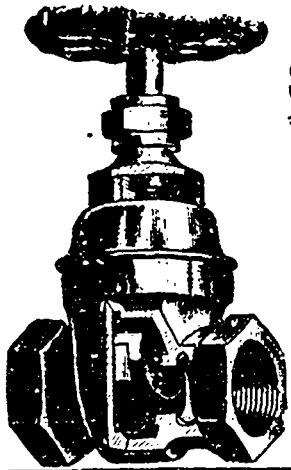
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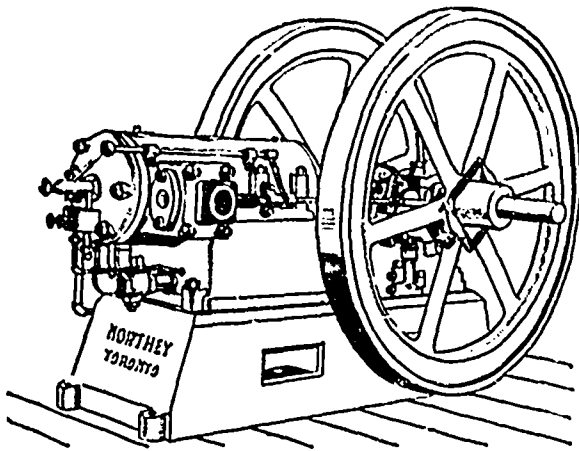
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## RAIL AND WATER TRANSPORTATION.

Owing to the wonderful increase in the carrying capacity of railways during the past twenty years, and to the corresponding reduction in the cost of rail transportation, there has arisen a very general impression that the days of the usefulness of canals have passed. It is pointed out that whereas in 1880, the average rate of freight per ton per mile on all the railroads of the United States was \$1.17, this was reduced to seventy-eight cents in 1896, and on some railroads as low as fifty-five cents. Engineering News says:—"It is plainly evident that a few years more will see the entire disappearance of the old-time canal barge as a vehicle for freight transportation. The 60,000 pound freight car is a competitor which it cannot meet." Among other facts which have tended to the frequent opinion that canals are obsolete may be mentioned the following:—The Delaware and Hudson Canal Company has recently abandoned part of its water route; the State of Maryland is offering to sell the Chesapeake and Ohio canal as a useless and expensive encumbrance; Mr. Andrew Carnegie, who was one of the earliest advocates of the construction of the now abandoned canal between the Ohio and Lake Erie, to give Pittsburg a water avenue to the lakes, now says that conditions have to change, that the canal would be a costly failure. In addition to these facts, the Erie canal appears to be incapable of maintaining its former traffic in competition with the great trunk railways running from Buffalo to New York. Neither have the Canadian, Welland and St. Lawrence system of canals been able to secure for that route anything like the volume of traffic which seemed to be reasonably expected when they were undertaken. Admitting all these facts, do they warrant the conclusion that canals are obsolete,

or do they not rather suggest the enquiry whether canals, through which vessels and barges of large capacity can pass with greater rapidity of transit, may not yet far outstrip railroads in cheapness of transportation?

Mention has been made of a few canals which have now become useless, or whose traffic has proved quite insufficient to afford a fair return for the expenditure incurred. It is only fair to refer to other canals which have proved successful. Among these may be mentioned:

(1) The Suez canal, the tonnage passing through which in its first year, 1869, was 6,756 tons net; in 1870, 436,699 tons; in 1875, over 2,000,000 tons; in 1891, 8,698,777 tons, since which there has been comparatively little change. Nor should it be lost sight of that Great Britain has been an immense gainer financially through the splendid policy by which the Earl of Beaconsfield secured the contract of this canal.

(2) The Sault St. Marie canal, connecting Lake Superior with the lower lakes. The traffic on this canal during the season of 1898 amounted to 21,234,664 tons, carried in 17,161 vessels. Among the principal articles were:—7,778,043 barrels flour, 88,418,480 bushels grain, 11,706,960 tons iron ore, 3,776,450 tons coal, 895,485,000 m. feet lumber, 250,170 tons pig iron, 124,226 tons copper, etc.

(3) German canals. The Kaiser Wilhelm canal has been in operation three years; the tonnage passing through in first year was 1,505,083 tons, and for fiscal year ending March 31, 1898, was 2,469,795 tons, an increase of sixty-four per cent. Mr. Frank H. Mason, United States Consul-General at Frankfort, in a report to his Government entitled, "Inland Water Transportation," says:—"No one who studies the underlying causes of German industrial progress can fail to notice the important and rapidly increasing role that is played by the canals and navigable rivers, which are being improved and extended every year, and carry freights at such low rates that protection economists begin to complain that they render the importation of foreign merchandise altogether too cheap and easy. A few figures will show the enormous development of inland water traffic in this country during the past ten or twenty years. Prior to the canalization of the river Main from Frankfort to its confluence with the Rhine at Mayence, which was finished in 1886, only small boats ascended the river to this point, and Frankfort had a total traffic of not more than 150,000 tons, against 930,000 tons of freight annually received and sent by rail; the per centage being fourteen to eighty-six respectively. During the first five years after the river was canalized, the water traffic rose to 700,000 tons against 1,400,000 tons by rail, an increase of 467 per cent. to fifty per cent. by rail. Since then the river traffic has increased steadily year by year, to a total of 1,753,799 tons in 1896, to which is to be added 225,253 tons of logs and lumber arriving in the form of rafts from the Upper Main. Similarly the trade of Cologne rose from 200,000 tons in 1876 to 1,000,000 tons in 1896, and the aggregate of the German Rhine ports, from 5,100,000 tons to 16,250,000 tons in same period. The total length of German canals and inland waterways is 8,700 miles; and important extensions, such as the Oder canal groups, and the Elbe-Trave canal are still in course of construction. The Danube-Oder and Oder-Muldan. Elbe canals will, when completed, form a continuous waterway nearly 2,000 miles long, and will connect the waters of the Baltic with those of the Black Sea.

Several interesting features are presented in this report. Mr. Mason has conclusively established his point as to the great influence which the German canals have exercised in promoting the industrial progress of that Empire; he shows also that the immense increase in water traffic has not been at the expense of the railroad interests, as the traffic of the latter increased in a very satisfactory manner. It is evident from this report that the low rates of transportation by water imparted a marketable value to many commodities, which but for this low freight would have had no mercantile value. Above all, it is clear that Germany has profited far more by the development of local traffic than by the mere transportation of foreign merchandise. All these features of the inland water transportation in Germany should be carefully considered by Canada in connection with the many projects of improved means of transportation now under discussion.

Russia. Late official publications give a detailed account of the immense canal about to be undertaken by the Russian Government. It is proposed by this means to connect the Black Sea with the Baltic and one of the main objects is to enable Russia to concentrate her navy in less than a week. The canal begins at Riga, and follows the course of the Duna to Dunaburg. From there an excavation is to carry it to Lepel, along the water course to the Dneiper, and down the river to the Black Sea at Cherron, which is to be the southern terminus. Its entire length will be 1,080 miles, of which only 125 miles will be of artificial construction. The cost of the entire project is estimated at \$97,000,000, and it is proposed to have it completed in four years. The canal and waterways are to be of sufficient depth to enable the largest battleship to pass through at a speed of six knots per hour, and are to be furnished with electric lights along its entire length, so that passage may be continued day and night.

United States. Owing to the small depth of water and small dimensions of locks, and heavy expense of horse towage, it had become evident that the small class of boats employed were unable to compete with the splendidly equipped railways running between Buffalo and New York. A few years ago plans were prepared for the enlargement and deepening of the canal, by which boats of sixty per cent. greater capacity than at present employed could pass through, to be towed by steam or electric power at much lower cost and with much greater rapidity than now; by all of which improvements the cost of transportation might be reduced one-half. The estimate of the cost of enlargement was \$9,000,000. The legislature at Albany submitted the scheme for the approval of the electors of the State, and having received their sanction, appropriated the amount required. Great scandal has followed the expenditure of this large sum of money, which has been squandered injudiciously, recklessly, and, it is charged, dishonestly. Major Symons, an eminent engineer, was employed by the United States Government to investigate and report on the various projects of improved inland water transportation. With regard to the then scheme of enlargement proposed for the Erie canal, he condemned it as utterly inadequate, and recommended that it should be so enlarged as to give passage for barges 200 feet long, thirty feet broad, and drawing ten feet of water, the locks to be reduced in number and arranged to give passage to two boats at one lockage, with mechanical lifts to replace

flights of locks where advisable, the business to be conducted by fleets consisting of one steam barge and three motorless consorts, running between Buffalo and New York; the barges to be strong enough for running on the Great Lakes. He estimates the expense for improvement of the whole route at about \$40,000,000. He furnishes an estimate of the season's expenses of the fleet, including insurance, ordinary repairs, six per cent. annual deterioration and six per cent. on investment, and shows that, exclusive of transfer charges at Buffalo, and without claiming anything for back freight, wheat could be transported from Buffalo to New York for 1.20 cents per bushel. Such extensive improvements may not be undertaken by the State of New York, but the possibility of their being accomplished is a feature which must be kept in view in any decision as to the merits of rival projects.

Welland and St. Lawrence canal system. It may be a matter of regret that when the present system of canal capacity was adopted, Parliament did not anticipate such an immense increase in the capacity of the great number of vessels employed on the Upper Lakes as has taken place. The existing system was adopted after a very thorough consultation with leading authorities on the subject. Mr. T. C. Keefer, in his treatise on Canals of Canada, shows that the following opinions were submitted to Parliament:—"The superintendent of the Welland Canal thought that 200 feet between lock gates was long enough; the Board of Trade, of Toledo, recommended 215 feet; the Board of Trade of Oswego, 250 feet; the Board of Detroit, 250 to 275 feet, with fifteen to sixteen feet depth of water; the Board of Trade of Milwaukee, 300 feet, with fifteen feet depth of water; the Boards of Trade of Toronto and Ottawa, 350 feet; Mr. Alvin Bronson, of Oswego (of long forwarding experience), 200 feet, and for vessels of 750 tons burthen; Mr. Charles Howard, of New York, 200 feet, which, he said, would pass 800 ton vessels, and allow deep sea vessels to pass through two-thirds loaded. The best authority in Canada, the manager of a transportation company in Montreal, thought that 'sailing vessels of 20,000 bushel capacity were most suitable for present harbors, as well as in reference to length of voyage.'"

In 1875, Parliament adopted the present system of four teen feet depth of water with locks 270 by 45 feet. However blameless the Dominion Parliament should be held with respect to their unfortunate decision on the present inadequate canal system, it is difficult to find any excuse for the dilatory and wasteful manner in which these works have been prosecuted, so that over twenty-three years have elapsed and they are not yet completed. They have been undertaken piece-meal, and parts have been completed at great cost, with the intermediate links unfinished. It would be difficult to estimate the loss sustained by the country through interest paid on the cost of hitherto almost useless finished canals, and through prolonged dear transportation, and the loss of commerce which these canals were intended to command, and which under a more vigorous and intelligent policy they would have commanded. The failure to secure the expected traffic has been the cause of the indifference and distrust towards canal transportation, which are so generally entertained and expressed. Admitting that owing to the dimensions of the greater number of Upper Lake vessels, these canals are heavily handicapped, is there any good reason for hoping that even under these circumstances, they may yet secure such a

volume of traffic for the St. Lawrence route as will afford a gratifying return for the expenditure incurred in their construction?

The system of transportation by this route suggested by some of the most experienced men in the grain and forwarding trades, is the employment of one strong and powerful steamer with two large and strong steel barges as a fleet, having a capacity for carrying in all, about 225,000 bushels of grain in each trip. It is estimated that this fleet should make eight round trips between Lake Michigan ports and Montreal during the seven months of navigation. This season's expenses, allowing six per cent. on cost of fleet, nine per cent. for unusual deterioration and marine insurance, and all running expenses including ordinary repairs, are estimated at not over \$45,000. Three cents per bushel for eight trips would yield for the season \$54,000, which would cover expenses and canal tolls on grain. The revenue to be derived from west-bound freight should be more than sufficient to cover any loss from unforeseen delays and contingencies. Under this estimate, the grain carried pays the forwarders a fair profit and contributes quite a large revenue to the Government in shape of canal tolls. If tolls are abolished, the three cents per bushel would cover marine insurance on the grain.

In deciding upon the merits and probable success of any of the new projects which are proposed or may be proposed, it is not enough to show that in cheapness of transportation they will be superior to the Erie or Welland and St. Lawrence canal routes as at present employed, but it must be shown that they will be cheaper routes than either of these when the proposed enlargements and improvements are completed.

#### A POLITICAL FALLACY.

The Boston Herald argues that the commerce between Canada and the United States is more beneficial to the latter country, because Canadians have purchased from Americans more goods than the Americans have bought in the Dominion. This is the persistent "balance of trade" theory, which is based on a combination of fallacies, the chief being the idea that trade to be profitable to one party must be a loss to the other. The Herald is of opinion that when an American sells goods to a Canadian it is profitable to the seller and detrimental to the buyer. Anyone breaking loose from theories and looking at trade in the concrete can see at once the fallacy of that idea. The Americans sell cotton to Canadian farmers, who sell grain to the British manufacturers, and these in turn cancel the debt by selling their wares to the American cotton planters. "Canada" has sent nothing to the "United States." By this persistent theory the intercourse must be injurious to the Dominion and beneficial to the United States. The same could be said of all the transactions that go to make up this circle of exchanges. The fact that trade takes place without outside bonuses is proof that it is beneficial to both the seller and buyer. The idea that purchases are evils still holds with all nations except Great Britain and New South Wales.—Toronto Globe.

Let us see how this "trade in the concrete" operates. The Americans sell to the Canadians two classes of goods—those that are admitted free of duty and those that are dutiable. In the fiscal year 1897, Canada imported more than \$3,000,000 worth of raw cotton from the United States, which came in free, and also large quantities of other articles, all intended for manufacture in this country, and most of which are not produced here. These articles constituted our raw

materials. During the same period we imported from the United States and other countries goods to the value of \$111,294,000, upon which \$19,891,000 duties were paid, and it should be remembered that Canada produces similar articles covering almost the entire list. Now, will The Globe inform us what special advantage it was to Canada that the labor expended in the production of this \$111,000,000 worth of goods should have been performed by foreigners in foreign countries if they could have been produced in Canada by Canadian labor? If the labor could have been performed to good advantage in Canada, why should it have been performed by foreigners? It is true that the imports increased the volume of our foreign trade, but why should we value that trade particularly if it was to the detriment of Canadian labor? The Globe may say that these imports were in payment for exports that we had made, and that small imports implies small exports; but it certainly cannot claim that even if we made no imports we could find no foreign markets for our exports.

Foreign trade is a good thing in its way, but why should we purchase abroad things that we can make at home? If the Canadian farmer insists upon purchasing American goods how can he expect to sell his products to the labor in Canadian establishments which could produce the same goods, but which is out of employment because of the action of the farmer. The farmer is the one who, as The Globe so elegantly puts it, pays through the nose. He pays the ship for taking his produce abroad while it might have been sold to good advantage at home, and he pays the ship for bringing back foreign goods that might have been made to good advantage at home. The farmer catches it on both sides.

#### FRAUDS ON THE CUSTOMS.

At the recent annual meeting of the Commercial Travellers' Association of Canada, held in Toronto, the matter of commercial frauds upon the Customs was quite fully discussed, perhaps the most interesting remarks that were made being those of Mr. P. H. Burton, of the Merchants' Dyeing and Finishing Company, of Toronto, and a member of the Canadian Manufacturers' Association. Mr. Burton asked if the importing of goods into Canada was to remain in the hands of men who are willing to make an honest declaration and pay an honest duty, or should it pass into the hands of men, who, thinking they cannot make enough profit in an honest way, are making false declarations every day upon the goods which they enter. Mr. Burton felt warmly upon the subject, and asked if the principle and the precedent was to be established that false entries could go on year after year and nothing be done at the end of it. He referred to a notorious case a few years ago, whereby a firm by systematically undervaluing goods was able to sell cheaper and drive competitors out of the market. And when brought to task, he alleged, they were able to compromise a \$200,000 claim for \$10,000. Mr. Burton then moved the following resolution, which was seconded:—"That the Commercial Travellers' Association of Canada, in annual meeting assembled, hereby declare that it has become a matter of common notoriety that frauds upon the Customs by producing for Customs' purposes false invoices in which the true value of goods entered is much underrated, so as to pay less than the proper amount of duty, have frequently been practised to the detriment of honest importing; that the members of this association, while competing against one

another for business, seek to do so in a friendly spirit and above board, and do not want to be stabbed in the back by unfair competition, that this is a matter affecting all trades, because of the principle involved and the precedents likely to be established; that the Government have enacted certain laws for the protection of the revenue and the proper punishment of all such frauds—so that those who commit these frauds do so with their eyes wide open as to the risks they run; that this association—representing 4,399 members, engaged in the various trades and industries of the country—knowing well the conditions and difficulties of business desire most emphatically to say that in their opinion no compromises should be made, but that the decision of all such cases should be left to the courts of justice, thus affording all parties an opportunity of being publicly heard.”

The resolution was unanimously carried.

**CANADA'S TARIFF PREFERENCE FOR BRITAIN AND THE BRITISH MERCHANDISE MARKS ACT.**

A recent interpretation of the British Merchandise Marks Act makes it possible that German, French and other foreign goods destined for Canada may be passed in transit through British ports and made to appear as of British origin and therefore entitled to Canada's tariff preference. It is clearly the duty of Canadian Customs officers to maintain a close watch for violations of the Customs Act that might be perpetrated in the manner indicated.

The interpretation alluded to is contained in the recent report of the British Commissioners of Customs in which they say:

The Select Committee of the House of Commons appointed to inquire into the effects and operation of the Merchandise Marks acts, stated in their report to the House, dated July 27, 1897, "The committee are of the opinion that it is unnecessary and uncalled for by the act to detain goods and insist upon a qualification, because they are marked with English words of description, if intended for sale in this country, or with words in the language of that to which they are consigned, unless such words are calculated to deceive the purchasers in regard to the country of origin." That English manufacturers should describe their goods in the language of the country to which they are exported for sale has for many years been strongly insisted upon by consuls and vice-consuls as a means of stimulating trade in British goods in foreign countries, and the committee's conclusion is obviously only an application of this principle to the converse case of foreign traders who manufacture for an English speaking market. We have, therefore, with your Lordships' concurrence, laid down a rule to the effect that trade descriptions in the English language applied to foreign goods imported into the United Kingdom are not to be regarded as indirect indications that the goods are of British or Irish origin, unless the officers have good ground for considering that such trade descriptions are specially designed to convey, and do in fact convey, an impression of British or Irish origin for the goods. The adoption of this ruling will, we believe, go far to remove many of the objections that have been taken to the Merchandise Marks acts as interfering unduly with freedom of importation. The Select Committee further recommend that goods in transit should be exempted from the operation of the Merchandise Marks acts. To give full effect to this recommendation an alteration of the law would be required. But, acting in the spirit of the recommendation, we have, with your Lordships' concurrence, adopted the principle that no examination of goods in transit is to be made specially for the purpose of scrutinizing marks. Accordingly we now take notice of marks on such goods only if we meet with them in the

course of examination of the goods for revenue purposes; and as we are revising our transit regulations with a view to reducing to a minimum the opening and examination of packages in transit, the occasions on which in future marks will come under observation will be rare. As further recommended by the committee, steps are being taken to ascertain what precautions may be necessary to prevent the customs authorities in India and the Colonies from being misled as to the origin of goods that have passed through the United Kingdom in transit.

**TAX EXEMPTIONS IN TORONTO.**

Following is a complete statement showing the amount of the exemptions for 1899 upon land, buildings and machinery in the city of Toronto as completed by the Assessment Department. As compared with the conditions of 1897, there has been a slight decrease in the amount of Church property exemptions and a decided increase in the amount of city property exemptions.

The exemptions on Church properties for 1899 amount to \$4,896,099, distributed as follows:—

Exemption.	Value of land.	Value of buildings.	Total.
Methodist .....	\$302,384	\$827,545	\$1,129,929
English .....	366,217	711,850	1,078,067
Presbyterian .....	225,567	701,750	927,317
Roman Catholic .....	153,390	562,200	715,590
Baptist .....	79,315	314,390	393,705
Congregational .....	40,551	185,200	225,751
Salvation Army .....	24,878	51,672	76,550
Other denominations .....	\$2,561	266,629	349,190
<b>Total .....</b>	<b>\$1,274,863</b>	<b>\$3,621,236</b>	<b>\$4,896,099</b>

The exemptions of schools and colleges for 1899 amount to a total of \$5,677,377, as follows:—

Exemption.	Value of land.	Value of buildings.	Total.
Schools (Pub.) .....	\$271,711	\$831,150	\$1,102,861
Schools (Sep.) .....	\$2,889	195,575	278,464
Colleges and other educational institutions .....	2,128,721	2,167,331	4,296,052
<b>Total .....</b>	<b>\$2,483,321</b>	<b>\$3,194,056</b>	<b>\$5,677,377</b>

The total exemptions for the year 1899 are classified as follows:—

Exemption.	Value of land.	Value of buildings.	Total.
Churches, etc. ....	\$1,274,863	\$3,621,236	\$4,896,099
Schools, colleges, etc. ....	2,483,321	3,194,056	5,677,377
City property .....	2,403,561	3,696,410	6,189,971
Ontario Government property .....	1,571,347	2,324,800	3,896,147
Dominion Government property .....	555,220	658,300	1,213,520
County of York property .....	40,000	40,000	80,000
Miscellaneous .....	456,129	208,430	664,559
Machinery (under by-laws) .....	.....	.....	1,644,370
<b>Total exemptions .....</b>	<b>\$8,874,441</b>	<b>\$13,743,232</b>	<b>\$24,262,043</b>

The total exemptions for 1897, over and above income exemptions of \$2,455,500, amounted to \$24,168,486; making the net increase in the exemptions over what they were two years ago, \$93,557. The exemptions on real property and machinery during 1897 were distributed as follows:—

Exemption.	Value of land.	Value of buildings.	Total.
Churches, etc. ....	\$1,431,681	\$3,624,088	\$5,055,769
Schools, etc. ....	2,684,443	3,005,465	5,689,908
Ontario Government .....	1,701,250	2,085,450	3,786,700
Dominion Government .....	566,667	684,650	1,251,317
City property .....	2,268,869	2,269,050	4,537,919
Charitable institutions .....	378,450	893,600	1,272,050
Cemeteries .....	360,888	19,100	379,988
County Courthouse .....	41,200	40,000	81,200
Miscellaneous .....	45,275	68,350	113,625
Machinery, plant, etc., exempt under by-laws .....	.....	.....	2,000,000
<b>Total .....</b>	<b>\$9,478,703</b>	<b>\$12,689,783</b>	<b>\$24,168,486</b>

EDITORIAL NOTES.

The Canadian Manufacturer Publishing Company, Limited, will, at an early date, begin the publication of an Export Edition of THE CANADIAN MANUFACTURER.

Premier Marchand in the course of his speech at the opening of the Quebec Legislature, a few days ago, replying to some observations of Hon. Mr. Flynn, made an interesting reference to the pulp industry and the possibility of an export duty on pulpwood:—"The leader of the Opposition has referred to one very important question, one upon which we should try to agree upon a policy which shall be in the interests of the province. I refer to the question of this pulp industry, which has just arisen and promises an enormous development. The honorable gentleman is mistaken in reproaching the Government with having omitted to consider this question. It is true that we have when in Opposition, reproached the Government of the day with having neglected to properly utilize the public domain as a source of revenue. That we were justified can be seen by one instance. The late Government sold 2,100 miles of timber limits for \$34,000 or \$35,000, we sold 1,900 miles for \$135,000. But to return to this pulp question, the Government has not neglected it. The Government has given it serious consideration, and has recognized it as a question which should be studied with the greatest care before any final decision is formed. As for me, I am ready to recognize—it is actually painful for me to see—how our pulpwood is going out of the country to the advantage of the United States pulp-mill owners, and I am ready to take any proper steps to preserve this wealth for our own people, but I think it would be a mistake to come to any hasty decision. We know that the question is before the international commission. If the duty is retained, the position of the pulp-wood millers will be such that it will be necessary to adopt more effective means of compensating our manufacturers for the advantages which their United States competitors will enjoy over them."

The Cobden Club Committee has issued a circular to the members, recommending that they should pay more attention to foreign affairs and do their best to secure the adoption of free-trade principles in all the new territories which Great Britain and other civilized powers acquire. It should be the policy of this country, the committee think, to make it clear that our interests in such acquisitions are purely commercial and to refuse to allow foreign nations to enforce protective tariffs against us in any new country where Englishmen have already established their interests.—The Textile Mercury.

Mr. Cobden contended that within fifty years after the adoption of free trade by Great Britain, every other civilized nation of the earth would have adopted that policy. The fifty years have passed and every civilized nation of the earth is firm in its advocacy of protection except Great Britain. Mr. Cobden's idea was that the open door to commerce would prevail throughout the world—open because of the free-trade influence of Great Britain. Now we find the Cobden Club demanding that Great Britain should refuse to allow foreign nations to enforce protection in any new country where British trade is already established. It would be interesting to see Great Britain endeavoring to force an open door in Madagascar against the wishes of France, or in certain parts of China within the spheres of influence of Russia and

Germany, or in Cuba or the Philippines where McKinleyism stands at the door. The Cobden Club Committee talk nonsense.

A most forcible object lesson in political economy is that presented in a dispatch from London published in The New York Sun which says:—

The alarm over the startling decrease of British exports and the increase in imports has been spreading rapidly throughout England during the past few days, and the soothing optimistic explanations offered by Sir Robert Giffen utterly failed to check the increasing panic. The agitation of the subject is already producing radical political schemes for stopping the impending ruin of British trade. The principal measure advocated is one which is destined to speedily become a great issue in British politics, and one which directly concerns the growing foreign trade of the United States. This is the preferential trading between Great Britain and the colonies, an idea which appeals strongly to the alarmed manufacturers in Great Britain. There is little doubt that this will soon become a burning issue in Imperial politics, and it is by no means improbable that it will sooner or later find a realization in some form.

During the year 1898 in all the manufacturing industries in Canada there were but 303 failures in business, with a total liability of \$2,229,083. These are classified as follows:

	No.	Liabilities.
Iron, Foundries and Nails.....	8	\$298,400
Machinery and Tools.....	22	192,672
Wool, Carpets, Knit Goods.....	3	6,233
Cotton, Laco and Hosiery.....	1	4,500
Lumber, Carpenters, etc.....	38	525,014
Clothing and Millinery.....	65	148,933
Hats, Gloves and Furs.....	2	10,213
Chemicals, Drugs, Paints.....	4	35,950
Printing and Engraving.....	10	68,669
Milling and Bakers.....	15	83,564
Leather, Shoes, Harness.....	29	223,868
Liquors and Tobacco.....	3	60,014
Glass, Earthenware, Brick.....	5	18,505
All Other.....	98	552,548
Total.....	303	\$2,229,083

There has been of late a plainly perceptible faltering in the familiar tone of positive assurance with which British free-traders have been long used to proclaim the indisputable soundness of their doctrines. We find, for example, in an English textile journal such a confession as this:

In the prosperity promised, and partly induced, by the industrial revolution, Mr. Cobden and his followers saw only the superficial and unstable truths of the time, and made the mistake of thinking and affirming that these were the immutable laws of economic science.

This was indeed a mistake. Suppose the American people had made the further mistake of accepting Mr. Cobden's doctrines as "immutable laws?" Fortunately they were wise enough to follow the leading of their own instincts; and, persistently adhering to the protective principle, they have within a century made this the greatest of all the manufacturing nations of the world. After all, the proof of the pudding really is the eating. Sixty years ago men might have had some excuse for doubting if the policy of sheltering domestic industry behind a protective tariff were a wise one; but the American who should venture to question that policy now has placed upon him the arduous task of trying to account for the fact that the most highly and persistently protected of the nations, starting with no manufactures at all, has acquired the



first place among the nations engaged in such industry, and is to-day the most self-dependent and self-contained, the richest and the most prosperous of any. In truth, the conditions now existing in the United States supply demonstration so complete of the fact that protection was best, for us at any rate, if not for other people, that there is no reason for wonder that the most vehement of the British free trade propagandists should begin to doubt if Mr. Cobden was right after all. —The Textile Record, New York.

The Toronto Globe gives editorial approval to the following from its London correspondent:

Going back again to the question of fruit, the canned fruit will always have a limited market here compared with the preserve trade, which is an immense one, and one which, if Canada had free sugar, she could use to great advantage. It would employ more capital and labor in Canada in five years than your sugar refineries will in fifty.

This is an old song sung very much out of tune. The London man might be excused for not knowing any better, but The Globe certainly knows that Canadian jam-makers, where they manufacture for export, can obtain a refund of ninety-nine per cent. of any duty they may pay on sugar consumed in their industry. The London man, and The Globe also, might study to advantage the effect of free sugar in Great Britain and the fact that the British Government are even now proposing to impose a duty on foreign sugar.

The fourteenth regular annual meeting of The American Protective Tariff League took place on January 19th at The League headquarters in New York. There was a large attendance of members from various parts of the country, and strong interest was manifested in the work of The League for the past year, and in plans for future usefulness and along the lines so successfully followed heretofore. First Vice-President Cannon presided. An account of the general operations of The League was embodied in the report of the General Secretary, which also embraced the financial statement of the Treasurer. This report showed that the receipts of the organization for the year ending January 15th had been \$35,222.56, and the disbursements \$33,710.83, leaving a cash balance of \$1,511.73, with no liabilities of any description. It was recommended that the assessment for 1899 be placed at \$60. The report was adopted and its recommendations approved.

The January 31st issue of Textile America was its final publication as a monthly, and beginning on February 11th, its production will be once a week. Its aspiration is to be the best dry goods paper, not only in the United States, but in the world, and we think its ambition will soon be gratified. It is one of our most acceptable exchanges.

At a meeting of Toronto No. 1 of the Canadian Association of Stationary Engineers, held a few days ago, a resolution having reference to the explosion of a steam boiler in this city recently, deplored the loss of life and personal injury to the innocent victims of the event, and it was further resolved

that the Association, as a body of engineers, place themselves upon record as concurring with the verdict of the coroner's jury, which set out the fact that the man in charge of the boiler, was incompetent. It was also resolved that all steam boilers should be under the charge of practical engineers, who have certificates, and each boiler be inspected yearly by some competent person.

Mr. Hardy's Government never introduced a more popular law than that one, which the Opposition forced upon him, requiring all pine logs taken off the Crown domain to be manufactured in Canada.

Having found his opponents his best advisers in respect to that matter, Mr. Hardy might take counsel from them in respect to another.

Let him bring in a bill of exactly the same type and make it apply to nickel ore and matte.

Such a measure might not be liked by some of the friends who worked for him in North Hastings, but it would please the people.

He has the power; let him use it.—The Mail and Empire.

The cases are not parallel. The Ontario Government had the right to require the manufacture of logs into lumber in the province, cut on Crown Lands after the enactment of the law, but it certainly has no right to require that the nickel ores taken from other than Crown Lands, shall be manufactured into refined nickel in the province.

The advent of the Canadian Postal Note marks a considerable step in the direction of simplifying the sending of small amounts by mail. The old post office order was very good in its day, but it was cumbersome and hardly in keeping with the advanced spirit of the times. Post office orders, having served their day and generation, must now, so far as the remittance of sums under \$5.00 are concerned, give way to the more modern postal note. That it is here we know; that it has come to stay, at least until it is crowded out by something better, is beyond peradventure, as the following figures will show:—During the first month they were on sale in Canada, somewhat less than 4,000 notes were sold, all told. The second month the demand had increased to over 12,000; the third month to 28,000 and the fourth month to over 60,000. The story told by these returns is that the postal note is filling a real want, and that our people are beginning to find it out. As a means of remitting small sums, the postal note is not only a long way ahead of the post office order, but should also supersede the old, and we might add pernicious, method of sending postage stamps, which, by the way, is now illegal. The postal note can be purchased just as easily and quickly as postage stamps, the cost is only nominal, and we understand that where a payment is disputed, the note itself, signed by the person to whom the money was paid, is always available from the department at Ottawa by sending them the number of the note. These good points should certainly recommend them to the public for sending small remittances. They can be purchased during all post office hours, and are payable at all money order offices. The rates are one cent on note for 20c., 25c., 30c. or 40c.; two cents for 50c., 60c., 70c., 80c., 90c., \$1, \$1.50, \$2, \$2.50; three cents for \$3, \$4 and \$5. Odd cents may be made up by attaching postage stamps not exceeding nine cents in value, to the face of the note.—The Trader.





### ENGLISH INQUIRIES FOR CANADIAN PRODUCTS.

The High Commissioner in London has received the following enquiries during the week ended January 27, 1899, from English business houses who are interesting themselves in Canadian trade, and invites communications on the subject from the Dominion.

1. An enquiry has been received from a firm open to buy metal residues such as zinc, copper, lead, tin, ashes or hard spelter, and the following ores: Copper, lead, silver, gold, tin or nickel.

2. A firm of manufacturers want a traveller calling upon wholesale woollen merchants to represent them on commission.

3. An importer of cider is ready to buy new sweet cider in lots of 60 to 120 casks. It should be put in whisky casks (ten hoops).

4. An agent with a good connection among the wholesale buyers in the Dominion, is required to represent manufacturers of woollen and worsted cloth for both ladies' and gentlemen's wear.

5. An enquiry has been received for the names of exporters of Canadian turpentine (commonly known as Balsam of Canada) in drums of 1 cwt. each.

6. Canadian lumber merchants who have already embarked upon the business of preparing wood blocks for road paving purposes, may like to have the name of an agent who calls upon the London Vestries from time to time and would be glad to submit samples and prices.

7. A firm of good standing in Glasgow is ready to import grain and provisions on consignment.

### TOOLS IN BRITISH GUIANA.

United States Consul at Demarara says:—"Vises for engineers and blacksmiths, tongs, anvils, chisels and hammers are the tools chiefly imported. England sends most of them. They are packed in casks, and the transportation charges are 30s. (\$7.29) per ton weight, or forty cubic feet. The duty is ten per cent. The manufacturers' prices are: Parallel vises, wrought iron, to screw on top of bench, weighing 2½ and 4 pounds, \$3.36 to \$3.84 each; best quality, with adjustable head to fix at any angle, weighing 4 pounds, \$7.68 each; combined parallel vise and anvil weighing 3½ pounds and 7 pounds, \$6.96 and \$10.56 each (50 per cent. discount is allowed); parallel vises with strong cast-iron bodies and steel jaw plates, jaws from 2½ to 5½ inches, opening from 3½ to 6 inches, weighing 10½ to 70 pounds, prices \$3.36 to \$13, less 47½ per cent. discount; tongs, close and hollow-mouthed, 20 cents per pound; side and flat, round and square, 26 cents per pound; paper rake and shovel, 64 cents each, or \$1.92 per set; anvils, single, from \$4.68 to \$5.76 per cwt. net, according to quality; double, from \$4.92 to \$6; chisels, cast steel, flat cross, cut half round, or diamond point, 24 cents per pound; boiler-makers' hammers, 30 cents per pound. Forty per cent. discount is granted on chisels and hammers. Retail prices, about 100 per cent. on landed cost."

### A CHANCE FOR CANADIAN PACKERS.

Lord Strathcona, Canadian High Commissioner at London, has received the following letter from the British Admiralty office:—

"I am commanded by my Lords Commissioners of the Admiralty to acknowledge the receipt of your letter of the 16th of December, No. 27,892, transmitting a copy of a letter from the High Commissioner for Canada, stating that it would be quite possible for many Canadian firms of good standing and position to supply the Admiralty with certain articles of food obtained from America, and asking that such firms on application might be given the option of tendering. In reply I am to state for the information of the Secretary of State for the Colonies that my Lords will be very pleased to invite any Canadian firm of packers, who may apply, and who may prove ability to carry out the contracts, to tender."

As I think I stated once before, tenders for Admiralty

supplies are received only from an approved list of firms, whose position is above reproach, and whose goods have proved suitable for use in the navy, a certain standard being absolutely required. The letter which I have quoted gives to Canadian firms the opportunity of showing that they are eligible for this list. I need not dwell upon the desirable character of such business as the navy offers, but I hardly think it would be of advantage to any but large and well-established firms of packers to attempt to obtain the business. Since the contracts are awarded by tender, and it is absolutely necessary to show ability before tendering to carry them out, small firms, however enterprising, or however good their product, would hardly stand a chance. However, any who care to look into the matter can, I believe, obtain particulars from the Canadian Department of Agriculture.

### GOOD MATCHES WANTED IN SIAM.

British Consul Beckett (Chiengmai) remarks that Japanese matches continue to inundate the country. "They are, without exception, worthless. In the rainy season, three or four matches must be struck before a light can be obtained. A case of ten boxes cost in Chiengmai 4 atts (1d.), or a box sold separately at ½ att. A box of good matches, therefore, sold at four times this price, or 2 atts (½d.) would be a bargain of equivalent value to the purchaser. Curiously enough, good Swedish matches, imported from Moulmein, are sold in the markets of Mehongson, six days west of Chiengmai and Muang Hang, in British territory six days northwest, at a price of ten boxes for 8 atts (2d.), and yet the same matches when sold at Chiengmai, which is rare, are 3 atts per box, a price which is prohibitive. English or Swedish matches sold at Chiengmai at 2 atts (½d.) per box would, I am confident, find a ready sale."

### BICYCLES IN JAVA.

United States Consul Everett, at Batavia, Java, writes:—"The use of bicycles, which a few years ago was unknown in Java, has within the last three years advanced tremendously. There are now between 3,000 and 4,000 bicycles in the Island of Java, and the number is increasing. Wheeling is confined to Europeans, half-castes, and Chinese, the Arabs and natives not having taken it up. Elderly people do not ride as they do at home, and women very little, as it is considered immodest for a girl over fifteen to ride a bicycle. I do not, therefore, recommend sending any ladies' wheels here.

"About sixty per cent. of the wheels in use here are cheap, and the majority of these cheap ones are German. This is due not only to the enterprise of the Germans, which has far surpassed that of any other country, but also to the fact that people here are very close and penurious, and always buy the cheapest article obtainable, regardless of quality.

"Of the better grade of bicycles, nearly all are English. These were first in the field. They are very heavy and clumsy, and ought to be easily supplanted by lighter and better machines.

"The wear on wheels is not very great. Long-distance riding is unknown, although the roads everywhere are almost perfect. The sun, however, is hot, and the only time one can ride is for an hour in the early morning, and about the same time in the evening. Riding at night, even with a lamp, is looked upon with disapproval. Consequently, with care, there is no reason why a wheel should not last ten years. In spite of all this, the bicycle dealers maintain that the business is increasing slowly, and they think that with proper effort a very large number of additional converts to bicycle riding could be made among the Chinese.

"As regards shipments, the best way is to ship via Liverpool London, or Southampton, the two former preferably, thence by English steamer direct to Batavia.

"As regards details, there is not much to suggest. In the east of Java, people seem to like the steel rims; in the west,

the wooden rims. I do not know why, for I think climatic conditions have little to do with it. Any kind of bicycle, if kept clean and in good order, will stand the climate very well.

"Double-tube tires seem to be preferred, though there is no motive apparent, except that they are the fashion; and, as turned out by German firms, cheap—likewise worthless.

"In my opinion, the kind of wheel it would best pay to push would be a good medium grade. It is hardly worth while just yet to try to sell the very best, as few people are willing to pay the prices. On the other hand, in the very cheap grades it is useless, as well as bad policy, to attempt to compete with the Germans. Let goods be well made and honest, and, if properly pushed, they will surely find a market in an island where the roads are perfect and where there are 40,000 Europeans and hundreds of thousands of Chinese."

#### PAINTS IN SIAM.

The French Minister at Bangkok says there is a somewhat considerable trade in colors for paints in Siam, where most of the buildings are of wood, but the Customs statistics do not permit of the extent of the imports being stated. Oil paints are the most important, and of these the consumption in recent years has greatly extended, owing to the building operations which have been carried out. The colors most generally employed are zinc white and white lead, the very heavy sales of these two products being explained by the fact that there is not an apartment in Bangkok into the painting of which they do not enter largely. Other colors which find a ready sale are greens, blues, browns, yellows, reds—varnishable red in particular, red lead, Sienna earths, and red and yellow Italian earths. Most of these are sent to Bangkok in the form of paint; but often the colors are mixed locally with linseed oil and spirits of turpentine, this being the most advantageous mode of procedure. In either case, most of the imports are from England. "That country has supplied Siam so long, and the use of English colors has become so habitual, that it is difficult to secure the acceptance of others without complying with the English taste, and the conditions as to price and consignment in use with the English."

#### TIN-PLATE WARE.

Tin-plate basins, of 30 cm., cost at Benguela 15,000 reis per gross; plates called "improved plain tin soup plates," of eight inch (20 cm.), cost 8,500 reis per gross at Benguela. It is to be remarked, however, that the natives are displaying a tendency to abandon the use of tin-plate goods in favor of those made of enamelled iron.—Belgian Vice-Consul at Mossamedes.

#### BELGIAN IMPORTS.

In his annual report Consul-General Lincoln, of Antwerp, says:

"In connection with a consideration of the subject of Belgian imports, the figures given in regard to the following articles will be found of interest.

"The quantity of starch and nonedible farinaceous substances exported from the United States into Belgium during the first six months of 1898 was 5,206,253 pounds, as against 2,608,462 pounds in the first six months of 1897, and 169,973 pounds in the first six months of 1896.

"The importations of certain kinds of timber from the United States increased in a notable manner during the first six months of 1898. Thus the imports of oak and walnut boards for the first six months of 1898 were 1,830 cubic feet, as against 961 feet in 1897. The increase in the import of sawed oak and walnut for the same period of time was also notable, the figures in 1898 being 104,546 cubic feet, as against 66,190 cubic feet in 1897.

"Belgian wheat imports for the first six months of 1898 from the United States were 292,582,000 pounds, as against 143,584,570 pounds for the corresponding period in 1897. The amount of the import of rye for the first six months of

1898 was 86,198,510 pounds, as against 25,368,797 pounds for the first six months of 1897, and 16,868,496 pounds for 1896, a very notable increase. The import of wheat flour for the first six months of 1898 was 2,555,018 pounds, against 882,803 pounds for the corresponding period of 1897.

"The import figures for malt were 1,024,711 pounds during the first six months of 1898, against 495,007 pounds in 1897, a notable increase.

"One of the most notable increases in imports from the United States is lard, the importation of which for the first six months of 1898 amounted to 18,543,477 pounds, against 7,568,431 pounds in the corresponding half-year of 1897. The increase in the importation of other animal substances, such as fish and fat other than lard, is also noteworthy, the import being twice as large in the first six months of 1898 as in 1897, the figures being 3,379,468 pounds for 1898 and 1,551,694 pounds for 1897.

"The import. of canned fish, tobacco, wood for dyeing purposes, smoked ham, tongue and lard show notable increases."

#### LABOR-SAVING DEVICES IN CHINA.

In reply to an export association in New York, Consul-General Goodnow, of Shanghai, writes as follows:

"I cannot give you any encouragement in regard to the shipment of wheelbarrows, scrapers, dump cars, and the like to China. The wheelbarrow used here has one large wheel in the middle and a seat on either side, where passengers or loads are carried. Once in a great while, dirt is carried in baskets on such a barrow, but ordinarily it is carried by a coolie in two baskets hung on the end of a bamboo rod balanced on his shoulders. These baskets are about the size and shape of a grain scoop. Labor-saving devices are not in demand in China. The cheapest thing here is a man. There is more labor than can find employment. A coolie carrying dirt will receive from seven to ten cents gold per day. He must work from sunrise to sunset—not very steadily or very intensely, but putting in a great many hours and accomplishing a large amount of work for the amount of wages paid. There are more coolies willing to work for this pittance than there is work for them to do."

#### DEVELOPMENT OF THE KONGO FREE STATE.

The recent celebration by the city of Antwerp of the progress of the Kongo Free State, has attracted wide attention. In his speech on that occasion, the king, after calling attention to the enormous difficulties in the way of commercial development in Africa, spoke of the remarkable advance in trade made by the Kongo during the last few years, although the railway connection with the interior navigable waters of that territory was completed only last July. The importations, from 7,500,000 francs (\$1,447,500) in 1893, increased to 22,000,000 francs (\$4,246,000) in 1897, of which more than 16,000,000 francs (\$3,088,000) worth came from Belgium. The exportations increased from 5,500,000 francs (\$1,061,500) in 1893 to more than 15,000,000 francs (\$2,895,000) in 1897, of which 13,000,000 francs (\$2,509,000) was sent to Belgium. The king spoke of the probability that the railway now finished and others to be constructed would increase this commerce at an even greater ratio. The Government policy in regard to the Kongo, he said, would be to keep it an absolutely neutral power, as Belgium has been; to imitate Germany in the formation of numerous export associations; to encourage by all means, private and official, the establishment of centres of trade in Africa.

#### THRESHING MACHINES IN RUSSIA.

There is a good demand for horse-power threshing machines of improved construction, fitted with straw shakers, riddle and corn screen and automatic feeder. These machines are much in favor with the peasant proprietors and German colonists and they prefer them to the steam threshers; firstly, because the capital invested is small compared with the latter—they

are sold, including horse gear for eight horses, at £105—and secondly, they are afraid of using steam power, not being accustomed to it. Russian and German firms are the only sellers of this kind of machine in this district. There can be no question of competition with the native made machine, as they are sold at the same price as those of German make. Steam threshing machines are in limited demand in this district, but a few sets are sold every season. German makers are trying hard to get a hold of this branch, and are pushing their machines and competing with the well-known British makers, and they have succeeded in selling several sets during the last two years in the Crimea.—British Vice-Consul at Theodosia.

#### LINOLEUM IN ROUMELIA.

Rooms in Salonica are generally three by four or four by five m. square, and the floors are covered with linoleum of the cheapest class. It is a somewhat coarse material, heavily glued, backed with a reddish brown coating and printed with bright attractive designs. It is used in large quantities, and is obtained from Belgium and England. The price for a room of the size above referred to runs from twenty francs. Linoleums for stairs and vestibules also sell in large quantities.—Saxon Export Association's Report.

#### TOBACCO PIPES IN ANGOLA.

The only kinds that can be imported here are pipes with plain unornamented heads, with a vulcanite or horn tip. They must always be fitted with lids, and those with bent stems are most in request; long-stemmed pipes would have no sale here. Common pipes are sold in the interior at the price of from 700 to 800 reis apiece. "Brummagem" pipes, for sale to the natives, are sold as follows:—Small wooden, straight or curved stem, painted red, 900 reis per dozen at Benguela; ditto, ditto, yellow, 1,000 reis. They are retailed to the natives at 200 reis apiece (in the interior). Imitation meerschaum pipes, weighing forty grammes apiece, are also found here. The bowl has an opening of twenty-two mm., the stem being eight and one-half cm. long, and the price 1,800 reis per dozen. In Mossamedes the natives use tin pipes, costing thirty reis apiece.—Belgian Vice-Consul at Mossamedes.

#### PROPOSED RAILWAY IN NORTHERN MEXICO.

The fact that a company under the name of the Chicago, St. Louis, and Texas Air Line Railway Company has been chartered to build a road from San Antonio to Brownsville, Tex., and the entire route surveyed, has caused interested comment among men prominent in business and financial circles in Matamoros and northeastern Mexico. The commencement of this road will undoubtedly result in the building of a road from Matamoros to Mexico city. It seems strange that a road has not already been constructed, not only because it would traverse a country of the most varied resources—agricultural, grazing and mining—but it would be by from 400 to 600 miles the shortest route from Mexico city to the manufacturing cities in Canada.

#### AGRICULTURAL IMPLEMENTS IN GUATEMALA.

This will never be a good market for agricultural machinery, on account of the mountainous character of the country; but such farm tools as hoes, axes, picks, shovels, machetes, and forks are used in large quantities. Hoes have the greatest sale because they are used on coffee fincas in clearing the land of brush and weeds. They should be large, of the finest steel, and have a round eye for the handle. The axes must also have round eyes, instead of the oval form used in the United States. The latter does not sell well here, for the Indian insists on making his own helve. These articles, as well as the machetes, should be especially made for this trade. Hunting knives in ornamental sheaths sell extensively.—United States Consul-General at Guatemala.

#### COAL IN THE ARGENTINE REPUBLIC.

The recent exorbitant prices of English coal have compelled certain railway and gas companies to import North American coal, whilst briquettes and coke for foundries were purchased in Belgium. As a general rule the buyers were quite satisfied with their purchases. The firm of Wilson, Sons & Co., Ltd., of Buenos Ayres, was the first to receive coal from the United States for its Monte Video and Buenos Ayres branches. The quantity already supplied exceeds 10,000 tons. Since 1888 the imports of coal to the River Plate have continued to increase. In 1891 they were 520,000 tons; 560,000 in 1892; 650,000 in 1893; 680,000 in 1894; 750,000 in 1895; 850,000 in 1896; 950,000 in 1897, and 600,000 tons during the first nine months of 1898. In 1897, prices for coal on board Riachuelo were as follows; Cardiff, 5 to 8 piastres gold per ton; Glasgow, 6 to 8 piastres; Newcastle, 7 to 9 piastres; foundry coke, 8 to 11 piastres per ton. In 1898, the prices of Cardiff coal, put down in Riachuelo and Rivieres, have undergone the following fluctuations: January, February and March, 5.60 to 6 piastres gold per ton; April, 9 to 10 piastres; May, 12 piastres; June, 14 piastres; July, 15 piastres; August and September, 14 piastres. During the months of July to September, Yorkshire, Newcastle, and Glasgow were supplied in place of the Cardiff, and cost from 9 to 10 piastres gold per ton on board. Owing to the lack of Cardiff coal, several loads for use by the railway companies were imported from Norfolk (U.S.A.). Several other loads were expected at the beginning of October for Rio de la Plata; they were quoted at 10 and 11 piastres gold per ton on board. Belgian briquettes were quoted on September 29th at 9 to 10 gold piastres, and Belgian foundry coke at 12-13 piastres per ton.—Belgian Vice-Consul at La Plata.

#### LEATHER AND HIDES IN MONTENEGRO.

There is only one firm in the whole country engaged in preparing leather, which is done in a very primitive way to meet the local demand, but small quantities are also exported to Ragusa (Dalmatia). This firm is at Podgoritza, the manager being M. Célébitch. It manufactures Montenegrin belts and straps in all colors. Prepared leather for the boot and shoe trade is imported in large quantities from Austria and Italy. Montenegro exports the relatively large quantity of three hundred thousand small hides to Trieste. The trade in hides is one of the most important branches of the commerce of this small country. On the other hand it seems that there would be some chance of success for a tannery in Montenegro, and more especially at Podgoritza in the most fertile part of the principality, where cattle are reared to the greatest extent.—French Official Report from Cettigné.

#### LEATHER IN CHINA.

There is already a considerable importation of leather into this Consular district, both sole and upper, all of which is used for making boots and shoes. Of this the bulk comes from the United States, and there is no reason why our tanners should not have a practical monopoly of this business, and largely increase their export of raw leather to Japan. There is little reason to expect a demand for harness leather, or for boots and shoes. The duty on leather since January 1, 1899 is 00558 yen (2.77 cents) per pound, specific, for sole, and 10 per cent. ad valorem for other kinds.—United States Consul-General at Hong-Kong.

#### TINNED GOODS IN ANGOLA.

Tinned goods of all kinds are imported in considerable quantities. Nearly all the preserves, confectionery, jollies, sardines and other fish, come from Portugal. I have remarked that, in most of the localities I visited in Angola, condensed milk seemed to be totally unknown.—Belgian Vice-Consul at Mossamedes.

### HINTS TO EXPORTERS.

In Brazil there is a prejudice against black. The English used to send excellent sewing needles to that country, but they were wrapped up in black paper. When informed by their agents of the bad effect produced by this color, the factories of Saxony at once sent a consignment of needles (perhaps inferior) packed in pink paper. The Brazilian market was theirs in a very short time. The Chinese absolutely detest green. A French publisher was one day struck with the idea of sending a very pretty and very elegant Chinese calendar to the Celestial Empire. The article would have taken well, but, unfortunately, a good deal of it was printed in green, and not one single copy was sold. In Russia the peasant women are accustomed to tie certain kinds of printed cotton handkerchiefs into their hair. These used to be supplied by Lancashire, and there was no competition. One day the agent of a Dresden export company heard the women complain of the triangular shape of the English handkerchiefs; they wanted them square, but the makers would not consent to the change. The Germans at once began to make these handkerchiefs of square shape, and the result is—at the present time—almost the entire trade is in the hands of the Germans.—French Chamber of Commerce at Milan, Italy.

### MINING MACHINERY IN NEW ZEALAND.

Coal-cutting machines are busily at work on the west coast of New Zealand. The New Zealand Mines Record mentions that there are four at the Granity Creek of the percussion type, actuated by compressed air. The coal is blasted down during the night and left ready for the fillers in the day shift. The results from these coal-cutting machines and compressed air plant have been so satisfactory that the management have added a duplicate air compressor. At the Coalbrookdale Colliery an electric coal-cutting machine is at work in the Cascade mine, and two electric percussion machines in the new mine, where the seam is seven feet thick with a strong sandstone roof. At the Iron Bridge Colliery a new electric cable is laid, and four new percussion machines are at work. The seam promised to be favorable for coal-cutting machinery. The flat seam is eighteen feet thick covered with a strong iron grit sandstone.

### WALL PAPER WANTED IN ROUMELIA.

A more inviting appearance is imparted to the poorly-built houses at Salonica by means of wall paper. For bad walls it is, of course, clear that no fine papers are used; hence the demand is for common lines in rolls of from six to seven meters, in one, two and three colors, with and without gold ornamentation, at from twenty-five to thirty centimes per roll for good, and from fifteen to eighteen centimes per roll for common papers, c.a.f. Salonica, packed in bales. Payment, four or five per cent. for cash or at four to six months'

acceptance. Germany (Cologne) and Austria supply the cheapest papers. The demand is exceptionally large, it being found cheaper to use paper, instead of planed boards, for lining the numerous trunks and presses made for linen, clothes, etc.—Saxon Export Association's Report.

### PAPER AND MACHINERY WANTED IN FRANCE.

Paper products of certain classes might find a market in St. Etienne, Le Puy, Montbrison, and Lyons; especially packing and wrapping papers, ribbon rolls, piece-goods wrappers, lace rolls, dry-goods box stock, cardboard, and a peculiar grade of pulp board used by "lisseurs," or pattern makers for looms. There is no paper-box machinery in this city; though immense quantities of small dry-goods boxes are used, they are entirely hand made. Steam laundry machinery is unknown in the interior cities of France. All the washing is done in a primitive way, by women at the edges of streams, which often happen to be several miles out of the cities.—United States Consul at St. Etienne.

### TINNED-PLATES IN CHILI.

The trade is a small one, but almost all in the English article, although a little has come from the United States. There are several fruit canning enterprises in the country, and some of these make their own cans, but there are also two small can factories. The machinery used, I am informed, is adequate and up to date. The lobster (really crayfish) fishery at the Island of Juan Fernandez cans its product; the management complains of being unable, as yet, to find anything which really prevents alkali, in which the fish is very rich, from attacking the cans. The native market takes all this canned fish.—British Government Commissioner's Report.

### WHISKY IN BRITISH EAST INDIA AND IN ITALY.

The imports of British whisky into East India have increased from 434,237 gallons in 1892-3 to 497,964 gallons last year. Last year Germany supplied 7,499 gallons, value 35,503 rupees, of whisky "made in Germany."

With a considerable permanent colony of English and Americans, with an incalculable number of English and American travellers, with at least 4,000 British ships calling annually at Italian ports and having crews that amount to quite 100,000, it may well be imagined that there is a demand for whisky in Italy, and the import is, indeed, far from being insignificant.—German Official Report.

### ACETYLENE GAS IN PERU.

Illumination by means of acetylene gas has been introduced in several factories and in the new General Post Office buildings at Lima, Peru.—German Official Report.

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## CAPTAINS OF INDUSTRY.

The following items of information, which are classified under the title "Captains of Industry," relate to matters that are of special interest to every advertiser in these pages, and to every concern in Canada interested in any manufacturing industry whatever, this interest extending to supply houses also.

If a new manufacturing enterprise of any kind is being started, or an electric lighting plant instituted, or an electric railroad, or a telephone, or a telegraph line is being constructed; or a saw mill, a woolen, cotton, or knitting mill; or if any industrial establishment has been destroyed by fire with a probability of its being rebuilt, our friends should understand that possibly there may be something in the event for them. Do you catch on to the idea?

The starting of any such concern means a demand for some sort of machines, machinery, or supplies, such as steam engines and boilers, shafting, pulleys, belting, lubricants, machinery supplies, wood or iron working machinery, ventilating and drying apparatus; pumps, valves, packing, dynamos, motors, wire, arc and incandescent lamps, and an infinite variety of electrical supplies, chemicals, acids, alkalis, etc. It is well worth the while of every reader of the Canadian Manufacturer to closely inspect all items under the head of Captains of Industry.

At the recent annual meeting of the Ottawa Board of Trade, a statement was submitted showing the resources of water power within a radius of forty-five miles of the city. This summary is based on the opinions of such engineers as A. Bell, of Almonte, and Clark and Keefer, of Ottawa, and upon information obtained from prominent lumbermen. The total is 664,000 horse power.

The Toronto Carpet Manufacturing Company have just placed an order for carpet looms with the M. A. Furbush & Son Machine Company, Philadelphia.

The report of the American Consul General at Montreal, shows that \$31,000 worth more of carpeting was imported into Canada from the United States in 1897 than was imported in 1893, and that a decrease of \$44,000 was noticed in the imports of carpet from Great Britain in 1897 as against those of 1893.

Charles Burrill, of Weymouth, Digby county, N.S., left for England a few days ago to conclude the arrangements for a scheme in which he is interested and which is to be put through by British capital. The new company will buy large tracts of spruce timber land along the Sissiboo river, back of Weymouth, and erect one or more pulp mills on certain of the excellent water privileges in the Sissiboo.

The Dominion Weaving Co., Maisonneuve, Que., has leased new premises and propose to considerably increase their plant.

The Magnetawan Tanning and Electric Co., Magnetawan, Ont., have increased their capital stock to \$100,000.

The Sturgeon Falls Electric Light and Power Co., Sturgeon Falls, Ont., have been incorporated with a capital stock of \$20,000.

The Voelker Light Co., of Toronto, has been incorporated with a capital stock of \$40,000 to acquire the Canadian patent of the Stirling Light Co.

The J. Hungerford Smith Co., Toronto, has been incorporated with a capital stock of \$20,000 to manufacture extracts, etc.

Farmers in the vicinity of Fort Saskatchewan, Alberta, held a meeting recently in regard to the proposed new flour mill at that place, and it was decided to make the capital stock of the company \$30,000 in shares of \$60 each. The town of Fort Saskatchewan gave a free site for the mill.

Dunn's lumber and sawmill at Sault St. Marie, Ont., was destroyed by fire Feb. 11th, loss about \$4,000.

The Richelieu River Navigation Co., have on the stocks in the yards of the Polson Iron Co., Toronto, a new steel screw steamer 112 feet long. She will be complete in time for the opening of navigation.

The Eugene Munsell Co., of New York, probably one of the largest concerns in the world handling mica, will establish extensive works at Ottawa for preparing mica in various forms for the market.

The loss sustained by the destruction by fire of the factory of the North American Bent Chair Company, at Owen Sound, a few days ago, amounts to about \$75,000.

At a recent meeting in Toronto of the Directors of the Hammond Reef Gold Mining Co., a contract was closed with the Jenckes

Machine Company, of Sherbrooke, Que., for thirty additional stamps, the necessary ore crushers, aerial rope tramway, flue vaners, water wheels, etc. This will give the company a thoroughly equipped, 40-stamp mill, and will make it one of the largest and most complete free milling gold mill plants in Canada. The Board also let a contract to the Canadian General Electric Company for generators, motors, electric line and complete equipment for the production and transmission of electric power from Clearwater Falls, a distance of less than two miles. The stamp mill is of the latest design and the stamps of 1,050 pounds weight each. The heavier stamps have been decided upon, as they have been found to give better results on like properties and are now in general use in Australia and South Africa, and in such mines as the Homestake, Alaska, Mexican and Treadwell on this continent. It is expected that this new plant will be in full operation in August next, crushing over 100 tons a day.

The Manitoba Hotel, at Winnipeg, Man., the property of the Northern Pacific Railway Co., and perhaps the largest and finest hotel structure in Canada, west of Ontario, was destroyed by fire Feb. 8th.

It is announced that Messrs. Frederic Nicholls, Geo. A. Cox, A. E. Ames, H. M. Pellatt, and J. W. Flavell, of Toronto, and associates, are forming a company to acquire the Fisher patents in the construction of automobile vehicles. The vehicles for use in the United States and for export will be made in Chicago. In Canada the "electrics" will be made by the Canadian General Electric Company, at Peterborough, Ont. The arrangements for the introduction of the vehicles are said to have been completed. An electric cab company has also been formed in Toronto, chiefly by directors of the Canadian General Electric Co., and ten cabs have been ordered for livery purposes from the Peterboro' works. It is expected that they will be ready to begin a service early in May. The cabs will be of the sort already familiar to visitors to New York. The storage batteries can, when exhausted, be recharged by means of a simple attachment to the wires in any house supplied with electric light. The new vehicle will not be confined to purposes of hire.

The Farmers' Union Elevator Co., of Grötna, Man., is applying for incorporation with a capital stock of \$10,000.

The Portland Rolling Mills Co., St. John, N.B., is applying for incorporation, with a capital stock of \$90,000.

## INGERSOLL-SERGEANT Rock Drills

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The Dominion Woolen Mfg. Co., Beauharnois, Que., have decided to add to their already extensive plant now spinning machinery and looms.

The Hawthorn Woolen Mills Company, Carleton Place, Ont., are increasing their lighting plant and have placed their order with the Royal Electric Company for one of their 25 k. w. bi-polar direct current generators.

Users of belting will be pleased to note that the well-known firm of D. K. McLaren, with head office and factory in Montreal, and branches in Galt and Ottawa, have opened a stock depot at Toronto, where they will endeavor to keep an assorted stock of their "Genuine Oak" belting, which it is claimed gives entire satisfaction to all who use it. This branch is in charge of Mr. James T. Craig, late Craig & McArthur, who will be found at the old stand, 69 Bay street.

The Polson Iron Co., Toronto, are building three large pulp digesters for the Rioridan Paper Mills Co. at Hawkesbury.

An order for 160,000,000 feet of lumber has been placed in the sawmills at Vancouver, B.C., for a Chinese railway. New mills are being erected to increase the output.

The Owen Sound Iron Works Co., Owen Sound, Ont., has been incorporated with a capital stock of \$20,000, to carry on the business of iron founders, machinists, etc.

Mallow & Malcolm's carriage works, Hamilton, Ont., were destroyed by fire Feb. 4th. Loss about \$800.

A firm composed of leading capitalists of Ottawa and Toronto, with a capital of \$800,000, will shortly erect what will probably be one of the largest locomotive works in Canada. The old Perkins foundry and machine shop has been leased, and in a few months machinery and all the necessary plant will be placed in it. A large addition will be made to the building. A big shop for the manufacture of acetylene gas engines will be built. The company will take power from the Chaudiere.

Messrs. Moir, Son & Co., Halifax, N.S., have recently established an acetylene lighting plant into their extensive confectionery works that is giving much satisfaction.

The Frost & Wood Co., Smith's Falls, Ont., has been incorporated with a capital stock of \$800,000, to carry on the business of manufacturing agricultural machinery, implements, etc.

Last Saturday the Laurie Engine Co., Montreal, shipped to Winnipeg the new 500 h.p. engine they have just completed for the Winnipeg Electric Street Railway Co. This engine is the first of a new design the company intend to manufacture, and is of most graceful proportions. It is of the vertical cross compound Corliss type, provided with tail rods and a shaft governor.

This latter is directly connected with the high pressure steam valve which is of the piston slide valve class. This valve was made thus as the Corliss valves, being unbalanced, would require a governor of much larger proportion in order to keep the supply of steam completely under control, which is thus affected by using a piston valve. The cylinders are respectively high pressure eighteen inches, low pressure thirty six inches in diameter, with a common stroke of two feet. The fly wheel is ten feet in diameter and weighs about fifteen tons. The engine was built for electric generating purpose, and is provided with one of the Canadian General Electric Co's most modern generators which is secured directly to the engine base plate. The machine occupies very little space compared with other engines of the same power, the cylinders being placed very close together, only allowing sufficient room between the main bearings for the fly wheel and generator. The eccentrics are erected on drag shafts which are at either extremes of the engine and are operated by drag links which are attached to the crank pins. The greatest length of floor space required is only thirty feet which makes the engine very compact. It stands about seventeen feet high from the floor line. The working steam pressure is to be 125 pounds per square inch and the speed 150 revolutions per minute.

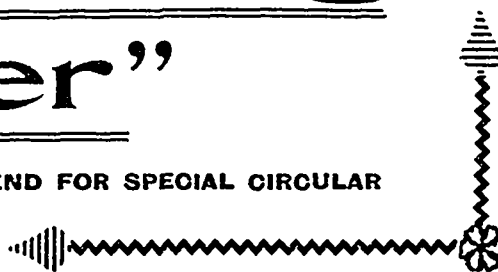
# THE WM. HAMILTON MNFG. CO., LIMITED,

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A charter of incorporation has been granted to W. F. Maclen, Frederick Diver, J. J. Palmor, J. T. Johnson, and William Christie, under the title of the Central Press Agency, enabling them to carry on a printing, publishing, and stereotyping business. They are also given authority to purchase and take over the good-will, business, contracts, and assets, and to assume and pay off the liabilities of the Central Press Agency of Toronto. The share capital of the company is placed at \$100,000.

Messrs. Clayton & Sons, Halifax, N.S., manufacturers of ready made clothing employ about 100 more hands now than at any previous time their total number of employees now being upward of 500. A new brick warehouse, 60 x 30 feet, four stories high, for their wholesale business has recently been completed as a wing of the present main building. Their factory contains every special machine for the manufacture of clothing that is made. In one room 250 hands are employed, and all the machinery is run by electric motors.

The Sturgeon Falls Electric Light and Power Co., Sturgeon Falls, Ont., has been incorporated with a capital stock of \$20,000.

Some of the facts and intentions of the Grand Falls Power Company, whose head office is at Fredericton, N. B., are given by The Fredericton Gleaner. The company, with a capital of \$5,000,000, was organized last June. It includes Senator Proctor, Vermont; Vice-President Hobart, New Jersey; Secretary Alger Michigan; Sir William Van Horne, president of the C. P. R.; R. B. Angus, ex-president of the Bank of Montreal; William Mackenzie, president Toronto Street Railway Company, and Hugh H. McLean, St. John. The property belongs to the town of Grand Falls, N.B., and the town cannot lease it until proper legislative authority is given, which is to be secured at the next session of the Legislature. After the lease is obtained the company propose to erect a mechanical pulp mill, a sulphite pulp mill, a paper mill, and a sawmill, all on the very largest scale. The output is to be 270 tons of pulp per day.

A thriving business is that of Messrs. Joseph Orr & Sons, of Stratford, Ont. They

manufacture sideboards exclusively, and find that they have sufficient orders at present to keep them busy until February 1st. Their business increased 15 per cent. in 1897 over 1896, and this year's increase over 1897 is estimated at 25 per cent. In 1896, 40 hands were employed; in 1897, 45 to 50 and in 1898 about 55 hands. This year the firm expended between \$3,000 and \$4,000 in new machinery, and at the same time added about 5,000 feet of floor space. At present they are compelled to work the whole staff twelve and one-half hours a day to keep up with the orders that are coming in. As it is, there is a considerable number of orders which they cannot fill. Next year it is the intention of the firm to expend between \$6,000 and \$7,000 in plant, and also to increase the floor space by erecting an addition to their already large establishment. When asked how business was, Mr. Orr said it was booming, but as he is a well-known Conservative he suggested "that it was not due to the efforts of the Grit Government, but to the efforts of the firm itself."—The Globe.

Speaking of the Perth Flax and Cordage Co., of Stratford, Ont., The Globe says: "In 1896 these mills were a very small affair compared with what they are now. Last year the Perth Flax and Cordage Company was formed under the management of Ald. John Hogart and new extensive buildings have been erected at a cost, plant and all, of over \$20,000. The main factory is of brick, two stories high, and 104 x 40 feet. In addition there is an engine room 24 x 20; a rope-walk 350 feet long; a flax mill 36 x 56, two stories high, and a storage barn 106 x 40. The power is supplied the different mills from one large boiler, the steam being passed underground to the flax mill engine 120 feet distant, while another engine in the factory supplies the power there. At present a lot of new machinery is on the way from Dundee, Scotland. All kinds of dressed flax are turned out, and cordage and twines of all sizes in flax, hemp and jute are manufactured. They also deal in flax seed. The output has been doubled during the past year, and the hands employed in the factory have been increased from 17 or 18 to about 50. During the summer about 100 are engaged pulling flax."

Messrs. J. C. Wilson & Co., paper makers, Montreal, have sent us their catalogue of souvenir post cards, representing sports and pastimes in Canada, embracing forty designs on twenty different cards, and a series of patriotic post cards, including Columbia and Britannia, British Ensign, Britannia with British Lion and Old Glory, etc. The fad of collecting fancy post cards, which has been in vogue in Europe and other countries for some years, is making its presence felt in Canada and the United States. The idea of sending an invitation, congratulation or message of greeting and remembrance to friends or relatives on a card embodying a beautiful design, has struck a popular fancy and the custom of exchanging these cards which is not only a novel feature, but also instructive, promises to become as popular on this side as it is in Europe.

Mr. Jonathan Ellis is contemplating building a twenty-set yarn mill at Port Dover, Ont.

## The Canadian Manufacturer

Toronto, Canada,

Is the OFFICIAL ORGAN of the

Canadian Manufacturers' Association,

which represents all the important Manufacturing Industries of the Dominion of Canada.

Published Twice a Month.

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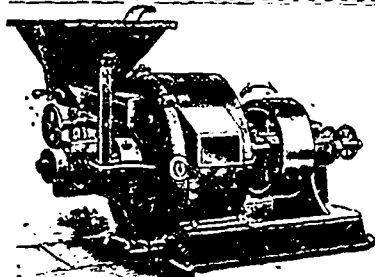
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LUBRICATING OILS, GREASES, AND BOILER COMPOUND, COTTON WASTE, ETC.

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**MILLSTONES.**

FRENCH BUHR AND ESOPUS STONES. *Send for Circular.*

**STURTEVANT MILL CO.**

BOSTON, MASS.

**ANOTHER CANADIAN IRON FURNACE.**

The town of Midland, Ont., is to be the site of a blast furnace industry. The Canada Iron Furnace Company propose to build a sixty ton charcoal furnace there, the town appropriating the sum of \$50,000 as a bonus. In discussing the matter at a public meeting at Midland a few days ago, Mr. George E. Drummond, Managing Director of the Canada Iron Furnace Co., stated that his company had large and important charcoal iron furnaces at Radnor Forges, Que., with auxiliary iron consuming works at Montreal, St. Thomas, Hamilton, etc., and they desired now to erect a furnace at some point in Ontario that would give them cheaper access to the Canadian trade of the west. He stated that with all their immense facilities now in operation in Canada they were still compelled to import large quantities of pig iron from the United States in order to obtain necessary mixtures of metal with their present special charcoal iron made at their own Radnor works in Quebec, with which to furnish car wheels to the Intercolonial Railway, the Canadian Pacific, the Grand Trunk and the Canada Atlantic and many other railways of Canada. He went on to say that it was the intention of his company to develop Canadian iron mines and

from the reports that have been received concerning the ore beds of the north shore of Lake Superior as well as those of the counties of Hastings, Victoria and Nipissing district, he felt confident that sufficient supplies could be obtained in due time through which Ontario would be able to supply crude material that they are now compelled to import, and with that object in view, if the bonus by-law is carried and necessary legislation obtained, they are arranging with the Ontario Director of Mines, Mr. Archibald Blue, to make a thorough investigation of the existing iron mines at the places indicated as soon as the snow was off the ground.

**MUNICIPAL OWNERSHIP OF ELECTRIC POWER PLANT.**

The town of Orillia, Ont., has passed a by-law appropriating, \$75,000 with which to install an electric power transmission plant to be owned and operated by the corporation. The work of construction will be proceeded with at once, and the plant is expected to be in operation within a few months.

The "power scheme," as it is locally termed, has been under consideration for more than a year, and all the details have been

fully worked out, even to awarding the contract and disposing of the light and power, provisionally, of course. The proposed source of power, the Ragged Rapids on the Severn river, is nineteen miles overland from Orillia. It is an ideal water-power, with a natural head of thirty-four feet, easily developed, and having a capacity of between two and three thousand horse power at low water. Of this it is proposed to develop 800 horse power at the present. Three hundred and fifty horse power will be utilized to run the electric lighting and water works plants, owned by the corporation, while about 250 more will be used by industries at present located there. With the remainder, the Council will endeavor to induce manufacturers to locate in the town by offering power at exceptionally low rates.

The Town Council has been twice elected to office on the platform of carrying out the scheme. After investigation it fully themselves, they employed Mr. Wm. Kennedy, jr., of Montreal, to report upon it. His report was favorable, and Mr. Roderick J. Parke, of Toronto was then instructed to prepare plans and specifications for the plant. Tenders were asked upon these, and after keen competition the contract was awarded to the Central Construction Company of Buffalo, N.Y., who tendered to put in the

**The KAY Electrical Manufacturing Co.**

HAMILTON, ONT.

Begs to announce that in future it will conduct its business under the name of

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140 x 40 ft.

The other 90 x 60 ft.

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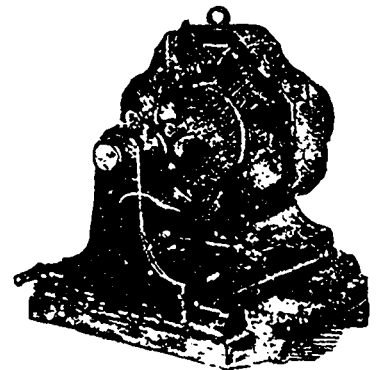
Esplanade and Jarvis Streets, TORONTO.

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**The Electrical Construction Co. of London, Limited.**



**MULTIPOLAR MOTORS & DYNAMOS**

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whole plant, electrical and hydraulic, for \$67,200. Various extras will bring the price up to \$73,800. All the machinery will be of the latest and most approved pattern. The dam is to be of stone masonry, the flume of steel, and every other part of a like substantial nature, with a view to having the plant outlast the term of the debentures, which is thirty years. The power will be transmitted at a pressure of 20,000 volts, and used at 1,000 volts. None of it will be transformed to direct current, but the town will supply alternating motors and charge a rental for them.

Orillia was the first to apply to the Ontario Government for the right to develop a water-power under the recent legislation. It was granted leave to develop 500 horse power at an annual rental of \$100, and to take what more was wanted at 12½¢ a horse power. Orillia will also be the first municipal corporation on the continent to go into the power business. It will have the lowest schedule of power rates in America, lower than that in vogue at Niagara. The rates range from \$27 a horse power for small takers to \$13.50 per annum for 30 horse power and over, for a 24 hour service. There will also be an exceedingly low tariff of light rates, as a reduction of from 20 to 40 per cent. will come into force as soon as the plant is installed, and in addition to these advantages it is expected that there will be a tidy little surplus of receipts over expenditure to go towards reducing the taxes. It is an alluring prospect, an interesting experiment in municipal ownership.

#### ACTON'S MUNICIPAL LIGHTING PLANT.

The Municipal electric lighting plant at Acton, Ont. was completed and put into successful operation a few days ago, over which event The Free Press takes much enjoyment. Among other things it says:—

"The last piece of the electric lighting plant machinery was placed in the power house on Saturday morning and on Saturday evening the current was turned on both the street and domestic circuits. Considering that all the machinery was new and the

installation of the system was in many respects intricate, it was a genuine surprise that everything went without a hitch, and that the plant was continued in uninterrupted operation from dusk until midnight on its first day. The citizens generally were delighted that at last electric light was an established fact, and that the streets were brilliantly lighted in every part of the town. Similar satisfaction was also expressed by our merchants and hotel men, the majority of whom have installed the lights in their places of business, as well as by those who have had it put into their residences."

Speaking of the details of the construction:

"Electrician Reynolds had general oversight of plans and arrangements; Mr. N. Forbes and Officer Graham of the erection of the power house; Mr. W. Cowan, of the Goldie & McCullough Co., of the placing of the boiler and engine, and Mr. H. J. Hurd superintended the construction of the electric wiring and machinery department for the W. A. Johnson Electric Co. Every man of them performed his work with skill and dispatch, and as a result we have within seventy days from the inauguration of operations a first-class plant installed.

"The plant includes the following: A stone power house 24x50, floored with maple with walls and trimmings of dressed red birch. The engine and dynamo room is 24x37 and the boiler room 24x13. The engine is of the Wheelock type; capacity 75 h.p. nominal, and the boiler 90 h.p. These were supplied by the Goldie & McCulloch Co., G. C., and uphold the reputation of that well-known firm. The dynamo is a fifty kilowatt machine, with a capacity of 1,000 incandescent lights. It is of the alternating current type, which system has been placed with much success in various electric stations. This firm also supplied a fine two-panel marble switchboard with full complement of controlling instruments. There are fifty-six 32 c.p. incandescent street lamps, arranged in two circuits independent of each other, and a third circuit for domestic and commercial service, also independent. The main driving belt is a 16 inch belt, 65 feet long, and the dynamo belt is a 10 inch, double, endless. Both were supplied by the belting department of Acton Tanning Company."

#### ONE-BATH METHODS FOR ANTHRACENE ACID BROWNS AND BLACKS.

The following one-bath methods of dyeing the Anthracene Acid Browns and Blacks supplied to us by Wm. J. Matheson & Co., New York, have been found to yield most excellent results.

**Anthracene Acid Brown.**—The bath is corrected with oxalate of ammonium, if necessary, and the requisite quantity of dyestuff then added. The goods are entered at 100° F., and the temperature slowly raised to 140° F., when 1 per cent. acetic acid (50 per cent.) is added, then to 160° F., when another addition of 1 per cent. acetic acid is given the bath, and finally to 195° F., when the third addition of 1 per cent. acetic acid is made. The bath is then brought to the boil and kept at this point for at least ¾ hour. At the end of this period, ¾ per cent. acetic acid are gradually added to the bath, and the boiling continued until the complete exhaustion of the color. After dyeing, the chroming is done at the boil, and requires from ½ to ¾ hour, using 1½ to 2 per cent. bi-chrome: the quantity of bi-chrome employed being regulated by the depth of shade.

When dyeing on a chrome mordant, the material must first be rinsed before being entered into the dye-bath. In this case it will be found that ½ per cent. bi-chrome will be sufficient to use in the treatment of the goods subsequent to the dyeing. Anthracene Acid Brown by itself, and also in combination with the Anthracene Acid Yellows and Black, are always dyed in one bath according to the above recipe, since such dyeings are just as fast to milling and light as are those obtained where two baths are employed. If it is desired that the shades be absolutely fast to light, it is then necessary that the dyeing be done on a chrome mordant. Shades of such fastness to light are produced in this manner using Anthracene Acid Brown R or N in combination with Alizarine Blue CS.

The one-bath dyeings of Anthracene Acid Brown R, N, B and SW, and also the combination of these colors with Anthracene Yellow and Anthracene Acid Black LW are entering into very successful competition with those of the Alizarine Colors in combination with the extracts of logwood and fustic. This is owing to their much simpler

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WE MAKE A SPECIALTY OF SUPPLYING

COMPLETE  
WATER POWER  
PLANTS

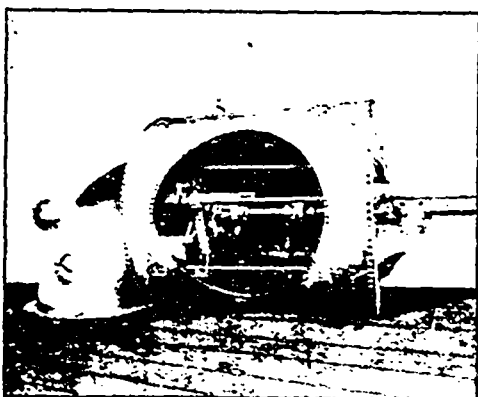
Designed to meet the working conditions in each instance, and to yield the highest efficiency obtainable thereunder. Every detail constructed in a thorough and substantial manner, and the whole equipment installed on the site by our own workmen, especially skilled in this class of work.

If you are interested in water power in any way, we should take pleasure in supplying you with information regarding our work in the above line.

Catalogue Free on Request Correspondence Invited.

The JENCKES MACHINE CO.  
42 Lansdowne St., Sherbrooke Que.

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35-inch Crocker Wheel in Horizontal Setting, for Shipton Electric Light and Power Co., Danville, Que.

method of working, their low cost of production, and to the fact that the dyings obtained with the Anthracene Acid Colors are as fast to light as are those obtained by the use of the Alizarines in combination with the natural extracts. Where fastness to light is particularly desired, we can recommend that combinations of Anthracene Acid Browns R and N, with Anthracene Yellow C and Alizarine Blue CS be employed. It is well to note that if the water to be used in the above operation be found to be so strongly calcareous as to cause the tops to appear dusty after dyeing, that this evil may be overcome by the addition of  $\frac{1}{2}$ -1 per cent. of muriatic acid to the bath after dyeing, i. e., after chroming.

**Anthracene Acid Black.**—The bath is corrected with oxalate of ammonium, as before, and the temperature raised to 140°-160° F. There is then added to the bath, besides the necessary quantity of dyestuff, 6 per cent. acetic acid (50 per cent.), or 2 per cent. bi-sulphate of sodium, or 1 per cent. sulphuric acid. The goods are then entered, and within 10 minutes the bath is brought to the boil. After boiling for  $\frac{1}{2}$  hour, 4-6 per cent. bi-sulphate of sodium, or  $1\frac{1}{2}$ -2 per cent. sulphuric acid are given to the bath, and the boiling then continued until the complete exhaustion of the color.

Particular attention must be paid to the exhaustion of the bath, and bi-sulphate of

sodium or sulphuric acid is added in such quantity as to ensure a complete exhaustion of the same. Should any dyestuff remain in the bath, it will be precipitated by the bi-chrome in the subsequent fixing process, and the dyings so obtained will be likely to rub off. On the other hand, an excess of acid must be carefully avoided, for if too much acid be present, the bi-chrome acts too energetically on the dyeing, thereby impairing its brightness. It is well to add acid to the bath, only until the latter begins to get clearer. The complete exhaustion of color will then be effected by slightly stronger boiling. The chroming is done at the boil after dyeing, and requires  $\frac{1}{2}$ -1 hour, with 1-1 $\frac{1}{2}$  per cent. bi-chrome depending on quantity of water and dyestuff.

Anthracene Acid Black LW is well adapted for the production of jet blacks, while by shading with 2-10 to 3-10 per cent. Diamine Green G, especially full shades are obtained. To produce a blue-black, a combination of equal parts of Anthracene Acid Brown R, Anthracene Acid Blacks LW and ST has been found very useful.

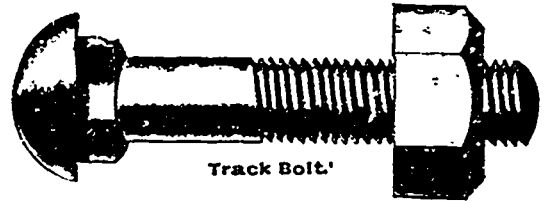
The extensive iron ore areas in Newfoundland, owned by the Nova Scotia Steel Company, have passed into the control of Mr. Henry M. Whitney and associates, of Boston, Mass., the consideration being, it is said, \$1,000,000.

**INDUSTRIAL ACTIVITY IN QUEBEC.**

Arrangements have just been completed for the establishment of a new line of great ocean freight steamers which will make the city of Quebec their terminus. The new line will be inaugurated in the season of 1900 and will be operated in conjunction with the Great Northern railway. This railway connects with the Parry Sound route, which is designed to carry the grain of the Western States and Canada to the ocean. Steamers of immense capacity, which have been chartered to cover the distance between Duluth and Parry Sound, will bridge the gap between the Northern Pacific and the Parry Sound railway, making them practically one system to the ocean. The belief is that the immense American traffic in grain which lately congested the port of Buffalo will contribute enough to make an important addition to the trade of Quebec, and in part so revive the languishing business of the port as to make it once more an important Canadian outlet. The project is the outcome of the new activity which has developed in the old historic town. Great changes are taking place there daily, which go to show that Quebec is preparing to take its place in the struggle for commerce which is going on between the ports on this side as well as on the other side of the Atlantic.

Two factors have contributed to stimulate

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*Track Bolts and Nuts,  
 Bridge and Roof Rods,  
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Track Bolt.

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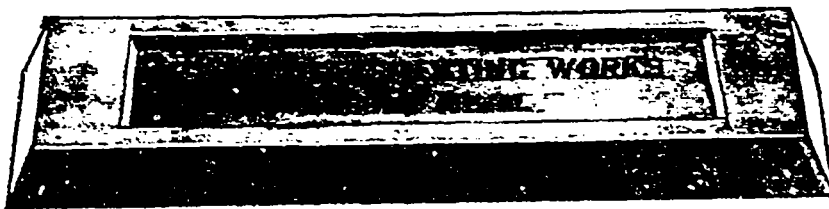
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the ambition and arouse the hopes of Quebec. The more important of these is the enlargement of the ocean carriers. Twenty-five years ago, when the bulk of ocean freight was moved in sailing vessels, Quebec was a busy, thriving port. But the general application of steam carried the trade by its doors, and took it to Montreal. The

tendency to-day to larger ships, which are unable to safely ascend the river so far as Montreal, threatens to transfer the trade of the St. Lawrence to American ports unless vigorous efforts are made to secure a well-equipped deep-water terminus on the St. Lawrence. It is to meet that need that old Quebec is to-day bestirring herself. The other factor in the situation—the deepening of the Canadian canals, which is to be completed next year, to fourteen feet—promises to bring from the lakes to the seaboard a larger trade, in which Quebec expects to have a share. For these reasons a revival of the maritime importance of the place is confidently expected, and Quebec counts upon the trade which it has lost being returned with interest.

A writer in The Canadian Gazette says that Quebec is like the sleeping beauty, after she had received the magic kiss. The simile, however, scarcely does justice to this city, because for several years past the modernizing effect of progress has been felt in old Quebec. A great step in advance was made when the C.P.R. built the magnificent Chateau Frontenac, which, during the summer, is taxed to its utmost by tourists. Of late years it has been almost impossible to accommodate the throngs of of summer visitors, who, by viewing the oldest parts of Quebec, could see a city of a century ago. Following this advance and the erection of splendid municipal buildings, has come, somewhat late in the day, the electric street car. But, though tardy, it seems now that electricity is coming in with a rush. One company which has a magnifi-



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 112 South Twelfth Street,  
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cent power at the falls of Montmorency, is operating in the city. Another company is now building a dam on the Jacques Cartier river, to electrify Quebec, and a third is utilizing the Chaudiere power to give electricity to Levis and possibly to this city.

It is rather remarkable that the oldest part of the Dominion should have awaited so late in the day to be open for settlement. Yet at the back of Quebec, stretching north and west, there is a country that is new to the settler. This district, which, until a few years ago, was thought to be useless for agricultural purposes, now has some of the best farms in the province. Last year it attracted 1,300 new settlers. The Lake St. John district was opened up by the Quebec and Lake St. John railway. It contains 6,500 square miles of agricultural land, or 4,000,000 acres. In this immense area are already scattered 40,000 persons, whose numbers are being largely augmented by immigration each season. On the railway which traverses the district seven million dollars have been spent. Last year it carried 153,000 passengers, and 199,000 tons of freight, and this year there was an increase of about twenty per cent. No company has a more complete system of looking after immigrants than the Quebec and Lake St. John. It sends literature and lecturers throughout the continent, and the intending immigrants are carried by it free to their destination. In the past the over-

flow of the population of older Quebec has gone in the direction of the United States. To-day it is being diverted to the Lake St. John district, and the population is being swelled by the repatriation of exiled Canadians. There is, in fact, growing up in this hitherto neglected country a new province.

The pulp and paper industry have had a great deal to do with the opening of this New East. The clearing of a farm is no longer a loss of time and labor to the settler, but a source of remuneration. In fact, under present conditions the settler makes as much from his first harvest of wood as any the soil may subsequently yield at his invitation. He has, moreover, a market at his doors for his product. At Chicoutimi there is a mill now shipping three cars of pulp per day. All along the line are mills turning out lumber and railway ties, which give employment in the woods and elsewhere to 6,000 men. There is to-day not one idle man in the Lake St. John district, and it is difficult to get the labor required there. Northeast of Quebec, in the country opened up by the Great Northern railway, hamlets, villages and towns are springing up rapidly around the industries that are being established. Every man in St. Raymond is busy cutting and hauling square timber for the Quebec harbor works, for which 200,000 square feet have been ordered. That place is also turning out a similar quantity for the dam for the Jacques Cartier Electric Power Co., whose works are being built by a firm

of Toronto contractors. At Grand-Mere, \$2,000,000 have been expended by American and Canadian capitalists in the erection of great paper and pulp mills, employing 1,100 hands, which are to-day shipping largely to the London market. A town of 2,500 has sprung up around the industry. A few miles further west at Shawenegan, a Boston company is preparing to spend \$4,000,000 in paper and pulp mills. Some eighty-eight miles of railway have yet to be completed, which will be done next summer, and Quebec will have direct rail connection with the big paper and pulp establishment projected at Hawkesbury. It is predicted that when the new steamship service is in operation it will command a large traffic from these industries, as well as from the rapidly-growing Lake St. John district.

Mr. Daniel Scotten, it is understood, will erect a large tobacco factory at Windsor, Ont. The lot upon which it is to be built is 203 x 100 feet.

BRADFORD Merchant who is buying British Textiles on commission for two good German and Swiss houses and has ample warehouse and office accommodation, desires to add Canadian connection (knows market well) or any other country, and will confine himself to good houses. Address - Box 3495 Sell's, 167 Fleet St., London, England.

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Our output exceeds that of all other wood pulleys combined. There are no drawbacks with us, we have the best wood split pulley made, and we want to send you our new 260 page Catalogue, also our revised Discount Sheet and to tell you all about all kind of pulleys.

We carry a complete stock of pulleys in sizes from 4 in. diam. to 60 in. diam. any face, and can ship most any order on day received. A post card or a phone will bring us to you at any time.

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Bar Iron, Steel, Boiler Plate,  
Rivets, Tube Expanders,  
Hammers, Metallic Letters  
and  
Figures for Patterns.

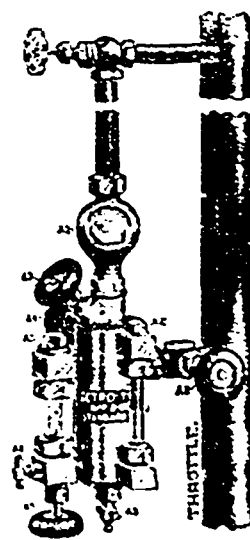
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Send for Catalogue and Prices.

**Detroit Lubricator Co.,**  
DETROIT, MICH.

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**THE NEW NIAGARA GORGE BRIDGE.**

The new suspension bridge about to be erected across the Niagara gorge, when completed, will be the only structure of its kind spanning the chasm, all of the old suspension bridges having been supplanted by new steel arches. This new bridge will occupy the site of the old Lewiston suspension bridge, and in general outlines, position, etc., will conform very closely to the old structure. Men are now at work erecting the false work for the short shore spans, and as soon as this part of the work is finished, connection will be made between the cliffs.

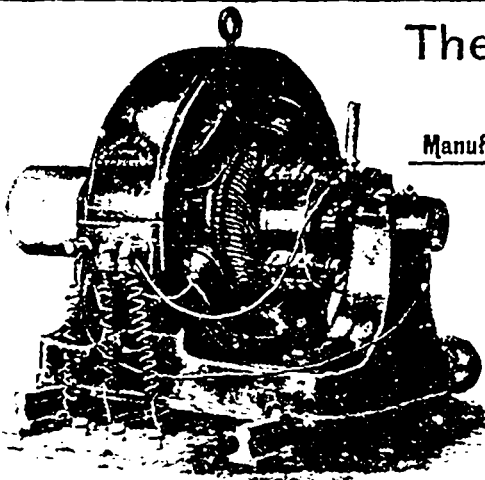
The length of the cable span from tower to tower will be 1,040 feet, while the span of the stiffening truss will be 800 feet. The width of the structure will be twenty-eight feet, and the width of the roadway will be twenty-five feet. This will be wide enough to allow a single track to be laid through

the centre for trolley cars, and will leave room on the outside of the tracks for teams to pass abreast. The floor will be two-inch oak plank laid crosswise. The suspended span will be connected to the banks by two approach spans, the one on the New York side to have a length of 31½ feet, and that on the Canadian side to be 19½ feet long. As the bridge will be located a little beyond the line of foot travel, no special provisions will be made for pedestrians, as on the other great bridges at the Falls. It is expected that about all the travel the bridge will catch will be in electric cars and carriages.

The towers and approaches to the bridge have already been constructed. The towers are four in number, two on each side of the river. They are not so massive as the towers of the old suspension bridges at Niagara, and are made of stone. The towers on the New York side stand twenty-eight feet back from the bluff, are twenty-six feet high, and have bases thirteen feet square.

The Canadian towers are fifteen feet back from the bluff, are eighteen feet high, and their bases are twelve feet square. The difference in the height of the towers is occasioned by a difference in the height of the banks, while their location back from the edge of the bluff is determined by the solidity of the ledge, that on the Canadian side being found more firm. In the construction of the new towers the greater part of the stone from the towers of the old bridge was used in the bases of the new ones, while the old inscription stones of the former have been preserved and have been placed in the new towers. The stone for the New York towers came from the Buffalo quarries, and that for the Canadian towers from the Queenston, Ont., quarries.

This latest Niagara bridge is to be supported by four cables, each composed of fourteen 2½ inch galvanized cast steel wire ropes. It is interesting to note that these wire ropes once formed a part of the cables of the old upper suspension bridge here at the Falls, which very recently gave way to a new steel arch. The span of the upper suspension bridge was so much longer that it has been found possible to cut the ropes of the old cable in two, and thus use them



**The Jones & Moore Electric Co.,**

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All Work Fully Guaranteed

**ELECTRIC LIGHT and POWER PLANTS a Specialty**

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**Engine Paeking,**

**Magnesia Pipe Covering**

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**SIMPLE, SAFE AND RELIABLE**

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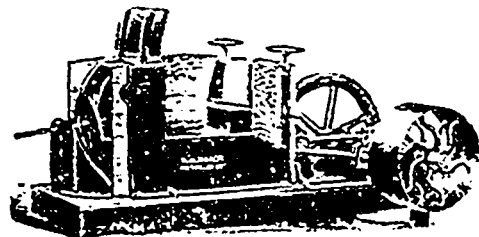


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Spokane, Washington.

**MINE PROMOTERS and ASSAYERS.**

Reports made on Mining Properties, and advice given on the merits of Mining Stocks and Properties



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Manufacturer of

**WOOLEN MACHINERY,**

Rotary Fulling Mills, Kicker Fulling Mills, Soaping Machines, Cloth Washers, Wool and Waste Dusters, Rag Dusters, Drum Spool Winders, Reels, Spooling and Doubling Machines, Ring Twisters, Card Creels, Dead Spindle Spooler for Warp or Dresser Spools, Patent Double-Acting Gig Dyeing Machines.

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THE BRADSTREET COMPANY, Proprietors  
346 & 348 Broadway, NEW YORK.

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The Bradstreet Company is the oldest, and financially, the strongest organization of its kind—working in one interest and under one management—with wider ramifications, with more capital invested in the business, and it expends more money every year for the collection and dissemination of information than any similar institution in the world

TORONTO OFFICES:

McKinnon Bldg., Cor. Jordan & Melinda Sts.  
THOS. C. IRVING, Superintendent.

for the new bridge. However, their length when so cut is hardly long enough to fill out the entire suspended span and reach back to the anchorages, and for this reason about seventy-five feet at each end of the cable span will be made up of eye-bars. The anchorages for the cables are in, and are located about 150 feet back from the edge of the bluff, the pits being filled with concrete.

Both of the approaches to the new bridge run to the north. That on the Canadian side is about 1,000 feet long, while that on the New York side is about 800 feet long. Both have face walls to prevent the native shale disintegrating under the weather, and in the spring face walls will be built against the cliffs at the end of the bridge for about 150 feet. Double tracks will be laid on the approaches in order to facilitate the passage of electric cars on and off the bridge. The width of the approaches is about twenty-five feet.

The weight of the steel to be used in the construction of the bridge will be about 800 tons, and the weight of the cables will be 200 tons. The capacity of the bridge will be such that it will easily take care of the heaviest trolley cars likely to run in the Niagara locality, together with a uniformly distributed load of forty pounds to the square foot over the entire structure. The height of the bridge above the water will be sixty-five feet, and above the tracks of the Gorge road it will be about fifteen feet.

The expectation is that the Niagara Falls and Lewiston road will make connection with the bridge at the New York end, and the Niagara Falls Park and River railway with the Canadian end. After connection has been made between the electric road tracks in this city and the tracks on the upper steel arch, it will then be possible to make the entire trip around the gorge in an electric car. Leaving Prospect park the route would carry one across the upper steel arch in a car on the Niagara Falls Park and River railway, down the river along the top of the high bank on the Canadian side over the same road, onward to Queenston, across the new suspension bridge to the New York side, up through the gorge along the water's edge over the tracks of the Gorge road, and through the city to the point of starting.

The new suspension bridge will probably be finished in time for the coming summer's travel, and then there will be a new attraction in trolley riding hereabouts. Eventually it may be arranged so that people may take an electric car in Buffalo or Rochester and without changing cars make the trip to this city, down the river to Lewiston and Queenston, and return home.

**SPECIAL CORRESPONDENCE.**

SPOKANE, THE CENTRE OF A RICH MINING DISTRICT.

EDITOR THE CANADIAN MANUFACTURER

Spokane, Washington, a city with a population of 45,000 located by the falls of the river from which it gets its name; is the



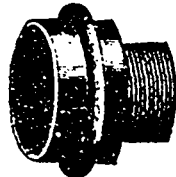
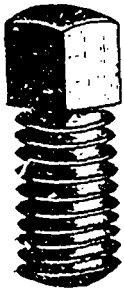
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For Heads of 3 Feet to 2000 Feet.

ADAPTED TO MILLING AND ALL POWER PURPOSES.

Recent tests at Holyoke enable us to guarantee:  
The Largest Power ever obtained from a wheel of the same diameter. The highest speed ever obtained for the same power. The highest mean efficiency ever obtained when running from half to full gate. We guarantee also: A runner of the greatest possible strength. A gate unequalled in quickness and ease of opening and closing.  
Write for pamphlet, stating your Head.

**JAMES LEFFEL & CO., Springfield, Ohio, U.S.A.**



The **Diamond  
Machine & Tool Co.**

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Manufacturers of....

**Machine Screws**

OF EVERY DESCRIPTION.

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WESTERN TRADE:—Toronto Stock Depot.

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THE LIGHTEST. THE STRONGEST. THE BEST.

If you use Electricity we Batteries Repaired and Recharged  
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BOBBINS  
SPOOLS  
PICKER  
STICKS  
CLOTH  
ROLLS, Etc.



JOHN HOPE & CO., - - LACHUTE, QUE.

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**BOBBINS and SPOOLS**

FROM SELECTED STOCK.

Correspondence Solicited .....  
Orders Promptly Filled.....

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recognized centre of what gives promise of being one of the richest mining centres of the world. To the north of the city lies the great mines of British Columbia, and the Northwestern territories whose output for 1898 in gold, silver, copper and lead amounted to \$29,638,200 while to the north also lies the famous Republic camp, in which, although its exceptional high values were but recently discovered, 16,600 feet of development work was done during 1898. The Colville Indian Reservation has been but hurriedly prospected, and but little development done in proportion to the many locations made, yet many ledges cropping to the surface are found carrying high values. On the Reservation, and in Stevens County, are many valuable mines of coal, marble, onyx, and other valuable stones.

To the south of Spokane, are the great dividend gold paying mines of Eastern Oregon.

To the east and southeast are the world renowned mines of the Coeur d'Alenes producing 40 per cent of the lead of the country with quartz and placer diggings of untold wealth. Here also lies the free milling gold mines of the Dixy, Florence and Pierce city districts.

To the west are the mines of the Okanogan Country, Chelan, Methow and Slate Creek, and the east slope of the Cascade Range, all of which are adjacent to Spokane, and reached by the various lines of railroads centring therein. It is Spokane capital that is developing those camps, and Spokane merchants who furnish the supplies.

During 1898 one hundred and twenty-one companies were organized in Spokane to develop the mines of the surrounding country, and of the several million dollars invested in the purchase of developed properties, by eastern capitalists, by far the greater part was received by Spokane parties, the result of this money being in evidence in the great improvements carried on in the city, and the heavy investments made in residence and business properties. Up to the year 1898, mining in the Northwest was confined to a few districts; now new fields are being opened up, the miner and the capitalist have joined hands, and through their joint efforts have displayed to the world greater mineral riches than was dreamed to exist. As a result of this untold wealth, new railroads are stretching out their arms through the Northwest in every direction. Eight railroads now centre in Spokane, three of these have transcontinental connections. In every district the activity and prosperity incident to extensive railroad construction is evident. To the north and northwest the Canadian Pacific is pushing its extension from Robson to Midway, a distance of one hundred and five miles. To the northwest the Kootenai Valley rail-

road is being built from Bonners Ferry to Kootenai Lake, fifty-three miles. To the southeast the Northern Pacific is pushing the construction of one hundred and sixty miles of track to tap the rich farming land of Camas Prairie and the gold fields of the Clearwater river.

South and southwest, the Oregon Railway and Navigation Company is building a line between Wallula and Lewiston, a distance of one hundred and fifty miles. There are also many projected lines to tap the mining districts not yet entered by any railway.

The product of precious metal of the western districts for 1898, as shown by the annual statement of John J. Valentino, President of Wells Fargo & Co's Express, shows the valuation based on shipments handled by the Express Co., and other conveyances as follows:

	Gold	Other metals
British Columbia and N.W.T....	\$11,975,000	\$17,663,200
Idaho .....	2,487,000	11,648,205
Montana.....	4,630,630	43,898,090
Oregon .....	2,172,369	2,215,119
Washington .....	320,590	457,956
<b>Total.....</b>	<b>\$21,585,639</b>	<b>\$75,882,570</b>
<b>Grand Total</b>	<b>\$97,468,209.</b>	

The outlook for 1899 is very bright, many established mines will be added to the regular list of shippers, and there will be rapid advances in this great industry. In this great scope of country many legitimate and meritorious investments present themselves, Spokane being the point where the prospector and capitalists come together.

JNO. R. CASSIN.

The village of St. George, Ont. is to be lighted by electricity.

## FRICITION PULLEY BOARD

If you are not yet using it, send for sample.

The Dominion Leather Board Co.,  
MONTREAL, QUE.

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### F. R. F. BROWN, M.I.M.E., Consulting Engineer,

Telephone Main 2651.

Machinery, Rolling Stock, Engines and Boilers of every description supplied. To quote a specialty.

ARBITRATIONS. VALUATIONS.  
22 Street Railway Chambers, Montreal.

## ACETYLENE GAS

**Ideal Generator** the only machine that submerges the carbide.

**No Opening** of generator.

**No Heat** in generator.

**No Overgeneration.**

**No Bad Odour** through house.

**No Danger.**

Recognized by all experts as the **proper principle.**

TOWN LIGHTING AND LARGE PLANTS A SPECIALTY.

J. WALLACE & SON, 156 King St. East,  
Hamilton, Ont.

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# 1899- 35th -1899 Annual Statement

OF THE

## TRAVELERS

INSURANCE COMPANY.

Chartered 1863. (Stock.) Life and Accident Insurance

JAMES G. BATTERSON, President.

Hartford, Conn., January 1, 1899.

**Paid-up Capital, - \$1,000,000**

### ASSETS.

Real Estate.....	\$2,000,684.43
Cash on hand and in Bank.....	1,510,090.17
Loans on bond and mortgage, real estate.....	5,785,923.99
Interest accrued but not due.....	231,279.62
Loans on collateral security.....	1,182,327.61
Loans on this Company's Policies.....	1,175,489.21
Deferred Life Premiums.....	321,697.95
Premiums due and unreported on Life Policies.....	251,120.97
United States Bonds.....	11,000.00
State, County and Municipal Bonds.....	3,611,032.28
Railroad Stocks and Bonds.....	6,638,373.37
Bank Stocks.....	1,066,122.59
Other Stocks and Bonds.....	1,462,300.00
<b>Total Assets.....</b>	<b>\$25,315,442.46</b>

### LIABILITIES.

Reserve, 4 per cent., Life Department.....	\$18,007,596.00
Reserve for Re-insurance, Accident Department.....	1,329,372.80
Present value Installment Life Policies.....	567,944.00
Reserve for Claims resisted for Employers.....	430,101.55
Losses in process of adjustment.....	220,213.33
Life Premiums paid in advance.....	35,267.63
Special Reserve for unpaid taxes, rents, etc.....	110,000.00
Special Reserve, Liability Department.....	100,000.00
Reserve for anticipated change in rate of interest.....	400,000.00
<b>Total Liabilities.....</b>	<b>\$21,209,625.36</b>

Excess Security to Policy-holders, \$4,105,817.10

### STATISTICS TO DATE

#### LIFE DEPARTMENT.

Life Insurance in force.....	\$97,352,821.00
New Life Insurance written in 1898.....	16,087,651.00

Insurance on installment plan at commuted value.

Returned to Policy-holders in 1898.....	1,382,008.95
Returned to Policy holders since 1891.....	14,532,359.52

#### ACCIDENT DEPARTMENT.

Number Accident claims paid in 1898.....	16,260
Whole number Accident claims paid.....	321,250
Returned to Policy-holders in 1898.....	\$1,254,500.81
Returned to Policy-holders since 1861.....	22,464,598.75

#### TOTAL.

Returned to Policy-holders in 1898.....	\$2,638,509.76
Returned to Policy-holders since 1861.....	36,998,956.27

SYLVESTER C. DUNHAM, Vice-Pres't.

JOHN E. MORRIS, Secretary.

H. J. MESSENGER, Actuary.

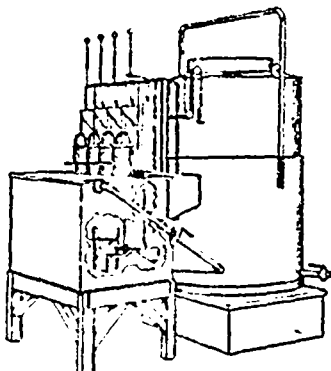
EDWARD V. PRESTON, Sup't of Agencies.

J. B. LEWIS, M.D., Surgeon and Adjuster.

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136 St. James Street

MONTREAL, P.Q.



Sizes - 2 1/2 light to 2000 light.

# Hamburg-American Packet Company.

## HANSA LINE.

The only direct line between Hamburg and Canada, affording regular sailings.

**WINTER SAILINGS.**  
HAMBURG AND PORTLAND, ME.

	From Hamburg.	From Portland.
SS. Helene Rickmers	Jan. 21th.	Feb. 13th.
SS. Alesia	" 28th.	" 20th.
SS. Strathlay	" 28th.	" 27th.
SS. Assyria	Feb. 6th.	Mar. 11th.

And fortnightly thereafter.

Through Bills of Lading issued to and from all points in Canada and Western States by the Grand Trunk Railway or their Agencies.

For further particulars apply to

**JAMES THOM, Manager,**  
13 St. John Street,  
MONTREAL.

## NOTICE

### To Importers and Exporters.

We beg to call your special attention to the improved service we intend to offer shippers and consignees next season. We have decided to increase the sailings of the **HANSA-ST. LAWRENCE LINE** between Hamburg, Antwerp and Canada, to a **10 days' service**, beginning in the month of April next. The sailings have hitherto taken place fortnightly, with extra opportunities when required, but we shall in future have a sailing from Hamburg, Antwerp and Montreal every ten days.

We are quite prepared to meet the requirements of the trade by arranging for extra boats, so that shippers and consignees can depend on a first-class service, with every facility for the prompt shipment and careful handling of their goods.

We would further point out that our line offers to shippers at Antwerp and consignees in Canada, special facilities in view of splendid accommodation at our loading and discharging berths. In Antwerp and Montreal we have extensive quay accommodation, protected by large sheds and connected with the different Railroads, thus ensuring the prompt trans-shipment of cargo.

In view of our efforts to provide a first-class regular service, in both directions (for our steamers also load back direct to Antwerp and Hamburg), we rely on your favoring us with your undivided support.

**JAMES THOM, Manager,**  
13 St. John Street,  
MONTREAL.

Mr. Archibald Blue, of the Ontario Bureau of Mines has a sample of gold ore, taken from the district around Rat Portage, which will form one of the exhibits of the Ontario Government's mineral display at the London Exhibition in May next, and also at the Paris

Exposition in 1900. The sample is composed of a schist and gold ore, weighing 30 pounds, and is richly studded with the precious metal. No definite decision has yet been reached regarding the matter, but the probabilities are the exhibit will be sent.

.. ORDER ..

# "Capitol"

THIS IS THE  
STANDARD GRADE

## "Renown" "Atlantic"

ENGINE



## CYLINDER

## RED OIL

NO BETTER OILS MADE

**THE QUEEN CITY OIL CO., LIMITED**

SAMUEL ROGERS, PRESIDENT

TORONTO, Canada

## C

THE  
CHEMICAL  
COMPOUND  
COMPANY

## C

CORRECTLY  
COMPILED  
CHEMICAL  
COMPOUNDS

## C

CIVILITY  
CAREFULNESS  
COMPLETENESS  
CONTINUITY

## DO YOU KNOW

That you are paying for Boiler Compound all the time whether you use it or not?

IF YOU DO NOT BUY

You will pay your coal dealer more than its cost in the extra Coal you burn.

## Zinkolene Saves Money

THE CHEMICAL COMPOUND CO., 311 Temple Building, Toronto.

## ONTARIO GOLD MINING DISTRICT :

- Sultana Mine.
- Foley Mine.
- Mikado Mine.
- Olive Gold Mine.
- Cameron Island Mine.
- Hammond Reef Mine.

## A Few Mines



WHO USE

## BRITISH COLUMBIA :

- Le Roi Mine.
- War Eagle Mine.
- Old Ironsides Mine.
- Centre Star Mine.
- Crown Point Mine.
- Knob Hill Mine.

# CANADIAN RAND DRILL COMPANY, Montreal

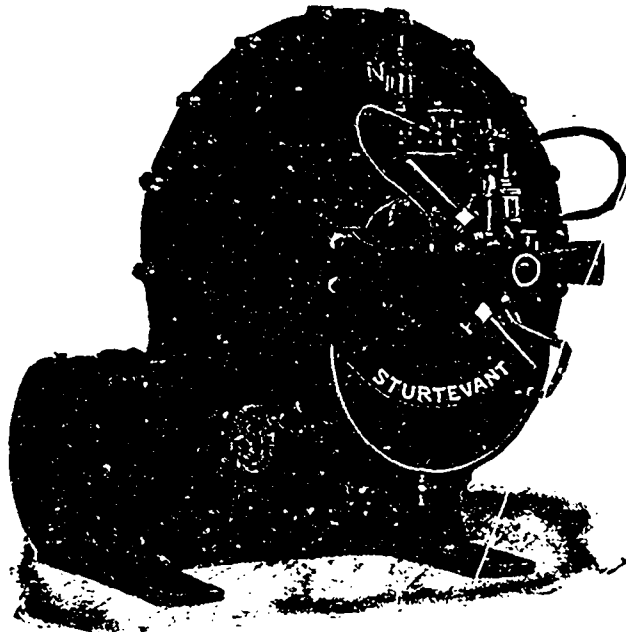
When writing to Advertisers kindly mention THE CANADIAN MANUFACTURER



**THE STURTEVANT ELECTRIC FANS.**

In the accompanying illustration is presented one of the Sturtevant Monogram Type Electric Fans. The shell of the fan is of cast iron, exactly similar in proportions and form to that used in the regular Monogram Blowers and Exhausters. This fan is arranged as an exhauster having the side to which the motor is attached entirely closed, so that air and dust will not be drawn across the motor.

The field ring of the motor is of wrought iron, and is bolted directly against lugs which project from the side of the fan.



Sturtevant Monogram Electric Fan.

The poles are two in number, also of wrought iron, and carry the field windings as shown.

The armature is of the drum wound type, and the shaft carrying the same is supported in ring oiler bearings suspended in yokes projecting from either side of the field ring.

To avoid any trouble from oil, it is dripped directly into a tank attached to the under side of the field ring.

The entire arrangement is extremely compact and stable, and is susceptible of support in any desired position. In very small sizes it is sufficiently portable to be used for temporary location, as for instance, in different parts of the hold of a ship.

Plants of this type are usually built to operate at pressures of from 1 oz. to 5 oz. per sq. in. The illustration is taken from Bulletin II. recently issued by the B. F. Sturtevant Co., of Boston, Mass.

In its excellent treatise on "The Ventilation and Heating of School Buildings" the B. F. Sturtevant Co., of Boston, Mass., makes this emphatic statement. "It is evident that, above all else, the movement and supply of air in a ventilating system must be made positive at all times, but readily variable to suit changed conditions, and experience has conclusively proved that only by mechanical aid can these results be obtained. Hence the rapid and extended introduction and the assured success of this comparatively new method of ventilation, whereby, in its ordinary application, the air of any desired volume and temperature, is forced to the exact points where it is wanted." How absolutely this fact holds true in practice, and how essential mechanical means are to the attainment of success are clearly evidenced in the following lucid statement from the pen of Prof. S. H. Woodbridge.

"The superiority of the so called mechanical, as compared with the gravity, method of ventilation appears in the relatively small space needed for flues, both supply and discharge; in the sureness and uniformity of ventilating action through all variations of weather; and in the low cost of moving air through a ventilating

system. Air ways in gravity methods must be made from two to three times larger than those required in well arranged mechanical methods, unless the rate of flow through the flues by the gravity method is greatly accelerated by heat used for that purpose. The mechanical, and therefore, the money, waste inherent in such a method appears from the fact that when the escaping air is raised 30 in temperature, each cubic foot of that air carries outward more than one-half a thermal unit—in work equivalent, approximately 400 foot lbs. In a well designed mechanical system the average requirement of work expended on each cubic foot of air is less than 10 foot pounds.

"Under these latter conditions the maximum power expenditure would be one horse power for each 200,000 cubic feet of air moved per hour, one-half horse power per class room and its equivalent in other air supply throughout the building. If the air is propelled through a ventilating system by steam driven fans, and if the engine steam is condensed by the ventilating air which it serves to warm, the cost of the motive power used is negligible. If the exhaust steam is wasted the cost in full per class room would be two pounds per hour. If the exhaust steam is used for warming purposes, the fuel cost would be reduced from one-fifth to one-sixth pounds per hour per class room, as against the seven pounds above found necessary for heating the discharge air in vent flues through a range of 30 in temperature. The reduction of fan work to a minimum is not, under the circumstances, important as a matter of economy. The main duct velocities may easily be carried to and beyond 1,000 linear feet per minute, and the flow through distributing and up-take flues to 750 linear feet. Between the mains and the branches a velocity of from 1,000 to 1,500 linear feet can be provided for the purpose of insuring an evenness of supply to rooms under the ordinary varying conditions of air pressure in them due to wind action."

**THE CANADIAN  
COLORED COTTON  
MILLS COMPANY.**

- Cottonades, Tickings, Denims,
- Awnings, Shirtings,
- Flannelettes, Gingham,
- Zephyrs, Skirtings,
- Dress Goods, Lawns,
- Cotton Blankets,
- Angolas, Yarns, etc.

Only Wholesale Trade Supplied.

**D. MORRICE, SONS & CO.**

AGENTS

MONTREAL and TORONTO.

**Reduce Your Fuel Bills  
Increase Your Output...**

BY USING

**The IMPROVED JONES UNDERFEED STOKER**

Guaranteed Increased Economy, from 15 to 50% | Guaranteed Increased Boiler Capacity from 40 to 100%.

**The First and Only Successful Underfeed Stoker.**

No Underfeed Stoker is successful without infringing our Patents, and the public are warned against importing or using infringing devices.

N.B.—Have you seen our Underfeed as applied to Houses, Schools, Churches, etc? (Send for Circular).

For Estimates and other Information write

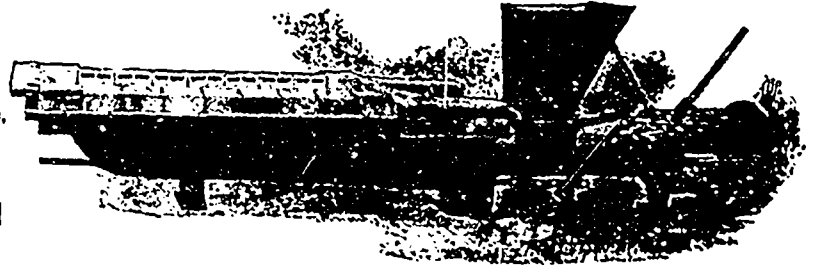
**The General Engineering Co. Limited**

SOLE MANUFACTURERS FOR CANADA,

Head Office.... **80 CANADA LIFE BUILDING, - TORONTO.**

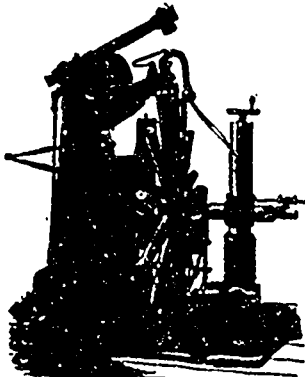
**Montreal—A. TREVETHICK, - Box 1123.**

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**AUTOMATIC SPOKE DRIVING MACHINE.**

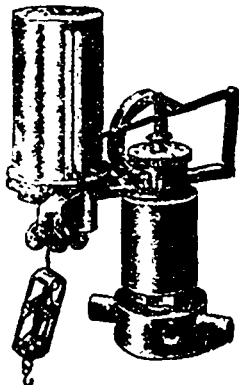
The accompanying illustration is of an Automatic Spoke Driving Machine manufactured by the Defiance Machine Works, Defiance, Ohio. It is specially adapted for use in hub, spoke, wheel, bending, carriage, wagon, plow handle, brush handle, shaft, pole, patent hoop, and furniture factories and planing mills.



The engraving represents the company's No. 2 special heavy patent automatic spoke driving machine, which has been designed for driving spokes in wagon, truck and heavy artillery wheels, driving spokes as large as 5" in diameter in wheels from 24" to 72" diameter.

This machine is used by the leading wheel and wagon builders, who require a machine to cover both medium and extra heavy work. It performs this work more perfectly and at an immense saving over hand labor. It is extremely simple in its operation, and con-

**The McInnes Indicator...**



(Patented).  
With Vulcanite Sheathing for all Speeds and Pressures. Adopted by the British Admiralty.

**SPECIAL INDICATORS**  
For Gas and Explosive Engines, Ammonia Compression Machines, Torpedo Boats, Launches and Locomotives.

Patent Flexible Unstretchable Wire Cord for Indicator Leads.

Catalogue on application.  
**SOLE MAKERS:**  
**T. S. McINNES & Co., Limited**  
42 CLYDE PLACE,  
GLASGOW, - Scotland.

**Dominion Oil Cloth Co.**

Manufacturers of ...

**OIL-CLOTHS** of Every Description

Floor Oil-Cloth, Table Oil-Cloth,  
Carriage Oil-Cloth,  
Enamelled Oil-Cloth,  
Stair Oil-Cloth, etc.

Office and Works  
Cor. St. Catharine and Parthenals Sts.,  
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**Felts for Pulp Mills**

20 years in the business—the first to make Felts in Canada; capacity 1,000 lbs. per day. All our Felts are woven endless, without a splice. Our Felts will last longer and make dryer Pulp. All up-to-date mills use our Felts. New mills, when in need, write for samples and prices.

**HAMELIN & AYERS, Lachute Mills, P.Q.**



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**THE SAFETY LIGHT AND HEAT CO.**

Have in successful operation Machines from 5 to 200 Lights.

**SIMPLICITY AND SAFETY** are the leading features. Being deeply water sealed **IT CANNOT LEAK.** **IT MAKES THE GAS COOL**, washes it twice, and thus makes only **PURE GAS.** **NEVER CLOGS THE BURNERS.**

**THE SAFETY LIGHT & HEAT CO., Dundas, Ont.**

Sole Proprietors and Manufacturers of the **CELEBRATED CLIFF-WARDLAW GENERATORS.** SEND FOR BOOKLET.

**The London Machine Tool Co., LONDON, ONT.**

Toronto Office, 42 York Street. **MANUFACTURERS OF GENERAL MACHINERY...**

Having recently sold our patterns and plant to the A. R. Williams Co., of Toronto, retaining only such machines as are useful in our business, we beg to say that we are rapidly putting in New Machinery, from new and improved designs, and are now in a position to receive orders for all Standard Tools for Metal Working in all branches. It will be our aim, by personal supervision of the product of works, with expert men of large experience at the head of each department, to turn out nothing but first-class work at moderate prices. And as we intend to deal directly with the manufacturers, they will be enabled to get their machinery at first cost.

As we shall not be able to personally visit each manufacturer, it is for this purpose that we publish this advertisement. This is our agent who is going about to solicit a share of your patronage. We are thankful for the patronage extended to us in the past, and hope that we may secure an extension of the favors for the future.

All correspondence relating to the following Tools will be promptly answered, viz:  
**LATHES**—Engine, Gap, Break, Turret, Fox, Spinning, Etc.  
**PLANERS**—Standard, Crank, Plate, Etc.  
**DRILLS**—Standard, Sensitive, Multiple, Radial, Etc.  
**MILLING MACHINES**—Lincoln, Plain, Universal, Etc.  
**SHAPING MACHINES**—Whitworth, G. & E., Rack-Driven, Etc.  
**HAMMERS**—Stoam, Sandage Drop, Stiles Drop.  
**BULL-DOZERS** for all purposes.  
**PUNCHES AND SHEARS** for Plate, Angles, Channels, Gauges, Etc.  
**PRESSES** for Cutting, Stamping, Drawing Wring, Riveting, Etc. We shall also esteem it a pleasure to give quotations on Special and General Machinery in our line.

ALEX. GARTSHORE, President. J. G. ALLAN, Sec.-Treas. JAS. THOMSON, Vico-Pres. and Gen. Mngr.

**THE GARTSHORE-THOMSON PIPE & FOUNDRY CO.**

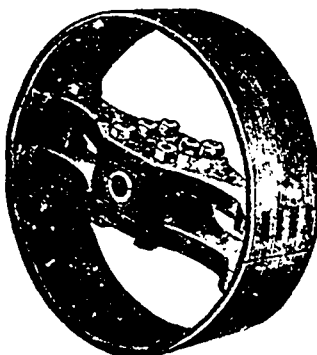
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3 in. to 60 in. diameter.

**For Water, Gas, Culverts and Sewers**

Special Castings and all kinds of **FLEXIBLE AND FLANGE PIPE.**  
**WATER WORKS SUPPLIES** **HAMILTON, ONT.**



**BENT WOOD SPLIT PULLEYS,**  
RIM... (REID'S PATENT).

The Strongest, Lightest and Best Belt Surface in the World

No Glue, no Nails in Rim like Segment Rim Pulleys, to be affected by Steam, Dampness or Moist Temperature.

**EVERY PULLEY GUARANTEED.**

**The Reid Bros. Manufacturing Co., of Toronto,**  
257 King St. West, Toronto.

tains many valuable features over machines heretofore used for this purpose.

The frame is cast in one piece with cored centre, making it very stiff and reliable to stand the heavy labor expected from it.

The bed-plate upon which the form rests is a heavy casting, occupying 6 feet by 2 feet floor space.

The hub to be operated upon is held at each end in a pair of adjustable saddles having independent vertical adjustments for the length of the spoke and a horizontal adjustment to accommodate the length of the hub.

The hammer shaft is of steel, 2 7/16 in. diameter, and it runs in genuine babbit-metal self-lubricating bearings, and is driven by a powerful friction clutch which is connected by foot pedal at the base of the machine for starting and stopping the hammer.

When in use, the foot of the operator is placed upon the pedal which immediately engages the friction clutch and instantly starts the hammer, which delivers a blow similar to the swinging of a hammer by hand. The force of the blow is regulated by the pressure applied to the pedal. It will strike the blow heavy or light as desired. By the aid of an ingenious device, the frictions are automatically disengaged before the hammer delivers the blow which prevents shock or injury to the machine. The friction acts as a loose pulley when disengaged.

The graduation of the blows is so quickly accomplished that the stroke of the hammer can be changed after the hammer is started by changing the pressure of the foot upon the pedal.

The adjustable gauge is conveniently arranged to guide the spoke, being driven

to exact position, returning out of the way when not in use. The dish staff is also furnished to test the work.

The hammer helve is attached to the machine by a friction binder, and it is easily removed when desired. The hammer is made of solid swedes iron.

The friction driver is 18 in. by 5 in., driven by a single 5 in. bolt 250 rotations per minute, and it can be belted to from above, below or either side direct from the main line shaft.

For further information, enquire of the Defiance Machine Works, Defiance, Ohio.

The William Davies Co., Toronto, perhaps the largest pork packing and meat curing concerns in Canada, will still further enlarge their works and go into the meat canning business.

**JOHN J. KELLER & CO.**

104 and 106 MURRAY ST.  
NEW YORK

220 Church St., Philadelphia.  
135 Pearl Street, Boston.

**Aniline Colors,  
Dyewood Extracts,  
Sumac and  
Nutmeg Extracts.**

FAST COLORS for Wool Dyeing,  
One Dip Cotton Colors, Novelties  
and Specialties for Calico  
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**LIGHT YOUR  
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**LUXFER PRISMS**

The latest device for

**LIGHTING**

dark rooms and  
offices

**By Daylight**

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**Luxfer Prism  
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- Shafting, Pulleys**
- Hangers**
- Tube Cutters**
- Pipe Cutting Machines**
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- Wood Lathes**
- Dough Mixing Machinery**
- PAPER BOX MACHINERY.**
- Special Machinery of all kinds.**

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Nos. 73 to 81 Adelaide St. W.,  
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Telephone 1585.

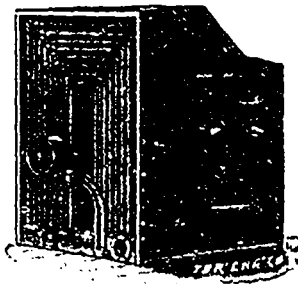
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The Fan System of Steam Heating for Heating  
of Factories and all Classes of Buildings.

**DRYING . . .**

Appliances for Drying

**Lumber, Brick, Wool, Cloth,  
Hair, Soap, Glue, etc.**



Heater and Housing.

**VENTILATING . . .**

Ventilating Fans for removal of Dust, Foul Air, etc.

WRITE FOR CATALOGUE AND PRICES.

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Fan.

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15 Lemoine Street, Montreal.

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Philadelphia, Chicago, and  
Gloucesterville, N.Y.

**Dyewood Extracts,  
One Dip Alizarines,  
Aniline Colors,  
Dyestuffs and  
Chemicals.**

**THE WOOD SPLIT PULLEY.**

The Wood Split Pulley is an established factor in manufacturing enterprises now, and needs no argument to prove its status. As now known, it is one of those things which occasionally appear upon the industrial stage; entering like apparitions, yet proving to be so substantial and all pervading, that it shortly becomes difficult to comprehend that only yesterday, as it were, it was non-existent,—even less than a shadow. When Pepper's ghost was first exhibited it was a mystery unfathomable to the most learned. Faraday could not even suggest a method for its production, and when Prof. Pepper led him upon the stage and laid his hand on the cold plate-glass reflector, he was lost in astonishment.

The Wood Split Pulley, made by the Dodge Manufacturing Company of Toronto, seemed just as chimerical to the manufacturers of 1886. They knew it was merely a delusion—and now the same men are at a loss to know how or why they were deceived. It was only because they were unable to see the reality that was behind, and not seeing that they could see nothing but a transparent shadow.

Nevertheless, the Dodge Pulley was not a phantom, nor were those who befriended it deceived by a delusion.

Looking backward over its history—a history by the way not yet rounded and completed, it does require some mental effort directed in a logical method, to fairly comprehend what the reality consisted in, and those who to this day have not been able to see the stern facts hidden behind the veil of the past are not to be condemned as entirely stupid. They simply are not acquainted with the

history and mechanical conditions which preceded this invention which now appears so simple, that it is difficult to believe that it has not always existed.

In considering such a history, it is usually possible to select a few salient facts which serve as pivotal points for the whole fabric, and furnish keys to unlock all the mysteries of the situation.


There was not, in 1880, in all the world a dealer in pulleys. There was not a stock of pulleys anywhere, from which a purchaser could select the pulley he might want, and at that time it was not known to any man how it would be possible for anybody to deal in pulleys on the basis of a supply on hand ready for immediate delivery.

Dodge Manufacturing Company entered upon the manufacture of the Dodge Pulley upon the basis of a supply on hand ready for immediate delivery, and within a very few years there were numerous dealers carrying

stocks on the basis of a supply ready for immediate delivery, and at the end of thirteen years the Dodge Company had supplied such dealers and such stocks in every city throughout Canada, with numerous agencies and stocks in foreign countries.

This historical fact, about which there is no dispute, is sufficient warrant for an enquiry as to how and why.

**ACTIVE SOLICITORS WANTED EVERYWHERE** for "The Story of the Philippines," by Murat Halstead, commissioned by the Government as Official Historian to the War Department. The book was written in army camps at San Francisco, on the Pacific, with General Merritt, in the hospitals at Honolulu, in Hong Kong, in the American trenches at Manila, in the insurgent camps with Aguinaldo, on the deck of the Olympia with Dewey, and in the rear of battle at the fall of Manila. Bonanza for agents. Brimful of original pictures taken by government photographers on the spot. Large book. Low prices. Big profits. Freight paid. Credit given. Drop all trashy unofficial war books. Outfit free. Address: H. L. Barber, Gen. Mgr., 336 Dearborn Street, Chicago.



**PAGE FENCE QUALITY.**

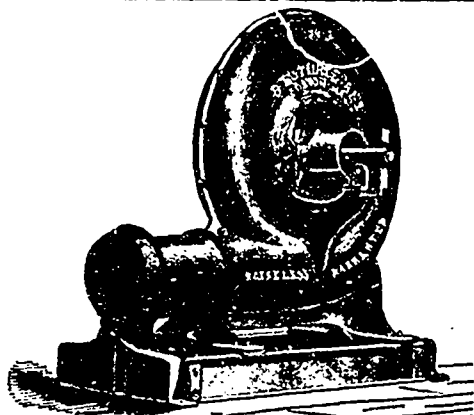
When you seek the best fence that can be made from wire, we know that you will buy the

**Famous Coiled Spring Page.**

It isn't like any other on earth—it's better. It was the first and it is still the foremost woven wire fence

For the truth about its uses and quality, address

**THE PAGE WIRE FENCE CO. LTD.**  
WALKERVILLE, ONT.

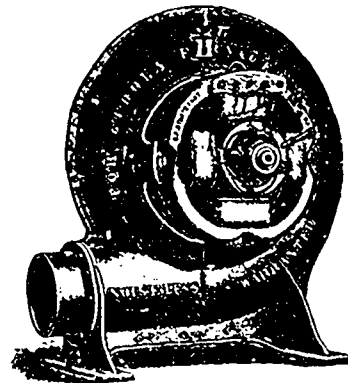


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**The STURTEVANT  
STEEL  
Pressure  
Blowers**

—FOR—

**Cupola Furnaces and Forge  
Fires**

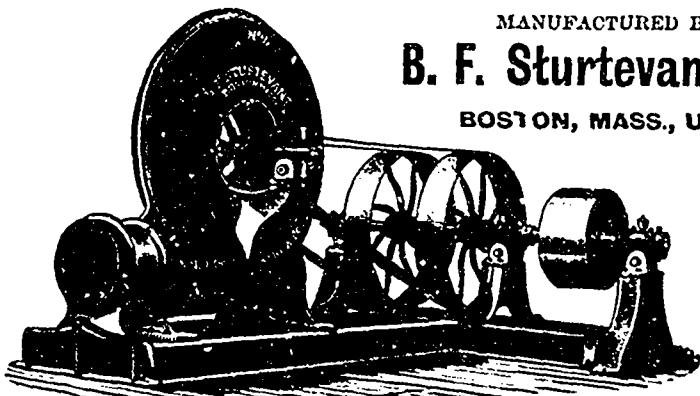


Blower with Electric Motor.

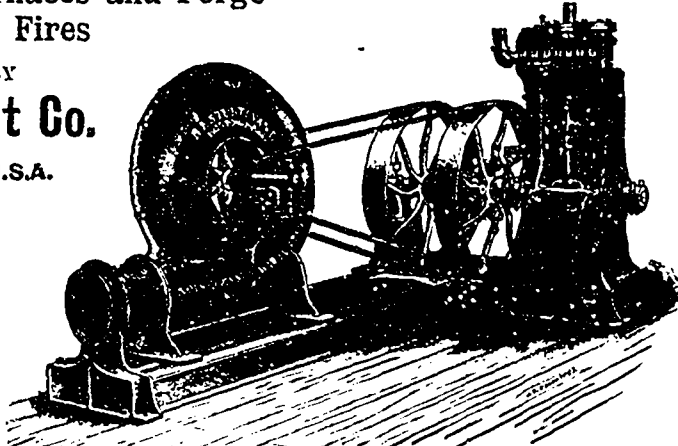
MANUFACTURED BY

**B. F. Sturtevant Co.**

BOSTON, MASS., U.S.A.



Blower on Adjustable Bed with Combined Countershaft.

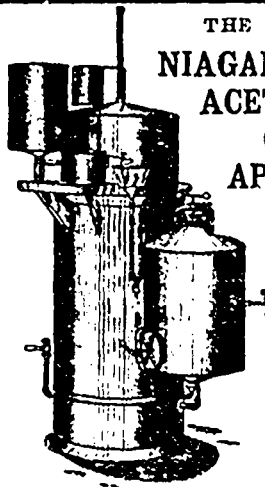


Blower on Adjustable Bed, with Double Enclosed Engine.

**A. R. WILLIAMS MACHINERY CO.,** General Canadian Agents, Toronto, Brantford, Montreal

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**ADVERTISE**  
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 At Lowest Cost.  
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**SPECIALIZE.**  
 Correspondence Invited.  
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 Sole Agent for Advertisements  
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THE  
**NIAGARA FALLS  
 ACETYLENE  
 GAS  
 APPARATUS**

Patented in  
 Canada, United  
 States and  
 Great Britain.

This is the  
 only machine  
 perfectly auto-  
 matic in its ac-  
 tion, requiring  
 little or no atten-  
 tion. Machines  
 made in 10 sizes  
 costing \$15 and  
 upwards.

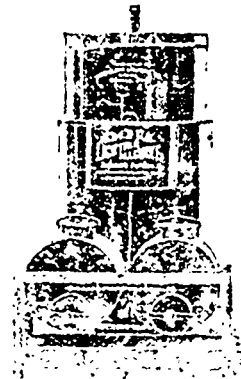
**Acetylene Gas the Coming Light.**  
 CHEAPER THAN ELECTRIC LIGHT  
 COAL GAS OR COAL OIL

For Private Dwellings, Business Houses  
 Churches, Public Halls and Offices.

For particulars write to the  
**NIAGARA FALLS ACETYLENE GAS MACHINE CO.**  
 NIAGARA FALLS, ONT. LIMITED.

**Sun Lighting Machine.**

ACETYLENE GAS.



The  
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 of  
 Perfection  
 in  
 Lighting.

At the Mini-  
 mum of Cost.

Suitable for any place where Artificial Light  
 is required. Dwellings, Stores, Churches,  
 Factories, Hotels, Street Lighting, etc.

Write for Catalogue.

THE  
**Acetylene Lighting Co.**  
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One says it was only shrewd business enterprise, but that is inadequate as an explanation, because business enterprise could not make possible what was impossible under existing conditions. Therefore, the conditions must have been changed. Between commercial shafting one inch to three inches in diameter, there are thirty-eight different diameters, hence for a full stock the dealer would have required thirty-eight pulleys, one of each size, to match any shaft on which a customer might wish to put a pulley. Pulleys which it would have been necessary to carry in stock, at that time, may be said to vary from ten inches to forty-eight inches in diameter, varying by two inches, and from four inches to twenty-four in width of face, varying by 1/2 inch. So then, 20 diameters to be carried 38x20 equals 760; 41 graduations in width of face 760x41 equals 31,160 pulleys from which the dealer could fill an order for one pulley, within the limits specified. No dealer would wish to confine his ability to fill orders for one pulley, out of 31,160. Hence that number would be multiplied. Nobody ever thought of carrying such a stock. But the Dodge Company showed how, from a stock of 820 pulleys, less than 3 per cent. of 31,160, any order can be filled within the limits named. That is what nobody has before thought how to do. They did it, and revolutionized the pulley business throughout the world. How did they do it? They did it by adding to the pulley another member, to-wit, and interchangeable centre, whereby any pulley can be immediately fitted to a shaft of any size. No pulley had ever before that been provided with a removable centre, intermediate the pulley and shaft, as a part of its structure and original intention. That was the new idea and invention that made it possible to make pulleys as articles of merchandise which could be kept in stock ready for immediate delivery and use. Of course the inventors did not stop with that. They also sought the best structural design and from the beginning put the best material, workmanship and structural design in their pulleys, so that from the time when they had convinced the skeptical consumers that a wooden pulley would do work and not collapse, their pulleys have been received everywhere as the standard of excellence.

Believing that our readers will be interested in a description of the manner of their construction, we publish the following detailed account.

A wooden pulley should be like the Deacon's One Horse Shey, -equally strong at all points, and it would be difficult to point to any part and say this is less important than any other. Nevertheless there is one point,

which needs to be guarded more than any other, and which in all pulleys except the Dodge, is left without extra safeguard. That point is the point at the junction of the arms and the rim. The importance of this point will be evident when it is considered that a pulley quite commonly makes 300 revolutions per minute and frequently twice or more times that number, and that direction of the belt strain on the ends of the arms is reversed twice each revolution. There is no human structure or known material which will not yield to pressure, and the arms of a pulley, however it may be made or of what material, will spring a little under the pull of the belt, and this alternate pull of the belt, first one side and then the other, and alternating from three hundred to six hundred times per minute, will sooner or later have an effect to grind out any joint in which there is the minutest movement, and this deterioration will be hastened or retarded by the conditions of speed and actual belt pull. Try to move the hand backward and forward three hundred times per minute and some realization of the violence of that movement will be obtained.

It has been found that two pieces of wood united with the best glue, properly prepared, will be stronger in the joints than in the wood itself. This has been proved thousands of times in the Dodge factory, by breaking apart pieces of pulley rims, glued as the parts of the pulley are uniformly glued in that shop. Not once in ten thousand times does the separation occur in the space between the block, but the wood gives way on one side or the other of the glued joint. This statement has to bear on two points in the structure of the pulley. The rim is made with glue and without nails, and the joint between the arms and rim is made solid with glue and a wedge driven in by the side of the tenon to insure that solid contact of the glued surfaces which is essential to a properly glued joint. These points will be referred to again more in detail.


THE RIM.

The rim is composed of layers of wood suitably matched at the ends of the segments and secured together by glue. No nails are used in the rim or about the pulley, because the glue joint alone, properly made, secures all the strength there is in the wood, and nails actually weaken the wood without imparting additional strength elsewhere. The effect of changes of temperature and moisture on nailed structures may be seen on the weather boarding of any wooden house, which has been standing exposed to the sun a few years. The nails will appear partly drawn out, and this is a matter of common observation. Nails are a source of weakness,

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and their use was abandoned by Dodge Mfg. Company several years ago. Experience has fully justified the wisdom of doing so.

After the rim (minus the edge segments) has been formed as described, it is chucked on a lathe and the inner surface is turned out smooth and true, and is then sawed in two transversely, on an irregular curved line to form interlocking portions, and the mortise notches are cut to receive the ends of the spoke arms.

**THE ARMS.**

The spoke arms are made from ash or maple planks, those woods being preferred on account of strength. The arm stock having been cut to proper dimensions, the hub block is glued on and the end wedge-shaped tenon is cut.

The two arms required for one pulley are then secured together with dogs and simultaneously sawed to shape on the edges. The rim and arms having thus been prepared they are united, and the rim joint made solid and secure with glue and wedges. There is always a slight vacancy between the end of the arm and the rim, because it is practically impossible to fit the arm tenon so that it will exactly fill its mortise. This space is filled with melted sulphur which has the property of solidifying without shrinking, and thus the rim receives solid support over the end of the arm.

When the arms have been put in place, the hub blocks will be about half an inch apart, and it is then necessary to bolt the two halves together; pieces of wood about half an inch in thickness are placed between the hub blocks to prevent all springing of the pulley spoke arms under strain.

The arms having been inserted, the two halves are then bolted together with pieces of wood between the opposing faces of the hub and rim ends. The pulley is then again chucked in a lathe and the centre hole is turned out. The pieces of wood inserted serving to keep the halves of the pulley slightly apart, and affording the tool solid wood in which to work after being contra-turned to a standard diameter, so that it is adapted to any one of the standard sized interchangeable centres or bushings. The edge rings are then glued on to complete rim.

These edge rings are then cut with a straight saw in line with the previous cut, so that the rim is again entirely divided and separable into two parts. The pulley is ready for the final finish by turning its face and edges.

The packing strips are therefore removed and the pulley is placed on a mandril which may exactly fit the centre-hole or is made to fit the same by means of the proper one of the interchangeable centres, interposed between said mandril and pulley. The man-

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dril, or mandril and bushes, being exactly the diameter of the centre opening, the pulley halves will be slightly separated at hub and rim before the clamping bolts begin to act, and said slight separation at the rim will be closed by the action of the clamping bolts.

Having been securely clamped to the mandril which may be a part of the lathe, if desired, the pulley is finished by turning its face and edges and is then balanced.

All the pulleys above 20 inches in diameter are provided with stay bolts running through the arms near to the rim and back into the rim where they are securely anchored by malleable iron anchor nuts.

Pulleys of large size or designed for extra heavy duty are strengthened by stub arms.

This completes the story of the pulley which has revolutionized the practice of the world.

The monetary value of this invention to the manufacturers of the world, and through them to the consumers of manufactured products is simply beyond computation; but may be dimly understood when it is considered that before this invention every pulley was made to order, which meant a delay anywhere from one day to a week or more, and this delay frequently meant the shutting down of a factory, or some part of it, for that length of time. In consequence of this invention, any ordinary demand for a new pulley can be supplied at once from the stock of some neighboring dealer, and there is only the delay of an hour or two instead of a day or more.

But the delay in getting a pulley was only a part. Taking down a section of shafting, stripping the pulleys off, putting on the new one and replacing the old ones, frequently required more time than was occupied in getting the new pulley. All of this is saved by this invention, since a Dodge pulley may be put in place in a few minutes without removing the shaft from its hangers.

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M. Lethoule, an electrical engineer from Paris, France, has been visiting Quebec province examining its water powers, especially with a view to estimating the advantages for electrical developments there. His information, it is stated, is being collected for a department of the French Government. This official presentment of the advantages which the province offers for the application of electricity to the industrial purposes is expected to influence French capitalists favorably toward Canada, and especially toward Quebec, the province covered by his inquiries. M. Lethoule expects to return to Quebec and spend a year there studying its resources.

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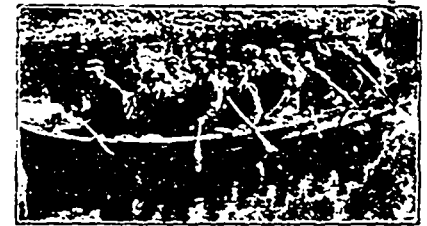
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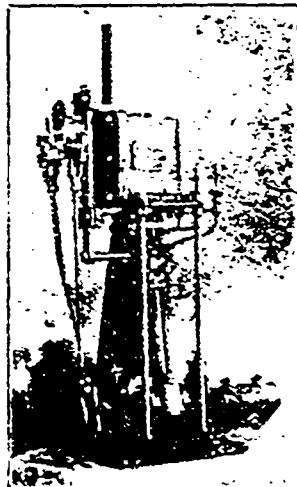
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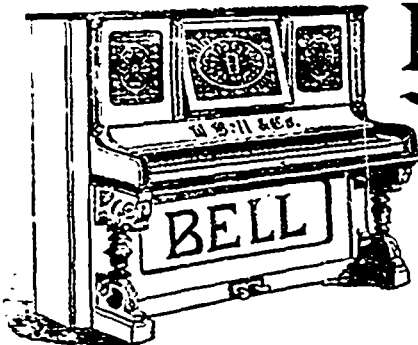


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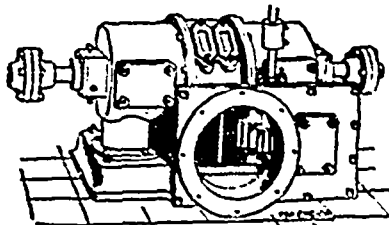
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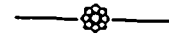
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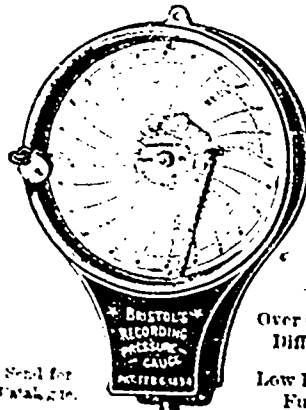
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