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EXPORTS OF MANUFACTURES

The following table shows the total value of exports of domestic manufactures from Canada, and the value of such exports to Great Britain and the United States by years, from 1868 to 1890.

	TOTAL EXPORT.	TO GREAT BRITAIN.	TO UNITED STATES.
1868	\$15,675,272	\$6,442,004	\$7,493,348
1869	17,456,059	8,092,541	7,382,783
1870	18,327,191	7,197,771	8,778,562
1871	18,473,242	7,121,020	8,830,564
1872	19,469,457	7,362,105	9,310,852
1873	24,460,673	9,128,103	11,899,246
1874	22,916,431	10,932,460	9,100,326
1875	20,025,925	11,284,634	6,090,060
1876	19,542,107	12,013,209	4,945,829
1877	18,955,036	11,787,548	4,540,716
1878	17,780,766	10,822,876	4,440,673
1879	13,087,205	7,619,974	4,172,634
1880	16,197,348	7,696,506	6,372,689
1881	20,366,131	10,044,048	7,953,129
1882	21,247,393	9,043,985	9,256,393
1883	21,970,375	9,458,573	9,452,112
1884	22,400,981	10,067,796	9,312,498
1885	19,276,270	7,470,011	9,075,394
1886	18,959,271	8,517,960	8,276,684
1887	19,999,296	8,507,033	9,319,884
1888	20,382,594	8,225,313	10,118,179
1889	22,394,516	8,732,300	10,819,538
1890	25,541,844	11,672,049	10,960,002

These exports consisted of books, bread and biscuits, candles and soap, carriages, cottons, clothing, hats and caps, cordage, junk and oakum, furs, glass and earthenware, gypsum, lime and cement, scrap iron, iron and hardware, leather and manu-

factures of boots and shoes, machinery, musical instruments, oil cake, rags, sewing machines, wrought stone and marble, salt, tobacco, snuff and cigars, woollens, wood and manufactures of, ale and beer, whisky, sundries, n.e.s. and ships are sold to other countries.

NICKEL STEEL.

THE recent armor tests made at Indian Head, Maryland, by the United States Government, possess considerable interest to Canada, in that it was decided that the nickel steel plates which were experimented upon were undoubtedly the best armor plates ever subjected to such tests. These tests were applied to six plates, three of which were furnished by the Bethlehem Iron Company and three by Carnegie, Phipps & Co. The Board of Armor Tests, appointed by the Secretary of the Navy, under whose supervision the tests were made, after careful consideration of the results upon the firing upon the six plates, decided that they be placed in the following order of merit, viz:—

1. The high-carbon nickel steel Harvey plate, furnished by the Bethlehem Iron Company.
2. The high-carbon nickel steel plate, furnished by the Bethlehem Iron Company.
3. The high-carbon nickel steel plate, furnished by Carnegie, Phipps & Co.
4. The low carbon nickel steel Harvey plate, furnished by Carnegie, Phipps & Co.
5. The low-carbon nickel steel plate, furnished by Carnegie, Phipps & Co.
6. The low-carbon steel Harvey plate, furnished by the Bethlehem Iron Company.

It will be observed that of these six plates, five of them were composed in part of nickel, and that the one which stands lowest on the list contained no nickel.

The right side of plate No. 1 showed very remarkable qualification. The two projectiles which struck that side penetrated not more than 7 inches, the head remaining in the plate, completely filling the hole, and with the appearance of having been welded to the surrounding metal, while the body was shattered into many fragments. No cracks were made on that side of the plate, while the back of the plate showed no disturbance, except a hardly noticeable swelling on the surface. All of the armor plates were more or less cracked through, but only two. Nos. 3 and 6 badly, and these two plates alone showed cracking before the fifth shot. Plates Nos. 1, 2 and 3 kept out all the projectiles, No. 4 was perforated by one, and Nos. 5 and 6 by two projectiles each.

Comparing the plates of this trial with the Creusot steel and the Creusot nickel steel plates of the Annapolis trials of September, 1890, the board in their report were of the unanimous opinion that:

No. 1, the high-carbon nickel steel Harvey plate furnished by the Bethlehem Iron Company, and No. 2, the high-carbon nickel steel plate furnished by the same company, are superior to the Creusot steel and nickel steel plates of last year.

The Secretary of the Navy has given a written opinion of these tests, and those portions of it which are of the most interest to Canada we summarize as follows:

By far the most momentous question which the Department has had to consider in connection with the construction of the new navy is that of armor: 1. to secure a supply of American manufacture, and 2, to determine what kind of armor should be adopted, having reference both to its composition and mode of treatment.

The experiment made last year at Annapolis, described in the annual report for 1890, consisted of a test of the two principal foreign types of armor, the English compound plate and the French all-steel plate, and an entirely new plate, also made in France upon the special order of the Department, of nickel steel. The result of the trial showed that the compound plate was decidedly inferior, and that as between nickel steel and all steel the former had distinct and positive advantages, the all steel plate being broken into four pieces while the nickel plate remained absolutely uncracked.

A series of tests made during the following spring and summer confirmed the conclusions formed at the Annapolis trial as to the superiority of nickel steel, and the Department accordingly decided to adopt it, and made arrangements with the contractors looking to that end.

It remained, however to give a thorough trial to the first armour of domestic manufacture before beginning to place it upon the vessels, and for this purpose it was decided to order typical plates, which should be made the subject of an experimental test. This trial was to ascertain two points: 1, whether our domestic manufacturers could produce an armor that would stand competition with the material manufactured abroad, and 2, which of the various modes of treatment suggested would give the best results. In reference to the latter point the questions to be considered were the relative merits of rolling and forging in the manufacture, and the effect of a new method of treatment, named, from its inventor, the Harvey process, designed to harden the surface of the plate while retaining the toughness of its body.

In these trials, the plates were subjected to tests more severe than had ever been applied to any foreign Government trials and the results were in the highest degree satisfactory. Each of the six plates were superior to the English compound plate, while the nickel Harveyed plate and the high carbon nickel plate were superior to all the foreign plates of the Annapolis trial. They may, therefore, be pronounced in advance of the best armor hitherto manufactured in Europe.

Further light was thrown upon the question of the relative merits of all steel and nickel steel armor, and any doubt which may have remained on that subject was finally set at rest. Of the three plates made by Bethlehem two were of nickel steel, one treated by the Harvey process, the other not and the third was of all steel, Harveyed. Both the nickel plates proved to be far superior to the all-steel Harveyed plate, notwithstanding the advantages which it may have derived from the special treatment, and both proved superior to the French all-steel plate tried at Annapolis.

A third nickel plate, manufactured by Carnegie, under the rolling process, also showed a marked superiority over the all-steel plate, and both it and the corresponding Bethlehem plate manufactured under the hammer showed a capacity of resistance to perforation fully 10 per cent. greater than that of the French all-steel plate. In this respect the results furnished by the two American plates manufactured by the different processes (forging and rolling) proved to be remarkably uniform, the 6 inch shots that were fired at them differing in penetration but an inappreciable amount.

The trial thus definitely establishes the fact that armor of excellent quality may be produced by the rolling process and that forging by means of the hammer, the greatest source hitherto of expense in manufacture, is no longer to be regarded as an absolute necessity. The importance of this fact can hardly be overestimated, for it raises a probability that within a year or two the armor-producing capacity of the United States may be quadrupled in case of necessity, and that if we

had 10,000 tons to let and could give 18 months from date of contract to commence delivery, the cost of manufacture would be reduced from 25 to 33 per cent., while the work hitherto confined to two firms would be thrown open to a large number of competitors.

Finally, the trial shows that the high-carbon nickel Harveyed plate is undoubtedly the best armor plate ever subjected to ballistic test.

All the nickel entering into the construction of these armor plates was produced in Canada. The discovery of the value of nickel steel in the manufacture of armor for war ships came fortuitously, just at the time that the United States Navy authorities were deciding upon what particular style of plates they would adopt for their new ships. At the Annapolis trials both English and French plates were experimented upon, and the superior excellence of plates composed of nickel steel inclined the authorities to adopt that style, deciding at the same time to make further and more exhaustive tests with it, the result of which is here alluded to.

There are other features of this matter which are of great interest to Canada besides the fact that nickel gives the chief value to armor plates, and that Canada is necessarily the chief source of supply to all the world for nickel for manufacturing armor plates. It was demonstrated that armor plates of the very best quality can be made on this side the Atlantic; that rolled plates are as efficient in resisting the impact of rifle shot as hammered plates, and that the cost of plates can be, under the American practise, very much cheapened. The secretary of the Navy tells us that the importance of these facts to his country cannot be overestimated, for they raise a probability that at an early day the armor producing capacity of the United States may be quadrupled if necessary. If these facts are of such vast importance to the United States, who could estimate the value of them as applied to Canada if we were in a position to manufacture such armor plates, and why should we not be in that position? Is there anything in the way of natural advantages that the United States possesses that Canada does not possess in as great or greater degree? Every material and constituent entering into the manufacture of nickel steel exists in Canada. They are quite as easy of access and our already established facilities of transportation place it within our ability to enter upon the enterprise at relatively small expense and with an assured guarantee of its financial success. Other countries may engage in the manufacture of armor plates, many of them have already done so, but all of them are to a certain extent handicapped by the fact of their inability to produce their own nickel. They may produce every thing else requisite, but they have no sufficient supplies of this most essential article. But Canada possesses every requisite for the enterprise, including the nickel, and it only remains for our Government to take proper action in the matter to ensure its establishment.

This action should begin by an imposition of an export duty upon the nickel contained in ore and matte taken out of the country. Previous to these experiments in the United States that country imposed a duty of fifteen cents per pound upon all imports of nickel, no distinction being made between the cruder forms and the refined metal—it all paid duty at the rate of \$300 per ton. The production of nickel in that country has never amounted to more than about 100 tons per year, and when

it was discovered that nickel must be had in large quantities for the manufacture of armor plates, the duty was removed from ore and matte, but a duty of \$200 per ton was retained upon the refined metal. Canada was the only country from which nickel could be had, for the supplies of the rest of the world were insufficient to meet the demands of any country producing it. Excepting Canada, New Caledonia was the largest producer, and the exports from that island last year were only 5,000 tons of matte, the nickel contained therein being probably not more than from 500 to 1,000 tons, and this was all required by France, to whom it belonged. This American duty of \$200 per ton was therefore aimed directly against Canada, and to prevent the manufacture of refined nickel here for the American market. The result of this hostile legislation was to force the carriage of the Canadian ore and matte to the United States for refining, thus depriving this country of all participation in any profit that might accrue from the business. Canada's benefit from the mining of her nickel ores consisted in the holes in the ground from which they were taken. Under a more liberal policy, seeing her great necessity for nickel, if the United States had placed refined nickel upon the free list as well as the ore and matte, Canada would have had an opportunity to have erected refining works, and finally to have engaged in the manufacture of nickel steel for armor plates and for commercial purposes; and if we are now forced in self-defence to impose an export duty, the American Government may thank themselves for it, for they have certainly over-reached themselves, or will have done so when the Canadian export duty is laid.

IMPOSE THE DUTY.

This journal desires to acknowledge courtesies extended to it by Mr. David T. Day, Chief of the Division of Mining Statistics of the United States Geological Survey, in giving the latest published facts regarding nickel. Mr. Day, in a note to the editor, says:

I beg to state that the world's product of this metal (nickel) in 1889 is estimated at about 2,000 tons, and the countries contributing to this supply were New Caledonia, Canada and the United States. I have no accurate statistics of the production of nickel in foreign countries; but in the period mentioned the United States produced 252,663 pounds. It is thought that Canada could produce enough nickel to supply the world independently of New Caledonia, which has been the largest producer of nickel for the last ten years.

The printed matter sent us by Mr Day was published in 1890, and it is needless to observe that since that date wonderful developments have been made in the important uses to which nickel can be put. Since then it has been discovered that nickel is absolutely essential in the manufacture of steel armor for war vessels, and that all the armor now being manufactured for the American navy is nickel-steel. It is also a fact that the equivalent of about 1,000 tons of pure nickel, were obtained from Canadian mines last year, to be used in the manufacture of armor plates for the American navy. According to Mr. Day, the production of nickel in the United States, in 1889, amounted to only 126 tons. This quantity is insignificant as compared with the demand for the article in that country; and that the chief supply must come from Canada

is shown in the fact that, in the only preliminary tests and operations in manufacturing nickel-steel armor plates for the American navy, entire dependence was had upon the Canadian supply. Previous to the discovery of the great value of nickel the production and importation of the article into the United States were as follows:

PRODUCTION OF NICKEL IN THE UNITED STATES.

	QUANTITY	VALUE
1886.....	pounds 214,092	\$127,157
1887.....	" 205,556	133,200
1888.....	" 203,328	127,632
NICKEL IMPORTED FOR CONSUMPTION IN THE UNITED STATES.		
	QUANTITY	VALUE
1886.....	pounds 277,112	\$141,546
1887.....	" 139,037	205,232
1888.....	" 316,895	138,290

The word nickel, as here used, includes metallic nickel, nickel in nickel ammonium sulphate, and nickel in ore and matte.

We have given the foregoing facts to show that the production of nickel in the United States is entirely inadequate to the demand. Secretary Tracy, of the United States Navy Department, in his report to Congress on the first day of the present session, says:—"By far the most momentous question which the Department has had to consider in connection with the construction of the new navy, is that of armor, first to secure a supply of American manufacture and, second, to determine what kind of armor should be adopted, having reference both to its composition and mode of treatment." But the recent tests have convinced the Secretary of the infinite superiority of nickel steel, and orders have been issued for the manufacture as rapidly as possible of nickel-steel armor for all the twenty two war vessels now under construction, the quantity required being 15,945 tons. No doubt France will draw her supplies of nickel from her penal colony of New Caledonia, and it is possible that such supplies will be adequate to her demand. But it is doubtful if other countries can obtain their supplies there, considering the fact that the largest output of the New Caledonia mines was not equal to that of Sudbury in 1889. The great distance from New Caledonia from points of consumption, and the great cost of transportation, handicap that island very heavily in competing with Canada; and it is not likely that the New Caledonia competition will for many years affect the value of nickel.

Considering the situation and our opportunities, it is to be hoped that our Government will take prompt and effective action to secure to Canada the benefit of her nickel wealth. Without the expenditure of a dollar, by imposing an export duty, hundreds of thousands of dollars can be covered into the Dominion Treasury every year; and if but a portion of this wealth were advanced to encourage the manufacture of nickel-steel at home, there is no reason to doubt but that in a very short time we would be a heavy exporter of the article.

Impose the duty.

CANADIAN MUGWUMPERY.

MUGWUMPERY may be described as that mental condition disappointed politicians arrive at when, for reasons best known to themselves, they find that the political grindstone is ir-operative, as far as sharpening their little axes goes. With some politicians when this condition is reached, they either try

some other axe, or some other grindstone; but they keep up the trying all the same. Other politicians may also pursue this method, with this difference, that they consider sulking to be dignity, and imagine that general and promiscuous exhibitions of sulkiness and surliness, to be indicative of the highest elevation that statesmanship may attain. In American politics George William Curtis and Carl Shurtz were and are fine specimens of such mugwumpery. Not being quite able to convince the Republican party, to which they professed to hold allegiance, that beneath their respective hats was concentrated all the wisdom, virtue and statesmanship that the gods ever bestow upon men—in other words discovering that they could not rule their party, with a gravity becoming asses, and with looks of wisdom that owls might envy, they roosted high like evil omened birds, above the common level of humanity, and croaked out their warnings of the danger to the country which none but them could see. It is true they gathered about them other dissatisfied spirits, and they were happy in their adoration. But the Republican party seems to flourish without these white souled politicians, and the American people seem well content with the previous constitution of their political parties. Mr. Curtis and Mr. Shurtz might have done as Sir Richard Cartwright did and have openly allied themselves to the opposite party, but they didn't do it.

An outbreak of similar mugwumpery has developed in Canada, the *Montreal Star* showing many symptoms of the disease. The *Star* professes allegiance to the Conservative party, or at least it pretends that it is an upholder of, and believer in Canada's National Policy of tariff protection. We are not advised as to the cause of its disgruntlement and disaffection, but it is evident it has a hidden sorrow which, like the worm in the bud, is producing canker in its tender heart, and embittering the fountains of its joy. We do not know just where or how the axe and grindstone business applies; but the *Star* is continually showing its disappointment by its attacks upon those whom it would have the world believe are its friends.

One of its most toplofty displays of mugwumpery is contained in an editorial addressed to the Canadian Manufacturer's Association. It finds its incentive in the resolutions passed at the late meeting of the Association in which the National Policy was again endorsed, and then from its lofty pinnacle above the heavenly orbs this star of mugwumpery proceeds to read it a lecture. It had hoped that the Association would have given Mr. Foster to understand that it was in favor of tariff reduction "to a safe degree;" that having their business restricted to the home market because of the tariff, a generous desire for the prosperity of the country should have induced them, as shrewd men of business, to acknowledge the folly of taxing the community into a discontented and unstable condition; that its argument "has all along been based upon the assumption that the Canadian consumer is overtaxed."

To this overtaxation, it tells us, is due the fungus growth of mortgages and other interest-eating contrivances which bear down heavily upon the farming industry; and it depicts a gloomy condition of things, as prevailing in Canada, which suggests some of the best efforts of Sir Richard Cartwright. "It is perfectly competent," it tells us, "for the manufacturers' to contend that these evils are not caused by over-taxation, and then to set forth the real reasons for their existence." Cer-

tainly it might be competent to do this if the woeful condition complained of prevailed, or if it was peculiar to Canada, as arising from the operation of our fiscal policy, and not prevalent in Great Britain where an opposite policy prevails. The *Star's* argument indicates the presence in its editorial department of one of these smart Alecks, who, like the ass which covered itself with the skin of the dead lion, expect passers by to become overwhelmed with terror at the sound of its voice. But Canadian manufacturers and the Canadian people know the difference between a live lion and a stuffed skin; and their keenness of perception enables them to discern between the roaring of a lion and the braying of the equine quadruped.

If the *Star* would come down from its mugwump perch in the lofty firmament and give some practical consideration to Canadian politics, we would be pleased to have it explain itself in this matter. It suggests that the Canadian manufacturers go in for a revision of the tariff, and it intimates that if the revision is not made, the farmers, who, it says, are so seriously affected by it, will themselves take the matter in hand and bring about free trade. We would be willing to admit that the skin was that of a veritable lion, and that the equine bray was the roar of the mighty king of the forest, if the *Star* would kindly point out where tariff revision is required, and in what respect the farmers are over-taxed. Our impression is that in no agricultural industry has the Government overlooked the farmers, neither in protecting them in the articles they produce nor in looking for foreign markets for their produce. If this impression is wrong we ask the *Star* to show wherein it is wrong. But generalities will not answer. We know that mugwumps are not students of practical politics; but we live in a utilitarian age, and fine theories, drawn from the celestial spheres, are not applicable to Canadian necessities. Show us something tangible. Show us, if possible, that the Canadian farmer will be benefitted by depriving the Canadian manufacturer of the Canadian home market. Show us that the Canadian farmer will do better to sell his produce abroad, in competition with the world, than to sell it at home. Show us how the Canadian farmer will be benefitted by the closing of Canadian factories and workshops, and the transfer of the labor now employed in them to Canadian agricultural pursuits, thereby decreasing consumption and increasing production. Show us how Canada can be a self-contained nation if all the manufactured articles we require are made for us in distant lands by strangers, while we become nothing more than the hewers of wood and drawers of water for them. Tell us where the revenues for the support of the Government will come from under the threatened free trade, or even under a tariff for revenue only, which is the same thing. Tell us where the Canadian farmer will find the ready hard cash with which to pay the tax-collector under free trade.

No doubt this saintly *Star* will decline the active consideration of these questions. It asks the Canadian manufacturers to accept them—that is—to go in for "tariff reform," but will it show how the thing can be done along the lines indicated by it. Will the *Star* please shed some common-sense light on the subject?

ADVERTISE IN "THE CANADIAN MANUFACTURER."

SECTION 3.

SECTION 3 of the McKinley tariff reads as follows :

That with a view to secure reciprocal trade with countries producing the following articles, and for this purpose, on and after the first day of January, 1892, whenever and so often as the President shall be satisfied that the Government of any country producing and exporting sugars, molasses, coffee, tea and hides, raw and uncured, or any of such articles, imposes duties or other exactions upon the agricultural or other products of the United States, which in view of the free introduction of such sugar, molasses, coffee, tea and hides into the United States he may deem to be reciprocally unequal and unreasonable, he shall have the power, and it shall be his duty to suspend, by proclamation to that effect, the provisions of this Act relating to the free introduction of such sugar, molasses, coffee, tea and hides, the production of such country, for such time as he shall deem just, and in such case and during such suspension duties shall be levied and paid upon sugar, molasses, coffee, tea and hides, the product of or exported from such designated country as follows, namely: (Here follows the schedule of duties upon the articles named.)

This is the lever which is being used so effectively in forcing the West India Islands and the South and Central American States into reciprocal relations with the United States. It will be observed that agricultural products are the chief things which the United States have to trade off in return for sugar, molasses, coffee, tea and hides; and it will be further observed that the United States is the largest and best customer the producers of these commodities have. No regard is paid to the financial necessities of these producing nations, nor are they to be allowed to levy import duties upon American agricultural products under pain of having their products excluded from the American market. We do not challenge the right of the United States to make and enforce such a law; but it is in line with other provisions of their tariff which imposes prohibitive duties upon such Canadian agricultural products as eggs and barley. In fact it seems to be the policy of that Government to shut out of its market, as far as it has the ability to do so, all such things coming from abroad which can be produced at home; and to force other countries to accept free of duty all American agricultural products in exchange for the privileges of the American market of such merchandise as is named in Section 3, which the American market cannot possibly do without.

And it is the terrors of this Section 3 with which the Canadian advocates of unrestricted reciprocity are holding up before Canada in the hope that she will be driven to enter into an agreement with a selfish neighbor by which our manufacturing interests would be destroyed. It is true that if Canada were inclined to do so she does not have the market that the United States has for the absorption of the products of these Southern islands and States, and therefore we have no inducements to offer, no great lever to use to force them to accept Canadian products in any better terms than they are inclined to accord. But the advocates of unrestricted reciprocity do not point out to us wherein we would better our condition if their fad were adopted, nor how Canadian produce could find entrance into these southern markets on equal terms with American products, even if we had unrestricted reciprocity. Section 3 does not stipulate that in the event of unrestricted reciprocity between Canada and the United States, Canadian

agricultural products should be received on the same terms as American products, then what benefit would Section 3 be to us?

It was in the same spirit, as developed in Section 3, that the United States forced Canada to remove the export duty upon saw logs. If Canada desired to supply American mills with saw logs well and good, but if Canada desired to restrict the export of logs, Canadian lumber was to be discriminated against. We have heretofore shown that the American pine forests contiguous to the Canadian line are fast being depleted, and that their productive capacity will be entirely exhausted in a very few years. Yet in the face of this fact, and of the other fact that when that time arrives the entire dependence must be upon Canadian forests, the Canadian Government very unwisely allowed themselves to be bulldozed by the McKinley tariff into removing the export duty upon logs. Instead of doing this the other course should have been adopted and a higher export duty imposed.

So, too, as regards nickel. The spirit of Section 3 prevailed when the previous duty upon all forms of nickel except refined was removed, and a duty of \$200 per ton retained upon this latter article. The production of nickel in the United States is only about one hundred tons per year, while the demand for the manufacture of armor plates alone amounts to ten times that quantity. But the spirit of Section 3 was manifested in the determination that Canada should not manufacture refined nickel for the American market, no matter how strong the requirement for it might be, although this great requirement could not be met except with the produce of Canadian mines. Why should Canada not exercise some of this Section 3 spirit and impose an export duty upon nickel contained in ore and matte measured by the McKinley import duty upon the refined article? It would be sensible and dignified to do so. If the spirit of Section 3 is so important for the prosperity of the United States, why would it not work equal good for Canada?

PROFIT SHARING IN CANADA.

THE division of the profits accruing in industrial establishments is a new departure in Canada, although it has been in operation in other countries, particularly in France, where the system was ventured upon a number of years ago. The introduction of this system into this country was made a few days ago by Messrs. T. S. Simms & Co., manufacturers of brushes, etc., at St. John, N.B. On the last day of the old year Mr. T. S. Simms, the head of the concern, gave a dinner to which all of his employees were invited, about eighty in number, including quite a number of young girls; and after the repast he read to his company the following proposition, which had been printed for the occasion:

It is fitting that we, who spend so much of our time under one roof, in earnest business occupation, should occasionally meet in this social manner, if there be no other object in view than for social intercourse; but to-night I have invited you here for the purpose of unfolding a plan which I trust will meet with your approval, and in which I hope for your hearty co-operation.

Some nineteen years ago I came into this business, and at that time, one at least, of our number was employed in it, and others have been for many years. You have seen it grow

from small proportions to a business employing nearly a hundred hands, and from a market limited to our own province to one embracing the whole Dominion.

We are probably all dependent on this business, while we are engaged in it, for our means of livelihood, and in its success we all are, or ought to be interested.

Many, I may say most, of our employees are faithful and careful; some could hardly be more so if the business was their own; and yet, despite this fact, I see that much is wasted, and much more care and economy could be exercised. It is my purpose to offer you to-night such an inducement as will encourage you to put forth your best efforts, and which, I trust, will be to our mutual advantage.

Briefly stated, my plan is to share with you the profits of the business; and then on every dollar you save or make, a share will go into your own pockets. The man who saves a foot of lumber where it now goes into the fire, will save something for himself. He who saves an ounce of bristles will add to the profit of all. The girl who is saving of stock and wire will do the same. The broom-maker who saves two pounds of stock in a day will have saved a month's wages in a year; and so I might go on enumerating the saving that may be made in stock, tools, machinery, oils, nails, tacks, twine, paint, gas and a hundred articles that will suggest themselves to you, but to further enumerate them is unnecessary. Also, by improving your workmanship, which already is of high order, a larger sale at better prices may be secured. Now, as to the details of the plan. The management of the business will remain as heretofore, in my own hands, and the system of wages will be the same. As you will have no voice in the management, so you will not be called upon to share the losses. Should there come a year with no profit, your wages will be paid the same as usual. If the capital should become impaired, no profits will be shared until that amount is made up.

Capital will be paid interest at six per cent per annum. A salary will be paid for management. A percentage will be allowed for depreciation in plant; a small percentage will be allowed for a sinking fund, and also for an invalid fund.

After providing for the above, the profits will be shared in an equal percentage between capital, salary for management and wages. This will apply only to those who have been in the employ of the firm at least ten months when the profits are divided.

You will have the privilege of appointing two of your number, pledged not to divulge any facts that in the interest of the business ought not to be made known, who can inspect the accounts, and see that the above agreement is faithfully carried out; or, if found desirable, a public auditor will be employed.

This agreement is entirely voluntary on my part, and after the first year will be continued or discontinued, or modified, as in my judgment will be for the best interest of the business.

Your dividends will be paid in cash, but the suggestion is offered that you deposit the whole or a part with the firm, for which certificates of deposit will be given and interest allowed at the rate of six per cent per annum.

Let us try this plan, with the determination on the part of every one that it shall be made a success; and I am satisfied, if we all enter into it heartily, that the close of the year will find us all in a better condition financially, and the effect will be felt in more cordial relations one with another, and also habits of economy and thrift stimulated, which will benefit us in many ways.

This proposition seems exceedingly fair and generous, and from the well known benevolent disposition of Mr. Simms' firm, the kindly feeling with which he is regarded by his employees, and judging by the faithfulness so many of them have observed for so long a time in his employ—some of them for twenty years—there can be but little doubt that this important move will be entirely successful.

Profit sharing has been adopted by quite a number of manufacturing establishments in the United States, particularly in the New England cotton mills, the initiatory having been taken, we believe, by the N. O. Nelson Manufacturing Company, of St. Louis, some six or seven years ago. This sort of co-operation has taken a firmer hold in France, where it originated, than in any other country; and there are quite a number of systems of such co-operation.

The systems of profit-sharing among the employees who do not invest in the business are many. Some firms provide first for the interest on capital and give the workmen a large share of the balance. Some divide the net profits without first providing for interest on capital. In the latter case the proportion allowed to labor is of course much less than in the former. The method of division depends also on the nature of the business, as in some the capital required is much larger in proportion to the amount paid in wages than in others. Then there are many ways of paying the share that goes to the employees. Some pay in cash the whole allowance to labor. Some pay a part and deposit the balance for a retiring allowance. Some pay part cash and deposit part. The firm of Barros, Tassart & Balas, allow the workmen five per cent. of the net profits—half in cash, the other half for a provident or retiring fund. This has given the employees an average addition of over ten per cent to their salary. Besselièvre's cotton factory, on the Lower Seine, shares profits with all that have been in the employ more than five years. These have received a bonus of from \$30 to \$75 each annually, or from seven to seventeen per cent. increase in their wages. The great Bon Marche system of stores in Paris has been dividing profits since 1880, when Madame Boucicault, the proprietor, took ninety-six employees into a sort of partnership. The General Transatlantic Steamship Company divides profits with all the employees from the manager to the cabin boy. The Co-operative Paper Company, of Angouleme, divides the profits generally, allowing something for capital, something for intellect and something for labor. The men are encouraged to invest their shares in the business, and in 1885 the employees' shares in the establishment amounted to \$269,000. There are a few instances in which the whole body of workmen have, by investing their shares of the profits, become the principal owners of the business. The first firm in France to adopt the system has been one of the most successful. It is a house painting, glass tinting and decorating firm in Paris. The nature of the work is such that the faithfulness and carefulness of the employees counts for much. M. Leclair, who wanted to begin the system in 1842, was handicapped by the Government, which persisted in thinking that his propositions involved danger to the institutions of the country. In due time he got his project under way and it worked well from the first. Men now in the employ of the house have acquired a large interest in the business. The provident fund from which retiring allowances, pensions to widows and allowances to orphans are paid amounts to nearly half a million dollars. The retiring pension after twenty years' service is \$240. Widows and orphans get \$120 a year each, until the children are of age. There is a sick allowance, and the remaining share of the profits affords each good man some \$80 a year bonus. The instances cited are among the more successful. Some have failed to meet the

hopes of the promoters. The want of success in these cases—and there are several in England—has almost invariably been due to a failure of one of the parties to carry out the agreement. What seemed to be a successful experiment in co-operative mining in England failed because the men were drawn into a labor agitation with which, under their system, they had nothing to do. Another failed through the action of the mine owners. But it is believed that in nearly every case where the conditions were at all favorable, and where the experiment was given anything like a fair chance for a considerable time, it has been advantageous to all parties. There are some branches of business, and some industries in which the system could not conveniently be adopted. But complete and organized co-operation in some fashion is the ideal condition for labor and capital.

This departure of Messrs. T. S. Simms & Co. will be watched with much interest by all classes of the community interested in industrial enterprises and the employment of labor; and its success will solve a problem which has always given occasion for the deepest reflection.

EDITORIAL NOTES

CANADIAN manufacturers, and all who are interested in knowing the precise status of our manufacturing industries, as affected by our exports of manufactures, are under obligations to Mr. George Johnson, Dominion Statistician, for the facts which we present in an editorial article, having reference to this subject. Mr. Johnson prepared them by special request for the Canadian Manufacturers' Association; and other similar facts, and of equal importance, will be supplied through this journal.

We request special attention to an editorial in this issue in which the manufactured exports of Canada are given for a long series of years. This is the first time these facts have ever been made public. They relate, chiefly, to those manufactures in which the products of the forest are the chief materials used; and it accentuates the fact, which has so often been asserted in *THE CANADIAN MANUFACTURER*, that the exports of "manufactures" from Canada were greatly underestimated. Subsequent to these, similar facts will appear in this journal, having reference to others of the great divisions into which the industries are classified. These facts give an importance to the manufacturing industries of Canada, which very few Canadians, or any one else, have fully comprehended.

The estimates made by the United States Government for 1891 of the area, production and value of the principal cereals of that country have been published. The crops of corn, wheat and oats, including all but two or three per cent. of the cereal aggregate, are reported. The total for corn has only been exceeded once. The wheat product is the largest ever grown in any country, and the yield per acre in the United States is the largest ever reported. The total for oats was slightly exceeded in 1889. The aggregates are as follows:—Corn, area, 76,204,115 acres; product, 2,060,151,000 bushels; value, \$836,439,218. Wheat, area, 38,916,897 acres; product, 611,780,000 bushels; value, \$513,472,711. Oats, area, 25,581,861

acres; product, 736,394,000 bushels; value, \$232,312,267. The aggregate of all cereals is the largest yet produced, and will supply fifty-four to fifty-five bushels per unit of population. The average value to the farmer is 40.6 cents for corn, 83.93 for wheat and 31.46 for oats. And it is this large market that the Grit orators and papers are declaring to be indispensable to the Canadian farmer.

A few days ago a deputation of agents representing the steamship companies engaged in the trans-Atlantic trade from Montreal, waited upon Premier Abbott, at Ottawa, with the request that the duties upon rolled iron be reduced. They stated as their argument that because of the large increase in the manufacture of iron in Canada, the importation of the article from Great Britain had greatly diminished, in consequence of which the steamship lines were suffering from the lack of heavy freights. They alleged that the duty upon iron was excessive, and desired the Government to reduce it "so as to promote the importation of manufactured iron," and thus give additional employment to their ships. This proposition is the acme of impudence. Who are these steamship agents that they should seek to change the long established policy of the Government? Do they speak by the authority of the owners of the ships? It is doubted that a dollar of Canadian money is invested in any of them. They are owned abroad, probably to greater or less extent by British manufacturers of iron, who seek to crush our rolling mills out of existence, so that their's may survive. Canada is under no obligations to British ship owners, none whatever. Whatever services they render are well paid for. The prosperity of Canada is nothing to them—they have no care as to whether a great manufacturing industry is successful or not—they are here to make money out of the people. Mr. Abbott did well to send them about their business in short order. The incident shows the desperateness of the free traders, and the quality of brass and impudence of which they are composed.

DURING the recent discussion of the Sunday street car question in this city, a correspondent of a morning paper, speaking of the time when the Israelites were wandering in the wilderness, says:—

In all the wars and conflicts that have followed since, it has been the masses in the main that have suffered, and the longer their hours of labor the more they approached slavery, being deprived of proper time for rest, recreation and thought, while those who employed them, having leisure to think and to plan, have always got the best of it. As the Sabbath is about the only day for rest, some want it for worship, and others for recreation. The trouble is that some of those who want worship decri recreation, and some of those who want recreation decri the worship of God. Both are necessary. King Alfred, of old Saxon times, allotted eight hours for labor, eight hours for food and recreation, and eight hours for sleep, and no better division has ever yet been made. In a successful and paying cotton mill in New England forty years ago, the hands worked thirteen to fourteen hours per day, and produced 5,000 yards per head per year, by adopting the best machinery from time to time. They now work ten hours per day, instead of thirteen or fourteen produce 30,000 yards of cloth per head per year instead of 5,000, and the operatives receive double the wages and the goods are sold for one-third less. This is also the case in every branch of manufacturing, more or less,

and has placed what were once luxuries within the reach of all sober and industrious labor.

This is a strong argument in favor of protection, as applied to Canadian manufacturing industries. Where free trade has heretofore found its strongest foothold, the population was dense, and the hours of labor, in the struggle for life, long and arduous. It is so now in most countries, and it is against the competition of this cheap labor that protection raises a barricade behind which Canadian workmen find time for rest, recreation and thought; for it is true that those who are forced to work long hours, are the ones who are the nearest approached to slavery.

Now that some changes are being made in some of the Departments of the Dominion Government, it is to be hoped that the suggestions this journal has for so long a time been urging, in the interests of Canadian manufacturers, may receive the attention it deserves. It is well known that under existing arrangements these interests are not as well looked after as their importance demands; and as we have heretofore shown, it requires no new legislation to enable the Government to carry this idea into effect. It is immaterial to the manufacturers how this is to be done so long as it is done; and the importance of the matter, and of our emphasis of it, is shown in the facts which we herewith give regarding the export trade of Canada in manufacturers for a long series of years. These facts have never before been given to the public, and we owe it to the courtesy of Mr. George Johnson, of the Statistical Bureau of the Department of Agriculture, that we are able to present them at this time. The clerical labor involved in preparing the facts was very great, and was not included, we imagine, in any calculations of the Department as regards the returns of the recent census. The facts were collated by Mr. Johnson at the request of the Canadian Manufacturers' Association, and we take pleasure in announcing that others of similar character will be published as soon as the preparation of them is completed. It has always been our contention that the manufacturing interests of Canada were made to appear as dwarfed and minimized in such official reports as appear in the Trade and Navigation Returns affecting our exports of manufacturers, and our object in working for some new Department of the Government, or some change in the methods of existing Departments, has been with a view to bringing the volume and importance of our manufacturing industries more clearly and prominently before the people of Canada and of the world. If the facts which are now presented for the first time in a concise form are surprising, we can assure our readers that other forthcoming facts will also show most favorably. Let this good work go on.

THE appearance of a deputation of Montreal agents of trans-Atlantic steamships at Ottawa last week, asking the Government to reduce the duty upon bar iron with a view to increasing the consumption in Canada of British made iron, thereby giving their steamers increased freights, recalls the situation. In 1890—we have no later facts,—the imports of scrap iron were about 53,592 tons, valued at \$678,574, or about \$12.50 per ton, the duty being \$2.00 per ton. In the same year our imports of bar iron were 10,190 tons valued at \$310,000, or

about \$30 per ton, the duty being \$13 per ton. Nearly all this scrap was imported from Great Britain, and was manufactured in Canadian rolling mills into bar iron. The low rate of duty, —\$2.00 per ton,—gave this material the preference over pig iron—duty \$4 per ton—in this industry, a consequence of which was that comparatively little puddled iron was made in Canada. This was hard on the blast furnace industry. It is somewhat more expensive to make bar iron of pig, though for some purposes such iron is considered of greater value than iron made of scrap. It can be seen, therefore, that we are not likely to have many puddling mills under existing circumstances. Puddled iron being more expensive to make the industry would be handicapped by a duty on its raw material—pig iron—100 per cent. higher than the duty on the raw material—scrap iron—used in existing mills. That considerable puddled iron is used in Canada is shown in the large importations of it, and in that a large proportion of the pig produced in Canadian furnaces is consumed in its manufacture. According to the ethics of protection the \$11 difference in the duty between scrap at \$2 per ton, and bar at \$13, should indicate the difference in wages paid to workmen employed in the Canadian mills, and probably some other slight charges. If the duty on scrap, which is a more advanced form of iron than pig, were raised to \$4, the same as upon pig, it would force the manufacture of puddled iron here, and to that extent greatly benefit our mining and blast furnace interest; and the presence of sufficient quantities of home-made puddled bar on the market, would evidently restrict the imports of the British article. If the scrap mill people could show that a \$1 duty on their raw material was working them a grievous injustice, no doubt the duty upon imported bar would be advanced.

AMERICAN manufacturers are discovering that their exporting interests are not as well looked after as they might be, and are demanding that a Department of Commerce be made a feature of their Government, the head of the Department to be a cabinet officer and a member of the President's official household. Meetings of influential business men and business organizations have been held in many of the trade centres, and resolutions have been adopted, the general tenor of which are to the effect that while there are a number of departments of the Government representing various interests of the people, no department exists especially devoted to the commerce of the country. Committees appointed for the purpose are preparing memorials to Congress, and having them extensively signed, setting forth these views, and requesting that the department of the Government asked for, be immediately authorized and organized. Regarding this matter the *American Manufacturer* says:

There certainly seems to be need of such a department. The commercial interests of the country are entitled to this recognition in the General Government. The creation of a Department of Agriculture has resulted in marked benefit to the farming interest, and it may reasonably be expected that a Department of Commerce will be alike beneficial to the trade and commerce of the country. Aside from the fact that general business interests require the establishment of such a department, it is urged that, under the present condition of things, there is too great a burden on the Secretary of the Treasury. Within a comparatively short time three men have succumbed to the exacting demands of this office, and it is held that the

proper relief can be found only in the establishment of a department which shall take part of the work now done in the branch headed by the Secretary of the Treasury. The movement for the formation of the proposed Department of Commerce will doubtless gather strength as it progresses, and should receive the support of the commercial interests throughout the land.

Like the United States, Canada also has great need of such a department; unlike that country, the machinery for such a department has already been authorized, it remaining with the Government to put it in motion when they see proper to do so.

Nor unfrequently seen together in the rotunda of the Rossin House are two brothers, John Charlton and Thomas Charlton. The first is the notorious M.P. from Lynedoch, the second the large lumber dealer from Tonawanda. However unsound may be John Charlton's public views, his private views may sometimes be followed, as for example in his estimate of the future prospects of the Reform party, as reproduced in the *Empire* last March, or his ideas on the lumber trade, in which he is largely interested, and in which his active business ability has gained him great success.

"Every year," said Mr. Charlton, "American lumbermen are paying more attention to Canada. The removal of the export duty on logs was a most wise move on the part of the Dominion Government. The export duty of \$1 a thousand was doing considerable damage to the trade. There was a reciprocal clause in the McKinley Act providing for the removal of the duty on lumber if the export duty on logs was abolished. Sir John Macdonald took advantage of this clause, and the two Governments a year ago last fall completed arrangements. The U. S. Government, however, removed the duty on white pine lumber only. The spruce lumber was left still liable. The spruce men in Canada are now kicking hard at this distinction, but their protests will be little heeded by Uncle Sam. It is idle for them to demand a return to the export duty on logs. It will not place them in any better position, and it will only cripple the white pine trade."—*Empire*, Dec. 30th

Indeed! Mr. Charlton's private views as herein expressed on the lumber trade of Canada "may safely be followed." Dr. Spohn, ex-M.P., during the last session of the Dominion Parliament, in arguing for unrestricted reciprocity with the United States, showed that the removal of the export duty upon pine logs had resulted in the closing down of hundreds of saw-mills in Ontario, and the transfer of hundreds of Canadian mill laborers to the United States, where Canadian logs which had been carried there, were cut into lumber. The Messrs. Charlton are thus engaged in the manufacture of lumber from Canadian logs at Tonawanda, New York. They have their mills there, because the McKinley tariff imposes a duty upon Canadian lumber, but not upon Canadian logs; and their opposition to an export duty upon logs arises from selfish and personal motives entirely. And it is the selfish views of this selfish and interested Mr. Charlton that the *Empire* tells us may be safely followed. If we had an export duty upon logs, Messrs. Charlton's mills in New York might be closed down, but employment would be given to the hundreds of mills in Ontario now idle, and the Canadians who followed Canadian logs to the Charlton mills would return to work in the Canadian mills. The *Empire* is not on the right track.

In a recent review of the market our esteemed contemporary the *Empire* has this to say:

In canned goods the market has been very healthy and

satisfactory. The new pack was a large one, but it came upon an absolutely bare market, and the output was absorbed in a rather unexpected way. This kept the market in a healthy position and the outlook for holders of the leading staples is very satisfactory. There has been an increased export business, which is likely to develop more rapidly in future, for Canadian packers have a decided advantage over American in that their tin is admitted free. The Americans pay a high duty, but get a rebate. The difference in favor of the Canadian packers is sufficient to give him a fair profit.

This would be interesting reading to American packers if it were literally true, as it is not. It is true that the McKinley duty upon tinplate is heavy, but when it passes through any process of manufacture and then exported, as when used for canning purposes, a rebate of 99 per cent. is returned to the manufacturer. Thus if a hundred pounds of tinplate pay a duty of \$2.40, when manufactured into cans and exported all of this duty is returned to the manufacturer except 2.4 cents; and as the hundred pounds of tinplate will make about 400 cans, it can readily be seen that the actual duty remaining to the Government—2.4 cents—is not so much of an item in the cost of the 400 cans as the *Empire* seems to suppose. If this imperceptible difference in favor of the Canadian packer is sufficient to give him a fair profit over the American packer, then the Canadian duty upon canned goods is an unnecessary tax upon Canadian consumers. The *Empire* must have a grudge against the Canadian packers. It does not understand the necessity of their interest being protected by the tariff.

The Canadian packers of canned fruits and vegetables obtain their supplies entirely from Canadian farmers. If there was no duty upon such supplies coming from the United States, the season being so much earlier there than here, and lasting so much longer, our canners would be customers to American farmers, therefore the tariff in this respect is a direct benefit to Canadian farmers, but the canners are not so much benefitted by it. On the other hand the duty upon canned goods restricts the importation from the United States, and this benefits both the Canadian farmer and canner. And yet the *Empire*, which poses as the special friend of the Canadian farmer, says that the net duty of one one hundredth of 2.4 cents per pound paid on tinplate consumed by American canners in their export trade, (tinplate coming into Canada duty free) is sufficient to give the Canadian packer a fair profit over his American competitor.

We congratulate our esteemed contemporary, the *Canadian Lumberman*, upon having passed safely and expeditiously through certain rejuvenating influences which have made it decidedly one of the handsomest trade journals which come to our table. We might have expected as much when the *Lumberman* abandoned the back woods down about Peterboro' and gravitated to Toronto. It seemed to shake the sawdust out of its hair, as it were, and put on city style, and the city atmosphere has certainly been healthful to it. Celebrating its thirtieth anniversary, its January issue was in an entirely new suit—tailor made from crown to sole—and now it is the realization of the life dream of Editor Mortimer. Now that the *Lumberman* is in such brave and manly shape, we hope to see it bend much of its energies in urging the Government to re-impose the export duty upon saw logs. Give the Canadian lumbermen and saw mill men a chance, also the Canadian manufacturers of saw mill machinery.

Our issue for February is filled from cover to cover with interesting and instructive reading matter embellished with a great number of beautiful illustrations, among which are a series of reproductions of instantaneous photos that have, perhaps, never been excelled. In

these dull winter days one might imagine that it would be impossible to obtain fresh material for a magazine like *Outing*, but the publishers are equal to the situation and certainly submit a most charming lot of it in the February number. The contents are: "Cycling in Mid-Pacific," by Chas. E. Trevathan, illustrated by Watson; "The St. Bernard Kennels of America," by E. H. Morris, illustrated by Dustin and from photos; "Cowboy Life The Trail," by Bronko, illustrated by Watson and from photos; "The Game of Curling," by R. C. Whittet, illustrated by Simons; "Saddle and Sentiment" (continued), by Wenona Gilman, illustrated by Watson; "A Bang at a Norwegian Bear" (illustrated), by the author of "A Dead Man's Diary"; "The Lessons of the Horse Show," by Frances Trevelyan; "College Rowing," by Oneida; "Winter Smelt Fishing," by Clayton J. Kinsley; "The Connecticut National Guard," by Lieut. W. H. C. Bowen, U.S.A., illustrated by Watson, and from photos; "Photography and Athletics," by W. I. Lincoln Adams, illustrated from instantaneous photos; "Uncle Duke's Bar Story," by Lillian Gillilan; "Harry's Career at Yale" (continued), by John Seymour Wood, illustrated by Watson; "Wapiti Hunting in Manitoba," by Cervus, illustrated by Watson; "Training," by Malcolm W. Ford, and the usual editorials, records, poems, etc.

A most unique magazine is the February *Ladies Home Journal*, entirely made up, as it is, in prose, verse and fiction by daughters of famous parentage, some of the "daughters" being famed themselves. Thirty "daughters" are represented, each by an article, story or poem, and a more curious and successful innovation in magazine literature has not been made for years. The issue is in every respect a surprise, and is a powerful argument in behalf of hereditary genius. Hawthorne's daughter, Mrs. Lathrop, for example, has an excellent story; Mildred Howells, the novelist's daughter, writes a very sweet poem; the daughters of Charles Dickens, Thackeray and Horace Greeley all write of their famous fathers; President Harrison's daughter, Mrs. McKee, surprises by writing a very strong article on "The Training of Children"; Gladstone's daughter tells "How a Woman's College Began" of which she is Vice-Principal, General Sherman's daughter tells a clever war story; Julia Ward Howe presents three literary daughters; ex-Senator Ingall's clever daughter, Ethel, sketches Mrs. Lebad Stanford; Jefferson Davis's favorite daughter, "Winnie" portrays "The American Girl Who Studies Abroad," from her own experience, and these are followed up by the daughters of Sir Morell Mackenzie, "Mrs. Alexander" and Richard Henry Dana; Miss Bradley, writes of the "Queen of Westminster Abbey," of which her father is Dean. And as a fitting compliment to the fore-part of the issue Julia Ward Howe, Mrs. Henry Ward Beecher, Mrs. Admiral Dahlgren, Mrs. A. D. T. Whitney and other famous mothers tell "How to Train a Daughter." This is, indeed, a curious number, and the most novel ever issued by a magazine. None of the *Journal's* departments are omitted, the "famous daughters" occupying the fore part of the magazine, while Dr. T. Image, "Bob" Burdette, Margaret Bottomo and all the other *Journal* editors form the rear-guard. Such an issue is worth five times its modest price of ten cents. Published, at one dollar per year, by the Curtis Publishing Company of Philadelphia.

The always perplexing labor question receives first attention in *The Popular Science Monthly* for February. In an article entitled "Personal Liberty," by Edward Atkinson and Edward T. Cabot, are given the decisions of the courts concerning restrictions on hours and modes of labor, regulation of the method of payment, etc. In "The Story of a Strange Land," Professor Jordan, of Stanford University, tells how the hot springs and lava cliffs of Yellowstone Park were formed, and how fishes have come into its lakes and streams. The delightful story is made still more attractive by several full-page pictures. Mr. Carroll D. Wright treats of "Urban Population," in his series of Lessons from the Census, and sets forth a result in regard to the slum population of cities that contradicts the accepted belief on this subject. Mr. Daniel Spillane has an interesting, fully illustrated article on "The Piano-forte," giving the history of its development out of the harp. Another illustrated article is on "Stilts and Stilt-walking," by M. Guyot-Jaubert, describing what has been a very useful means of locomotion in certain parts of France. There is a suggestive paper on "Electricity in Relation to Science," by Professor William Crookes. In "The Nationalization of University Extension," Professor C. Hanford Henderson defends this policy against an editorial criticism in the November *Monthly*, and a rejoinder to Professor Henderson appears in this month's Editor's Table. The question, "Is Man the Only Reasoner?" is discussed by James Sully, who examines critically the latest work of Romances on mental action. Mrs. Mary Alling Aber concludes her account of "An Experiment in Educa-

tion," begun in the last number, describing the results obtained with her mode of teaching in Englewood, Ill. There is sound common sense in Miss Tweedy's article on "Homely Gymnastics," the essence of which is contained in this prescription that she quotes. "One broom; use in two hours of house-work daily." This number contains also "New Observations on the Language of Animals," by M. De Lacaze Duthiers, in which the writer shows by numerous anecdotes, that animals express their impressions by modulations of their cries. In "Recent Oceanic Causeways," M. E. Blanchard gives a survey of remarkable changes that have taken place in the land and the seas. A Sketch and Portrait are given of William Edward Weber, who in 1834 set up the first permanent workable telegraph line. The departments are well filled as usual. New York: D. Appleton & Company. Fifty cents a number, \$5 a year.

CANADIANS everywhere will be delighted with the new magazine, the *Dominion Illustrated Monthly*, the first issue of which has just reached us. The publishers in their prospectus declared their intention to make this new magazine, in its literary, artistic and mechanical features, a credit to Canada; and the initial number is a decided proof that they intend to keep their word. The *Dominion Illustrated Monthly*, with an artistic cover, presents a very handsome outward appearance; and the contents of this number, both in literary excellence and artistic illustration, will command the admiration of every reader. "The Raid from Beausjour," by Chas. G. D. Roberts, begun in this issue, is a powerfully written story, with illustrations by Patterson, of the days when Abbé Le Loutre's influence caused rapine and bloodshed in the newly acquired British province of Nova Scotia. Rugby foot-ball during the last year or so has become the most popular of autumn games in Canada, and therefore the bright and full description of the game written for this number by R. Tait McKenzie, with about a dozen illustrations showing the field and various stages of the game, will delight every lover of athletics. "Hamilton's Raid on Vincennes," by Douglas Brynner, is a vivid description of an episode of the Revolutionary War; and Mr. Brynner's dispassionate and unmercenary marshalling of proofs clears the character of Hamilton from the aspersions of American writers, while it shows up some of the "fathers of the revolution" in anything but an enviable light. Mrs. A. M. McLeod, in "Beyond the Pentland Firth," gives a fine description of Kirkwall and other points in the Orkneys, combining Pictish, Roman, Norse and Scottish legend and story with modern scenery and conditions of life in the most fascinating manner. Duncan Campbell Scott contributes a quaint and interesting character study, styled "John Scantleberry," while Rev. Arthur John Lockhart (Pastor Felis), in the familiar "Red and Blue Pencil," delights his readers with one of those semi-confidential but wholly charming letters which have won for him a distinct place in Canadian literature. A splendid portrait of the late Duke of Clarence and Avondale, with a sketch of his life; a delightful children's story, by Miss Marjory McMurchy; poems by Arthur Weir, S. M. Baylis, Helen Fairbairn and J. T. Burgess; "Modern Instances," by Prof. Roberts, and Book Reviews, by the editor, complete this brilliant number. It is splendidly illustrated throughout, and its distinctly Canadian character is a strong feature, and ensures it a hearty welcome from the public. The number is accompanied by a beautiful colored supplement, "The Cobbler's Shop," from the painting by Von Haanan. (A supplement is issued with every number, and will prove a most attractive feature). \$1.50 per annum. The Sabiston Litho. & Pub. Co., Montreal.

THE February *Wide Awake* comes to hand with an exceedingly entertaining list of contents, suited to all classes of young people. And the old readers can well profit by the material that *Wide Awake* offers. We wonder, for instance, if the parents of boys and girls really know what an excellent and absorbing story Mrs. Maria McIntosh Cox is giving in her serial "Jack Breerton's Three Month's Service?" While the young people read it with growing interest and imbibe lessons in honor, manliness and devotion to duty from its stirring incidents, not one of the elder generation of Americans but can live again the dramatic scenes of 1861 which it portrays, when homes were rent and anxious hearts were overstrained by the news from the front and the terrible disappointment of Bull Run. The story appeals to all. So, too, though in a different way, does the Arabian story of pluck and endurance, "The Lance of Kanana," thrill its readers month by month. Among the important contributions is the last story ever written by Eliza McCormick, one of New York's promising newspaper men, untimely cut off by death scarcely six months since. His story "The Sign of the Prophet Jonah" is bright, natural and entertaining, and will interest every boy and girl who knows and admires Bret Harte's poem about the lost children of Greyport. Mrs.

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Harriet Maxwell-Converso has another of her interesting Indian articles "With Seventy Chiefs at Ohswekan;" Mrs. Maud Howe Elliott talks delightfully about "Some Horses that I Have Known;" Mrs. Jane G. Austin gives the charming story of "Lara Standish's Sampler," of which all readers of "Standish of Standish," and "Betty Alden" will be glad to know more; while all admirers of George MacDonald's absorbing historical story "St. George and St. Michael" will be delighted to localize the romance by reading Mrs. Humphrey's entertaining account of a day "At Raglan Castle with Dorothy and Richard." Lovers of adventure will enjoy Lieut.-Col. Thorndike's thrilling experience "In the Straits of Cape Horn;" Harriet Puckney Huse's sketch of a story "On a Florida Reef," and Henry Cleveland Wood's Kentucky pioneer story "Under Fire." "A Solemn Warning," a humorous story by Charlotte M. Vaile, will be enjoyed by the legion of "Little Women" worshippers, and Dorothy Holcomb's "Writings down" about "The Night of the Fire" will also raise the ready smile. "The First Steamboat" and "A Pet Seal" are short instructive papers, and the department "Men and Things" is full of readable items. The poetry of the number is excellent. The pictures in the number are illustrative and characteristic, and the feeling that the children of this generation who have the possibilities of regularly reading so helpful and elevating a magazine as *Wide Awake* are blessed indeed is expressed again by a perusal of the February issue. *Wide Awake* is published at 20 cents per number, \$2 40 per year. D. Lothrop Co., Publishers, Boston, Mass.

MESSRS. J. L. O. VIDAL & SON, City of Quebec, are agents to sell and handle, on commission, all sorts of new and second hand machinery. This is a well-known and well-established house, who do a very large and satisfactory business in Eastern Canada, and who are now inviting those who may be interested to correspond with them.

The Lunenburg Iron Company, Ltd., was organized last summer by two Yarmouth gentlemen, who enlisted the interest of a number of Lunenburg citizens to establish a foundry. The foundry has now been built, and the first cast, which was a success, was made on December 5th. The following is taken from Lunenburg *Progress* of December 9th: "The Company is incorporated under the Joint Stock Companies Act, with a capital of \$10,000.00, and Mr. W. T. Lindsay, Chas. E. Patterson and P. O. B. Harris, are the provisional directors. The foundry premises consist of a lot of land at the head of the harbor 200x220 feet, with a water frontage of 220 feet, on which are three substantial buildings, one of which is 30x40 feet, two stories used below for engine room and fitting shop, and containing engine and boiler, blower, forge, lathe, drills emery wheels, etc. The second floor is devoted to the pattern maker's department, of which Mr. Wm. H. Sanders, one of the stockholder's, has charge. Here is also the necessary machinery for making and mounting patterns. Another building is the moulding shop and foundry, size 35x65 feet, well lighted and ventilated, with floors of cement and iron copings on which the moulding is done. The furnace or cupola for melting the iron is in this building, and is 44 inches in diameter and 28 feet high, made of steel and lined with fire brick 9 inches thick clear to the top. These bricks were specially imported from Taunton, Mass. The pipes which feed the wind chest, to force the draft while the iron is being melted, are brought in under ground from the 'blower' in the other building. The moulding sand here used is brought from Albany, New York, the only place in America where it is found suitable for stove plates. Connecting these two buildings is a shed 15x20 in which is the 'gingler,' a machine used for clearing the sand off the castings as they come out of the moulds. Here is also the pickling tank in which iron patterns are 'pickled' in sulphuric acid before being used. The third building is 20x30 feet, used as a storehouse for sand and coal, and is conveniently situated within the yard, which yard is enclosed with a substantial fence and used for storing pig iron, fire brick, coarse sand, wood, etc. Eight hands are now employed, and it is expected that some six or eight hands more will be required in the near future. The patterns of some eleven stoves are now being boarded, including three cooks, three ranges and two office or cabin, and three parlor stoves, some of which, it is expected, will be on the market by the New Year. The company intend making a specialty of their cook stoves, called 'Our Own,' made expressly for them at the Vedder Pattern Works at Troy, New York, design of which is registered at Ottawa. They also have the patterns of two parlor stoves which they call the 'Mayflower,' also made for them at Troy. Besides making stoves they are prepared to do general casting and jobbing, and will soon have a full line of vessel-casting on the market."

Captains of Industry.

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

A FINE flow of natural gas has been struck at Cayuga, Ont. The Brunette Saw Mill Company will build a large addition to their works at Sapperton, B.C.

The Vancouver Steamship Company are building a fine steamer at their shipyards at English Bay, B.C.

The Northfield Soap Company, Northfield, B.C., is being organized with \$5,000 capital, to manufacture soap.

The Victoria Brewery and Ice Company, with a subscribed capital of \$150,000, will erect a brewery at Victoria, B.C.

The Hartman Manufacturing Company, of Pittsburgh, Penn., will establish a branch of their works at Hamilton, Ont.

The Wanzer Sewing Machine Works, at Hamilton, Ont., were almost entirely destroyed by fire Jan. 6th; loss about \$30,000.

The Westminster Woolen Manufacturing Company, New Westminster, B.C., will increase their capital stock from \$10,000 to \$75,000.

The Mercer Company is applying for incorporation, with a capital stock of \$180,000, to manufacture agricultural implements at Alliston, Ont.

The saw mill, roller flour mill and grain elevator of Mr. George Easterbrook, at Tweed, Ont., were destroyed by fire Jan. 25th; loss about \$75,000.

The name of the Ontario Bolt Company, whose works are at Swansea, near Toronto, has been changed to The Ontario Forge and Bolt Company, Limited.

The Canadian Colored Cotton Mills Company is being incorporated at Montreal with a capital stock of \$100,000 to manufacture colored cotton and woolen goods.

Mr. H. H. SPICER, manufacturer of cedar shingles, Vancouver, B.C., is adding new machinery, which will increase the capacity of his mill to 160,000 shingles per day.

The Moulders' Facing and Mineral Paint Company, has been formed in Dundas, Ont., to manufacture mineral wool, mineral paint, moulders' facings, supplies, etc.

The Canadian Oiled Clothing Company is being organized at Port Hope, Ont., with a capital stock of \$20,000 to manufacture waterproof horse and wagon covers, etc.

The Canadian Steel Barge Company has been incorporated at Port Arthur, Ont., with a capital stock of \$128,000 to build steel vessels for freight and passenger service.

MESSRS. E. LEONARD & SONS, London, Ont., supplied the steam engines for the power house of the New Westminster & Vancouver Tramway Company, New Westminster, B.C.

The Mercer Company, with headquarters and works at Alliston, Ont., has been incorporated, with a capital stock of \$180,000, for the manufacture of agricultural implements.

MESSRS. WELEN BROS., furniture manufacturers, Victoria, B.C., have established an electric light plant in their factory, supplied from Toronto. This is news. Who supplied it?

LA FOUCIERE DE DRUMMONDVILLE (The Drummondville Foundry) is being incorporated at Drummondville, Que., with a capital stock of \$24,000 for the manufacture of machinery, etc.

It is said that 100,000 bushels of wheat were grown around Killarney, Man., last season, and now the authorities of that town offer a bonus of \$4,000 for the building of a flour mill there.

MESSRS. GEORGE MATTHEWS & CO, pork packers, Peterborough, Ont., and who also have branch establishments at Ottawa and B.C., are starting a branch of their works at Vancouver, B.C.

It is reported that the Canadian Pacific Railway Company will erect extensive repair shops at Vancouver, B.C., for making such repairs as may be necessary to the company's trans-Pacific steamers.

THE Northey Manufacturing Company, Toronto, builders of steam engines and boilers and of all kinds of iron machinery have received their letters of incorporation. The capital stock of the company is \$100,000.

THE McPherson & Hovey Company, Clinton, Ont., have succeeded to the business heretofore carried on in that place by Messrs. Farran, McPherson & Hovey. They conduct an iron foundry and manufacture threshing machines.

THE first medals awarded for an exhibit of slate in British Columbia have been received by the directors of the Westminister Slate Company, from the management of the British Columbia Agricultural Society, of Victoria.

THE Haworth Belting Company, Toronto, have recently manufactured two large leather belts for the electric light works of the Hamilton Electric Light Company, Hamilton Ont. They are each three ply thick, four feet wide and 115 feet long.

THE electrical apparatus by which the town of Lachute, Que., is now lighted, was furnished by the Royal Electric Company, Montreal. The steam engines and boilers and driving machinery were supplied by Messrs. McQuatt and McRae, of Lachute.

THE B. Greening Wire Company, Hamilton, Ont., request those who may be interested to write for catalogue and price list regarding the trace, halter, tie-out, post, heel, evener and other chains manufactured by them. Their coil chain is made in seven sizes.

MESSRS. ALEXANDER & CABLE, the well-known lithographers of Toronto, have merged their business into the Alexander & Cable Lithographing Company with \$46,000 capital stock. They will add considerable new machinery and enlarge their facilities for doing business.

MESSRS. THOMAS DOWN & Co., brassfounders, etc., Toronto, have just completed a double cylinder combination chemical fire engine and hose carriage for Messrs. Hiram Walker & Sons, Walkerville, Ont. During last year Messrs. Down & Co. built five of these machines.

THE Boiler Inspection and Insurance Company of Canada, whose head offices are at Toronto, will apply to the Dominion Parliament for permission to insure against loss of human life and against accidents arising out of the use of machinery and mechanical and electrical appliances, etc.

THE Straight Lake Nickel Mining Company has recently been formed in Toronto for the purpose of developing some very valuable nickel lands in the Sudbury district. The fact that ex-Mayor E. F. Clarke, of Toronto, is president of the company is a sufficient guarantee of its character.

MESSRS. SMITH & Co., 219 Front Street East, Toronto, call attention to the fact that they are manufacturers and dealers in wool stock, shoddies, etc., and that they buy or work up, to be returned, wool pickings, woolen and cotton rags, etc. They make a specialty of carbonizing and neutralizing.

THE Canada Paper Company, with depots at Toronto and Montreal, are calling attention to some specialties manufactured by them, included in which are strawboard, for covering pulleys; millboard, for packing joints; pressboard, for knitting mills; manilla wrapping paper, etc.

MESSRS. GEORGE L. DIEHL, & Co., manufacturers of food mantels, etc., Toronto, have just occupied their large factory at 785 King Street West, erected for the purposes of their business. It is equipped with every requisite necessary in the business, and the firm will largely increase their output.

MESSRS. H. A. MASSEY, and J. T. JOHNSTON, of Toronto, and a number of other Canadians, and Mr. John Marier, of Marder, Luce & Co., Chicago, are seeking incorporation as the Toronto Type Foundry Company, with a capital stock of \$150,000, to erect and operate a type foundry in Toronto.

THE Metallic Roofing Company of Canada, Toronto, solicit correspondence regarding the Owl brand corrugated roofing manufactured by them. This article is put up painted or galvanized in sheets up to eight feet in length, and is specially adapted for covering foundries, workshops, factories, warehouses, elevators, etc.

MESSRS. JOHN INGLIS & Co., Toronto, are building a 300 horse power tandem compound steam engine, for the electric light works at Kingston, Ont., to be in place and ready for operation in two months. They are now at work building two steam boilers for the passenger steamer *Campana*, and a boiler for the electric light works at Brant, Ont.

THE Brandon Manufacturing Company, Toronto, are getting out an entirely new line of folding lawn chairs, settees, camp beds, camp stools, etc., which they think will "catch onto" the trade in fine

style. The business of this concern increased twenty-five per cent. last year. The Brandon Company claim to be the largest manufacturers of washboards in Canada.

THE fly-wheel of the large Polson-Brown automatic steam engine being built by the Polson Iron Works Company for the Royal Electric Company of Montreal will be 18 feet diameter and 54 inch face, and weigh 10 tons. The Polson Company have just shipped a 1,000 horse-power pair of Polson-Brown automatic engines to the electric light works at Hamilton, Ont.

THE Waterous Engine Works Company, Brantford, utilize their advertising space in our pages in displaying a telegram received by them from the Royal Electric Company, Montreal, concerning grip pulleys. The Waterous people supplied a pair of these pulleys to the Electric people which pleased them so much that an order for three more of these grip pulleys has been given.

THOMAS DOBIE, of Toronto; Francis Mercer, John Mercer, Frederick D. Mercer, Francis S. McDowell, all of Alliston, George H. C. Wright, London, Eng.; Thomas Anderson and Malcolm S. Mercer, of Toronto, are applying for incorporation as the Mercer Company, limited, for the purpose of manufacturing agricultural implements, etc., with headquarters at Alliston, Ont., and a capital of \$180,000.

THE "Peerless" wrought steel sink manufactured by the Steel Sink, Range, Boiler and Stamping Company, Mimico, Ont., near Toronto, is giving much satisfaction to the trade. These sinks are made from one plate of sheet steel of number fifteen gauge, and are lighter, stronger and more durable than cast iron sinks. They will not break from heat or cold. They are furnished to the trade, either painted or galvanized.

MESSRS. COULTER & CAMPBELL, proprietors of the Dominion Copper and Brass Works, Toronto, are introducing the necessary machinery and will engage in the manufacture of bath tubs. This will be a special feature of their business, and they claim that the baths which they will make will be of unequalled excellence. This will be in addition to the large business they do in manufacturing copper and brass work for brewers and distillers, etc.

MR. HAMILTON MCCARTHY, R.C.A., Toronto, has recently finished a bronze portrait bust of Mr. A. Thornton, this city, which reflects the greatest credit upon him, because of its truthfulness to the subject and the great artistic talent displayed in the reproduction. It is also of great interest to know that this is the first artistic bronze work ever produced in Canada, the result being the equal of any which can be made in London, Paris or Berlin.

MESSRS. C. SELLERS, & Co., 146 Niagara Street, Toronto, manufacturers of radiators, heating apparatus, etc., have begun the manufacture of plumbers' oiled soil pipe. They inform us that oiled pipe is much more desirable in every respect than the tared pipe heretofore so generally in use, and that it is always preferred by plumbers where really first class work is to be done. They say that they are the only manufacturers of oiled soil pipe in Toronto.

A LARGE and well attended meeting of Canadian nail makers was held in Toronto a few days ago which resulted in the formation of a pool for the better management of the trade. The manufacturers included in the arrangement are: Ontario Lead and Barbed Wire Company, Ontario Tack Company, Pillow and Horse Manufacturing Company, Montreal Rolling Mills Company, Peck, Benny & Co., Parmenter & Bullock, Dominion Wire Manufacturing Company and Ontario Bolt Company.

MESSRS. GAST & Co., manufacturers of mineral wool steam-pipe and boiler covering, Toronto, are calling attention to the Lamkin patent pipe covering made by them. They proffer the sensible advice, that if a covering is needed the best should be obtained, and they claim that their Lamkin patent is the best made—that it will pay for itself in six months, or, in other words, that the investment in it will pay a profit of 100 per cent. the first year. It will pay steam users to investigate.

FOUNDRYMEN will be interested in the announcement in another page of the Canada Iron Furnace Company, Montreal, whose furnaces are at Radnor and Three Rivers, Que. This company are manufacturers of the well-known "C.I.F." Three Rivers charcoal pig iron which is especially suitable for car wheels, steam cylinders, etc., and all castings where the utmost strength is required. This brand of iron, it is claimed, is fully equal to the famous "Salisbury" iron.

THE John Doty Engine Company, Toronto, has begun the construction of a fine large side-wheel passenger steamer for the St. Catharines, Grimsby & Toronto Navigation Company. She is to

be of steel and iron, 180 feet long, forty-four feet beam, engines to be 1,200 horse power, to have accommodation for 600 passengers, and will cost \$75,000. This vessel will resemble the *Chicora* in many respects, and it is expected that she will be finished and in commission by the middle of June next.

The Kemp Manufacturing Company, Toronto, are advertising in our pages the merits of the seamless wrought steel kitchen sink manufactured by them. These sinks are pressed from single sheets of steel, without seam or joint, rounded at the sides and corners so that no dirt can possibly collect, and are finished either painted or galvanized. Owing to the inherent tough quality of the steel of which they are made breakage is simply impossible, and in consequence of their comparative lightness, freight charges are less than half those charged on cast iron goods of similar character.

A DESPATCH from Moncton, N.B., reports a discovery of oxide of iron pum in Northumberland County, about twenty miles from the town of Newcastle, and an assay shows 96 per cent. of pure oxide of iron. Mr. Brumell, of the Dominion Geological Survey, who examined these deposits, says there is no similar deposits known to scientists. "The substance, it appears, does not require any refining or manufacture, but is ready for mixing in oil when it comes from the ground, two pounds giving the required 'body' to a gallon of oil. It may also be used for coloring, and is more powerful than any pigment in use. It is considered a bonanza."

The Ontario Steel Sink and Range Boiler Company, Toronto, are now driving their works at Mimico to their full capacity manufacturing their "Peerless" range boilers. Regarding this article it has no rivets, no seams, is reliable, absolutely tight, and very handsome in appearance. The body has a longitudinal rib in the interior on which the seams are drawn by an entirely new and patented process, which makes a perfectly even and flat surface, making practically a boiler without rivets or seams. The heads or ends are secured on the outside of the body with a swedge by a patented process, making a handsome finish and doubling the strength. They are tested to 200 lbs. pressure, and warranted. They are approved by dealers generally throughout the United States and Canada.

The Militia Department of the Dominion Government have received an instalment of the Martini-Henry rifle ammunition from the Government arsenal at the city of Quebec, the product of the machinery recently introduced there for that purpose. The cartridges are both in composition and appearance counterparts of the ammunition imported from the Old Country, and are expected to prove equally effective and accurate, for the trials made with this first product of the factory have been entirely satisfactory. The department officials are very well pleased with the new cartridges, and are naturally elated at the success of the plan of supplying the Canadian militia with ammunition of home manufacture. Of the machinery used in the production of these cartridges a considerable portion was made at the Government workshops in Quebec.

The Dodge Wood Split Pulley Company, Toronto, request the attention of users of machinery to the wood split pulley manufactured by them. They announce that some of the special points of merit are that every pulley made by them is a split pulley unless otherwise ordered; that these pulleys are from forty to seventy per cent. lighter than iron pulleys; that they are guaranteed to be strong enough to convey all the power of double leather belts the full width of the pulley; that it can be run faster than iron pulleys with greater safety, the fact being cited that a wood rim will sustain six times the centrifugal force of an iron rim; and that by this company's interchangeable bushing system any pulley can be made to fit any size shaft simply by changing the bushing. We understand that 20,000 of these pulleys are now in use in Canada.

The Polson Iron Works Company, Toronto, have on exhibition in the show window of Messrs. Rice, Lewis & Co., this city, a fine facsimile model of the steam cruiser *Constance*, recently built by them at their ship building works at Owen Sound, reference to which has already been made in these pages. Every detail observed in the construction of the *Constance* is reproduced in this beautiful model, even including the Norden eldt quick firing guns which constitute her armament. This fine specimen of mechanical skill, is, we learn, the production of one of the workmen employed by the Polson Company, and is equal in every respect to the model shown at the Toronto Exhibition of the Canadian Pacific Railway trans-pacific steamers, which excited so much admiration. This latter model was the work of British artisans, but it is in no way superior to the beautiful specimen of Canadian handicraft here alluded to.

The British Columbia Iron Works have several large contracts on hand at present. This company, with the proprietors of the Vancouver City Foundry and Machine Works, form the basis of a manufacturing industry in this city that is bound to grow in

proportion to the growth of the Province. The British Columbia Iron Works put in the hydraulic hoist at 32-34 Cordova Street, and it is giving such satisfaction that they will get an order from Victoria for a hoist of the same size. They are also building a band saw for Cassidy's sawmill. Heretofore all these bandsaws have been brought from the East. In a short time they will be ready to fill several large contracts for sawmill machinery. They are also putting two immense high pressure engines in the new steam-boat for Captain Cooper, of Westminster. A pumping engine for the British Columbia Draining & Dyking Company is also being built, together with other boilers and engines.—Vancouver, B.C., *Telegraph*.

PROF. L. W. BAILEY, of the Geological Survey, states that all the usual ores of iron occur to some extent in New Brunswick, including hematite, limonite, siderite or spathic iron, and magnetite, though none are now employed as a source of the metal. By far the largest deposits are those of hematite, or mixed hematite and limonite, which form extensive beds near Jackson, north of Woodstock, in Carleton county. They may be traced across the greater part of this county in parallel and closely associated bands, and vary from two or three to fifteen feet in thickness. Some-what extensive operations were at one time (1848-1865) carried on near Woodstock in the smelting of iron, and a charcoal iron manufactured which, for certain purposes, was highly esteemed. This was no doubt due to the fact of the ore naturally containing a considerable percentage (1.6 per cent.) of manganese, thereby adding materially to its tensile strength. It was, however, on the other hand also contaminated with a considerable amount of phosphorus (one analysis yielding 1.298 per cent. of phosphoric acid) and therefore apt to be cold short in a high degree.

The Mycenian Marble Company, Toronto, is a new concern who have recently engaged in what is quite a novelty in Canada—the manufacture of artificial marble. The marble is composed chiefly of the best quality of Portland cement, and the process of making it is very simple, but the article bears such close resemblance to the natural marble that even experts are deceived as to its true character. It is made in imitation of all kinds of marble, and can be used to advantage in all manner of interior decorations, the process of its manufacture enabling it being polished to quite as high a degree as natural marble. In fact the method of polishing it is precisely the same as that employed by expert marble polishers. The leading architects of both Toronto and Montreal who have inspected the marble manufactured by this company are loud in their praises of it, and give it their unqualified endorsement. The palatial residence of Mr. Duncan McIntyre, the millionaire railroad man, now being erected in Montreal, is being fitted up very elaborately with Mycenian marble manufactured by this company. It is especially adapted for dado wainscoting, vestibules, bath rooms, fire places, mantels, etc. The Company make a specialty of manufacturing it for these purposes; and they are prepared to contract to supply it for public buildings, offices, private residences, etc.

The editor of the *Sault Ste. Marie Pioneer* has invented a combination spittoon and stove pipe damper for which he should have received a patent, and would have done so if he had not slept upon his rights until an enterprising Yankee came along, appropriated the idea and obtained a patent thereon. The editor thus describes his invention. "The pattern is our own, and we have had it in use for years. Here it is: Cut a four inch hole, round or square, in the centre of any stove-pipe, fit it with a loose short jacket having the corresponding hole in it, a handle for turning, and you have a simple safe and durable damper and ventilator. To increase draft or fire close the damper; to check draft or give ventilation open the pipe. Placed into your stove pipes at a proper height from the floor you will be surprised what a convenient spittoon it is for 'chewers,' and how cleanly it swallows the old 'quids,' cigar-stubs, pipe ashes, match-stubs, etc. A practised 'chewer' will make a use of it. We tender a certain amount of sympathy with our istic brother in the great loss he sustains in not owning the patent on this useful invention, for the article would be undoubtedly useful in editorial offices in "Soo" towns; but we also chide him for waiting for the aforesaid enterprising Yankee to come and rudely rob him of his brilliant idea. But why didn't he make his stove pipe hole swallow the ruthless invader of his sanctum along with the old quids, etc?"

For some time past the winter quarters of the halibut have been a mystery, which many have endeavored to solve. About this time last year the British Columbia Deep Sea Fishing Company sent out a vessel, but were unsuccessful in discovering the haunts of this toothsome fish. This year the the British Columbia Fishing and Trading Company have been fishing regularly, but about three

weeks ago the halibut disappeared and they have been unable to trace them. On Tuesday evening the steamer *Eliza Edwards* left this port to endeavor to trace the fish, and she may probably be more successful, being an excellent sea boat with sufficient strength to withstand the storms of the North Pacific Ocean. It is supposed that the halibut remain during the winter in the coves of the Queen Charlotte Islands, and in the northern inlets of British Columbia. The steamer is provisioned for one month and will probably stay out that period, and efforts will be made to discover the breeding grounds of the fish. Her owners have gone to considerable expense in fitting her out, and she has all the necessary appliances for fishing in deep waters. The demand for this fish in Eastern Canada and the United States has largely increased of late, and with the splendid facilities for shipment offered by the Canadian Pacific Railway Company, it should become one of the chief industries of Vancouver when once the waters frequented by the fish are discovered. As this is a matter which is of the most vital importance to the whole Province, the Government would do well to take the matter up, and in all probability representations to this effect will be made shortly. —Victoria, B.C. Commerce.

THE Polson Iron Works Company are building two pair of Brown automatic steam engines for the Royal Electric Company, Montreal, the larger of which will develop 800 horse power, and the smaller, 600. It is claimed that these will be the largest electric light engines in use in Canada. When completed, these will make over 10,000 horse power Polson-Brown automatic steam engines operating electric plants in Canada. This list includes—

Name.	Engines.	Horse Power.
Royal Electric Co., Montreal.....	16	4,000
Toronto Electric Co., Toronto.....	6	2,000
Hamilton Electric Co., Hamilton.....	4	1,000
Manitoba Electric Co., Winnipeg.....	2	600
Halifax Electric Co., Halifax, N.S.....	2	600
Kingston Electric Co., Kingston.....	1	400
Barrie Electric Co., Barrie.....	1	200
N. Glasgow Electric Co., N. Glasgow, N.S.	1	150
Owen Sound Electric Co., Owen Sound....	1	150
St. Lawrence Sugar Refinery Electric Lights,	1	100
Orangeville Electric Co., Orangeville.....	1	100
Regina Electric Co., Regina.....	1	100
Prescott Electric Co., Prescott.....	1	75
Dominion Parliament Buildings.....	1	150
Windsor and Amherstburg Electric Railway,	1	150
Sundry small plants.....		90
		10,065

CONSIDERABLE interest was awakened in the trade by the introduction, some months since, of a fabric which claimed to be thoroughly waterproof and at the same time porous. In other words, tweeds and worsteds could be put through a process by which they would keep out the rain and yet retain their original qualities. It was introduced on the Canadian market from Germany, where it was invented; but the waterproofing process was not claimed to be a success upon all kinds of Canadian goods. Mr. John S. Rigby, a fellow of the Chemical Society of England, applied himself to a study of the subject, and has perfected a process by which the same result is achieved; but the German inventor has been eclipsed by Mr. Rigby, whose process not only makes any kind of woolen or worsted goods practically water-tight, but can be applied to any class of Canadian goods. This has been tested by Messrs. H. Shorey & Co., the largest manufacturers of ready-made clothing in the Dominion, who have been so well satisfied with the claims of the new process that they have purchased the right for the whole of Canada, direct from Mr. Rigby, and have already got samples on the market. The new fabric is called "the Rigby," in honor of the inventor, and is certainly remarkable. The writer was shown a piece of Canadian tweed which had been put through the process, and was made into a trough in which fifteen or twenty pounds weight of water was kept for a week without letting through a drop. Firms like Henry Morgan & Co., S. Carsley and N. E. Hamilton, of Montreal, who had declined to handle the fabrics first alluded to, were so well convinced of the remarkable qualities of the Rigby waterproofing system, that they have given orders, and will introduce it. —*Journal of Fabrics.*

THE Consumer's Cordage Company, whose head office is at Montreal, and who own cordage mills in several places in Canada, will erect an additional mill at Winnipeg, Man. The Winnipeg Commercial is in receipt of a letter from the Cordage Company in which it is stated: "You have no doubt heard numerous rumors and reports regarding the manufacture of binder twine in the city of

Winnipeg. We would state that we have fully decided to establish a factory in your city, and have already secured the necessary land. Further particulars will be given you in a few days. In the meantime you can conveniently state that we will do our utmost to have the factory started at the earliest possible date. Of course you can easily understand that it is a question that cannot be hurriedly settled, as we wish to build a mill that will fully meet the requirements of the West." Regarding this the Commercial says: "For some time it has been known that an effort was being made to organize a local company for the manufacture of binder twine, etc., in Winnipeg, the consumption of this article being very large in this country. Considerable progress has been made in organizing the proposed company, when now it is announced that another company is prepared to establish such a factory here. This time it is the Consumer's Cordage Company, which controls the manufacture of binder twine in Canada. A gentleman connected with this vast concern, was here last week, and it is reported that he has secured a site for a factory, and that an establishment will be instituted here large enough to turn out enough twine to supply the entire trade of the West. No doubt the knowledge that a local company was forming, has had the effect of causing the Consumers' Cordage Company to take this move. Whether one or both of these proposed factories are established, there would seem to be a good reason to believe that the industry would prove a profitable one here, while there is no question as to the large and rapidly increasing demand for twines."

MANHATTAN SELF-LUBRICATING PLUMBAGO PACKING.



THE packing of pistons and pump rods is a matter which deserves a great deal of attention. Very many of the packings that are on the market score and cut the rods so much, that in a comparatively short time they have to be discarded and new ones put in their place. Manhattan Packing, made by Greene, Tweed & Co., St. Chambers Street, New York City, has been on the market for more than twenty years, and where it has been used, has given entire satisfaction. This packing has a solid rubber core, and is made into the different sizes by braiding one cover over another until

the required size is obtained. Each strand is lubricated with an oil of very high fire test, free from acids, which cannot char or ignite, and with the best floated plumbago. It will lubricate until it is worn out, and there is nothing in it to injure the rods, but on the contrary, will keep them bright and smooth. This packing is used largely by steamers running from New York to various ports, and on many railroads, where it is specially valued in packing breaks and pumps.

NEW ANILINE COLORS.

Acid-Violet, 10 B, (Pat'd).—This new Aniline, which will shortly become in great favor with all wool dyers, has just been placed on the market by the well-known firm, the Farbenfabriken, vorm. Friedr Bayer & Co., of Elberfeld. Fast Acid-Violet 10 B dyes very evenly, and resists alkalis better than any other known Violet dyestuff. On account of its penetrating and even dyeing qualities it is specially suited for dyeing piece goods, and can also be used wherever wool is to be dyed in an acid bath. The shades obtained are a bright blue (resembling a Cotton Blue), and do not show a reddish violet by gaslight, which is the case with all other violet colors. Acid-Violet 10 B will show no fluorescence when dyed with Fast or Naphthol Yellow for olive and dark green, which has always been a drawback.

Azo-Acid-Brown.—This concern have also just introduced a new cheap Acid Brown that dyes wool perfectly, even in one bath with acid, producing a yellowish brown, absolutely fast to alkalis.

Benzo Dark Brown.—This new color produces a dark seal on cotton or mixed goods in one bath, fast to washing.

Chrome Blue, Chrome Violet.—These colors come to the dyer in the shape of a paste, and are dyed with chrome mordant. Shades produced are perfectly fast to fulling and light, and are also specially suited for dyeing or printing cotton or wool.

These goods are manufactured only by the Farbenfabriken, vorm. Friedr Bayer & Co., Elberfeld, Germany. For further par-

particulars concerning them, for dyed samples, prices, etc., address the Dominion Dyewood & Chemical Company, Toronto, who are sole agents for Canada.

NOT WORTH ONE NICKEL.

The persistency with which the principles of "free trade" are acted upon by our Protectionist Government in respect to our pine and nickel industries ought to win golden favors from those who are anxious to see the closest trade relations between Canada and the United States. But to those who desire to see "fair trade" relations prevail between these countries the prospect is the reverse of agreeable or even tolerable. It is no mere figure of speech to say that outside of fish, nickel and pine, Canada possesses nothing that is worth a thought to the American people. The United States has all the territory it wants; all the gold, silver, copper, iron and lead it can make good use of; it produces a surplus of grain, cattle, and all agricultural products; and it has as much general prosperity within its borders as can be found in any other country in the world. But the rapid settlement of its new territory and the extraordinary increase of its population have created such an immense demand for light building materials as to swallow up everything within reach at home and lead it to look abroad for present and future supplies. Reckless slaughter and careless treatment have devastated the once splendid fisheries of the United States and led it to covet those of the little British dependency upon the northerly boundaries. Previous to a year or two ago the American mines produced all the nickel demanded by her domestic manufacturers. But recent discoveries have shown that nickel, in conjunction with steel, is extremely useful in naval defence, and caused the Government to look beyond its own boundaries for a sufficiency of nickel to enable them to present an indestructible front to their navy. Canada has fish, timber and nickel in great abundance, and hitherto, by hook or crook, the United States has secured full supplies of these articles, and as freely and cheaply as if produced within her own territories, while at the same time reserving to herself the right of placing them in her own markets in the most desired form. As an equivalent for these decidedly valuable considerations Canada is permitted to exist with a liberal allowance of tongue thrashing as may suit the temper of her big neighbors in making the deal.

Now it has been said "no nation can become wealthy by producing raw materials and shipping them abroad. It simply exhausts its supplies for the benefit of foreigners, who are thus enabled to purchase for themselves supplies at chief rates." This is exactly what is being done with Canada's stock of fish, timber and nickel. American fishermen, by grace of abrogated treaty rights and political jugglery, are devouring Canadian sea and lake fisheries, and debar our fishermen the privilege of selling on equal terms in American markets. By a similar course of policy Canadian timber is poured into the United States free of duty at the rate of hundreds of millions annually, and our saw-mills are debarred by an import duty of \$1 per thousand from competing for the American trade. And, to complete this list of absurdities, we have built railways and other costly works in Canada, by which Americans come and transfer the products of our rich nickel mines to their own territory without costing them one nickel for revenue to the Paradise of Fools from which the valuables are taken. Evidently the rulers of Canada appraise the stores of fish, timber and nickel "Not worth one nickel," and are only glad to get rid of them at any price.

In the face of such a total disregard of common business prudence is there any wonder that Canadian saw-mills stand idle, or that our fishermen cannot compete in American markets, or that there is little life to be seen around Canadian nickel mines? We trow not. Apply the same rule to Uncle Sam's vast iron mines at Marquette and other points, and how long would it be before the best of his artisans would follow in the wake of the raw material and find employment in the country to which it was being transferred? Common-sense supplies the answer, and in the absence of that commodity the steady stream of immigrants to the United States will fully explain the consequences of such suicidal dealing. As a people we adopt Protection as a National Policy, we talk protection, and we pay for protection. But, in this fish, timber and nickel business, we play a game of jug-handled free trade for which we receive in return the strict enforcement of the United States Alien Act in the exclusion of Canadians from participating in the manufacture of the raw material save upon the imperative condition of becoming American citizens. If Canadians are content to remain "hewers of wood and drawers of water" to the United States they are excusable for making their lot as tolerable as possible by

pacifying their taskmasters with such rich gifts from their poverty. But, if this Dominion hopes to hold a place among independent nations the sooner it demands a fair equivalent for these wealth-producing articles, the sooner will it be likely to receive the respect of free-born people. Such a constant drain upon the supplies of this country—to build up the prosperity of a neighbor—must have an effect in weakening the allegiance of our people by leading them to conclude they exist only as a supernumerary appendage to a foreign people, without whose good favor the productions of this Canada of ours would be worthless. —*Sault St Marie Pioneer.*

EXEMPTIONS FROM TAXATION.

In the returns for 1889 the net valuation of city property is put down as \$116,663,137, and exemption to the amount of \$19,749,210 have to be deducted from this amount, leaving the entire charge of the civic government to be borne by properties valued at \$95,913,927. Up to that date the percentage of exemptions was steadily growing and it will be quite fair to assume that since then they have not diminished. Roughly speaking one sixth of the property within the city limits thus escapes its fair share of the cost of civic management. These exempted properties, however, in all cases enjoy their full share of city privileges and where any portion of them is needed for civic improvements they are not less exacting in their demands than the greediest of ordinary properties. Exempted properties have in many instances more than their share of sidewalks, sewers, lights and police protection, because of the great area of most of the grounds in proportion to the buildings erected thereon. One sixth of the city's income confiscated, without any lessening of the extent of its obligations, is a crushing tax to put upon a rising metropolis, and tends to strangle it in its very cradle. But one-sixth does not represent the whole of the loss. These exempted properties are never brought on the market and are outside all the speculative influences that tend to enhance the valuation of neighboring property. Assessors have very little interest in looking after values that do not show in their books and are in most instances inclined to look upon their possessors with a reverential eye that would prevent them from marking down improvements as they would with ordinary citizens. Hence, the valuation of exempted property is in all probability considerably under the mark, and people who have a very good understanding of the matter claim that nearly one-fourth of the whole valuation would be much nearer the mark than one-sixth. The evil is a great and growing one and the proprietors of these exempted properties are more interested than any other body of citizens in promoting a return to the common ways of honesty. In other countries the continued accumulations, combined with callous invasion of municipal and patriotic duties, have in times past so exasperated the people that past arrears have been recouped by the wholesale confiscation of the offending properties. History is said to repeat itself and the best advice that can be given to holders of exempted properties is to pay for the benefits received from the civic government, even as their fellow-citizens have to pay, and so remove a stumbling block of offence and bring themselves in deed and fact within the body corporate. —*Montreal Herald.*

Not quite a year ago the ship *Titan* loaded a cargo of big timber and decking for the Geo. W. Bush & Sons Lumber Company, of Wilmington, Del., a firm which does a great deal of work for the United States navy. This cargo gave such good satisfaction that the sale of another cargo of dimension stuff for a similar purpose has been effected to that firm by the Hastings sawmill. The barque *Mistletoe* has been chartered to carry it, and she left Buenos Ayres about December 1st to load in Vancouver. The good qualities of the cargo of the *Titan* have been the subject of general remark among the lumbermen of the eastern United States. Regarding it the Chicago *Northwestern Lumberman* said:—"Some political capital has been made by the Philadelphia papers in the shipment by the Hastings sawmill, of Vancouver, B.C., of a cargo of ship stuff to the George W. Bush & Sons Lumber Company, the journals claiming that the reduction of the tariff made such a sale possible. The *Lumberman* correspondent gained the information that the purchase from the British Columbia people was due to the excellence of their material as compared with Oregon and Washington sawmills, and was independent of the tariff reduction." The purchase of the second cargo is an undeniable testimony to the superiority of British Columbia Douglas fir. —*Vancouver, B.C., Commerce.*



INVENTIONS.



This department of THE CANADIAN MANUFACTURER is devoted to the interests of inventors, of patentees of inventions, and of manufacturers of patented articles. Patents are granted in Canada for fifteen years, the Government fee for which may be paid by instalments. Arrangements have been made by which the issue of all patents by the Canadian Patent Office will be promptly noticed in this department, and a brief description thereof given; and this will include not only patents, but Copyrights and Trade Marks, and all renewals and extensions thereof. Enquiries on these subjects are invited and will receive prompt attention. No charge will be made for answers by mail when return postage is sent. Information given free regarding patent laws and the obtaining of patents in Canada, United States, Great Britain and all foreign countries. Claims for inventions, as embodied in Letters Patent, also the illustrations of them, will be inserted in this journal at moderate charges. The attention of manufacturers is specially directed to the opportunities for lucrative business which may be acquired by close observation of whatever may appear in this department.

CANADIAN PATENTS.

The following patents have been issued from the Canadian Patent Office since January 16, 1892.

Information in regard to any of these patents may be had free on application to THE CANADIAN MANUFACTURER, or copies of American patents corresponding to these, where the American patent has been previously granted, can be procured through us for the sum of twenty-five cents.

MECHANICAL PATENTS.

- 38,129 Knotters for harvester binders, John F. Seiberling, January 16th.
- 38,130 Knotters for harvester binders, John F. Seiberling, January 16th.
- 38,131 Temperature regulator, James Finney McElroy, inventor, The Consolidated Car Heating Company, assignees, January 16th.
- 38,132 Refrigerator car and building, Joseph Francis Haurahan, January 16th.
- 38,133 Lubricating oil, Robert R. Graf and Harry Fowler Turner, January 20th.
- 38,134 Car ticket holder, William B. Moore and George B. Willet, January 21st.
- 38,135 Clothes drier, William Edward Austen, January 21st.
- 38,136 Milk receiver, Edward Batters, January 21st.
- 38,137 Shingle for roofing, George Henry Pedlar, January 21st.
- 38,138 Safety trap for discharging pipes, Edward E. Scott, January 21st.
- 38,140 Method of and apparatus for separating oxygen from atmospheric air, James Howarth Parkinson, January 22nd.
- 38,141 Hydrant, John Allen Gregg, January 22nd.
- 38,142 Brooch, or lace pin, safety attachment, William Wattie, January 22nd.
- 38,143 Water wheel and wind wheel, Narcisse Duval and Theodore Belanger, January 22nd.
- 38,144 Lubricating device, James E. Totman and Martin Eriksen, January 22nd.
- 38,145 Keel block, Warren Henry Carr and James Darius Robinson, January 25th.
- 38,146 Clothes washer, Edward Byron, assignee, of Garret Soger, January 25th.
- 38,147 Screw eye, The American Screw Company, assignees of Charles D. Rogers, January 25th.
- 38,148 Sulky spring tooth harrow, The J. W. Mann Manufacturing Company, assignees of Thomas G. Cook, January 25th.
- 38,149 Pulley, Isaac N. Kendall, January 25th.
- 38,150 Circular knitting machine, The S. B. Wilkins Company, assignees of John B. Bridges, January 25th.
- 38,151 Process of and apparatus for manufacturing gas, Burdett Loomis, January 25th.
- 38,152 Machine for cutting iron pipes, Alcide Charest, January 25th.
- 38,153 Boot and shoe, George Valiant, January 26th.
- 38,154 Machine for turning moldings, Julius F. Geiharat, inventor; James N. Stout, assignee, January 26th.
- 38,155 Sash balance and lock, Benjamin Marshall, January 26th.
- 38,156 Roofing fabric, Henry Ward Johns, January 26th.
- 38,157 Method of manufacturing files and rasps, Alfred Weed, January 26th.
- 38,158 Flushing siphon, Henry N. Ruttan, January 26th.
- 38,159 Neck yoke, Morrel Gadberry, January 27th.
- 38,160 Fish hook, John Thomas Eichelberger, January 27th.
- 38,161 Hydraulic stump extractor, Alfred Taylor, January 27th.
- 38,162 Device for tapping stay bolt holes, James Thomas Connelly, January 27th.
- 38,163 Boot and shoe counter, James Ferguson Sharp, January 27th.
- 38,164 Flange for loom and warper beams, William Stafford, January 27th.
- 38,165 Plow, Samuel Irwin, and Alexander G. Hunter, January 27th.
- 38,166 Car axle box lid, Robert Soutter, and Fred A. Haines, January 27th.
- 38,167 Calender, David Ross, January 30th.
- 38,168 Bedstead, James Massie, January 30th.
- 38,169 Stone cutting machine, David Rettiger, January 30th.
- 38,171 Accompanying Methods for musical instruments having key boards, George Philippe Omer Heroux, January 30th.
- 38,172 Rod and pipe cutter, Henry Diebel, January 30th.
- 38,173 Swinging chair, Julius M. Eller, January 30th.

ELECTRIC.

- 38,170 Armature for dynamo electric machines and motors, The Reliance Electric Manufacturing Company, assignees of Frank Bankson Rae, January 30th.

SCIENTIFIC PROCESSES.

- 38,139 Method of treating Permanganate to produce a porous spongy mass, James Howarth Parkinson, January 22nd.

MESSRS. SIEMENS AND HALSKE, under certain conditions as to patents, rates, and storage, have formally applied for a space of 17,250 square feet under cover, and 2,150 square feet out of doors at the Chicago Exhibition. The exhibit will require 1,500 h.p. to 2,000 h.p. for the operation of the machinery. An electric railway will be laid, electric boats supplied, and a model theatre, besides public lighting. A special building is asked for.

The U.S. Patent Office will exhibit at the Chicago Exhibition a comprehensive array of models to illustrate the wonderful progress of mechanical civilization. One group of models will show the progress of the printers' art from Gutenberg's crude invention to the latest rotary perfecting and folding printing press, capable of turning out newspapers at the rate of many thousands per hour. Other groups will show the development of the steam engine, sowing machine, agricultural machinery, the application of electricity, and other branches.

After experiments lasting over six years a French electrician, M. G. N. Gauzantes, has produced a primary battery miners' lamp, that is regarded with much interest. The composition of the solution, as usual, is a secret. The battery consists of a tin case containing two cells, round the sides of which are placed, four in each cell, vertical slips of carbon; in each cell a zinc rod is suspended from the cover into the generating fluid. Binding screws are fitted to the carbon and zinc poles, and the lid is tightly fastened. Upon this lid is placed the small incandescent lamp, with its guard and reflector. In size, the lamp is about 4in. wide, 2 in.

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PATENTS

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CABLE ADDRESS "INVENTION, TORONTO."

broad, and nearly 8 in. in height, and easily carried by means of a light handle affixed to the side. The weight of the lamp when fully charged is about 3lb. 12oz., and it gives a surface light equal to $\frac{3}{4}$ c.p. or $\frac{1}{2}$ candle in excess of that given by the most powerful safety lamp. The prime cost of construction is only 5s., and the weekly working cost of replenishing the battery is estimated at 5 $\frac{1}{2}$ d., while the life of the lamp is reckoned to be five years. The metals which serves as the anode is refined by a new and simple process, and allows a maximum generation of current without fear of rapid polarisation. The exciting fluid is stated to be a new combination, giving in a single liquid all the properties necessary for the production of a regular and constant current, and reabsorption of the sulphates produced. The lamp has been tested in Belgium with satisfactory results.

ONE BY ONE THE FLOWERS FADE.

PANICS have always offered interesting material for psychological study; not less interesting though less explored, would be a study of the psychology of craze. Somebody astonishes his neighbors by a brilliant success and without stopping to ascertain what are the elements or methods of that success, like moths to a candle, senseless mortals flock to claim a share of that success by copying the outside. Like the moth, they generally find their wings singed, if more serious disaster does not befall them.

During the past five years above two dozen manufacturing concerns have been organized for the purpose of manufacturing pulleys, or being in other business have taken up the manufacture of pulleys in imitation of the Independence pulley of Dodge Manufacturing Company. These concerns generally introduce some visible variations, but without exception they copied with exactness the essential features, i.e. the interchangeable bush which has, in the hands of Dodge Manufacturing Company, revolutionized pulley practice in this country and is making long and strong steps in the same direction in Canada,

NO.	SENT BY	RECEIVED BY	CHECK
5	Am	H	Collect
Time 8.50.		Nov 24 1891	
From Montreal		23	
To Waterous Eng Works			
Friction pulleys installed by you so far giving entire satisfaction have not been run with full load yet			
The Royal Electric Co			
TO SECURE PROMPT DISPATCH SEND REPLY TO			

The above is a report of one 93 x 22 and two 92 x 18 pulleys made to transmit 150 horse power each, shipped R. E. Co., July '91. Each pulley had six grips. Further confirmed by an order given January 7, 1892, for three Waterous Grip Pulleys 81 x 20, face, to transmit 250 horse power each.

THE TORONTO CONSTRUCTION & ELECTRICAL SUPPLY CO., LIMITED.

Authorized Capital \$250,000

OFFICE AND SHOWROOMS: 63 to 69 Front St. West, Toronto

Branches at Winnipeg, Man.; and St. John, N.B.

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Europe, Australia and Mexico, and will soon enter upon the same course in the more distant Orient. One by one these would-be rivals have retired with wings singed, and where three years ago, more than a dozen promising buds threatened incontinently to burst, now but two or three of them remain, with colorless petals partly exposed and evidently with worm eaten hearts. The rest, oh where are they? If worth while, ask the sheriff.

The last to submit to the inevitable is the Milburn Gin & Machine Co., of Memphis, Tenn. This concern owned a half interest in the foundation patent and therefore possessed equal rights with Dodge Manufacturing Company, to make pulleys with interchangeable bushings. Success perched not on their banners, for they, like the others, possessed not the magic secret of success—*Power and Transmission*.

At the time of the departure of the steamer *Historian* on her last trip for London, the *Herald* described a shipment of live lobsters to test the practicability of a device invented by Captain McGray. Lobsters had never before been sent alive to market over a long ocean voyage, and many authorities asserted that it could not be done. Captain McGray's method, it will be remembered, was, in a word, to place the lobsters in iron frames packed fairly close together, and keep a constant stream of fresh sea water running over them. Fifty-five lobsters were in the shipment by the *Historian*. A cable was received by Captain McGray from his brother, who was in charge of the shipment, that the lot had been landed in London, one half of them alive. Captain McGray was seen by a *Herald* representative yesterday and he said he was highly pleased with the result. It meant that the scheme would be a sure success. The lobsters accidentally became so chilled on the way to the steamer the day she sailed that Mr. McGray was strongly inclined to throw them overboard and abandon the experiment for that trip. The start was thus made under unfavorable conditions. Then the *Historian's* voyage was unexpectedly long—eighteen days. It was a week after the *Historian* was signalled at the Lizard before she reached London, instead of the day and a half usually consumed. It was a tedious week in the channel, delayed by the fog, but there is the satisfaction that by it the experiment was subject to the severest test. From the time the lobsters were taken from the sea at Sambro, till they were landed at London, was nineteen days and one-half of them alive, was under the circumstances a most satisfactory result. Patents have been applied for in Britain, Germany, the United States, Canada, etc. A company will be formed to secure and run a steamer which will be specially fitted up for this trade of carrying live lobsters to the British market. A steamer of 600 tons will have a capacity for 200,000 lobsters, and some fourteen trips could be made in the year. During the close

season in Nova Scotia, the boat would be employed in Newfoundland and elsewhere, so that she may be kept at work all the year round. When the difference in the price of lobsters on this side and on the other is considered, the value of the trade that may be developed, is at once apparent. It may revolutionize the lobster business.—Halifax, N.S., *Herald*.

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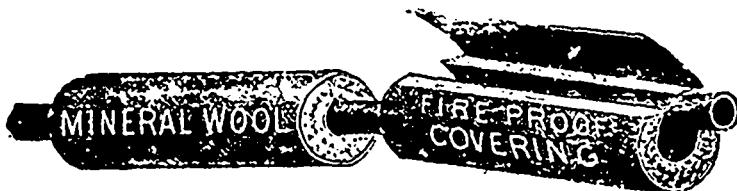
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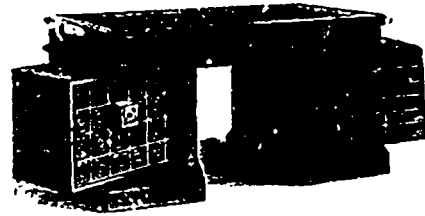
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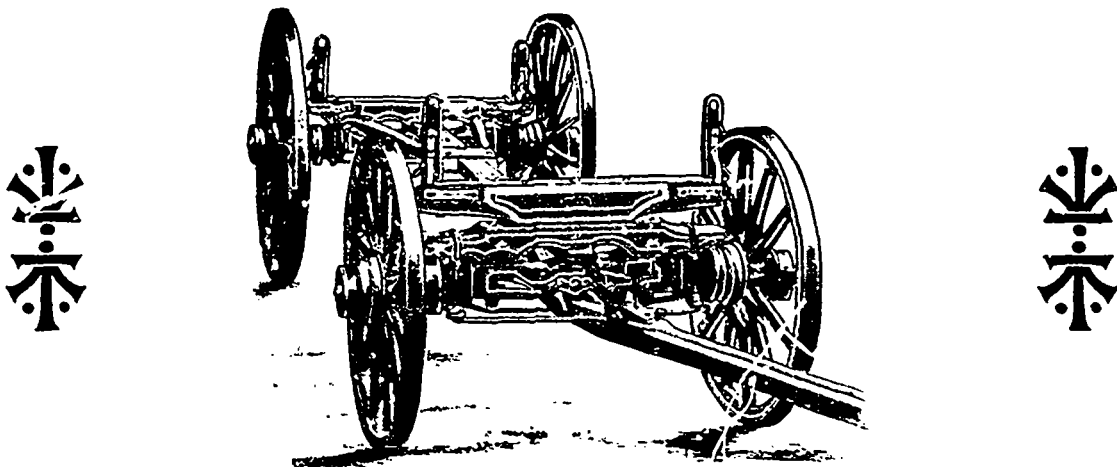
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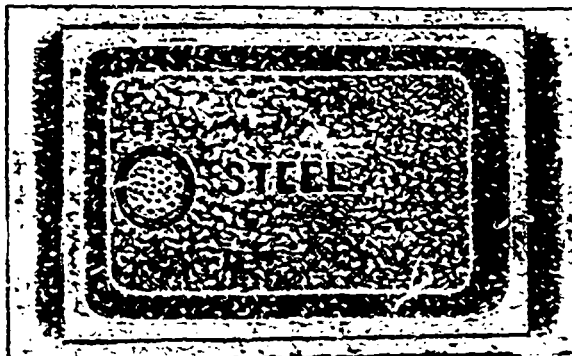
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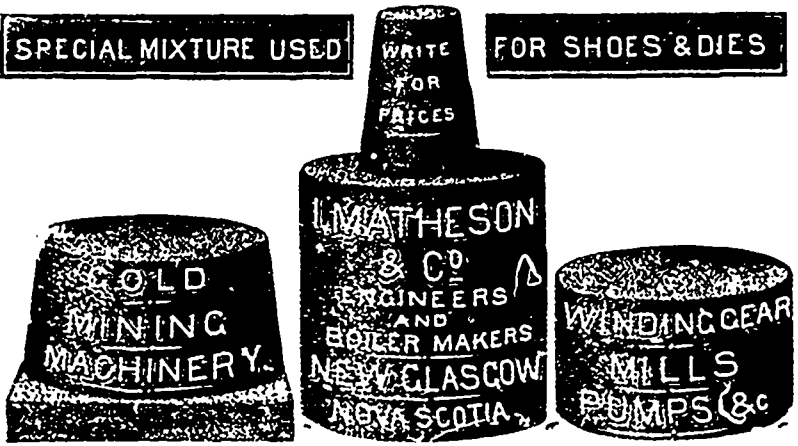
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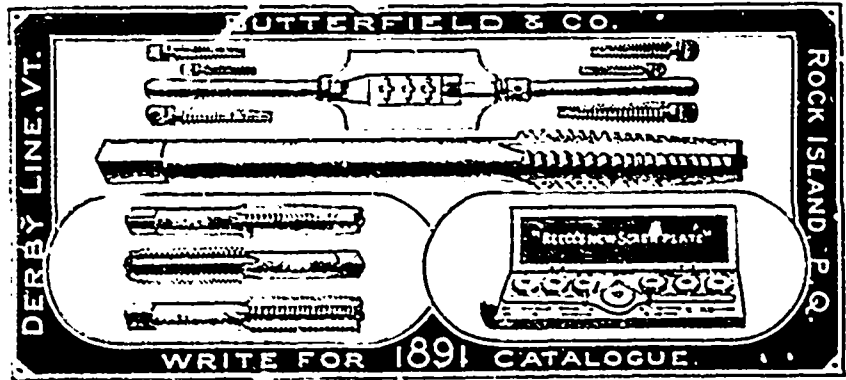
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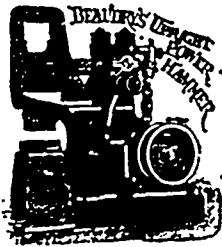


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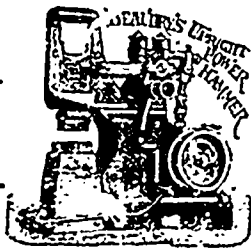
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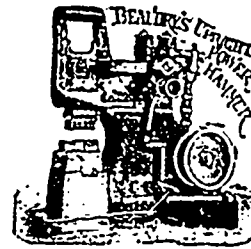




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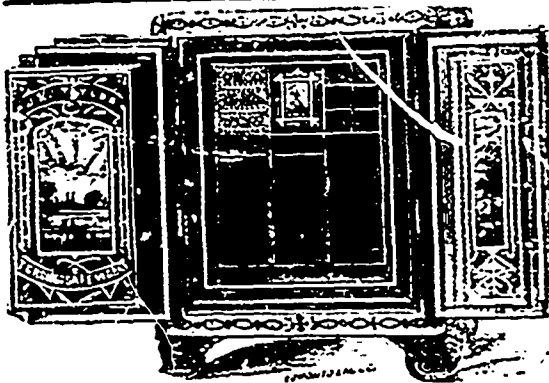


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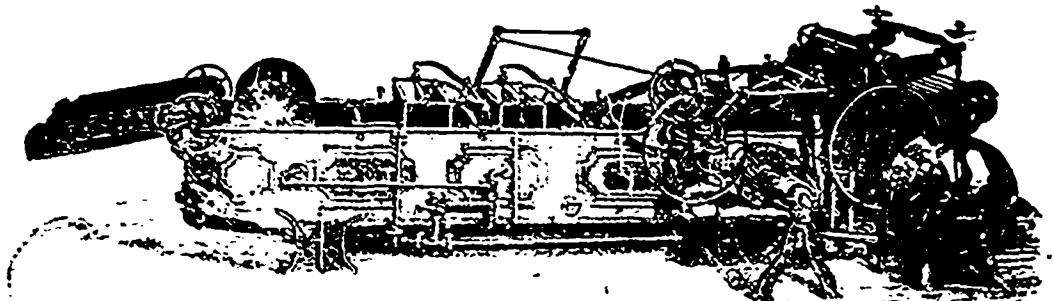
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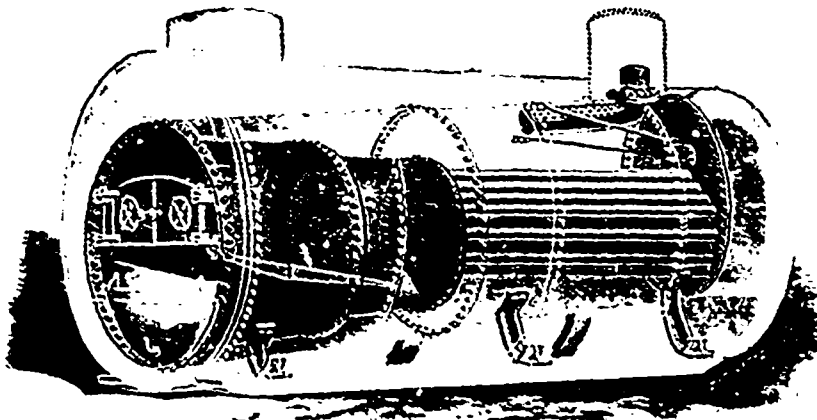
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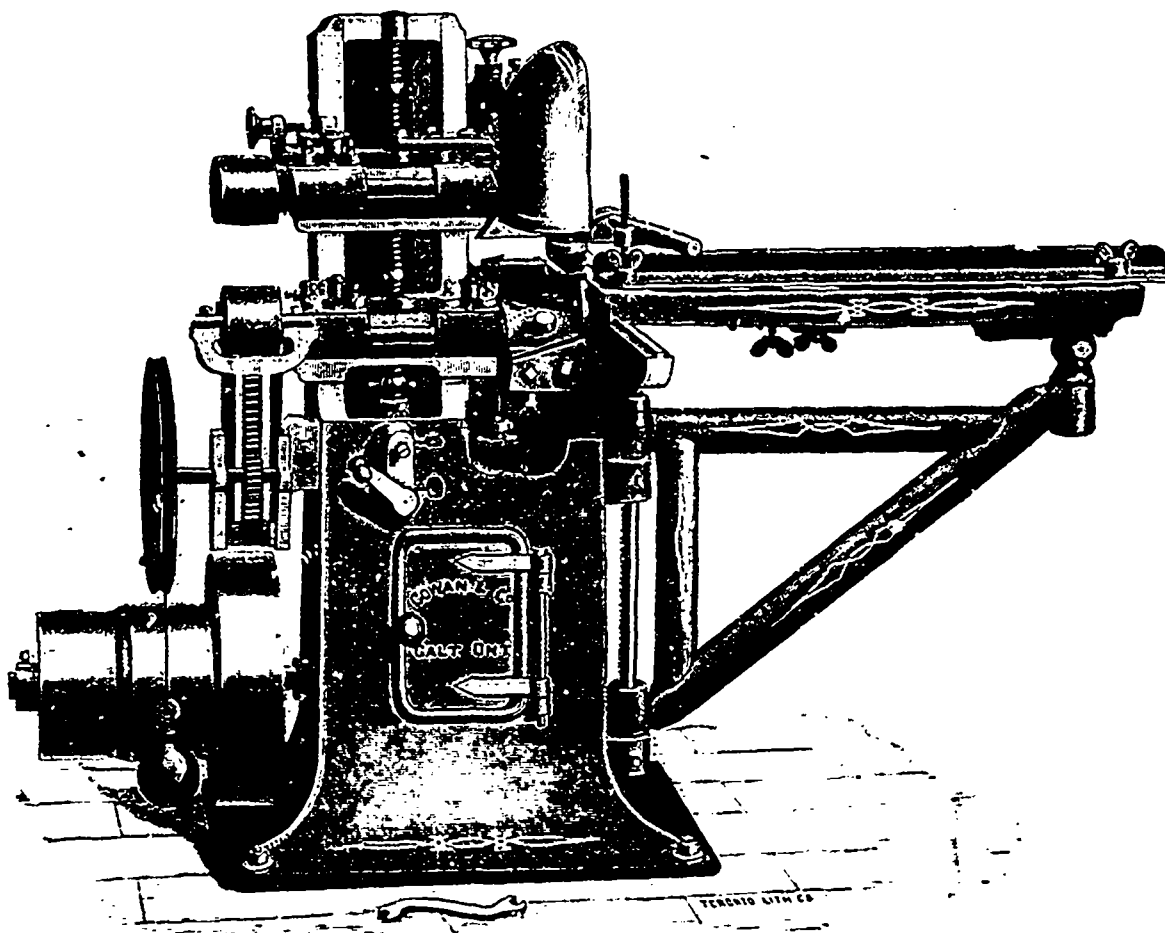
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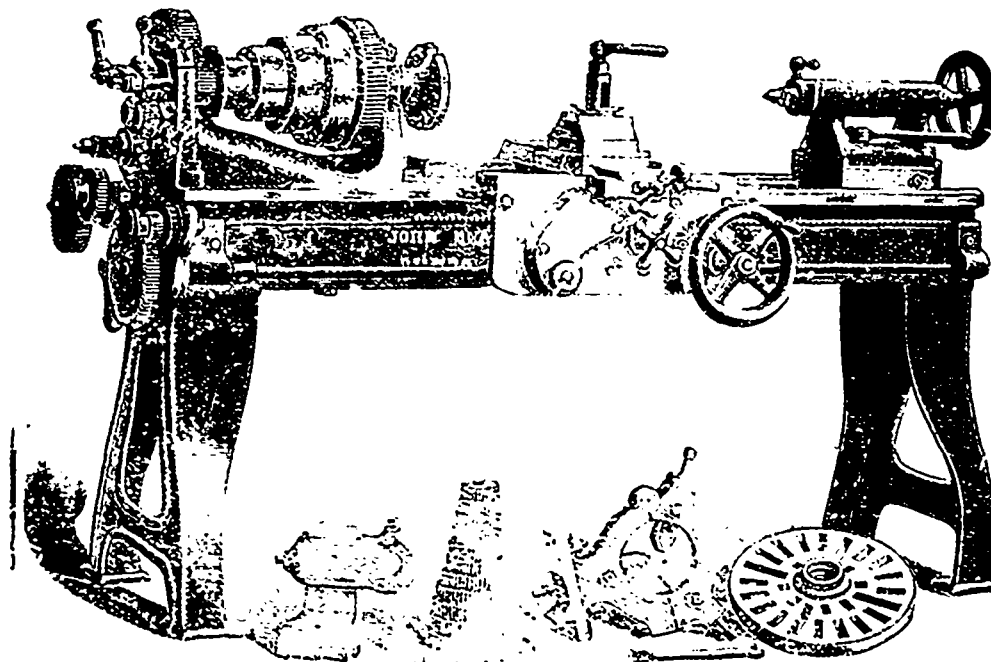
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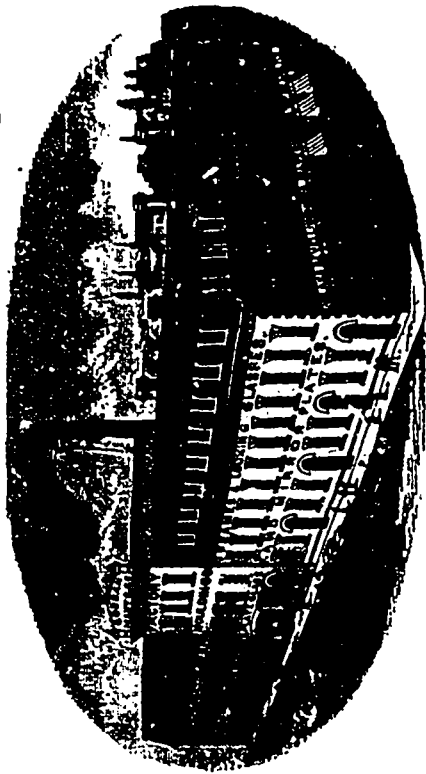
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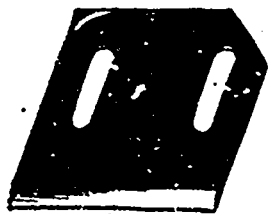


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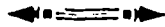
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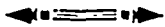
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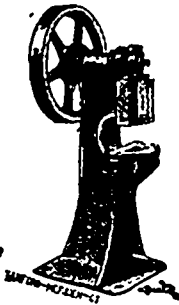
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