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CANADIAN MANUFACTURER

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DEVOTED TO THE MANUFACTURING INTEREST OF THE DOMINION

Vol. 22.

TORONTO, MARCH 4, 1892.

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HOSTILE TARIFFS.

CANADIAN free traders pretend to ignore the idea that any considerable and influential element in Great Britain seriously consider the necessity of a change in the fiscal policy of that country because of what they call the "hostile tariff" of the United States and certain other countries. They are enquiring very earnestly as to what will be the ultimate outcome of the tariffs which so seriously handicap British manufactures. They find that it is false policy to close their eyes to the fact that threatens them. With them the question as to the right or wrong of protection is not now seriously discussed, but what course should be pursued to enable them to retain their foreign trade. They feel that they stand upon ticklish ground, and they are fearful of what they call fiscal experiments. They know what their system did for them before protection swayed the world, and they affect to think, some of them, that a change of policy might be viewed as "retaliation," which word sounds unpleasantly to them, instead of protection to their interests, which many others of them deem inevitable. The *Machinery Market*, an influential trade journal published in London, has been investigating the matter by propounding a series of questions to many of the leading manufacturers of machinery in that country, and in recent issues it has published a symposium of expressions from them, giving their views on it. The questions

submitted to the manufacturers which bear most directly on the matter were "Does the increased tariff in the United States affect you?" and "What is your idea of the best way to counteract the effect on our trade of foreign protective tariffs?" The replies to those questions show that those concerns which never enjoyed much trade with the United States do not feel any particular ill-effects from the McKinley tariff, and included in these are those engaged in the manufacture of agricultural machinery, railway bridges, steam engines, hydraulic machinery, laundry machinery, boilers, electrical machinery, wood-working machinery, patent furnace bars, steam hammers, phosphor bronze, machine tools, stone breaking machinery, electric dynamos, gas engines, etc. It will be noticed that all these industries have arrived at a condition of great perfection in the United States under protection, and it is a fact that in many of them this perfection is more satisfactory to all concerned, producers and consumers alike, in that country than in Great Britain, as for instance American agricultural machinery is more popular and useful wherever it has been tested throughout the world than British machinery, and unequalled in all points of excellence except that manufactured in Canada. It is not surprising, then, that such British manufacturers say they are not directly hurt by hostile tariffs.

Having received a large number of replies to the questions alluded to, *Machinery Market* then proceeded to propound some others of equal or greater importance. The more important of these questions were "Would our trade suffer if an import duty were levied on all articles of luxury manufactured abroad?" "Would it not be good policy to abolish entirely all duties on articles of food (tea, coffee, etc.) imported into the country; admitting all raw materials free, and raising revenue on imported manufactured goods?" "What is the ground of objection on the part of our Colonies to the free admission of British manufactures?" These questions were found to be exceedingly embarrassing, and but comparatively few answers were made to them. Lord Salisbury said that they were not of a character which could be answered by his Government. The secretary of the Board of Trade said that the Board were unable to furnish any observations regarding them. The Cobden Club referred the questions to Mr. Medley, an influential member of the Cobden Club Committee, and this brought out a letter from that gentleman which was inspired from the ultra free trade standpoint, of course. His argument is that whatever tends to impede exchange of commodities injures trade, and that trade should not be injured, and that "there is only one practical mode of fiscally federating the Empire, and that is by the Colonies following the example of the mother country in her free trade policy."

It is refreshing to contrast the practical expressions of live British manufacturers with the views of this free trade theorist. The opinions of these manufacturers as to the best way of counteracting the effects of so-called hostile tariffs upon British trade are indicated in the following.—Get the working classes as well as the capitalists to thoroughly understand the effect produced by such tariffs. Some scheme of commercial federation with the colonies will likely prove the best methods of counteracting the evils of foreign protective tariffs. By adopting a protective tariff in Britain, reciprocally on manufactured goods only. A Sheffield manufacturer of tool steel says: "The

best way to counteract the effect of foreign protective tariffs is to do to others as they do to you. We protest vigorously against that stupid old talk about free trade. Can we suppose ourselves to be so much wiser than every other power on earth? Let us put on a small duty and see how the West would call out in favor of fair trade." "We advocate the commercial union of the Empire," says another. "Efforts should be made to get foreign protective tariffs removed by taxing luxuries imported into England." Another Sheffield steel manufacturer says: "The time has come when it should be intimated to those countries which keep out our goods by high tariffs that we propose putting a duty upon those articles which they export to Great Britain, unless they reduce their duties on goods of British manufacture." Another: "We advocate giving every possible advantage to our own Colonies in return for an exceptional reduction in their tariffs in favor of Great Britain, they putting us on a more favored basis than the United States." Another: "We advocate a counteracting import duty upon manufactured goods received from countries having protective tariffs." Another: "If other countries will not take our manufactured goods without duty, all manufactured goods should be taxed that come here." Another: "Imperial Federation will do it." Another: "We advocate reciprocity—that is, we should put a tax on goods coming from countries that tax our manufactures." Another: "We advocate combination with all our Colonies, giving and taking mutual advantage with all of them, and discriminating against foreign countries." Another: "The best way to counteract the effect on our trade of foreign protective tariffs is to impose countervailing duties equal in every case to the protective tariffs of the countries imposing them."

These expressions are all significant as showing the drift of opinion in Great Britain on this most important question. There is a very strong feeling looking to the adoption of protection there, not because the opinion is that free trade is wrong or protection right, but for self-defence. The ethics of the question have no weight whatever and cut no figure in the discussion. The manufacturers find themselves in a very uncomfortable position, and are realizing the fact that some sort of Imperial federation will assure to them a larger share of the markets of the Colonies than they now possess, and that it might be well if they instituted a tariff system by which the duties upon imports from foreign countries would be graduated according to the duties imposed by those countries against British manufactures.

Some such arrangement would no doubt be a capital thing for Canada. If Britain imposed a duty upon the products of foreign countries, but remitted those duties to Canada in consideration of our duties being made discriminatory as to her, it would not deprive us of all revenue from duties upon imports. Thus, if the United States, for instance, desired access to our market it would be at the cost of our maximum duty, or else at a sacrifice of a part of their duty.

THE exportation of nickel ore and matte from Sudbury goes bravely on, and all that we have to show for our fast disappearing wealth are the holes in the ground from which it is taken. This has become monotonous. Impose an export duty on the metal contained in the ore and matte.

KNOWS ALL ABOUT IT.

A TRADE journal published in Toronto, that poses as the organ of the wrought, cast, stamped, sheet and spun metal trades of Canada, has undertaken to enlighten its readers regarding the iron duties, speaking of them as "protection that does not foster." It very modestly declines to say whether its sympathies are with protection or not, neither assenting to or dissenting from the doctrine, but it deals as hard blows at it nevertheless, as it is capable of giving, much of the power of the blows being imparted by what might with politeness be called a very inaccurate statement. Speaking of the iron duties, it says:—

One of its anomalies is, that it puts a heavy tax, without including the revenue, on all consumers of bar iron, and yet it does not foster the radical production of bar iron in this country. This barren result is due to two clauses of the tariff, which are intended to be, and in effect are, complimentary to each other. The one is that there shall be a duty of \$13 per ton on imported bar iron; the other is, that there shall be no duty at all on imported wrought scrap iron.

It also tells us that since this \$13 a ton duty was put on bar iron, our own mills have produced all we want in this country, but that their output is not the product of our own ore; that the duty which ought to have been a grand factor in the development of our iron mines, has accomplished nothing but the building up of a few fortunes for the monopolists engaged in the manufacture of bar iron; that all our bar iron is made from the old rails, etc., imported from Germany and other foreign countries, and re-rolled here; that we get no natural benefit from the protection given to the rolling mills; that our mines are not developed nor are the revenues increased. It also tells us that the duty does not react beneficially upon the economies of our country, but it reacts injuriously upon them, as the tax it imposes upon the manufacturer who uses bar iron consumes the protection that is accorded him. Further, it leads to the production of iron unequal in quality. It is impossible to get regularity of straining resistance from bar iron that is made from scrap.

In concluding its most remarkable discussion of this subject our contemporary says:—

The most economical way of fostering a strictly Canadian bar iron industry is to take the duty off all bar iron and give a large bounty on every ton of bar iron made in Canada from native ore. That would do two things that we want done: it would give encouragement to Canadian enterprise to develop Canadian resources, and it would remove a heavy incubus off our manufacturing interests. Our nailmakers can make as cheap nails as those of any other country if they get the raw material free of duty. The same is true of the other manufacturers who work up bar iron.

Speaking of "anomalies," we suggest a few of them in the statements of our neighbor. It says that the duty of \$13 per ton puts a heavy tax without enriching the revenue. During the last fiscal year the imports of bar iron into Canada amounted to 192,297 cwt., valued at \$324,428, upon which \$125,019.78 duty was paid. We consider this enriching the revenue. And yet, we are told, this duty "does not foster the radical production of bar iron in this country." Let us see. During the last fiscal year the importation of scrap into Canada amounted to 879,347 cwt., valued at \$652,842, upon which

\$87,934.70 duty was paid. We do not claim to understand just what is meant by the "radical" production of iron, but we know that all this scrap was consumed in the manufacture of rolled iron in Canada, for, under the terms of the law, being scrap it was unfit to be used for any purpose without re-manufacture. These figures show that the "radical" manufacture of iron in Canada from scrap last year amounted to nearly 50,000 tons, and they also show that, although our learned contemporary speaks to the contrary, scrap iron is not on the free list, but paid over \$87,000 in duties last year. Every pound of scrap imported into Canada is liable to pay duty. We are told that since the duty was imposed on bar iron, "our own mills have produced all we want in this country;" but this is rather a wild statement to make in view of the fact that we imported some \$325,000 worth of bar iron last year.

It is rather remarkable that the "organ" of the iron industries of Canada should labor under the impression that bar iron is produced direct from the ore; or that the iron duties, which should have done so much towards the development of our mines, had done nothing in that direction. A study of the advertising pages of this journal will show that there are several enterprises in active operation in Canada employed in developing our mines, and in manufacturing puddled bar from our native iron.

It is a mean sling at enterprising Canadian manufacturers for the so-called "organ" of the iron industries, to declare that those of them who have invested their capital and are giving their energies to the development of the rolling mill industry, and the manufacture of bar iron are "monopolists." What makes them "monopolists?" Can the "organ" inform us what constitutes a monopoly? Any one who desires to engage in the manufacture of rolled iron in Canada is free to do so, and there is not nor can there be any monopoly to prevent him, and then to say that Germany supplies us with most of our scrap, when that country sent us last year less than \$3,000 worth against \$610,000 worth from Great Britain.

No doubt our rolling mill men will fully appreciate the generous reference made to their products by the "organ," in saying that their iron is "unequal in quality," and that "it is impossible to get regularity of straining resistance from bar iron that is made from scrap." This sounds very much like some of the free trade arguments put forth pending the elections last year, and which were very fully reported in these pages at the time.

It would be a queer way to give encouragement to Canadian enterprise and to develop Canadian resources in the direction indicated to take the duty off all bar iron and give a bonus on iron made from native ore. But that is just what the "organ" says it wants done. The suggestion is not in the right direction. If it is desired that the production of puddled iron in Canada be encouraged, it should be done by encouraging the production of pig iron, and the way to encourage the production of pig iron, is to increase the duty. Adequate protection in this direction would induce capital to go into the business, and when once sufficiently established, prices would through competition, be brought to a low level.

It looks as though the "organ" had employed a free trade imposter to write its disinterested editorials on the iron question.

THE CANNERS AND THE TIN-PLATE INDUSTRY.

THE CANADIAN MANUFACTURER takes one of its contemporaries to task because the latter makes the statement that Canadian canners have an advantage over their American brethren on account of the tin plate from which their cans are made being admitted into the Dominion free of duty. THE CANADIAN MANUFACTURER reasons thus: "It is true that the McKinley duty on tin-plate is heavy, but when it (tin-plate) passes through any process of manufacture and is then exported, as when used for canning purposes, a rebate of 99 per cent. is returned to the manufacturer," which is true enough so far as it goes, and in this respect the American canner does not seem to have much advantage over his competitor in Canada so far as relates to the export trade. There is, however, a considerable amount of red tape to be unwound to collect this rebate. This, however, is not the worst phase of the question. While the consumers in foreign countries obtain their canned goods without being assessed the duty, or a portion of it, the large body of home consumers, which includes almost every family in the land, pay tribute to the tariff ogre for the purpose of assisting to build up an industry which should stand upon its own bottom. If the duty were removed from canned goods the Canadian canners would, of course, have a good market here and the consumers would benefit thereby. If tin-plates were admitted free into our ports competition would bring down the price, more canned goods would be consumed and the industry would grow correspondingly. As it now is, the tariff helps nobody, but is in fact an injustice, since it discriminates in favor of foreigners. It has not even partially established a tin plate industry; it is an open question whether it ever will. Common sense, as well as common justice, demands its repeal.—*American Artisan*.

Our free trade contemporary rages like the heathen over the policy of protection, and imagines a hundred vain things. In fact it is bestowing much sympathy where it is entirely unappreciated, and those upon whom it is bestowed laugh it to scorn. If the American canner has to unwind red tape in collecting the rebate on imported tin, according to the *Artisan*, it is worth while to do so, considering the heavy duty on tin-plate. Tears are shed for the large body of home consumers who pay tribute to the tariff for the purpose of assisting to build up the tin-plate industry, but these poor deluded people do not seem to comprehend the fact that they are suffering to any great extent, for they endorsed the policy of protection, and elected the very men who enacted the McKinley tariff. Weeping over the woes of these insensible people who don't know that they are hurt, reminds us of Mark Twain weeping over the grave of his ancestor Adam.

It is all very nice for the *Artisan* to speak a kind word for the Canadian canners, who would, it says, under free trade between the two countries, have a good market in the United States. But insensate Canadian canners are not clamoring for that sort of trade. In fact they are a unit in declaring against it, and for obvious reasons. Of what benefit would the 60,000,000 American market be to them if they had free access to it, while their home market would be open to the ravages of the American canners? The benefit of the arrangement would be exceedingly gauzy and unsubstantial to them, while an extension of the American market over 5,000,000 additional consumers in Canada would be a nice plum for the American canners.

Free trade or unrestricted reciprocity between Canada and the United States would be fatal to the Canadian canning industry, and would also be a very heavy blow to Canadian

farming pursuits. Under the arrangement American fruits and vegetables would be free to Canadian canners, and these being generally cheaper than Canadian fruits and vegetables, and placed upon the market much earlier in the season, if Canadian canners continued in the business at all they would use American in preference to Canadian goods. On the other hand under the arrangement American canners, having free access to the Canadian market, would bring in their goods and supply the demand long before the Canadian canners had got through their season's work. So it is easily perceived that while free trade might be a very desirable thing for American canners, and fruit and vegetable growers, it would be a very bad thing for those industries in Canada.

The *Artisan* argues that free trade would reduce the price of tin-plates in the United States. This is disputed by a very intelligent class of economists, and the facts as applied to many other articles sustain them in their contention. In fact the commercial history of the United States, under protection, proves that protection, not free trade, is the prime factor in reducing prices, and it will be the same in the tin-plate industry without doubt. There are certain lines of manufactures produced in the United States, protected by heavy duties, which are made and sold for less than the duty, wire nails for instance. The *Artisan* may sneer at and deride the idea of the successful establishment of the tin-plate industry in that country, but when such reliable authority as Mr. Swank states that the industry is being established on a large and sufficient scale, and that millions of dollars are being invested in it, with our knowledge of the push, energy and keen business perception of American business men we take it as a foregone conclusion that the tin-plate industry will be established in the United States even against the hostility of the *American Artisan*.

From what can be learned regarding the situation in the United States, the interests of the canning industry there have not as yet been seriously injured by the increase of duty under the McKinley tariff, for the prices of tin-plate are only a very little higher there now than they were before the duty was increased, while the export prices in Great Britain have been reduced 25 per cent. or more in order to meet the increased duty. Two years ago when the duty was only one cent per pound, coke plates in New York cost \$5.20 per box, while at this time with the duty at two and two tenths cents per pound, the cost of the same article there is but \$5.35, an increase of but fifteen cents. Of course the Welsh producers, not the American consumers, pay the duty.

AMEND THE CUSTOMS ACT.

At the last meeting of the Canadian Manufacturers' Association, the following resolution was passed:

Whereas, by a recent decision of the Exchequer Court, it appears that job or unsaleable goods can be imported at slaughter prices, although in consequence of combinations amongst the manufacturers they cannot be sold for consumption in the home market at less than regular prices; and whereas it is unfair to the manufacturers of this country that such valuation should be allowed: Resolved, that the secretary be instructed to communicate with the Government with a view to having the Customs Act so amended that

such goods shall pay duty upon the regular and not upon the slaughter prices, and that where such goods have for any reason been withdrawn from the market where manufactured, the duty price for Canada shall be the lowest price at which bona fide sales have been made for consumption in the country where they were manufactured.

This resolution, the *Toronto Globe* says, "will bear watching," and explains as follows:

This means that American goods are not to be imported into this country except at the prices charged by the American combines. In other words, while the man who buys Canadian goods is to be forced to buy at Canadian combine prices, the man who buys imported goods is to be forced to buy at American combine prices. The consumer is bound hand and foot now, and the protected manufacturers want things fixed so that he cannot even wriggle.

The necessity for this resolution grew out of the circumstances of the Smith & Patterson undervaluation case, which was fully explained in these pages at the time. The goods, the product of an American manufacturing concern, were listed in a watch jobbers association in the United States, and could not be sold in that market for less than the list prices. They were, however, withdrawn from that market and sold at slaughter prices for export to Canada. They were seized in Montreal for undervaluation, the Government contending that they should be charged duty according to the American list prices. The importers resisted the seizure, and upon the trial of the case in the Exchequer Court, it was decided that as the goods had no real market value in the United States, the price at which they were sold should be the basis for duty. It was to overcome the palpable injustice of this decision, not only to Canadian manufacturers but to honest Canadian importers also, that it was determined by the Association to ask the Government to amend the law. Canadian manufacturers find their protection against the undue competition of foreign producers in the tariff. But there is an unfortunate hole in the Customs laws which allows these foreign competitors unjust access to the Canadian market, and the Canadian Manufacturers' Association ask the Government to stop this hole by a proper amendment to the Customs laws.

UNANSWERED QUESTIONS.

IN 1887, Mr. D. Ryland, a British merchant and manufacturer, doing business at Barnsley, England, addressed a letter to Mr. John Bright, M.P., regarding the question of free trade and protection, but although a long time elapsed between the date of that letter, and the death of Mr. Bright, it was never answered. This is to be regretted, for, as will be seen from that letter which we here reproduce, the points raised were very fairly put, and if the free trade policy of Great Britain is really the best for her, some of its advocates and defenders should surely answer Mr. Ryland's questions.

The following is Mr. Ryland's letter to Mr. Bright:—

DEAR SIR,—Having seen in the *Sheffield Independent*, a copy of your letter of November 25th, to Mr. John Pendleton, may I very respectfully ask you the following questions:

1. What reason have you for believing that Britain has suffered less than protectionist countries?
2. Is it not true that during the eleven years ending 1885, protectionist Germany had increased her home exports 37 per

cent., protectionist America had increased hers 20 per cent., whilst free trade Britain had decreased her home-produced exports to alien countries 24 per cent., though increasing them to our colonies 8½ per cent.? This, too, notwithstanding that according to Mulhall (a free trader), manufacturing energy (thanks to our splendid development of steam) costs in Britain 40 per cent. less than in Germany, and 16 per cent. less than in America, 75 per cent. less than in France, and 25 per cent. less than in Belgium?

3. Is it not true that during the past thirty-two years, whilst the amounts in savings banks in free trade Britain have only increased 61 per cent., they have in protectionist France increased during the same time 312 per cent., and in protectionist Germany 372 per cent., and in protectionist America even more than this?

4. Is it not true that whilst free trade Britain has from 1810 to 1881 only increased her manufacture of iron about five-fold, protectionist France has increased her's eleven-fold, and protectionist America has increased her's eleven-fold, and that whilst from 1870 to 1881, steel manufacture in Britain only increased seven-fold, it increased in Belgium eighteen-fold, in America twenty-two fold, and in Russia twenty-seven-fold?

5. Is it not true that from 1850 to 1880 the wealth per inhabitant of protectionist America increased 89 per cent., but the wealth per inhabitant of free trade Britain only increased 38 per cent.?

6. Don't you think our British workers would like to have the enjoyment of some of the depression of protectionist countries, when the foregoing figures are weighed over?

7. Don't you think that so soon as Britain is aroused to the gross injustice of loading her own producers and workers with all taxation, whilst giving foreign produce and manufactured goods a free market, that some statesman will be found quite capable of arranging a fair tariff system?

8. Don't you think that our army of Custom House officials, who now spend two thirds of their time in examining bales of foreign-manufactured goods and produce, to make sure that no tea or tobacco or other dutiable goods are therein smuggled, could not quite as easily and cheaply collect taxes on these foreign wares and would not taxes thus collected cost far less in collection than the present system of letting loose on Britons throughout the country a whole army of Inland Revenue Collectors, whose everlasting dunning is as extravagantly expensive as it is continually irritating?

9. Don't you think that our principal Colonies would be foolish if they stopped collecting taxes on imports, and thereby incurred the fearful expense and bother and risk of collecting taxation from their widely scattered inhabitants?

10. Don't you think that any and all of our Colonies would be delighted to grant us as much preference fiscally as we grant them, but that, whilst we continue to treat alien's produce quite as favorably as theirs, they will treat our wares the same as alien's? Would not you do the same?

11. Why should you object to a tax on foreign-grown corn, when all corn grown in Britain has to pay in taxation three shillings and sixpence per quarter, as proved before the Royal Commission on depression of trade?

12. If taxing foreign corn makes foreign corn dearer, will not our taxation on British-grown corn make it dearer, and does it not, therefore, follow that, under our Free Trade system, we are actually paying the foreigners at least three shillings and sixpence per quarter more than we need pay him for corn?

13. How can you say that British farmers have had farms twice too large for their capital, or that land here has been made to grow corn which should not have grown it; when the facts are that British farmers on this land raise more bushels of corn per acre than any farmers in the world?

14. If the question of rent of land "must," (as you say) "depend on what tenants are willing and able to pay," must not be the questions of rents of houses, offices, and other property, be treated similarly? Have you any houses, etc.,

you would let on this principle? If our Government, by special foreigner-favoring laws, decreased the rentals of your houses, at the same time pauperizing your tenants, and still continue to pile ever-increasing taxation on these houses, would you praise and flatter the leaders of this system?

15. If you can't levy on the breakfast-table a rate in aid of the British corn grower, how comes it that you levy a rate on the breakfast coffee or cocoa? a rate, too, on the dinner beer or after-dinner pipe? a rate, too, on the afternoon tea, and then coolly use all these very rates (wrung from British workers) in providing foreign workers with a free chance of either robbing British workers of work altogether, or of knocking wages down to starvation point?

16. When the Free Trade system has pauperized all the farm laborers, farmers, and landlords, whose turn will come next to be thus fleeced to help foreigners to rob us of our own market?

17. How does the Free Trade system benefit the cotton and woollen trades of Lancashire and Yorkshire, when, year by year, more foreign-made woollen and cotton goods are being imported tax free, whilst masters and operatives are year by year being more and more heavily taxed to support our market thus given free to the foreigners? When, too, year by year, agricultural laborers and their families are being driven off the land into the factories, thus keeping work scarce and wages low? When, too, if we did but divert our gold to India and our Colonies for corn, meat, and other produce, they would gladly spend it back with us for cotton and woollen, etc.?

18. Has not the improved condition of British workers since 1846 been distinctly traceable first, to the railway development (of which a Briton, named George Stephenson, was the father) and in which the 700 millions spent in Britain since 1846, and the 300 or 400 millions spent in our Colonies have mainly gone to provide more work and better wages for British workers? Second, to the wonderful development since 1864 of the inventions of Watts (also a Briton), and the resultant application of steam power to all kinds of work and to shipping? Third, to those brave wandering sons of Britain whose genius for colonizing has been far ahead of all other nations combined, and who collectively spend back with us all we spend with them, and whose remittance of the large amounts of gold they have from time to time found, has much increased the wage fund of Britain?

19. Don't you think it very shabby to rob our inventing and colonizing forefathers of the great honor due to them, and to give the honor to a foreign-favoring system that no other civilized nation would adopt? Is it not quite as base and senseless as would be the conduct of a lot of young patrons of the turf, who, whilst inheriting from their ancestors magnificent legacies, waste a lot of the wealth "backing their fancy," and still persist in praising the race course for what wealth they have not yet lost on it, but quite forget the memories of those to whom the wealth is distinctly traceable?

20. Don't you think that most of the six millions of British emigrants who, since 1846, have gone to America to be our competitors, would have preferred going to our own Colonies to be our customers, if British wealth had by fair fiscal arrangements been diverted to our Colonies, and don't you think we are frightfully heavy losers by thus robbing our Colonies of their birthright, namely, a fair chance of the home market?

I have a few more points to ask your opinion upon. My letter is, however, already too long. These points are summarized in chapters 1, 18 and 19 of a little book, entitled, "By and By" (Kensit, London). If I send you this book, would you oblige by reading these chapters and giving your opinion thereon. I want all the light I can get on this subject, and hence I beg you will excuse my long string of questions which for your ease in answering I have numbered.

Awaiting your kind reply, I am, dear Sir,

Yours respectfully,

DAN RYLANDS.

OUR CANADIAN HOMES.

A RECENTLY issued census bulletin gives some very interesting facts regarding the houses in which the people of Canada live.

The total number of dwellings in the Dominion (excluding the unorganized territory, the returns for which are not completely in), according to the census of 1891, just compiled, on April 6, 1891, was 930,684, of which 919,879 are built of wood, brick or stone, and 250 of sod. In addition there are 10,555 "shanties." Of the 250 sod houses (all in the North-west territories) 227 were occupied, eighteen empty of human occupants, and five being built. The shanties were all occupied, and are for the most part the temporary abode of lumbermen, railway navvies, gold hunters, cannery employes, land prospectors, Indians, etc. There may be twenty persons occupying a shanty at the time of the enumerator's visit, but all excepting one or two may have homes in Canada at which they are taken. The others being without any homes in Canada are taken in the shanty, which consequently becomes a census home and takes position as a habitation. In many cases the shanties along the railway lines, after being abandoned by the navvies, are entered by poor squatters. The total number of shanties in 1891 shows a decrease of 4,134 as compared with 1881. This decrease is altogether in the North-west territories, where in 1881 there were 9,882 occupied dwellings of this description, against 409 in 1891.

The 919,879 houses found by the enumerators on April 6, 1891, are classified as follows:

Inhabited.....	851,842
Empty.....	54,164
Under construction.....	10,873
Total.....	919,879

The total number of houses in occupancy (851,842) is an increase of 116,633 over the occupied houses in 1881—an increase equal to 15.8 per cent. The increase in population is 11.7 per cent. The population is, therefore, better housed by being less crowded than in 1881. The houses under construction on April 6, 1891, numbered 10,873, an increase of 991 over the number found by the enumerators in 1881. The "empties" of 1891 numbered, at the date of the census taking, 54,164, an increase of 7,581 as compared with 1881. Many of these are houses from which the families have moved into the new and better structures they, by their developed prosperity, have been able to provide for their shelter. Probably the same fact was observable in 1881.

Taking things as we find them, the percentage of uninhabited houses and the total number of houses constructed and under construction in April, 1891, was 5.8, which corresponds exactly with the figures of 1881.

According to provinces, the houses inhabited and the changes in ten years are as follows:

Province.	Houses Inhabited.	Increase.
British Columbia.....	16,776	9,784
Manitoba.....	29,176	16,776
New Brunswick.....	54,187	3,231
Nova Scotia.....	78,413	4,677
Ontario.....	403,012	41,978
Prince Edward Island.....	18,359	675
Quebec.....	244,444	28,332
North-west Territories.....	10,475	8,181

Including all occupied habitations, shanties, sod houses and other dwellings, the average number of persons under each roof is found to be as follows: British Columbia, 1.9; Manitoba, 5.2; New Brunswick, 5.8; Nova Scotia, 5.7; Ontario, 5.2; Prince Edward Island, 5.9; Quebec, 6.0; North-west Territories, 6.0.

The kind of houses in which our people live is for the first time procured by the census of 1891. Out of the 851,812 inhabited houses which are given by the enumerators, 697,356 are built of wood, 131,522 of brick and 25,964 of stone. Thus 81.6 per cent. of the dwelling houses of Canada are built of wood, 15.3 per cent. of brick and 3.1 per cent. of stone. It is of course, understood that the above facts relate to dwelling houses, and not to warehouses, stores, shops or public institutions.

Of the 697,356 wooden dwelling houses, 302,537 are one storey high; 171,052, one and a half storeys; 213,872, two; 3,808, two and a half; 5,162, three; 291, four; and twenty more than four storeys high, and 611 were undescribed owing to oversight of the enumerators.

Of the 131,522 brick dwelling houses there are:

One storey high.....	25,518
One and a half storeys high.....	13,785
Two storeys high.....	76,917
Two and a half storeys high.....	1,960
Three storeys high.....	13,040
Four storeys high.....	1,982
Five storeys high and over.....	80
Undescribed.....	1

Of the 25,964 stone dwellings there are:

One storey high.....	5,178
One and a half storeys high.....	4,283
Two storeys high.....	11,589
Two and a half storeys high.....	266
Three storeys high.....	3,085
Four storeys high.....	1,392
Five storeys high and over.....	171

Of the total of 854,812 inhabited dwellings 24,937 are one-roomed buildings, or almost two out of every hundred; 67,923 are two-roomed, or nearly eight out of every 100.

93,966 are three roomed, or 11 out of every 100.
131,250 are four-roomed, or 15½ out of every 100.
104,395 are five-roomed, or 12 out of every 100.
116,670 are six-roomed, or 13½ out of every 100.
89,125 are seven-roomed, or 10½ out of every 100.
80,419 are eight-roomed, or 9½ out of every 100.
47,036 are nine-roomed, or 5½ out of every 100.
37,447 are ten-roomed, or 4½ out of every 100.
48,055 are 11 to 15-roomed, or six out of every 100.
9,851 are over 15-roomed, or 1½ out of every 100.

Thirty-nine per cent. of all the dwelling houses inhabited are one-storey buildings.

Fifty-seven per cent. are one and a half and two-storey buildings; about 4 per cent. are from two and a half storeys up.

Of the uninhabited houses there were of:

One storey.....	23,227
One and a half and two storeys.....	21,198
Two and a half storeys.....	197
Three storeys.....	1,241
Four storeys.....	119
Five storeys and over.....	18

Total..... 46,000

In addition to these there were 8,164 houses found empty, but by oversight of the enumerators, not classified as to storeys and rooms.

Classified as to rooms, there were of houses uninhabited :

One room	3,837
Two rooms	6,853
Three rooms	6,322
Four rooms	8,221
Five rooms	5,021
Six rooms	5,773
Seven rooms	3,065
Eight rooms	2,817
Nine rooms	1,239
Ten rooms	1,192
Eleven to fifteen rooms	1,250
Over fifteen rooms	410

46,000

Of the houses under construction, numbering 10,873, there were 2,796 not classified through oversight of the enumerators as to rooms and storeys. The remainder, 8,077, were classified as follows :

One storey	2,704
One and a half and two storeys	4,746
Two and a half storeys	116
Three storeys	480
Four storeys	25
Five and over	6
Total.....	8,077

Classified as to rooms, there were of houses under construction of :

One room	749
Two rooms	939
Three rooms	572
Four rooms	1,118
Five rooms	613
Six rooms	1,117
Seven rooms	708
Eight rooms	851
Nine rooms	364
Ten rooms	452
Eleven to fifteen rooms	415
Over fifteen rooms	179
Total.....	8,077

The one-storey house seems to be going out of fashion, as 50 per cent. of the unoccupied and only 33 per cent. of those under construction are of that class.

EDITORIAL NOTES.

THE N.P. is on top.

THE N.P. will remain on top.

UNRESTRICTED reciprocity, alas, oh where is it ?

Out of 774 blast furnaces in Great Britain, only 386 are in operation at present.

UNRESTRICTED reciprocity is now but the fag end of a worn out and unpopular fad.

AND now for the immediate imposition of an export duty upon nickel ore and matte, saw-logs and pulp wood. Impose the duty.

CANADIAN nickel, Canadian saw-logs, Canadian canals, these three factors may be useful points in considering what sort of reciprocity we may grant to the United States.

THE N.P. is the Canadian torch of liberty and enlightenment which is now held aloft, directing the attention of the world to one of the fairest lands beneath the sun.

THE CANADIAN MANUFACTURER is right in opposing tax exemption for new industries in Toronto. The system is vicious in principle and unjust in practice.—*Cleveland Iron Trade Review.*

AFTER due deliberation a score or more of Canadian constituencies have again decided that the N.P. is good enough for them, and they have, therefore, within the past month, elected staunch and true pro-tariff men to represent them in the Dominion House of Commons.

EXPERIMENTS in burning brick with kerosene oil instead of wood are being made at Cambridge, Mass. As far as the experiments have gone, it has been demonstrated that sixty gallons of oil, worth \$1.50, go as far as a cord of wood worth \$5.00. The trouble is to regulate and properly distribute the heat, the oil making a very hot fire.

ARE your boilers insured ? This is a most important question for the consideration of manufacturers. It is practically impossible to tell when a boiler is liable to explode, but they do explode frequently, and usually with disastrous results. The cost of insurance against explosion is not large, and should be a legitimate charge in expense account. The insurance should not be neglected.

As Austro-Hungarian chemist has, it is said, solved the problem of securing a practicable method of waterproofing leather and rawhides. The idea is to impregnate the leather with a gelatine solution, combined with a mineral salt to coagulate the gelatine in the pores. The mixture to produce this result is as follows : Water, 1,200 parts ; gelatine, fifteen parts ; potassium bichromate, five parts.

THE *Bulletin* of the American Iron and Steel Association says, that "representatives of six beet-sugar factories met in San Francisco recently and formed an association to develop the industry. Three were Californian and three were eastern factories. Henry T. Oxnard, of Nebraska, was chosen president. This year there is sure to be another beet-sugar factory established in California, as all three now established in that state are paying well."

THE remarkable development of the nickel-mining industry in Canada is one of the marvels in the recent history of mining. In 1889 there was but one company producing in the Sudbury district, and in the following year the output exceeded 1,000,000 pounds of nickel, surpassing the output of the famous mines of New Caledonia. With these two deposits of nickel, both of which are of vast extent, and contain ore of high grade, there is evidently no danger that the demand for nickel will outstrip the supply.—*Engineering and Mining Journal.*

RUMORS have been current during the past week that an English syndicate of capitalists have been making efforts to consolidate the tanneries in the United States, with headquarters in the east, and a local representative in each state. It is stated that some of England's most prominent leather men are interested in the deal, and that £1,000,000

of the capital of the syndicate has been subscribed for. As an inducement, the advocates of the affair set forth an entire innovation in the tanning process, which, they claim, not only reduces the cost of the work fifty per cent, but saves much time as well.

Our Government, so long as it is controlled by Republicans, will have no reciprocity with Canada, excepting upon terms that are specially advantageous to us, and, as we are not likely to get such terms, we shall not have reciprocity with Canada at all. The American people are not such fools as to enter into engagements which will sacrifice their interests to those of Canada: and they are not so much enamored with England and English policy as to help that country to build up a mighty power all along our Northern border.—*The Manufacturer*.

Per contra, the Canadian people are not such fools as to enter into any engagements with the United States which will sacrifice the manufacturing interests of Canada. But the mighty pro-British power all along the Northern border of the United States will be built up all the same, and don't you forget it.

SOME of our American friends are clamoring for a reduction of the McKinley duty on Canadian lumber, and others of them are clamoring for a higher duty. In a moment of weakness the Dominion Government, at the threat of the McKinley tariff, removed the export duty on saw-logs. But while this encouraged the exportation of logs, it knocked the saw mill industry almost out of existence. According to their own showing, the pine forests in the United States are almost depleted, and the mill men there must have Canadian logs. It is a ground-hog case. That necessity is our opportunity. It is in accord with the ethics of protection, and is endorsed in spirit by the McKinley tariff. Therefore, impose the duty on saw-logs. Make it at least \$3 per thousand feet.

THE real estate and plant of the beet sugar company is to be sold by auction at the church door of the parish of Saint Romuald de Farnham, on Saturday. The shareholders of the Company at least have had quite enough of the N.P.—*Montreal Herald*.

On the contrary, quite the reverse. If the Government had followed the American example as regards the beet sugar industry as closely as it followed, or we should say exceeded that example, as regards another feature of the sugar question, the Farnham beet sugar plant would not have been sacrificed at auction. What the farmers of Canada now need, and what the Government should give them at the earliest possible moment, is a guarantee that for the next ten or fifteen years they will be paid an encouraging bounty on the production of sugar beets.

OUR musical contemporary, THE CANADIAN MANUFACTURER, has for some time past been practicing on a new song, entitled, "Put an Export Tax on Nickel," set to the well known tune, "Canada for the Canadians." In the course of a few years it doubtless will be able to sing the song in quite diverting style.—Cleveland, O., *Iron Trade Review*.

Our song is fast becoming a chorus, joined in by such a large number of Canadians who have votes, that the thunders of it will reverberate with telling effect in the House of Commons at Ottawa. The song and chorus will undoubtedly

be quite diverting and pleasant to Canadians; but our American friends, who have an armored navy to build, will not enjoy it so much. Perhaps we may use this nickel club of ours to knock some of the stullin' out of the McKinley restriction upon Canadian products.

It gives us pleasure to note the fact that the building of several large iron furnaces in Nova Scotia, and the enlargement of the capacity of the Nova Scotia Steel and Forge Company's works, are being pushed with much vigor; and that, without doubt, within the next ensuing six months, lines of iron and steel goods will be produced there different from any ever heretofore made in Canada. The good work goes on. It is being shown that the people of Canada favor protection, and they lose few opportunities of defeating at the polls men who present themselves for election to the House of Commons, who are not ardent advocates of the N. P. This bright feature of recent political development inspires confidence in capitalists, who now begin to see that the Canadian home market is to be reserved for Canadian enterprise, and is not to be thrown open to the unequal and unfair competition of the whole world.

REPORTS from Germany go to show that in many lines the McKinley tariff has been a severe blow to German trade with the United States, and in some of the German textile manufacturing towns the wages of working people are cut down to such a level that life to them seems scarcely worth the living. A wholesale emigration of these working classes, or the rapid opening up of other foreign markets, seems to be the only means of avoiding great distress in the manufacturing towns of that Empire.—*Journal of Fabrics*.

One of the greatest obstacles some of our Canadian manufacturers have to contend against is the competition of German goods, produced by these very working people whose wages are cut down to such a level that their lives are a burden to them. The McKinley tariff shuts them out of the American market, and our Canadian tariff is not sufficiently high to exclude the pauper made goods from our market. If these working classes are desirable emigrants and worthy people, they would be welcomed as an addition to our population, but our tariff should be made high enough to shut out the products of their labor if manufactured in another country.

AN order in council had been passed fixing the tariff charges for vessels using the Kingston dry docks. On vessels and steamers from 100 to 500 tons, the dockage is to be twenty cents per ton on the registered gross tonnage, and for all tonnage in excess of 500 tons the dockage will be ten cents per ton upon the excess. The dockage on tugs and vessels of less than 100 tons will be \$20; lay days, that is the days that a vessel remains in dock, one to commence twenty-four hours after the dock is pumped out, are to be charged at the rate of seven cents per ton per day and fractions of a day. In no case is the charge for lying in dock to be less than \$20 per day. Cargoes will be charged at the same rate as tonnage, but no charge will be made for ballast. Coal will be charged as cargo. It may be thought that these charges, considering the total cost of the dock, are low, but, in order that the Kingston dry dock may compete with the American docks on the great lakes, and obtain a fair share of business, the tariff has

been made to conform with the one adopted by the managers of the United States docks at a meeting held in Detroit in January last.

Though Canada leads this continent in the quality of its flax fibre, it has never claimed pre-eminence in any other vegetable textile fibre, being far beyond the cotton belt. In some of the swamps of this province and Ontario, there grows a plant bearing a seed filled, when ripe, with a fibre something like cotton, and a manufacturer, to whose notice it was recently brought, believes that a fibre equal to ordinary cotton can be spun from it. He is now making experiments with it, and if its cultivation and gathering should prove easy, Canadian swamp lands will be at a premium, and England will no longer have to lean on Uncle Sam for her supplies of cotton.—*Journal of Fabrics.*

The manufacturer who is here spoken of as making experiments with this swamp weed, can spend much time and money without the hope of a favorable result. England has been trying for many years to avoid leaning on the United States for raw cotton, but her chief supplies are yet produced there. Try cultivating the sugar beet. Let the Government promise a bonus of, say, two cents per pound, for a period of ten or fifteen or twenty years, on all sugar made in Canada from Canadian grown sugar-beets. There is profitable occupation for Canadian farmers in growing sugar beets, and for Canadian manufacturers in making sugar from them.

CANADIANS are very justly proud of the three noble ships belonging to the Canadian Pacific Railway Company which now connect our Pacific coast with China and Japan. In building these ships they were made to comply with the conditions of the British Admiralty as regards the British naval reserve. In case of necessity, it would be the work of but a few hours to make these ships among the most formidable and effective commerce-destroyers that the Admiralty could command. It is to be hoped and expected that whatever arrangements Canada may make as to a fast steamer service on the Atlantic, the same requirements will be observed. We know that the contemplation of this situation gives our worthy contemporary, the Philadelphia *Manufacturer*, much unhappiness, but Canada at this season is looking more to strengthening the ties that bind her to the mother country than to pacifying the querulousness of the Anglophobiacs. Discussing this question, the Secretary of the British Admiralty, at the late dinner of the Liverpool Royal Naval Reserves, said:

A review of the reserve-ship question would not, he said, be complete without mentioning the new force of mercantile armed cruisers—a force the value of which it would be difficult to over-estimate. They now retained on payment thirteen merchant steamers of an aggregate gross tonnage of 100,000 tons, and 150,000 indicated horse-power. Such a tonnage built for the Navy would cost over £6,000,000, and as they paid only £60,000 per annum to secure the call for their services, it was a good financial transaction for the country. This payment also gave them the call, free of charge, of fifteen other large and fine steamers. He might also mention that seventeen of these steamers are commanded by officers of the Naval Reserve. Moreover, the mercantile armed auxiliaries were excellent vedettes or watchdogs of a fleet, and to those who said that they would be better employed as food-carriers, he replied that very high speed and large cargo capacity was not a practical combination.

It is this "good financial transaction for the country" which

we may hope soon to see carried out in connection with the Imperial highway through Canada.

Our esteemed contemporary, *The Manufacturer*, of Philadelphia, is troubled with Anglophobia, which has become chronic. It may be like the shaking of a red rag before an enraged bull, but we republish for its benefit the following letter, written by Sir George Baden-Powell to the London *Times* :—

For the first time in our history has a "trooper train" this week crossed the North American continent, carrying to and fro reliefs of the Imperial forces of the Empire. In actual fact it has taken less than a week to transfer a body of 600 marines and blue-jackets, with their officers—and in good naval discipline—from the Pacific to the Atlantic. "Everything worked perfectly, and the officers and men were delighted with the run. Time was afforded for exercise twice a day." Such is the cabled record of this pioneer effort. I had the opportunity while in Canada recently, of inspecting this "trooper train" before its start. It was composed of a powerful engine and thirteen cars. Nine of these were "colonist" sleeping cars, each accommodating, day and night, sixty men in comfort. There were also a kitchen car, specially fitted to cook for 700 men, a "first-class" sleeper, providing comfortable quarters for thirty officers, and two roomy baggage cars. This "trooper train" was stored with all necessaries, arrangements being made to take up fresh provisions at the various stopping places. Such a "transport unit" can, of course, be multiplied indefinitely, and it has now been proved that battalions, batteries or men-of-war crews can readily and comfortably be transferred between Esquimaux and Halifax within seven days, which means a fortnight between Portsmouth and the Pacific. Mr. Goshen's far-sighted action in securing on the Pacific the new Empress line of armed mercantile cruisers, which can cross to Yokohama in eleven days, now enables us to reinforce our Chinese squadron within twenty-two days from England should need arise. The present troubled outlook in China is alone sufficient to make us grateful that this possibility has been opened out to us betimes. The pioneer "trooper train" has proved it to be feasible to transfer crews of ships on the Pacific station to England within fifteen days. Until this very week such transference necessitated a fifty days' passage round Cape Horn or via Suez. We may hereby save the material expenditure and waste of time of several weeks' travel for every seaman and officer going to and fro the Pacific. This accomplished fact proclaims eloquently the enormous advantages we secure from the co-operation of our great Canadian Dominion in the defences of the Empire and in our ability to support the United Kingdom in upholding the interests of civilization in these remoter parts of the world. We thus gain, together with a saving of expenses, new and invaluable strategic advantages.

The Copp-Clark Company, Toronto, have sent us, through Mr. W. J. Dickson, a copy of their 1892 Canadian Almanac. This is the forty-fifth year of the publication of this valuable repository of useful knowledge. There are some 224 pages of reading and other interesting matter, the subjects including every variety of information likely to be sought for in such a book.

The Vancouver, B.C., *News-Advertiser* announces that during the current month it will begin the publication of the *Financial Review*, to be issued weekly, and devoted to the financial, commercial, manufacturing and mining interests of British Columbia. The *News-Advertiser* Company have purchased the *British Columbia Commerce and Maritime Register* and will merge it with the *Financial Review*. We are exceedingly well pleased to learn that the new journal will give special prominence to the manufacturing interests of the Pacific Coast.

Nothing is more discouraging than to buy a mess of peas at the grocery and find them too old, or when cooked, without flavor.

But this need not be the case, for anyone can have fresh, sweet peas in their own garden by planting Vick's "Charmer" Pea. It has large, long pods, closely packed with peas of large size. When cooked they are of the finest flavor. This pea is very productive. Every lover of peas should send to James Vick's Sons, of Rochester, N.Y., for a package—only fifteen cents. Their *Floral Guide* tells of many new things that have been tested.

Three years of electrical progress and development are interestingly chronicled in the special Decennial Number of the *Electrical Review* of New York. This issue of the *Review* is dated February 20th, and celebrates the tenth anniversary of that journal. The number is finely illustrated and the articles are of unusual merit and timely interest. Nearly all the great electrical improvements have been made during the existence of the *Electrical Review*, and all these are mentioned in this special number. Among other articles are "Ten Years with the Telephone," "The Telegraph in America," "Electrical Footprints of a Decade," "Is Electricity Related to Nervous Force?" Several prophecies and predictions as to the future of electricity are also made. None of the contributions are too deep for the lay reader, and all are written by able electricians.

In spite of bleak March winds and the dying struggle of Winter, *Outing* for the month is as bright and cheery as a May morning. Every page breathes wholesome teachings of the grand old woods, of healthful exercise, of travel in many lands and of sports and pastimes pure and beneficial—such as our sons and daughters should be encouraged to follow. Not a line of the pernicious and sensational literature far too abundant at present, can ever find its way into *Outing's* pleasant pages. It is a magazine for ladies and gentlemen and is surely doing a good work. The current number is superbly illustrated and reflects the greatest credit on the publishers. The contents are as follows: "A Marauding Leopard," by Fitzroy Dixon, illustrated by J. Carter Beard; "Cycling in Mid-Pacific," (concluded) by Charles E. Trevathan, illustrated by Henry S. Watson and from photos; "The St. Bernard Kennels of America," illustrated by Dustin and from photos; "Photography and Athletics" (second paper), by W. I. Lincoln Adams, illustrated from instantaneous photos; "Standing Jumping," by Malcolm W. Ford, illustrated by Henry S. Watson; "The Connecticut National Guard," (continued) by Lieut. W. H. C. Bowen, U.S.A., illustrated; "Horseback Sketches," by Jessie F. O'Donnell; "Rowing," by Chase Mellen, illustrated from photos; "The Status of the American Turf," by Francis Trevelyan, illustrated by Henry Stull and from photos; "Moxley's Chum," by Valerie Berrie; "The Valley Quail of California," by T. S. Van Dyke; "Saddle and Sentiment," (continued) by Winona Gilman, illustrated by Henry S. Watson; "A Bit of Winter Sport," by Ed. W. Sandys; "Harry's Career at Yale," by John Seymour Wood, illustrated by Watson, and the usual editorials, records, poems, etc.

The *Popular Science Monthly* for March has a varied and attractive table of contents. First comes the fifteenth of Dr. Andrew D. White's "New Chapters in the Warfare of Science," dealing with Astronomy. The denunciations which both Protestant and Catholic theologians heaped upon the scientific teachings of Copernicus and Galileo are set forth in this article with abundant and exact references to the writers quoted. In the series on American Industries there is a fully illustrated paper on "The Organ," by Daniel Spillane, describing some of the largest instruments in the United States, and telling what advances American organ-builders have made in their art. Another illustrated article is a very readable account of "Domestic Animals in India," by John Lockwood Kipling. Carroll D. Wright contributes an instructive paper on "Social Statistics of Cities," in his Lessons from the Census. It is a comparison of the area, population, and the cost of each department of public works in fifty cities of the United States. Under the title "Wayside Optics," a lesson on the mechanism of the eye, with diagrams, is given by Dr. Casey A. Wood. In "Moral Educability" the possibility of educating the moral faculties is discussed by Edward J. Jackson. The latest important discovery in zoology, that of the Australian Marsupial Mole, is described, with illustrations, by Dr. E. Trouessart. This animal furnishes a connecting link between the ornithomylachus and pouched animals like the opossum and kangaroo. There is a very spirited Autobiographical Sketch of Justus von Liebig, which contains valuable observations on methods of teaching science. An account of "The Cotton Industry in Brazil" and its prospects is given by John C. Branner. There is an able and popular discourse on the natural history of babies by Dr. Louis Robinson, under the title, "Darwinism in the Nursery." This author has found in infants from an hour to a fortnight old a remarkable power of sustaining their own weight by the grasp of the hands. In the Editor's Table ethical teaching in schools is discussed, and the other departments present a pleasing variety.

New York: D. Appleton & Company. Fifty cents a number, \$5 a year.

The second number of the new national magazine, *The Dominion Illustrated Monthly*, has reached us, and we are glad to note that its contents are fully up to the mark of the February number, and in some respects show a decided improvement. Professor Charles G. D. Roberts continues his fascinating story of Acadia, "The Raid from Beauséjour," a tale which grows steadily in interest. "From Canada to St. Helena," is a very amusing paper, describing the travels of Mr. McCook, a Montreal journalist, in search of health, first to England, then to Wales, finally bringing up at the historic island of St. Helena. A poem by George Martin, the author of "Marguerite," follows, entitled, "To My Canary Bird." "Deacon Snider and the Circus" is a humorous story by one of our most powerful writers, William Wilfrid Campbell, of Ottawa, and shows that in prose Mr. Campbell is no less proficient than in verse. Another story, brilliantly told, is "When Bill Came Down," a dramatic sketch of British Columbia life. Dr. Wolfred Nelson, who accompanied the Hon. Adam Brown, Canadian Commissioner to Jamaica, gives an interesting account of his trip in "Jamaica Vistas," illustrated from photos. To historical subjects attention is given in Mr. J. M. LeMoine's "The St. Lawrence," in which many very interesting incidents are told of early life on the shores of our great river. A new feature appears this month in "Scraps and Snaps," by F. Blake Crofton, of Halifax, comprising a clever series of short humorous items. Portraits of the new Quebec Cabinet are given with a brief but comprehensive sketch of the life of each of the ministers. Sportsmen will greatly enjoy Mr. Hedley's paper on "Curling in Canada," the first instalment of which appears in this issue. The number closes with a pleasant story for young people by Samuel M. Baylis, called "How Jack Won His Snowshoes," a little sketch that will come home to many a Canadian school-boy. The publishers this month have been unusually generous with supplements, two good-sized pictures having been given; one is a handsome colored print, "Indulgence," from Paton Commere's painting, the other a reproduction of Sir George Harvey's great curling picture—probably the best of all engravings of the subject. The magazine deserves the support of all Canadians, and is the best literary value for \$1.50 a year we have ever seen. It is published by the Sabiston Litho. and Publishing Company, Montreal and Toronto.

The March number of the *Ladies' Home Journal* preserves most admirably the excellence which this popular magazine has accustomed its 700,000 readers to expect; the place of honor is given to the interesting and beautifully illustrated article by Ada Chester Bond, entitled "A Royal Recluse," which deals with the life of seclusion led by the ex-Empress Eugenie, at Farnborough, England. Mrs. Henry Ward Beecher continues her interesting reminiscences of her famous husband, and Miss Winnie Davis, daughter of Jefferson Davis, contributes her concluding paper on "The American Girl who Studies Abroad." Miss Davis writes entertainingly on a subject of which she has had practical and personal knowledge, and makes a strong plea for American training for American girls. Mrs. Frank Leslie and Henri Junius Brown answer with decided negatives the questioned accusations, "Are Our Girls Too Independent?" and "Are Women Inconstant?" Frederick Dolman gives an interesting sketch, illustrated with portrait, of Mrs. Charles H. Spurgeon, the widow of the famous London preacher, and Frances E. Smith an equally delightful one of Mrs. Gabriel Greeley Clendenin. The first part of a serial, "A Brief Prelude," by Margaret Butler Snow, capably illustrated by A. B. Wenzell, provides good fiction. Samuel Abbott and Harry Romaine contribute short poems, while the cover bears a poem to "March," by Lila Wheeler Wilcox. Rev. Dr. Talmage, Mrs. Ljman Abbott, Mrs. Margaret Bottomo and Mrs. Scovil are found in their respective departments. Robert J. Burdette discourses pleasantly "From a New Inkstand;" Ruth Ashmore continues her "Side Talks with Girls," and Foster Coates gives the boys much good information concerning trade schools, trade organizations and "Tradesmen Who Have Become Famous." The artistic is represented in the pages edited by Maude Haywood and Mary F. Knapp, the former of whom gives a special illustrated paper on "Artistic Ribbon Embroidery," as taught at the New York Society of Decorative Art." Mrs. Mallon writes of "Fashionable Visiting Toilettes," and Miss Hooper is as usual helpful to the home dress-maker. The juvenile subscribers are remembered in the full page of Mr. Palmer Cox's "Brownies," and the amateur gardener in Mr. Rexford's "All About Flowers." Altogether, the March number is of unusual excellence, and worth many times its modest price of ten cents. Published at one dollar per year by the Curtis Publishing Company, of Philadelphia.

Captains of Industry.

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

MR. W. W. BATEMAN is about starting a candy factory at Winnipeg, Man.

MR. JAMES S. PEREE is establishing a factory at Victoria, B.C., for the manufacture of vault lights and patent stone.

THE Karn Organ Company, Woodstock, Ont., made a shipment of five carloads of their organs to Europe a few days ago.

THE Standard Drain Pipe Company, St. Johns, Que., are putting in additional machinery and otherwise increasing their capacity.

THE Northumberland Paper & Egg Case Company, Cambellford, Ont., have just completed a new factory building at a cost of \$25,000.

THE works of the Hamilton Powder Company, at Northfield, B.C., will be enlarged to meet the requirements of their increasing business.

THE Farnham Beet Sugar Company, Farnham, Que., are enlarging their works in anticipation of a large increase in business the coming season.

THE town of St. Hyacinthe, Que., is offering a \$15,000 bonus to the Eastern Township Corset Company, to remove their works there from Sherbrooke, Que.

THE British Columbia Iron Works Company, Victoria, B.C., are making a fifty-foot addition to their moulding department, and a 60x50 foot addition to their machine shop.

MESSRS. J. REIMERS & Co., have begun the manufacture of pianos at 76-78 Esplanade Street West, Toronto. The concern control certain valuable patents in the construction of pianos.

THE factory of the Toronto Lead and Color Works is being considerably enlarged, it being the intention of the proprietors to enter upon the manufacture of coach and car colors in Japan.

THE Berlin Piano Company, Berlin, Ont., during the first year of their operations just ended, manufactured eighty pianos and 400 organs. They give employment to about eighty hands.

At the Government Printing Bureau, at Ottawa, the Senato Hansard reports are being set on the Merganthaler linotype machines, a number of which have recently been introduced there.

MESSRS. Porter, Reekin, Hunter and Irwin, of Warton, Ont., have formed a company and will manufacture terra-cotta goods, brick, etc., they having a large deposit of clay suitable for that purpose near that place.

THE Londonderry Iron Company, whose head offices are at Montreal, but whose works are at Londonderry, N.S., are manufacturers of pig iron, puddled bars, bar iron, nail plate, water pipe, etc. This is one of the most important iron industries in Canada.

JOHN ZWICKER, of Mahono Bay, N.S., has been engaged and is under contract to construct three whaleback barges, with a carrying capacity of about 400 tons coal each. This is something new in the line of building in Nova Scotia. Mr. Zwicker has now on the stocks his 127th vessel.

THE Pender Wire Nail Works, at St. John, N.B., have been newly fitted with machinery for preparing the wire to make into nails. There is a wire bench, a muller, a baker, and a hydraulic crane: the whole most modern and complete. This is said to be the first factory in Eastern Canada to be so fitted.

THE factory of the Globe File Manufacturing Company, Port Hope, Ont., of which Mr. F. Outram is manager, is 150 x 50 feet, with 50 x 30 feet annex, the machinery of which is driven by water power. The capacity of the works is about 600 dozen files and rasps per day, employment being given to about sixty hands.

THE Gutta Percha and Rubber Manufacturing Company, Toronto, have recently sold to the fire department of Victoria, B.C., a combined chemical fire engine and hose wagon. It carries 200 feet of ordinary two and a half inch hose, which in case of fire can be attached to the hydrant should the blaze be too great for the chemical apparatus.

THE Torbrook iron mines are being vigorously worked. The new railway from Wilmot to the mines affords splendid facilities for shipments, and an immense quantity of the crude ore is shipped over the Windsor and Annapolis Railway to the smelt works at Londonderry. About eighty men are employed at the mines now. —*Halifax Critic*

THE Polson Iron Works Company, Toronto, but whose ship-building yards are at Owen Sound, Ont., have been awarded the contract by the Dominion Government for the construction of a steel steamer for the fishery service in the upper lakes which will be an almost counterpart of the cruiser *Constance* launched from the Owen Sound works a few months ago.

THE Richelieu Woollen Mills at Chambly, Que., have recently made important extensions. Ten new Crompton looms have been put in, increasing the capacity now to fifty-nine broad looms. A Heathcote drying and tentering machine, a Boyd twister, a new American press and other machinery has been added, and, in addition to this, the Edison system of electric light has been introduced.

THE Otterville Manufacturing Company, Otterville, Ont., of which Mr. F. G. Bullock is manager, are manufacturers of a line of carpet sweepers which are claimed to be far superior to any imported from the United States. This is a valuable young industry growing up under the N.P. and has capacity to produce a large portion of all such goods demanded by the country. They also manufacture camp beds and chairs, step ladders, clothes bars, window screens, corn planters, corn shellers, boys' sleighs, snow shovels, etc.

THE Dominion Suspender Company, Niagara Falls, Ont., of which Mr. W. L. Doran is manager, are erecting a 50 x 50 feet addition to their present large factory. Their capacity now is 36,000 pairs of suspenders per week, and although their works are being run to their full capacity they cannot keep up with orders, hence the necessity for the enlargement. Much of the dies, etc., of the stamping machinery employed in this factory were manufactured specially for it by Messrs. Conner and Anderson, the well known die makers of Toronto.

THE B. Greening Wire Company, Hamilton, Ont., inform us that that they are now manufacturing dog leashes in six sizes; halter chains in six sizes; coil chains in seven sizes; post chains; tie weights and chains; cow chains in four sizes and four styles; tie-out or tethering chains; heel chains, trace chains, tug chains, etc. The number 50 tempered steel wire trace chain made by this company has a breaking strain of 2,400 pounds. The cow ties are made of Brown's patent steel chains, all fittings being of steel throughout, and are remarkable for their strength, lightness and handsome appearance.

BUSINESS is rushing with the Robb Engineering Company and full time is being worked in order to fulfil orders. The company have lately supplied a powerful engine and boiler for the Intercolonial Coal Company, Sydney, and will probably place one in the Canada Electric Company's works here. With these engines are used the English Purvis ribbed seamless furnace, allowed by the British Board of Trade to be used on ocean steam sloops. These engines are allowed by the Board a working pressure of 147 pounds to the square inch and are giving universal satisfaction. —*Amherst, N.S., Press.*

A DESPATCH from Moncton, N.B., reports a discovery of oxide of iron paint in Northumberland County, about twenty miles from the town of New castle, and an assay shows 96 per cent. of pure oxide of iron. Mr. Brunell, of the Dominion Geological Survey, who examined these deposits, says there are 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."

MR. L. A. MORRISON, Toronto, is meeting with very gratifying success with his newly invented automatic veneer and hoop-cutting machine. This machine is adapted for taking on an eight foot by four feet in diameter and slicing it into a continuous veneer of any desired thickness from one hundredth to half an inch thick. A feature of the machine is that it will automatically cut the veneer to any width from half an inch to four feet. It will not only accomplish a great saving of material, but likewise of labor, from the fact that all the material used will be provided ready cut into the proper width of cheese boxes, kegs, barrel hoops, staves, heading, baskets, boxes, and other articles that come within the scope of its operations.

The contracts for militia store supplies and necessaries for 1892 have been awarded by the Militia Department at Ottawa, as follows:—Grey blankets, E. Cook, Gananoque; slings, E. L. Kraft & Co., Hamilton; iron bedsteads, J. Wright & Co., London; leather mitts, A. R. Clarke & Co., Toronto; brushes and corn brooms, Kavanagh Bros., Ottawa; dry goods, Bryson, Graham & Co., J. M. Garland and J. A. Seybold & Co., Ottawa. One condition of the contract is that all articles to be supplied, as well as the material of which they are made, must be of Canadian manufacture. Marquees, Ottawa Manufacturing Company; circular tents, laversacks, accoutrements, palliasses, S. & H. Borbridge, Ottawa.

SINCE Canadian ready made clothing has found a steady market of late in the West Indies, the news that Canadian tweeds may be shipped to England need not shock us. Mr. Robt S. Fraser, of Montreal, has, as a matter of fact, received a good sized trial order for Canadian tweeds from a Yorkshire house, and if the goods serve their special purpose, this order will be followed by others. For some years odd shipments of Canadian Halifax tweed have been made to London to be used for English gentlemen's sporting suits, and the very name of Halifax tweed is of Canadian and not English origin, these goods having been first introduced into England by the officers stationed at the Nova Scotia capital.—*Journal of Fabrics.*

The Forrest Silver Bronze Packing Company, New York, have sent us a copy of a letter received by them from the chief engineer of the steamer *Momouth*, belonging to the Central Railroad Company of New Jersey, having reference to the silver bronze packing manufactured by them and which, according to this letter is being used with the greatest satisfaction on the steamer. In a recent issue we described this packing quite fully, illustrating it with an electro. The article is exceedingly popular with steam users, and the manufacturers will take pleasure in sending full information concerning it. This packing is patented in the United States, Great Britain and Canada, and applications for patents are pending in about all the other important countries of the world.

The Dominion Bridge Company, whose head offices are at Montreal, but whose extensive works are at Lachine Locks, near that city, inform us that there are now 74,118 feet, or fourteen miles of iron and steel bridges now in use in Canada which were manufactured by them. They build railway and highway bridges of all designs in both iron and steel; plate and lattice girders; pin and link or riveted truss work; trestles, swing bridges, turntables, roofs, telephone poles, house girders, truss rods, and all kinds of structural work. Regarding the reliability of the materials used by them in the construction of this class of work, they say that they keep a regular salaried inspector in Europe who guarantees the inspection and tests of all the materials which they buy there.

MESSRS. McCASKILL, DOUGALL & Co., manufacturers of varnishes, japans, etc., Montreal, are successors to the well known house of Messrs. D. A. McCaskill & Co. The change in name results from the fact that Mr. James S. N. Dougall has become a member of the firm. Mr. Dougall, was for many years connected with that other well known Montreal house, Messrs. McArthur, Cornelle & Co. Regarding the goods manufactured by Messrs. McCaskill, Dougall & Co., they include every variety of varnish and japan required by the trade, and the brand of the manufacturers upon the packages is a guarantee of their purity and excellence. They are put up in quarter, half, one, two, three and five gallon cans. They were awarded a diploma and gold medal at Kingston, Jamaica, against the world in 1890.

PROBABLY no mineral has so many non-technical names as steatite, which is also known by the appellations of soapstone, potstone, and hardstone, and which is itself merely a compact granular variety of talc—a soft mineral, soapy to the touch, of a greenish, whitish or grayish color, usually occurring in foliated masses, and a hydrous silicate of magnesia. Steatite can be formed into almost anything: beautiful fireplaces are made of it, and stationary wash tubs and sinks are important products. Not an ounce need be wasted; the dust is used to adulterate rubber goods, giving so-called gum rubbers their dull finish; and in paper, too, it is used to give weight, while all waste can be ground up into a flour, which can be made into a fireproof paint for coating the interior of mills or the roofs of buildings. This mineral is found in large quantities in the Province of Quebec and other parts of the Dominion.

The Royal Electric Company, of Montreal, are putting in a new set of belting. One belt is fifty-three inches wide and 125 feet long, and another is fifty inches wide and 150 feet long. These large belts are supplied by the well-known belting firm of Rolan & Sadler, Montreal and Toronto, whose products in this line are now

celebrated throughout the Dominion. This firm manufactures a belt dressing which is highly recommended by belt users. The majority of belt oils in the market cause a belt to become sticky and spongy by penetrating and destroying the fibre of the leather, while most of the belt grease for sale is of a sticky resinous nature that gums upon the surface of the belt, and is very injurious. This dressing is free from all these objections, for while making the belt pliable and smooth on the surface so as to come into close contact with the pulley, it will not saturate or gum the leather, and as a very small quantity is required to produce good results, it will be found cheaper than any other preparation.

The British Columbia Iron Works have now under construction two massive pulley wheels for the New Vancouver Coal Company's mines at Wellington. These are fifteen feet in diameter. The rim and hubs are of cast iron with wrought iron spokes, the wheel being cast in two sections. The proper balancing and adjustment of these wheels requires great exactness. They will not yet be completed for some days, and the work they have just completed are new jaws for the rock crusher on the North Arm. The set which came with the machine wore out last September, and a new set were ordered from England. These also have begun to show signs of wear, and those first received were taken to the iron works as a pattern. To meet the amount of business now done by the works it has been decided to increase the buildings and plant. The foundations are now being prepared for an addition to the moulding shop fifty feet square to the eastward of the present building. An addition 60x50 feet, two stories in height, will also be added to the machine shop, making the whole establishment of a considerable size. This foundry has been busy ever since it was established, and never more so than at present.

The Robb Engineering Co. are setting up one of their new automatic engines, "Robb-Armstrong" pattern, for the Canada Electric Co. here. This is the fifth of these engines placed in electric lighting stations during the past three or four months. The first went to the Chambers Electric Co., Truro, and has been running night and day since the first of November. The second and third, which went to the Sydney and Sackville Electric Stations, have been running regularly every evening, without showing the slightest defect or wear, and are considered, by the engineers in charge, marvels of perfection in every way. The fourth was started at Digby a few weeks ago, and Mr. Smith, proprietor of the electric light plant there, writes that he is delighted with the engine. Each one of these engines is driven from a "Monarch Economic" boiler, thus completing a steam power plant which gives the highest rate of economy in fuel that can be obtained from non-compound engines. The Electric Company here now have in use three engines and three Monarch boilers, giving them a total of over two hundred horse power, which, with new dynamos now in course of construction, will greatly increase their lighting capacity.—*Amherst, N.S., Press.*

THE Toronto School of Practical Science was opened a few evenings ago with much eclat, and it bids fair to become one of the most useful public institutions of our city. It is equipped with every desirable appliance. The laboratory, as it stands, is the most complete of any in America, and includes a number of the finest testing machines ever made. The power is supplied by a sixty-horse-power steam engine, a ten-horse power Otto gas engine, and a water wheel of about four horse-power. These are so arranged that either the whole or part of the plant can be driven by each in turn. There are also various devices for recording the fluctuations in speed and the increase and decrease of power. The most interesting machine is the Emery hydraulic scale, made by William Sellers & Co., of Philadelphia, for measuring the tensile strength of iron and steel bars. It is so exact that it will measure any resistance from one-half of a pound to 100,600 pounds. In a test recently a piece of three-quarter inch round iron was inserted, and in two minutes it pulled it apart, at the same time measuring its strength at 23,900 pounds. Another testing apparatus is the Olsen torsion machine. A piece of one-inch round iron was twisted in two, showing a maximum torsion of 10,090 inch pounds. What is said to be the largest screw-power machine for testing beams in America is in position in the basement. It was manufactured by Richle & Co., at Philadelphia, and has a measuring capacity of 100 tons. A white pine beam 4x6 inches square and six feet long, was placed on its end in it, and a pressure of 66,200 pounds was applied before it broke; the same sized beam, placed in a horizontal position, snapped like a pipe-stem under a weight of 6,400 pounds, while a three-inch cube of sandstone stood a pressure of 150,000 pounds before it crumbled. Besides these machines there is a complete electrical plant, consisting of both arc and incandescent dynamos, motors, and all kinds

PRESIDENT,
W. K. McNAUGHT.

SECRETARY,
J. J. CASSIDY.

TREASURER,
GEORGE BOOTH.

The Canadian Manufacturers' Association.

THE OBJECTS OF THIS ASSOCIATION ARE:

- To secure by all legitimate means the aid of both Public Opinion and Governmental Policy in favor of the development of home industry and the promotion of Canadian manufacturing enterprises.
 - To enable those in all branches of manufacturing enterprises to act in concert as a united body whenever action in behalf of any particular industry, or of the whole body, is necessary.
 - To maintain Canada for Canadians.
- Any person directly interested in any Canadian manufacturing industry is eligible for membership.

CORRESPONDENCE WITH MANUFACTURERS REQUESTED.

Office of the Association: Room 66 Canada Life Building,
KING ST. WEST, TORONTO

J. J. CASSIDY, Secretary.

TELEPHONE 1274.

of electrical mechanical contrivances. Another valuable device is a machine showing the valve motion of an engine, and so arranged that it will determine the action of steam in the cylinder at any part of the stroke or at any time.

A CANADIAN SEWER PIPE FACTORY.

The Toronto and Hamilton Sewer Pipe Company have issued a circular calling attention of intending purchasers of their lines of goods to a number of testimonials regarding them. They claim, with great propriety, that there is no make of pipe on the market stronger or more durable than theirs—that their pipe has been used to a greater extent in Canada than any other, and with the utmost satisfaction to all concerned. Regarding the testimonials spoken of, there is one from the Toronto City Engineer's office, as follows:—"In the past two years we have used a large quantity of pipe manufactured by your Company, laying several miles of sewers, in diameter from six inches and upwards. During that period the pipes have been of good quality, and quite up to the standard required. In my experience, acting in the capacity of Assistant Engineer in charge of sewers since 1883, I must say that I have failed to find, on opening the sewers in which Hamilton pipes have been used, any cracked pipes, and we have some sewers in the city laid with Hamilton pipe since 1882."

A report from the city officials of St. Catharines, Ont., says:—"St. Catharines has used about two miles of eighteen and about six miles of other sizes of pipe of your make, which have given entire satisfaction, and will want five or six miles more this spring."

In reply to enquiries made by the Mayor of Owen Sound, Mr. Wm. Haskins, of the Hamilton Water Works office, says:—"I have the honor of informing you that the vitrified sewage pipes manufactured in this city by the Hamilton and Toronto Sewer Pipe Company are the only ones that have been used by our city corporation for over twenty years, during which time many miles have been laid. The pipes now manufactured by that Company are not second to any that I know of, a vast improvement having been made since the factory was first established, over thirty years since. I have no hesitation in recommending these pipes for the sewerage of your town, feeling that they will give you entire satisfaction, as they do here"

MAMMOTH TIMBERS.

A SHIPMENT of timber the like of which has never before crossed the continent, is now aboard seven cars in the yard of the Hastings saw mill. Two of the cars contain only three pieces of timber, both being required for its length. These bear in large letters on the sides the insignificant motto, "British Columbia Toothpicks!" Two other cars have smaller pieces, yet of the respectable size of 21x21 inches, and upwards of 60 feet in length, but on these two cars is the largest piece of the shipment, it being 36 inches square and 68 feet in length, without doubt the largest piece ever shipped out of British Columbia. The three remaining cars are required for five pieces each 80 feet in length. It was with considerable difficulty that these pieces were loaded and arranged so as to take the curves. Stout uprights of wood project from the platform of the

flat cars, and these are held together at the top by heavy rods of iron, reaching from one to the other across the load. The timbers rest on sleepers of scantling at the rear of the foremost car, and front of the second, and these are greased so that at the curves the timbers may move sideways slightly, and then come back to their place when the train straightens again. Three cars are required for the longest pieces, but very little weight of these rests on the rear car, it being required for coupling, as the ends of the timber would extend beyond the length of the two cars. On either side of these cars in large letters on white cotton is the legend, "From the British Columbia Mills, Timber and Trading Company, Hastings Saw Mill Branch, Vancouver, B.C." Yesterday the shipment, with an engine attached, was photographed. This timber is consigned to the Montreal Harbor Commissioners, to be used in the construction of a dredge. The large pieces form the movable corner pieces, which hold the dredge in position while at work, and the pieces 80 feet long are for the crane on the dredge. The trees from which these gigantic pieces of timber were sawn, came from the B. C. Mills, Timber and Trading Company's claim near Mud Bay, and were taken out by way of Port Kells and down the Fraser River. The following is the number of pieces and their dimensions:

	FEET.
3 pieces, 36x36—60 feet	19,440
1 piece, 36x36—68 feet	
2 pieces, 21x21—66 feet	
1 piece, 24x24—60 feet	
3 pieces, 21x21—62 feet	21,911
3 pieces, 21x21—60 feet	
3 pieces, 21x21—64 feet	
5 pieces, 14x16—80 feet	21,138
Grand total	62,189

Word has been received that the timber reached Montreal on February 6th, having been only ten days in transit from here.—Vancouver, B.C., *Commerce*.

ONE modern shoe-pegging machine will peg two pairs of women's shoes per minute, cutting its own pegs from strips of white birch at the same time.—*The Engineer*.

DUST does not explode, but a spark flew into the dust chamber of a planing mill in Chicago recently and an explosion followed which completely wrecked the building and severely injured two employees.—*American Miller*.

SCIENCE comes to the front in the manufacture of grindstones. The best now made are composed of a mixture of pulverized quartz, powdered flint, powdered emery and rubber. They outwear by many years any natural stone.

THE alterations in the conductivity of pure copper, aluminum and magnesia, and of commercial zinc and German silver, after a lengthened exposure to a high temperature, have recently been investigated by J. Bergman, says *The Engineer*. Disks 70 mm. in diameter were heated to 300° C. maintained at that temperature for one hour, and then allowed to cool slowly. The conductivity of copper was increased by something like 2.4 per cent. by this process; that of aluminum, magnesium and zinc being increased, respectively, 3 per cent., 6.8 per cent. and 2.4 per cent.



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 and all renewals and extensions thereof will be promptly noticed in this department, and a brief description thereof given. 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 from February 4 to 20, 1892, inclusive.

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.

- | | | |
|--|--|--------|
| 38,213 Spring mattress, George W. Murray, February 4th. | 38,251 Store service apparatus; Seldon A. Bailey, February 10th. | |
| 38,214 Bed bottom of springs, Ozello R. Hunt, February 4th. | 38,252 Whiffletree, Nicholson N. VanPelt, February 10th. | |
| 38,215 Portable siphons, Sylvanus F. & A. Bowser, February 4th. | 38,253 Hot air drum, Ezra T. Whiting, February 10th. | |
| 38,216 Holder for pencils and crayons, William F. Chincuson, February 4th. | 38,254 Binding of books, Joseph H. Workman, February 10th. | |
| 38,217 Wire fence, Isaac K. Hallinger, February 4th. | 38,255 Water motor wheel, Samuel Wado, February 10th. | 38,30 |
| 38,218 Steam and vacuum pump, Ernst Korting, February 4th. | 38,256 Sewing machine cover, Cornelius C. Jenkins, February 10th. | 38,30 |
| 38,219 Railway chair, T. Davies, February 4th. | 38,257 Laundry indicator, Charles W. Turner, February 10th. | 38,30 |
| 38,220 Table leaf support, Charles K. Olson, February 4th. | 38,258 Device for opening hot boiled eggs, Franklin N. Jowett, February 10th. | 38,30 |
| 38,221 Attachment for inkstands, Barclay M. Everson, February 5th. | 38,259 Bolt and rivet cutter, John Helwig, February 10th. | 38,30 |
| 38,222 Car coupler, David U. Gravelue, February 5th. | 38,260 Buck-saw, John Stepler, February 10th. | 38,30 |
| 38,224 Wardrobe, William T. Cottier, February 5th. | 38,261 Rotary engine, Arnold Kubach, February 10th. | 38,30 |
| 38,225 Vaginal syringe, John R. Trott, February 5th. | 38,262 Bed bottom and brace, Walter H. Lightfoot, February 11th. | 38,30 |
| 38,226 Reversing mechanism for ironing machine, John J. Daley, February 5th. | 38,263 Combined flounce and belt, Adolph Neuville, February 11th. | 38,31 |
| 38,227 Valve gear for fluid rams and pistons, John Parkin, February 5th. | 38,264 Inhaler, Roland E. Woodward, February 11th. | 38,31 |
| 38,228 Safety rolling step-ladder, Charles S. & D. Sincemes, February 5th. | 38,265 Stove-pipe thimble, Michael J. Fahey, February 11th. | 38,31 |
| 38,229 Organ stop action, Newell M. Boynton, February 6th. | 38,266 Car coupler, Samuel G. Trine, February 12th. | 38,31 |
| 38,230 Vehicle, A. Houle, February 6th. | 38,267 Landing net, Charles S. Hebard, February 12th. | 38,31 |
| 38,231 Washing machine, Alonzo A. Casler, February 6th. | 38,268 Automatic signal device for railroads, Byron and Judson Shoecraft, February 12th. | 38,31 |
| 38,233 Nut-lock, John W. B. Cook and John H. Morgan, February 6th. | 38,269 Valve gear for engine, The Woolf Valve Gear Company, February 12th. | 38,31 |
| 38,235 Knife for binder and mower, Thomas K. McQueen, February 6th. | 38,270 Cove, Charles F. Baker and John H. Randall, February 12th. | 38,31 |
| 38,237 Saw dressing machine, Milo Covell, February 6th. | 38,272 Shoe-tie fastener, John B. Craig, February 12th. | 38,31 |
| 38,239 Car coupling, Michael Leduc and John Bourke, February 7th. | 38,273 Animal trap, Chauncey B. Trumble, February 12th. | |
| 38,240 Thill coupling, James O. Ferguson and Jacob A. Risch, February 7th. | 38,274 Bush hammer sharpener, Louis Mayor, February 12th. | 38,22 |
| 38,241 Anti-friction bearings for journals and axles, Henry B. Williams and Lemuel A. Jeffroy, February 7th. | 38,275 Cushioned car wheel, Benjamin F. Haugh, February 12th. | 38,23 |
| 38,242 Clothes drier, John Cross and Thomas R. Reid, February 7th. | 38,276 Reducing of bituminous rock, William Meakin, February 13th. | 38,23 |
| 38,243 Device for tapping mains, Mark P. Madden, February 7th. | 38,277 Dormant warehouse scale, John Milne, February 13th. | |
| 38,244 Car coupler, George P. Jones and H. Seeley Bell, February 7th. | 38,278 Connecting railway cars, Thomas Baril, February 13th. | |
| 38,245 Lock, Yale & Towne Manufacturing Company, February 7th. | 38,279 Swimming equipment, Patrick Curran, February 13th. | 38,23 |
| 38,246 Kitchen utensil, Horace P. Wiley et al, February 7th. | 38,280 Car replacer, John M. Donnelly, February 13th. | 38,271 |
| 38,247 Stove-pipe thimble, S. Cheney & Son, February 7th. | 38,281 Universal joint coupling, Thomas W. Moran, February 13th. | 38,28 |
| 38,248 Game, George F. Devine, February 8th. | 38,282 Road cart, Robert D. Scott, February 13th. | 38,28 |
| 38,249 Sash lock, Charles Alteman, February 9th. | 38,283 Valve for supplying hot water radiators and for other purposes, William M. Mackay, February 15th. | 38,28 |
| 38,250 Extension table, Frederick P. Cobham, February 10th. | 38,284 Tire for bicycle, Thomas Fane and Charles F. Lavender, February 15th. | 38,298 |
| | 38,286 Suspensory bandage, Josephus C. Chambers, February 15th. | |
| | 38,287 Car coupler, Charles A. Kennedy, February 15th. | |
| | 38,289 Flour bolt, Benjamin Barter, February 15th. | 38,299 |
| | 38,290 Automatic gas regulator, Myron J. Amick, February 15th. | |
| | 38,291 Boot cleaning apparatus, Austin Berry, February 15th. | 38,308 |
| | 38,295 Memorandum book, Marcus A. Miller and George E. Green, February 15th. | |
| | 38,296 Stove pipe, Cleophas Le Bel, February 15th. | |
| | 38,297 String for musical instrument, Lawrence A. Subers and Samuel B. Coughlin, February 16th. | 38,292 |
| | 38,300 Vehicle pole tip, William J. Austin, February 17th. | 38,293 |
| | 38,301 Car wheel, Wolcott J. Parmelee, February 17th. | 38,294 |
| | 38,302 Lamp extinguishers, Henry J. Clarry, February 17th. | |

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PATENTS

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CABLE ADDRESS "INVENTION, TORONTO."

- 38,303 Button worker, Hans J. Anderson and Frank B. Fargo, February 19th.
- 38,304 Manufacture of boots and shoes, Joseph Lauzon, February 19th.
- 38,305 Hydraulic wind mill regulator, Andrew Church and Charles A. Church, February 19th.
- 38,306 Aerial tramway, Alfred H. De Camp, February 19th.
- 38,307 Lubricant, Robert Hutchison, February 19th.
- 38,308 Press shoe for grain drill, John M. Szarkowski, February 19th.
- 38,310 Wick trimmer, Herbert H. Pearce, February 19th.
- 38,311 Horse shoe, William H. Moore, February 20th.
- 38,312 Folding rocking chair, John Thornbeck, February 20th.
- 38,313 Side dresser for swaged saw teeth, February 20th.
- 38,314 Faucet, Levi L. Hall, February 20th.
- 38,315 Combined boiler and toaster, James A. Varley, February 20th.
- 38,316 Cutting of soap and cheese, John J. Thomson, February 20th.
- 38,317 Cabinet bakery, Jessie McL. Brophy, February 20th.
- 38,318 Stove pipe, John W. Littlewood, February 20th.

SCIENTIFIC PROCESSES.

- 38,223 Oxy calcium lights, George R. Prowse, February 5th.
- 38,232 Laying artificial stone, Otto E. C. Guelich, February 6th.
- 38,234 Manufacture of cod liver oil, P. Moeller, February 6th.
- 38,236 Means for dry separation of materials of different specific weight and of different size, Hermann Papo and Wilhelm Henneberg, February 6th.
- 38,238 Drying and vulcanizing wood, Charles Howard, February 6th.
- 38,271 Embossing paper, card-board, and like impressible material, Kitchell Embossing Company, February 12th.
- 38,285 Manufacture of tile and other porcelain, earthenware and similar goods, February 15th.
- 38,288 Process for seasoning hub blocks, Standard Hub Company, February 15th.
- 38,298 Process of burning clay for paving material, for ballast and for other uses, The Western Burnt Clay, Ballast and Paving Company, February 16th.
- 38,299 Method of decorating glass, George W. Martin, February 17th.
- 38,308 Method of and means for displaying advertisements, Henry Heath, February 19th.

WELDING.

- 38,292 Electric soldering and cementing, The Thomson International Electric Welding Company, February 15th.
- 38,293 Method of working metal by electricity, Thomson International Electric Company, February 15th.
- 38,294 Induction discharge protector for welding apparatus, Thomson International Electric Welding Company, February 15th.

EDUCATION AND INVENTION.

MARK TWAIN, in his new novel, "The American Claimant," introduced his readers to a mechanics' club debate, the manifest object being to satirize the socialistic tendencies of the workmen of the present day. One of the speakers, a self-educated printer, delivers a long harangue to prove that we "over-rate the college culture share in the production of the mighty progress" of the nation. "In looking over a list of inventors," he continues, "I find that they were not college-bred men. Of course there are exceptions, but these exceptions are few." Now it has long been a custom, and a very pleasant one no doubt, that as soon as a man has risen to great prominence, his friends have sought to add lustre to his glory by making his origin more humble than it really was and representing his education as having been practically neglected. In the life of a presidential candidate, gotten up for campaign purposes, this may be all very well, for our partisanship makes us very credulous, but in the work of a standard author it is entirely different. Now the writer is well aware that Mark Twain is such a funny man that it is often difficult to know when to take him seriously. But in the present instance it is manifest that Mr. Clumens has allowed his reason to be carried away by the popular fallacy that the great inventors were men of little or no education, who started out in life with vague ideas of the alphabet and multiplication table. To say that the inventors, with very few exceptions, were not college-bred is to make a misstatement that could have been rectified at the expense of a very little research. To take only the more noted names in the field of American invention we find that Morse was not only educated at Yale, but that he achieved success as a portrait painter long before he ever dreamed of having his name connected with the electric telegraph. While very poor in early life, Whitney was quick to see the advantages of education, and endured many hardships for the sake of working his way through Yale College. Corliss received a good academic education, and knew enough to construct a machine for sewing heavy leather before he had ever seen the inside of a machine shop. Fulton was a man of education and was a landscape painter by profession before he became interested in mechanics. The elder Roebing graduated at the Berlin Polytechnic School and his son was educated at the Rensselaer Institute. Gatling was not only educated, but he studied medicine and took a degree. Moncure Robinson, one of our pioneer railroad constructors and the builder of the Philadelphia and Reading road, whose death was recorded last November, was designed for the law, and was educated in the Gerardine Academy and William and Mary College. Dahlgren and Ericsson received a military education, the latter having the title of LL.D. Rodman, of gun and powder fame, was a graduate of West Point; and Thurston, to whom we are indebted for more than one invention, was educated at Brown University. The list could be greatly extended if we included the names of men noted for their discoveries in the sciences, who must of necessity have had the highest education. It is poor policy, at best, for self-educated men to attempt to undervalue the advantages of a liberal education. No inventor need be afraid that he will handicap himself in his work by going through college. To state that Howe and Edison received very little education in early life proves nothing in an argument on this subject. While they deserve all the more credit on that account, who can deny that their services to the world might not have been even greater than they are if they had started out in life with the advantages of a college education.--*Mechanical News.*

PATENT REFORM.

ONE of the latest arguments advanced against the possibility of the Government assuming legal protection of patentees, is that infringement might be charged up against many of the presumably greatest inventors of the age. It is claimed that the drive-well, over the infringement of the patent of which there has been so much litigation, was invented more than sixty years ago. Also that almost the same sort of a weapon as the revolver of to-day is described in an English patent of 100 years ago. Again, the "nickel in the slot" device was known all about by the Egyptians, many centuries ago. The telephone, on a short distance scale, and many other important inventions, are claimed to have sprung from ideas advanced by our ancestors, and the ancients generally. This is not a wonderful argument. Plagiarism is, by literary men, considered dishonest, and yet there is not a writer, or an orator, in any of the professions, to-day, who does not, wittingly or unwittingly, plagiarize. It was from the knowledge of this that sprung the maxim of the wise man to the effect that "there is nothing new under the sun." There are to-day, on the shelves of the second-hand book stores in the largest cities of this country, moth-eaten volumes that have never been seen by men who have actually reproduced ideas and sentences, in many instances, almost word for word, the same as those contained in the long forgotten volumes. The proposition is not wonderful for the reason that the ancients had vague ideas as to these improvements, but were not sufficiently industrious or intellectually bright to utilize them in a common-sense way. The mind may be termed a panorama of ideas, which are of no earthly use unless they are put to a practical purpose. The people do not ask that the United States Government shall protect David's patent on the sling from which he cast the stone that slew the giant Goliath, but that the inventor whose genius and labor and capital is stolen within a day, or a month, or a year, by some unprincipled infringer, should be protected by the Government in the possession of the fruit he has so richly earned. The fact of the matter is that the patent system, as in many other things in this world, there is too much law and not enough justice. The inventor is a public benefactor. He earns the reward he gains and the people, represented by the Government, insist that he shall be protected in the enjoyment thereof.—Stores and Hardware Reporter.

SUICIDES OF PATENTS.

THIS is an age of invention. Patents cover acres of space, both in storage and government paper. Every day sees the incubation of a new idea. All must be necessarily original, to secure the endorsement of the authorized experts; but the grand procession begins to taper as it leaves the official door, and the ingenuity rewarded with a patent, realizes that without practical use, that beyond a pipe light, there is not so much use in the paper as there is in a toothpick. There may be merit in the invention; it may stop a gap in mechanical processes; it may be the nest egg of a fortune; but it gets into a box and keeps there, and the busy brain of which it was born gets into its night cap with a dream that never buys a loaf of bread or adds a nickel to the wealth of the inventor or the world. There is a reason for this. It has its causes. Some one muzzles the oyster. In many cases the culprit is the inventor. His ingenuity stopped at his patent. Perhaps he thinks it a golden egg and demands an exorbitant price for the unborn chicken, and is neither moderate or reasonable in his financial expectations. He finds his arithmetic and that of the market at variance, and not being able to arrange the difference he loses his opportunity by haggling over a royalty as a fish woman does over the value of a herring. This is not wise, for though an inventor's ingenuity may be tenfold more than his finance, it is impossible to utilize the first without a proportionate share of the second. In such cases the sale of a patent is the only alternative of a fatal obscurity. It should be remembered that no invention is so perfect, or so exhaustive of possible improvements, as to secure a permanent

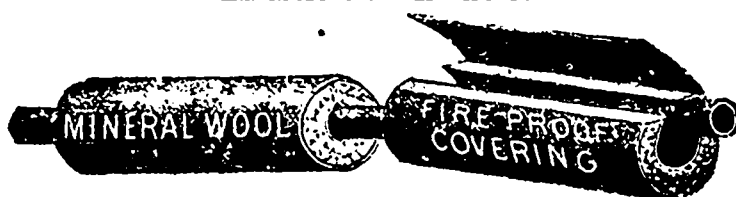
monopoly, or even a fair competing chance with other appliances that, though born a year later, are more available than elder competitors. There is no limit yet reached by human ingenuity in annexing the forces of nature to the industrial exploits of man, or subsidizing its laws to human service. It is the egotism of some inventors that makes even the brightest of intellects opaque to this fact, and consequently consign their masterpieces to the museum at Washington or the stove at home. How is it that common sense and genius seldom lodge under the same hat, and the simplest laws of barter, sale and value are misunderstood or ignored, forgetting that in these days a patent and an apple are on a par in the market, in which, if one is rusty and the other rotten, no sale can be effected. The missing virtue of some patentees is a proper valuation of time and apathy to the dangers of procrastination.

With some men the vice of precipitation and ambition is a hindrance. They start out on too large a scale and assume impossible allegations, with the usual result of breaking their backs with more than they can carry. It is a fact in business as in pedestrianism—that the man who walks carefully is less likely to fall in a hole than a man with swift legs and short sight. In the interests of the inventor it is advisable that if not able to produce he had better sell, and in no case to procrastinate when a reasonable offer is secured, or to over-reach himself in manufacture with the delusion that he can both eat the egg and hatch it. The patentees that have secured the best results have been those who have acted in the common sense practice we have advised.—Age of Steel.

If an inventor has made a meritorious discovery, he will find plenty of pretending capitalists, insurance agents, curbstome brokers, etc., who will offer to organize a million dollar syndicate and invariably ask the poor inventor for only one-third or one-half interest in the corporation for their pretended trouble, etc. If you signify your consent, says an exchange, they will incorporate under some lenient State law, hold a meeting, elect their officers. You, as a matter of form, transfer your right, title and interest to this newborn company, you are promised to receive a certain interest in stock only. Now this company stock (not yours) is floated on the public at a stated price, your slick insurance or curbstome broker gets his interest into cash or trades it to a pal and you hold the bag.

A new and valuable lumber-cutting machine was recently subjected to a most successful trial at Greenpoint, Long Island, in the presence of several of the most prominent lumbermen of New York. The experiment was highly successful, both in the superior character of the work turned out and in the speed and economy with which it was done. It was pronounced far ahead of any sawing device ever employed for such purpose. It will cut lumber of any thickness, from one thirty-second of an inch to two inches in thickness. It will take a log eight feet long and cut boards at the rate of forty a minute of any given thickness. There is not the slightest waste of material in the cutting. It is calculated that when saws are used one-fourth of the wood is wasted in sawdust and planing if inch boards are being cut. In sawing boards one-sixteenth of an inch in thickness the loss is 215 per cent of the material. The machine is forty-two feet long, fifteen feet wide and eight feet high. The object of the machine is to economize time, cost and raw material. The output of a single machine, when in good running order, is set down at from eighty to 100,000 superficial feet per day. It is claimed that this new invention will revolutionize the making of boards for cigar boxes, backs of pictures, butter boxes and the like. At the time of the test ash, cherry, birch and basswood logs were cut. The boards dropped from the blade as smooth as if rubbed with sandpaper. One of the witnesses of the trial, Mr. Albert Lewis, of the Wilkesbarre Lumber Co., one of the largest lumber concerns in Pennsylvania, said it was the most perfect thing he ever saw. "With our saw," he continued, "we cannot cut dry lumber at all, while this machine cuts any thing. Neither could our saws cut a board one-thirty-second of an inch in thickness, as this will. But the best thing it will accomplish will be the tremendous saving in the wood itself."

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An electro-chemical method of sharpening files has been published by an industrial association of Paris. It is the idea of M. Personne, and consists in cleaning the files from grease, then suspending them for twenty minutes from a metal plate in a mixture of 100 parts water, six parts nitric acid and three parts sulphuric acid. The plate is connected with several carbons in the same liquid. The corrosion of the metal takes place in the cavities only, the edges being sharpened exactly as by a file cutter. The process is said to be satisfactory and economical, and it may be applied to the sharpening of chisels and other tools.

There is a good opening for an inventive American mechanic to construct a signal gong or telegraph for communicating between the engine room and deck, also for transmitting steering and look out signals, alarm gongs, etc. It appears to us that an English firm maintains a close monopoly on these specialties just now, and the field is somewhat noticeable on account of no American instruments or system being on the market. This is not as it should be, nor do we believe but that more perfect, durable and efficient mechanism might be devised by an American who would turn his attention to this special feature of a steamer's outfit, and it is a foregone conclusion that a large patronage awaits the inventor thereof. Patent windlasses and steam capstans, the most perfect in the world, steam steering engines, also electric light installations and automatic fog whistles, have each been perfected by American skill, besides scores of other thoroughly efficient mechanical inventions; and why not a duplex gong or mechanical telegraph, with electric power if considered advisable, including all other necessary features which such an instrument is capable of? An American

patent or invention usually covers the field better than any foreign device, and we trust that we may soon hail an American gong for vessel use instead of meeting the imported articles so often as is now done. -Cleveland O., *Marine Record*.

The London, Eng., *Iron and Steel Trades Journal* mentions the organization of a company to acquire the patents and all improvements thereon for the United States and Canada of the process discovered by F. E. and S. F. Elmore for manufacturing metal articles, and more particularly copper articles, direct from rough copper plates. We take this description of the process, with comments on its practical value, from that publication. It is stated that the invention supersedes the process of rolling, forging, drawing, etc., and the present costly and laborious methods of manufacturing copper articles. By the invention of the Messrs. Elmore, copper is electrically deposited upon a revolving mandrel or mould, upon the face of which a burnisher is caused to move automatically for the purpose of condensing the copper particles as they are deposited, and at the same time producing articles automatically during the process of refining the copper, and at a cost hitherto unknown. The advantages claimed for the Elmore process are in making tubes, all drawing down and brazing are entirely done away with; there is practically no limit to seamless pipes. Copper articles can be produced more cheaply, articles produced by the process are absolutely uniform as regards density, thickness, textile strength. The Elmore process is certainly one of the most marvelous inventions of the time. The field for its usefulness in this country is immense, and in America there is a still wider sphere for the utilization of the process.

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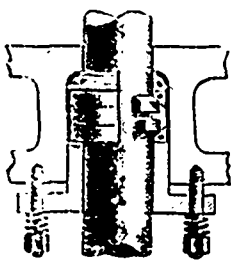
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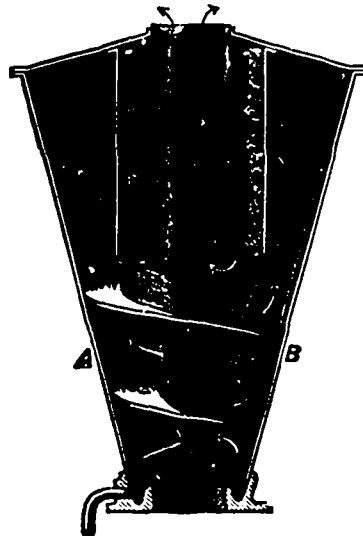
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W. L. SIMPSON, Proprietor.

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One of our English contemporaries has recently given a very complete account of the Bernardos arc welding process, as operated at the tube works of Lloyd & Lloyd, in Birmingham. Arc welding and the Thomson process seem to occupy quite distinct fields. The arc method has its peculiar usefulness in connection with large work in which the electric arc serves simply as a means of communicating very intense heat at the particular point necessary. As will be seen from the articles in question, it is applied with great effect to the manufacture of tubes, and gas, steam and water fittings generally. Until its introduction the makers were dependent on a powerful blowpipe for doing this rather delicate class of work, but the electric arc from its great power and convenience, has proved to be immensely more effective than any form of blowpipe yet devised; in fact Lloyd & Lloyd report that the cost of the weld by this process is only one-fourth that which was usual when the blowpipe was employed. It will be noted that the Bernardos process is

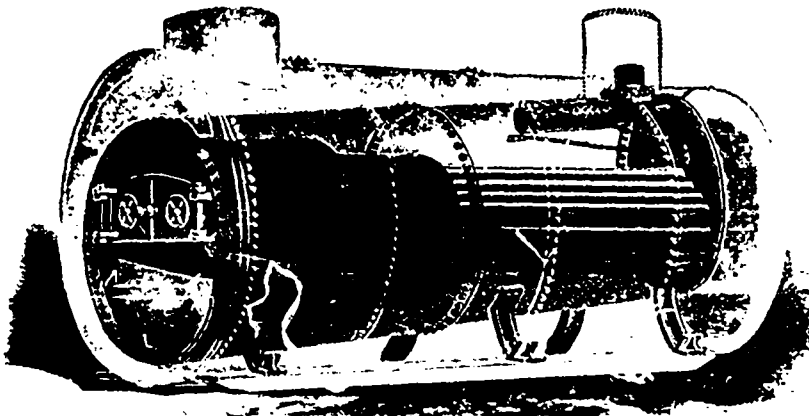
also widely different from the Collin system of arc welding, which has already been used in this country. Of the two it must be confessed that Mr. Collin's method is the most pleasing, since by the action of a magnet it converts a powerful arc into a blowpipe which can be handled so as to apply just the right amount of heat at just the point necessary. By the Bernardos process the arc is drawn between the metal itself and the carbon electrode. Inasmuch as the work forms the positive pole, the heat generated is very intense, but the process gives the impression of being less handy than the one just mentioned. It is certainly successful, and enables a class of work to be very readily done which would be impossible by any other process. For example, fittings 12 inches in diameter can be made out of 5-16 metal cheaply and rapidly, a feat which would be exceedingly difficult, if not impossible, to perform by other means. Apparently, arc welding has come to stay, at least in its application to certain classes of work.—*Electrical World.*

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JANUARY 1, 1892.

STATEMENT OF THE CONDITION
OF THE**Manufacturers' Life Insurance Co.**
OF TORONTO.

ASSETS.

Dominion Government Bonds.....	\$53,000 00
Huntsville Municipal Debentures.....	4,075 00
West Toronto Junction Debentures.....	41,847 10
Call Loans on Bank Stocks (Dominion and Imperial Banks, market value \$20,750.00).....	25,000 00
Mortgages on Real Estate.....	200,253 00
Reversions and Life Interests.....	3,002 00
Bills Receivable.....	2,051 11
Office Furniture.....	4,457 75
Agents' Ledger Balances.....	3,268 47
Outstanding and Deferred Premiums, less 10% held for cost of collection.....	53,906 84
Interest due and Accrued.....	5,349 77
Loans on Policies.....	2,123 88
Cash on hand and in Bank.....	31,784 47
	\$431,969 47

LIABILITIES.

Reserve (Item 4) on all existing policies in force.....	\$280,152 00
Death Claims unadjusted, not resisted.....	0,000 00
Contingent Fund for Medical Fees, etc.....	1,010 88
	\$281,162 88

Surplus on Policy Holders' Account **\$135,200 67**

INCOME FOR THE YEAR (1891.)

Cash received for Premiums.....	\$194,039
Cash received for Interest and Rents.....	13,457 11
	\$207,496 11

DISBURSEMENTS.

Expenses of Management, including Salaries, Commissions, Rents, Taxes, Medical Fees, etc.....	\$77,024
Death Claims.....	35,208
Surrendered Policies.....	2,660
Reinsurance Premiums.....	9,345
	\$124,237

Capital Stock Paid Up..... **\$127,320 67**
Surplus as above on Policy Holders' Account..... **\$135,200 67**

GEO. GOODERHAM, President.**JNO F. ELLIS,** Managing Director

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REED ORGANS
 — AND —
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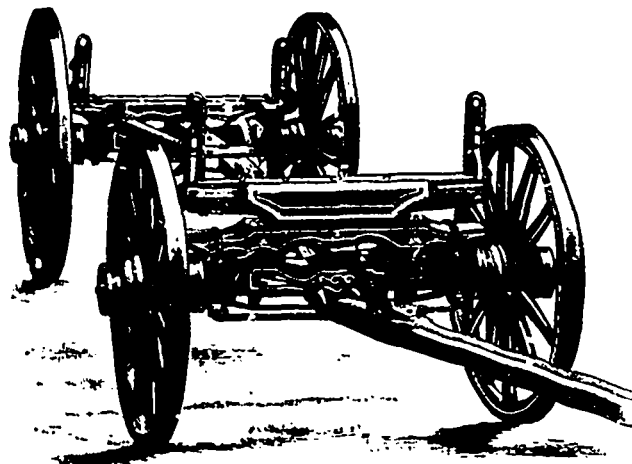
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 4,075 00
 41,925 00
 25,000 00
 200,253 00
 3,902 00
 2,051 11
 4,457 25
 2,268 17
 53,906 84
 5,119 00
 2,123 00
 31,784 17
 \$431,969 4
 \$28,152 0
 6,000 0
 1,010 0
 \$296,765 4
 \$135,200 6
 \$104,020
 13,467 1
 \$207,456 4
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 2,660
 9,315
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 \$127,320 6
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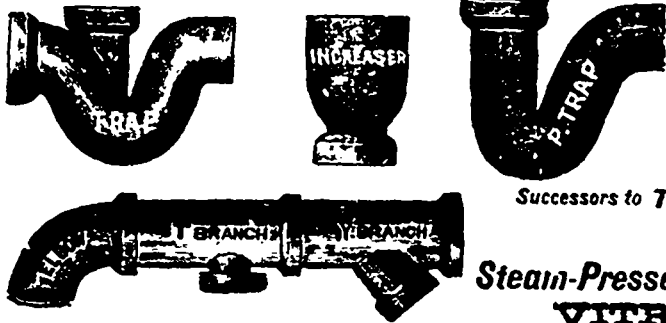
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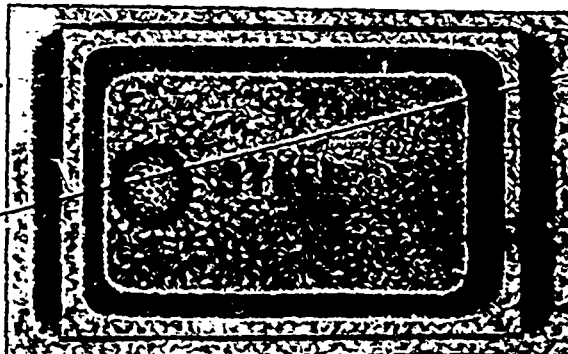
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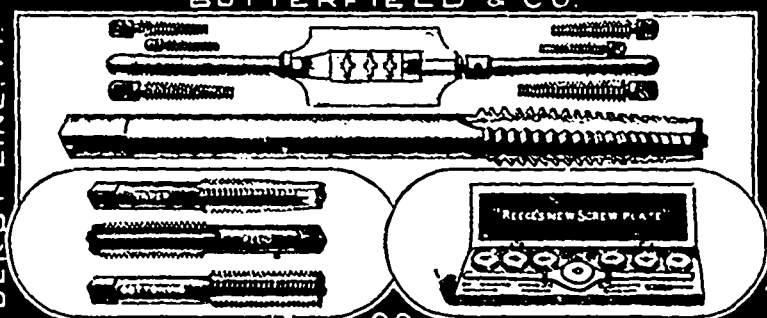
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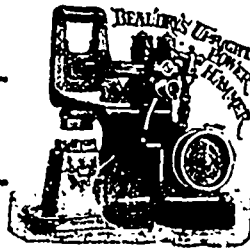
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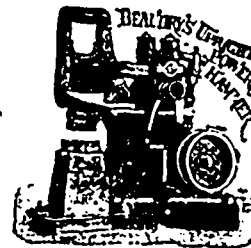
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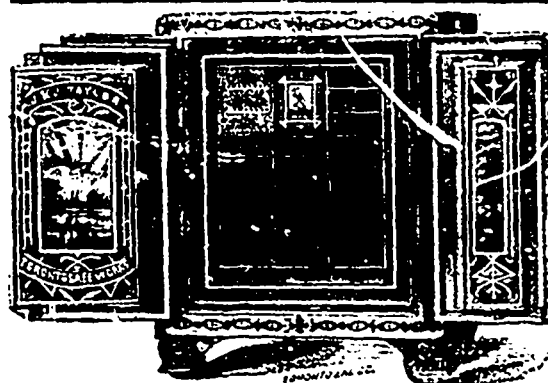


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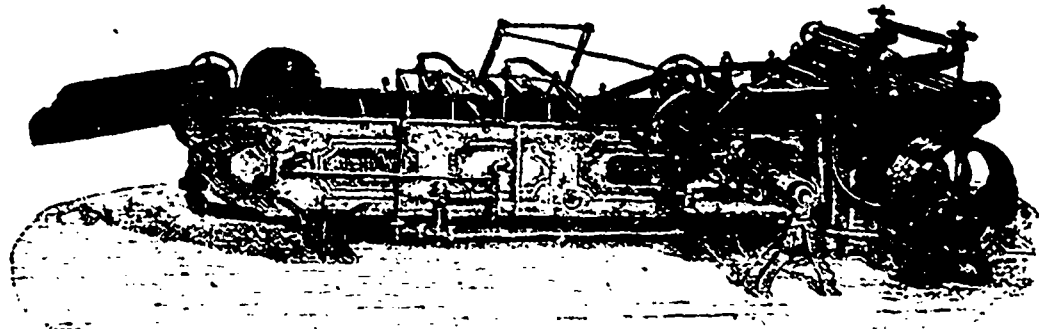
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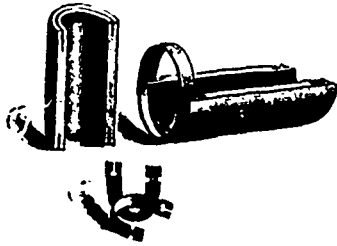
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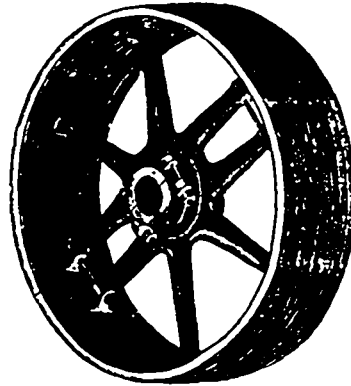
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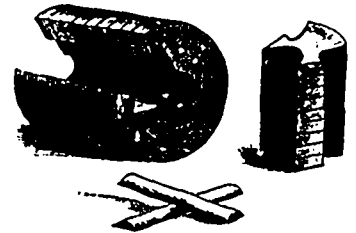
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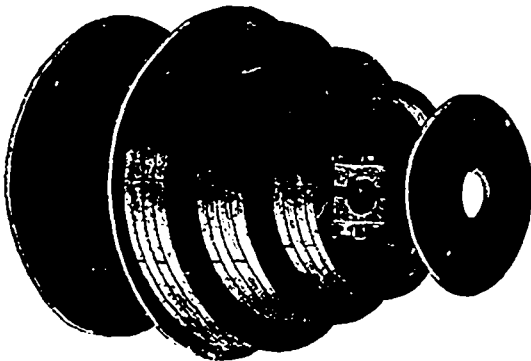
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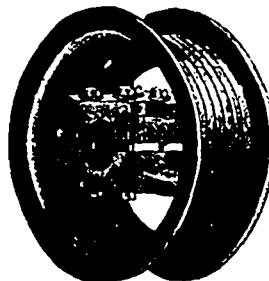
Iron Centre Split Pulley



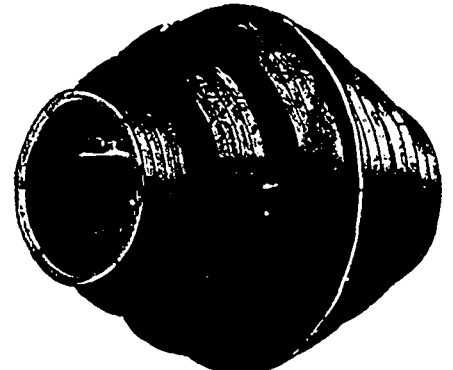
Our Wedge Pulley



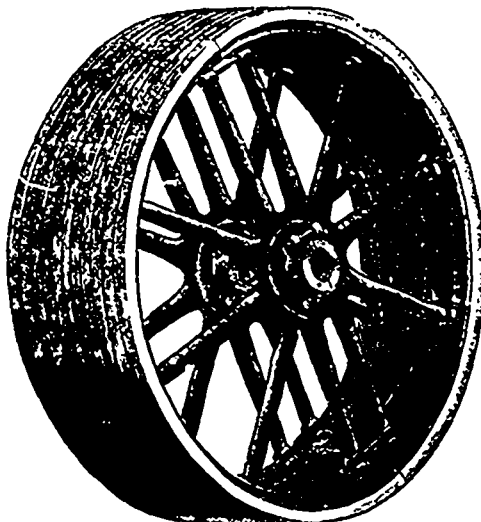
Single Cone Pulley with disc ends



Double Flange Pulley



Double Cone Pulley



Our Double Iron Centre Split Pulley

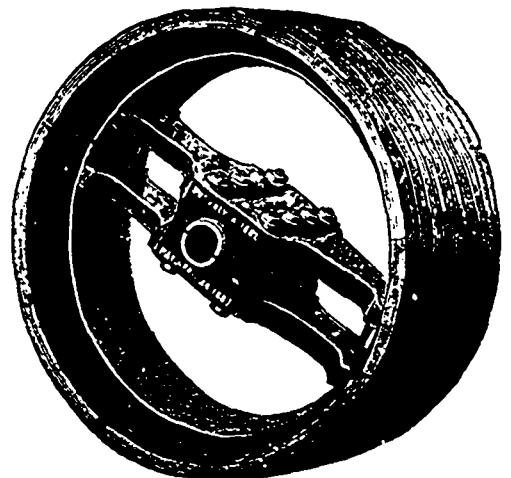
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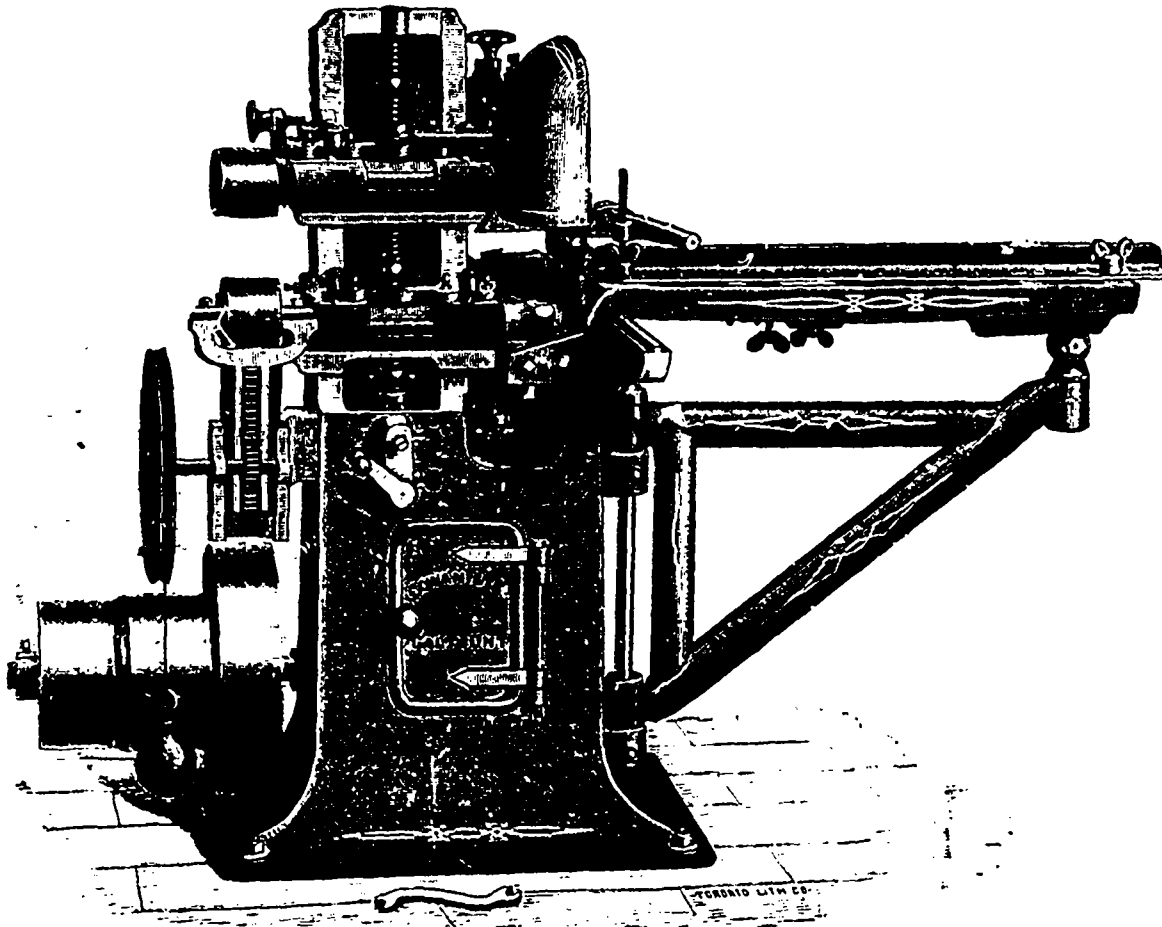


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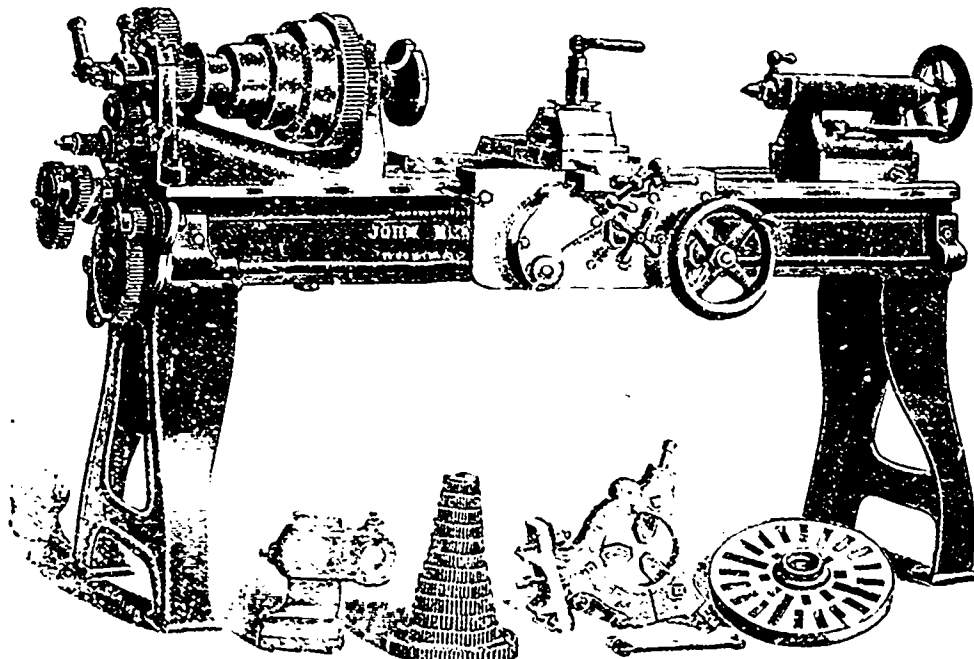
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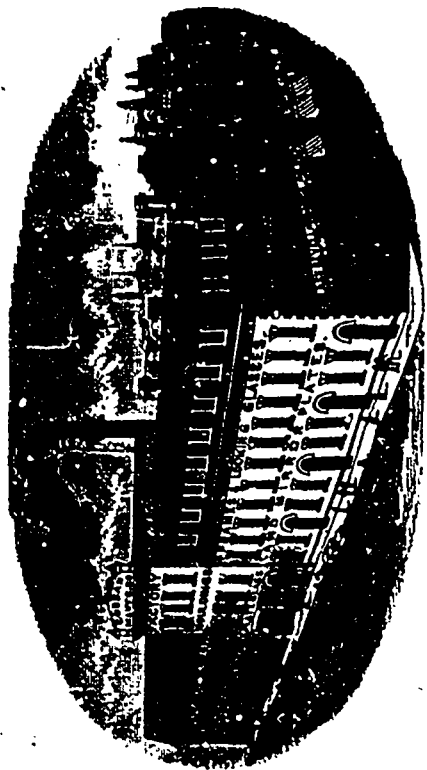
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