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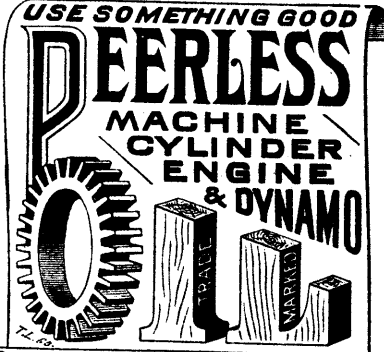
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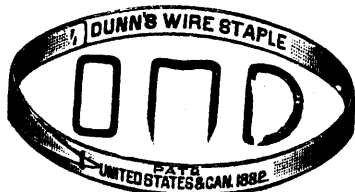
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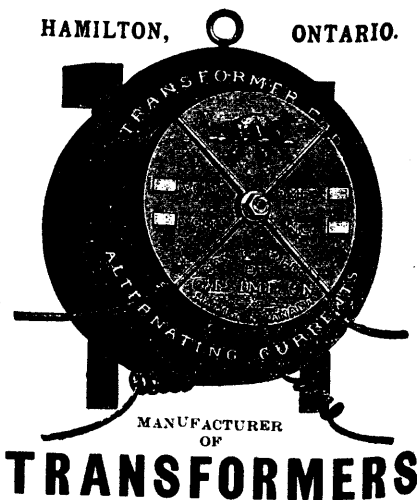
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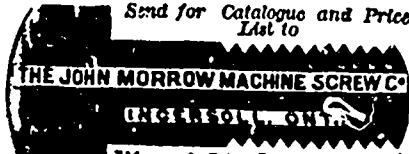
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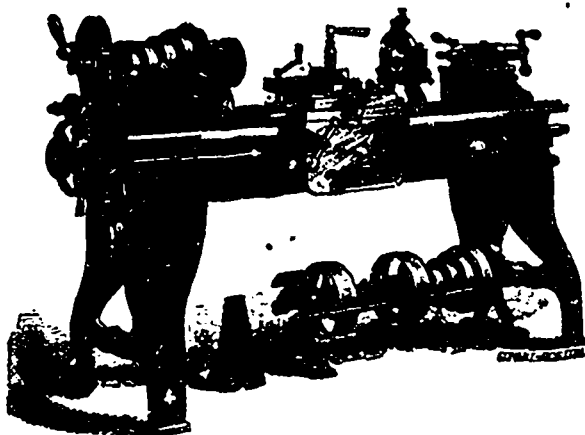
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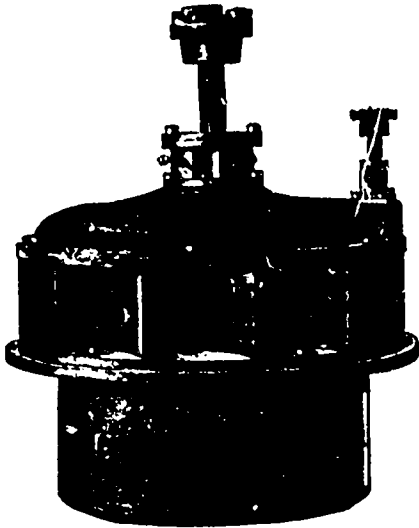
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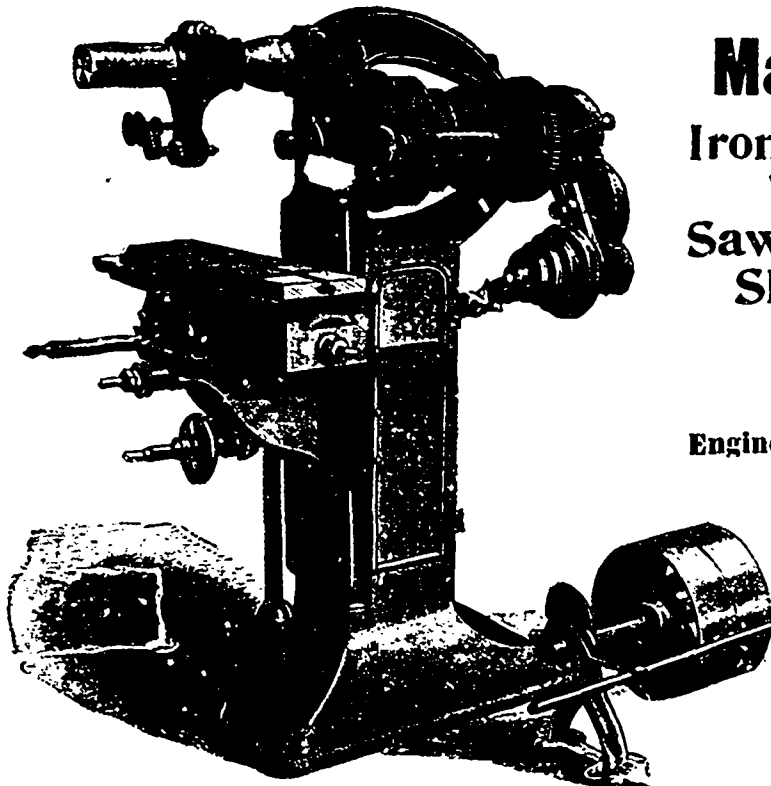
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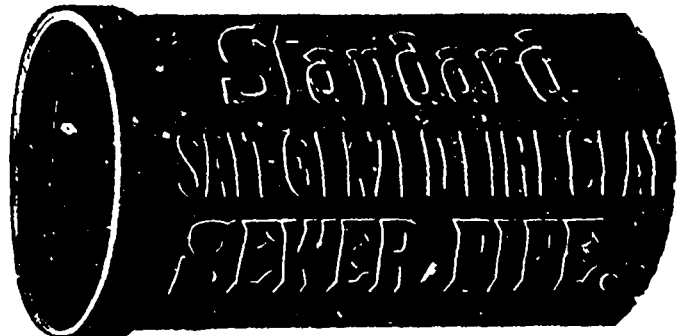
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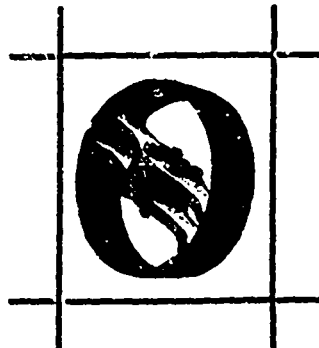
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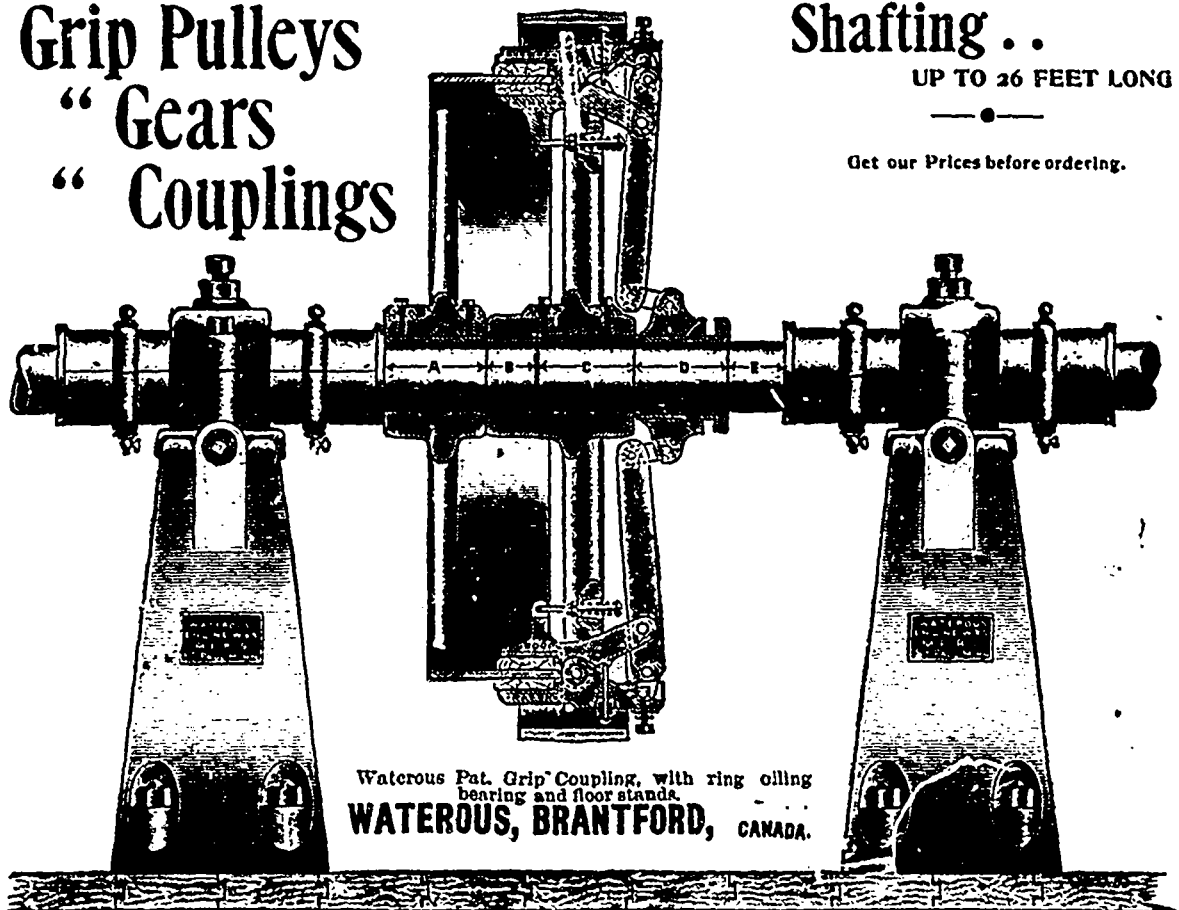
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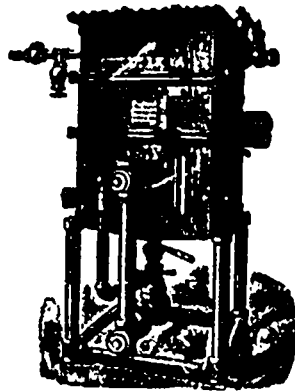
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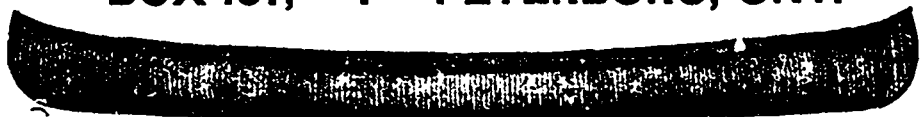
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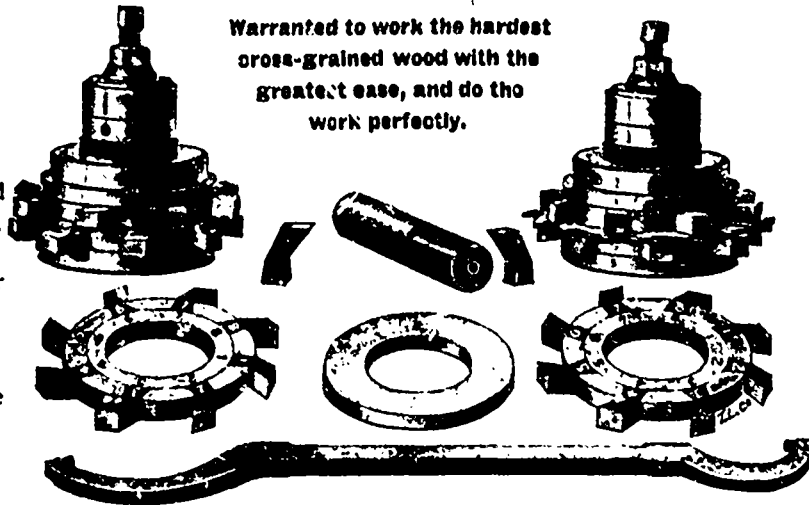
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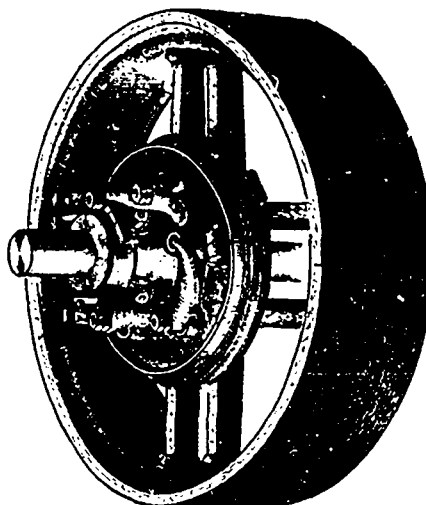
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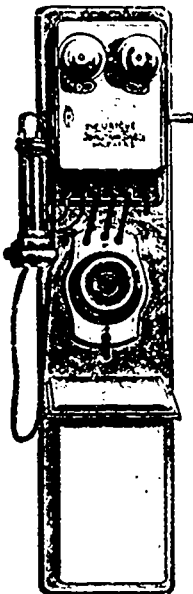
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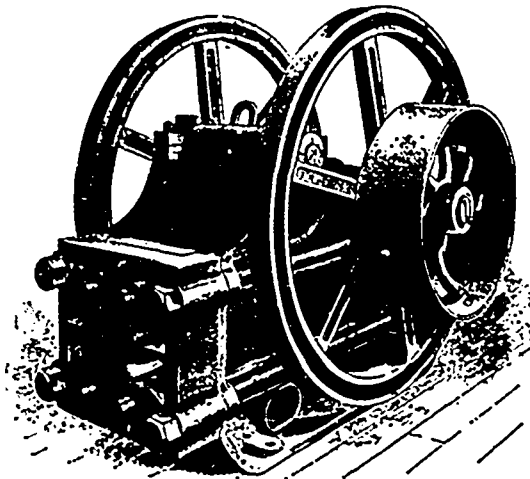
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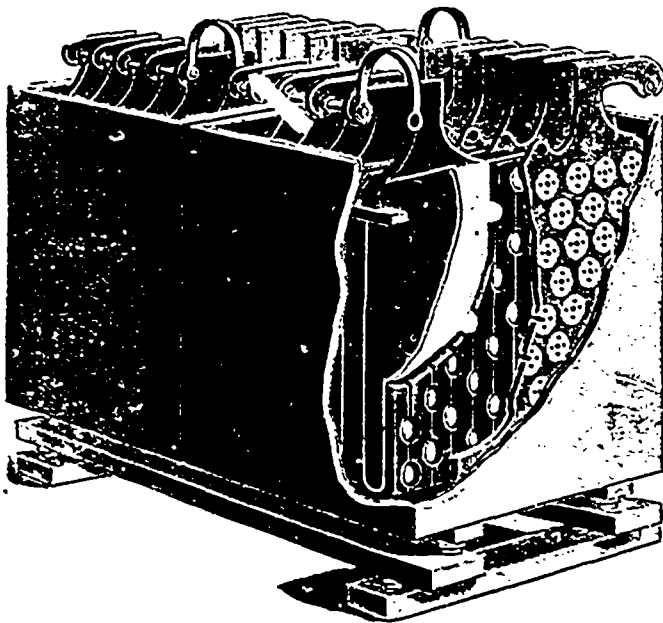
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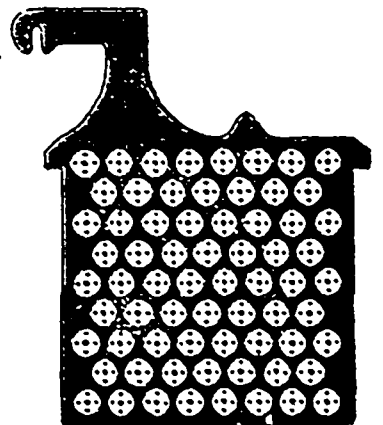
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DOES FREE TRADE MAKE THE BRITISH MANUFACTURER OR THE BRITISH WORKMAN RICH?

If protection is such a bad thing for Canada as its enemies profess to believe; and if free trade as they have it in Great Britain is so desirable for us as Mr. Laurier would have us believe, it would be very much in order for its admirers to show us how the British manufacturer and the British workman is benefited by it. Here in Canada the manufacturer is held up to scorn and abuse as a monopolist who gains great wealth by means of unjust tariff pro-

tection, although when particulars are demanded it seems impossible to name a dozen men who have accumulated more than a very moderate return upon their investments in their enterprises. Our workmen, too, are told that they are the victims of a bad system, relief from which can only be had by the adoption of a system that would without doubt precipitate both themselves and their employers into ruin.

It is fair, then, to compare the working of protection as we have it in Canada and of free trade as they have it in Great Britain, applied to both the manufacturer and the workman. We know that the Canadian manufacturer who is master of his business, and who invests his capital in a factory, is reasonably sure of a fair remuneration, but no more; and we know that the Canadian workman who is frugal and industrious may own his home and enjoy comforts and conveniences that do not fall to the lot of the average British workman.

An argument that is used to convince us that free trade as they have it in Great Britain is a most desirable thing is that under that system in that country merchandise can be produced at less cost and to better advantage than in protected countries. Time was when this might have been true, but facts are constantly being produced that show to the contrary. Those who are posted on current events know that many British manufacturers are being driven out of business because of their inability to compete with other manufacturers in the markets of the world, and but too often even in the British market; and we also know that because of this condition, and because of the closing of British factories, the British workman is reduced well nigh unto starvation. At his best estate under free trade he was forced to labor for minimum wages, and that because his remuneration for his services was so very small, living in a land of cheapness he had not sufficient wealth to afford him a decent living. As long as British manufacturers had a virtual monopoly of the trade of the world, and as long as the world looked to Great Britain for its supplies of manufactured products, free trade was a good thing for them; but when the manufacturers of other countries entered into fierce competition with them for the world's trade, they found that in order to hold on to even a respectable portion of that trade they were obliged to reduce the pay of their employes, and also to forego a portion of the profits that they had previously enjoyed.

This condition has been prevailing for years, and is constantly becoming more and more accentuated. Both employer and employe find that their candle is being burned at both ends. Protection has enabled other countries to become formidable competitors with them in the markets of the world, and free trade has made it possible for protected manufacturers to successfully compete with them in their own home market. In other words the world is not the oyster of the British manufacturer that he can open at his own sweet will, as it had previously been.

Recent events have developed economic changes that are working wonders in the industrial world. Has Britain been asleep that she has not kept step to these changes? Has free trade lulled her into a belief that other nations would stand still while she was in a condition of semivoluptuous repose? Time was, and that but a few years ago, that she

exceeded any other nation in the production of pig iron, but that time has passed. The London Iron and Coal Trades Review says that no one could have ever imagined that Lake Superior ores would now be selling at blast furnaces in the Pittsburgh district at less than Cumberland ores at West Coast furnaces, yet that is just what has happened. With equal cost of ore how can the British iron master hope to cope with his American competitor except by still further reducing the cost of labor. But that is just what is being done, judging from a report in our London contemporary above alluded to, of an interview on May 1st of a deputation of the British Iron Trade Association with the Home Secretary of the British Government in which the iron masters vigorously protested against that feature of the Factories and Workshops bill, then pending in the House of Commons, which proposed to extend the age at which boys might be employed at night from 14 to 16 years. The speakers referred to the keenness of competition from foreign countries, saying that it was most undesirable that, by restricting boy labor, the cost of the product should be increased and the chances of retaining British trade still further diminished; and we are also told that at a meeting of the General Council of the Associated Iron and Steel Workers of Great Britain, recently held in Sheffield, a formal protest against the restriction of boy labor at night was adopted.

Mr. Laurier tells us that his desire is that Canada and Canadian workmen should have just such free trade as they have in Britain. What do Canadian workmen think of it as demonstrated by the reports contained in a leading and reliable British trade journal? Yet that journal tells us that among the reasons advanced by this General Council of the Associated Iron and Steel Workers of Great Britain why it should not be made unlawful for boys of 14 years of age to labor at night in British ironworks was the following:—

In the mills where the boys are employed it is necessary that boys should commence work before reaching the age of 16, so that they may gradually become used to the kind of work, and raise themselves step by step in efficiency and into the more responsible positions in the mills. It is a well-known fact that the most expert and the ablest workmen in the finished iron and steel trades are those who commenced before reaching the age of 14 years. Under the present conditions of the iron and steel trades any extra cost or difficulty in working may mean the extinction of the trade and loss of employment both to men and boys.

This is a specimen of what Mr. Laurier would inflict upon the labouring classes of Canada if his free trade ideas could prevail.

The Iron and Coal Trades Review also alludes to a meeting of the Midland ironmasters, held at Birmingham on May 2, to protest against the passage of the above mentioned new factory bill raising the limit of age for boys in ironworks to 16 years. It tells us as follows:—

Sir B. Hingley, M.P., who presided over a large attendance, stated that to prohibit boys under 16 working in mills at night would add to the cost of production and cause great inconvenience to manufacturers. It would be preferable that lads should begin at 14 years, as they would then have a better opportunity of learning the work they had to do. Moreover, they would only work five night turns, instead of working six days in day time. Mr. Cloughton (Lord Dudley's agent) proposed a resolution to

the effect that the clause in the factory bill raising the age would be most disastrous to the iron trade, which was adopted.

Boy labor at night seems to the British ironmasters to be necessary to enable him to retain some measure of the world's trade that he had previously enjoyed, and which is slipping away from him.

WHAT ARE THE CAUSES?

Engineering, published in London, one of the most reliable exponents of British trade, speaking of competition in the iron and steel industries, says:—

No doubt the comparative decline of British iron and steel production is largely due to what may be described as artificial causes in the shape of duties or the State restrictions of foreign countries. These are beyond helping, and we need not look on them with much misgiving, for what protection grasps with one hand it loses from the other. If the United States put a prohibitive duty on rails our steel makers may sigh as they look on the splendid market that is closed to them, but we know that every dollar of that duty means so much insurance to us against competition in neutral markets at large. This is borne out by the figures, as we find that the export trade of America in iron and steel is insignificant at present, so that the magnificent total of that country is to be attributed to the extension of home demands. Of one thing we may be sure, that the energetic American steel makers will not allow their works to lie idle if there is a chance to cut into foreign markets. Whether the protective system of the country will destroy that chance, whether the ingenious nature of the people will enable them to produce cheaply in spite of protection and higher wages, or whether the fiscal scheme of the nation will be reformed, are matters that may supply food for interesting speculation upon which each can found his own conclusion.

There is this to be said about the British iron industry: Whether its large importance was due to the protection that had for so many years prevailed in that country or not, when free trade had its advent it found the industry in a condition of prosperity unequalled by that of any other country, or, in fact, by the rest of the world. And the circumstances surrounding the trade were such that other nations found not only great difficulty in manufacturing for their own home markets, but practically impossible to do any foreign trade. Great Britain had the ore and the fuel, the machinery and apparatus, the skilled labor and the technical knowledge to conduct the business to the very best advantage, and to produce iron at a lower cost than in any other country. She had, too, the ships, larger in number, and shipping facilities far more extensive with which to engage in trade with foreign countries, than all the rest of the world combined. This was the condition of the British iron industry at the advent of free trade and for many years after. It was a proud eminence for her to hold; and if she has not held it—if it is slipping away from her—if she is losing her proud laurels, Why?

There are those in Britain who, taking a keen and lively interest in the welfare of their country, attribute the decadence of the iron industry there to a spirit of indifference to the requirements of the business, self-satisfied at the achievements of the past and oblivious of the demands of the present. One of these critics the Iron and Coal Trades Review, charges the British Iron and Steel Institute with unexcusable apathy. It asks what the Institute

has done to assist the elementary industry of producing pig iron? Has it placed the practice of English pig iron makers in advance of that of other countries? Is not the very opposite the fact? And it says that the old-fashioned ideas promulgated by men who have been looked up to in England as leaders of blast-furnace practice have thrown England behind and kept her in the rear up to the present hour. English blast-furnace managers and engineers have been taught by such men to believe that it was wrong to use firebrick stoves, that it was wrong to use a high pressure of blast, that it was wasteful to exceed a certain output of pig iron in a given time, that there was nothing to be gained by adopting the so-called German coke ovens for the recovery of by-products, and other tenets which are regarded in Germany and the United States as the rankest heresies. And with what result? Mainly and briefly that, measured by the standard of economy of output, the blast-furnace practice of England is to-day much behind that of both of the countries named, and that the supremacy formerly enjoyed by England, as the chief pig-iron producing country, has virtually disappeared.

The same authority tells us that the British steel industry is in no more satisfactory condition—that in the manufacture of Bessemer steel Britain has long since been outstripped by the United States, and is even now threatened by Germany and Belgium; and it points to the fact that a single rail mill in the United States had produced in one week more than 5,200 tons of finished rails, and that more than 6,000 tons of ingots were made in eleven shifts by a plant of three converters, which was a sufficient cause for British steel makers to be ashamed of the best results they had ever achieved.

Recently on taking office as president of the British Iron and Steel Institute, Mr. David Dale stated that in 1869 the total production of pig iron throughout the world was estimated at 11,949,768 metric tons. Of this quantity the United Kingdom produced 46.3 per cent. and the United States 14.5 per cent., leaving 30.2 per cent. for the rest of the world, out of which France and Germany each contributed a little over 11 per cent. In 1892 the total had risen to no less than 26,859,544 tons, of which the United States made 34.6 per cent.; the United Kingdom, 25.4 per cent.; Germany, 18.4 per cent., whilst France declined to 7.5 per cent. The fact is, as shown by the Bulletin of the American Iron and Steel Association, that in 1869 the total production of steel in the world was put down at 670,155 tons; in 1892 it was 12,019,114 tons. In 1869 the United Kingdom contributed 41 per cent. of the total, Germany 24 per cent., France, 16.5 per cent., and the United States, 4.7 per cent. In 1892 the United States stood first with 35.2 per cent. of the whole make of the world, the United Kingdom contributed 24.7 per cent., Germany, 21.7 per cent., and France, 5.5 per cent.

According to Engineering, Germany, at this time, is the fast growing rival of Great Britain in the neutral markets of the world. In 1887 Britain exported 4,143,000 tons of iron and steel, not including machinery, and in the same year Germany exported 1,260,000 tons; while in 1894 Britain's exports had fallen to 2,545,000 tons against 1,439,000 tons from Germany. In 1887 Belgium exported

503,000 tons and in 1893, the last year for which statistics are given, 406,000 tons, as against 2,857,000 tons from Britain for that year.

Mr. Dale in his inaugural address admitted the growing competition of other countries in supplying the world's demands for iron and steel. Comparing the iron and steel exports of 1887 with those of 1893 he said:—"In 1893 the percentage of Belgian exports as compared with our own had risen from 12 to 14, those of France from 4 to 5, and those of Germany, the only country which shows at all a formidable comparative advance, from 30 to 42 per cent., and in 1894 to 56 per cent., whilst the total exports of iron and steel from the United States only amounted to 3 per cent. of our own. These figures show that, whereas in 1887 Germany, France, and Belgium together exported 46 per cent. of our own total, this figure had risen in 1893 to 61 per cent., an increase of 15 per cent., 12 per cent. of which must be credited to Germany."

Considering all the circumstances, the fact that the United States last year exported of iron and steel 3 per cent. of the value of British exports of those articles, speaks well for protection. As Engineering points out, although this small beginning on the part of the United States may be insignificant as compared with the exports from Great Britain, yet the fiscal policy prevailing there gives our neighbors the undisputed control of the largest, most valuable and most rapidly increasing market in the world. Under protection the iron and steel industry of the United States is increasing with most wonderful strides. Under free trade the industry in Great Britain is depreciating and falling off most alarmingly.

Has the fiscal policies of the two countries anything to do with these remarkable conditions?

A SUGGESTIVE CONTRAST.

In the Contemporary Review Mr. Mulhall, the well-known statistician, sets up a suggestive contrast between the three great British Colonies—or rather, groups of Colonies—any one of which, as he says, surpasses in importance all the Colonial possessions of any other European Power. Taking 1893 as the latest year for which complete statistics are available, he makes this initial comparison:—

	Population.		Revenue.	
	1873.	1893.	1873.	1893.
Australia ..	1,925,000	4,070,000	£ 12,400,000	28,200,000
Canada ...	3,830,000	5,030,000	4,300,000	7,800,000
South Africa	870,000	2,210,000	2,300,000	6,100,000
Total ..	6,625,000	11,310,000	19,000,000	42,100,000

The first thought that arises at the sight of these figures is one of pride in the colonizing powers of the English-speaking race. The population of these three Englands beyond the seas has nearly doubled in twenty years, and is now greater than was the population of England, Scotland and Wales together at the opening of the present century. The revenue has much more than doubled, and is now nearly equal to that of the whole United Kingdom when Queen Victoria came to the throne. In a word, as Mr. Mulhall says, three great nations are rapidly growing up in as many distinct quarters of the globe, based on the laws, language, and traditions of England. With such

figures as these before us, it is little wonder that we sometimes dream of a united English-speaking people powerful enough to carry the peace of the world in its hand.

Alluding to this matter the Canadian Gazette says that the contrast which Mr. Mulhall presents between Canada and Australia is, at first sight, disadvantageous to Canada. In population Canada has advanced 31 per cent. during the past twenty years; Australia, 112 per cent. In revenue the percentages are 81 for Canada and 127 for Australia, and in commerce 12 and 48. Similarly, what Mr. Mulhall calls the "public wealth" of Canada has risen from 392 millions sterling in 1861 to 980 millions in 1888—an average increase of 22 millions sterling per annum, or a little over £5 per inhabitant, compared with £19 in Australia. The average wealth per inhabitant he puts at £205 in Canada and £358 in Australia. But on the other hand, the Canadian debt (after deducting the value of State railways) is £7 per head against £26 in Australia. We should like to know the exact basis upon which this indebtedness is calculated before we accept the pleasing assurance that the Canadian bears less than one-third the burden of the Australian. Are the Provincial debts taken into account at all, or is Mr. Mulhall content with the federal debt alone? If so the comparison is not complete, for the Provinces of Canada have incurred not a little of their indebtedness for public works, such as each Australian Colony undertakes, and this must in fairness be included in the Canadian total. Passing that by, there are other considerations to be borne in mind in the comparison Mr. Mulhall draws. Australia's growth in population has been nearly treble that of Canada during the two decades, but Canada has not had the gold discoveries of Victoria, Western Australia, and the rest to act as primal magnets among the moving population of the old world. The gold fever of British Columbia came and went long before, and there was little in the isolated Pacific Colony of those days to turn the thoughts of the miners from the gold fields to permanent agricultural settlement. Some authorities tell us that we are at the opening of another gold era on the Pacific Coast. If so the benefit to the country may be more decided and permanent. Twenty years ago, moreover, Canada was little more than Ontario and Quebec. British Columbia was isolated at the one extreme, and the Maritime Provinces stood almost alone at the other; while between lay the rocky swamps of Northern Ontario, the trackless deserts of the prairie, and the pathless heights of the Rocky Mountains. Between the Australian Colonies there were no such barriers. The sea was to them as it is now a great bond of union and means of intercourse. And this suggests the question, what has Mr. Mulhall done with the inter Provincial trade of Canada? In the case of the Australian Colonies every cargo exchanged between Colony and Colony tells on the Customs sheet; of the vast and ever-growing interchanges between the Canadian Provinces no record can be kept. Were they known we fancy that Canada's commercial development in the twenty years would not be, as Mr. Mulhall represents, a mere fourth of that of Australia.

But as the Canadian figures stand, they tell a hopeful tale of progress. The imports and exports together were £45,400,000 in 1873, and £50,900,000 in 1893, and taking

into account the notable fall of price level—a fall of nearly one-third—the growth is found to be from £45,400,000 to £72,600,000, an increase of 60 per cent. The pastoral industry as represented in the exports of cheese, butter, eggs, and meat has almost trebled in twenty years, or, to speak more exactly, has increased 172 per cent., being six times as much as the increase of population, while the value of the flocks and herds has risen from £33,000,000 to £66,000,000 sterling—an increase of 106 per cent. The Canadian production of grain Mr. Mulhall puts at 2,100,000 tons in 1873 and 4,150,000 tons in 1893, as against the Australian totals of 1,015,000 and 2,290,000 for the same two years; and that, he says, shows a Canadian development per inhabitant of from 22 bushels in 1873 to 33 in 1893, as against an Australian development of from 21 to 22. But here, again, we should like to be sure that Mr. Mulhall is not counting as Canadian produce grain in transit merely through Canada from the United States to Europe; and against that must be set off Canadian exports via United States ports, such as Portland and New York. The truth is, that the exact measurement in figures of Canada's progress is made almost impossible as the immigration and trade returns are now compiled; but enough is, happily, certain to justify Mr. Mulhall's pride in past achievements and confidence for the future.

THEY WANT FAIR PLAY.

A new kind of protection is to be inaugurated in Canada. Manufacturers and producers in the eastern provinces have complained about the low railway rates from United States points, goods being hauled from distant points in the United States to consuming markets in Canada at much lower rates than were charged for similar Canadian products, hauled a much shorter distance to the same markets. Thus nearness to markets did not prove any material advantage to the home producers. We are now told that at a meeting of the railway agents, held at Montreal recently in conjunction with the metal manufacturers, it was agreed to advance railway rates from western and southern points from 15 to 40 per cent., in order to protect the Canadian manufacturers from the competition of United States goods.—Winnipeg Commercial.

Canadian manufacturers have long suffered from the unfair and unjust discriminations made against them by the railways in the matter of freight-rates, instances of which can be recited without number, as the Commercial well knows. It is mistaken, however, in saying that the manufacturers have asked for, or the railways have agreed to advance, rates from 15 to 40 per cent. or to any other extent. But they have asked for and have not been granted a system of rates that will be no higher say from Windsor to Toronto than from Chicago to Toronto via Windsor; no higher from Toronto to Peterboro' or Oshawa, than from Pittsburgh to either of those places via Toronto; no higher from Toronto to Montreal than from Detroit to Montreal via Toronto; no higher from Halifax, St. John, or New Glasgow to Toronto, than from Liverpool, across the Atlantic, and via Halifax or St. John to Toronto. Such anomalies are an ever present and effective drawback against which our manufacturers have to contend. In these days when competition among our manufacturers has brought prices down to the vanishing point of profits, it is useless to say that the protection afforded by the tariff

avails to exclude the foreign manufacturer while the reduced freight rates given him by the railroads frequently more than counterbalances the tariff charges. What our manufacturers desire is fair play.

UNDER WHICH POLICY?

Has the National Policy made you rich?—Toronto Globe.

The parrot-like repetition of this question is intended to create the impression that protection is a disadvantage to every one who lives in a country where tariff protection prevails; and that it would be of advantage to have free trade prevail free trade as they have it in Great Britain, as Mr. Laurier contends for. No Government can exist without a revenue, and the difference in method of obtaining revenue under protection and under free trade is that under protection revenue is raised chiefly by duties imposed upon imports, while under free trade it is raised chiefly by direct taxation. Under protection the duty is levied chiefly upon articles of luxury, which are not essential to the comfort of the masses, and is borne by the rich who can well afford to pay it; and upon such articles as are made in the country, in the manufacture of which the laboring classes find employment; and it is to be observed that where there is a demand for an article the competition between the manufacturers of it always has a tendency to reduce the price, so that as a general thing the price of the home made articles is about as low as the price of the foreign made article. It may be argued that protection does not make one rich—in other words, that one does not save or make any money in purchasing an article that is protected, but this is a mean and narrow view to take of the question. If one has a dollar to spend the country is enriched if the article purchased with it is made at home, and, in the protection of it, employment is given to home labor; while no such benefit obtains if the article is of foreign production. In every day life more anxiety is felt for the welfare of those of our own flesh and blood than for strangers; and in our national life patriotism impels one to think more of his own country and more solicitous for the welfare of his own countrymen than of other countries and their inhabitants. Saint Paul tells us that he who provideth not for his own household is worse than an infidel; and by the same assertion he who does not love his own country more than any other country cannot be a good citizen. The theory of free trade may be beautiful to contemplate. If there were no diverse races of people—if all the world spoke but one language—if all our aims and objects in life were centered in but one direction—if Utopia were here, then perhaps free trade might be possible, but not otherwise. We must take the world as we find it, and he who cares more for the prosperity of his own family and his own country than for strangers in foreign lands, is undoubtedly a better and more patriotic man than he whose visionary ideas lead him to grasp after the unattainable. In fact there can be no practical adaptation of the free trade theory in any government, for if it were practical Great Britain would have adopted it long ago. But we know that the yearly revenue of the British Government from duties imposed upon imports amounts to about a hundred million dollars. That Government

finds that when it has taxed every thing in the country upon which taxation can be laid, and that from the cradle to the grave the incubus of taxation bestrides the back of the Britisher, like the Old Man of the Sea upon the back of Sinbad, yet another hundred million dollars that can be obtained in no other manner must be raised by the imposition of customs duties upon imports. Mr. Laurier wants Canada to adopt free trade as they have it in Great Britain. It is impossible to have free trade in that country, but the system in force there is infinitely harder upon the laboring classes than protection is in Canada. The British workman may protest and protest against the cruel injustice until he is tired, but the products of prisons in foreign lands swamp the free trade market, and the workman walks the streets in idleness. He may be suffering for the commonest necessaries of life, and he may look helplessly on and see his wife and children dying of cold and starvation, while prison made goods from foreign penal institutions, imported absolutely duty free, forces the closing of the factories in which the British workmen would otherwise find remunerative employment. Does free trade make the British workman rich?

EDITORIAL NOTES.

Mr. Foster's idea of making both ends meet is not by reducing expenses, but by increasing taxes. He is too much like the toiler who proposed to make up for coming to business late by leaving work a little earlier.—London Advertiser.

Solely on account of the Advertiser it is to be regretted that Mr. Foster increased the duty on whisky twenty cents per gallon. If our contemporary had been coming to business late and leaving work earlier when the tax on the ardent beverage was \$1.50 per gallon, will it be any the steadier now that the tax has been increased?

The opening of the Chicago Metropolitan Elevated Railway was an event of unusual importance from an electrical standpoint, as electricity is here given the first opportunity on an extensive scale in this country to demonstrate its superiority over steam traction. The result of the first year's operation will be looked forward to with the greatest of interest, as a favourable outcome will undoubtedly cause steam power to be displaced by electricity on the New York elevated roads. The trial may indeed, be considered one between electric and steam traction in general, for here direct comparison as to these two rivals may be made for the first time on a sufficiently extensive scale. Railroads are notoriously conservative, but if it can be shown, as we believe will be in this case, that the electric motor offers economic advantages over the steam locomotive, the comparison will be so obvious as to have the necessary force to disarm prejudice in favor of the latter. Whether it will ever pay to run trunk lines of railroads by electricity is a question as yet far in the future, but there can be no doubt at the present time as to the financial practicability of electric traction for moderate distances, or to its applicability on many lines now using steam. The recent decision of the New York Central Road to run trolley cars on its steam line between Buffalo and Niagara shows that this fact is beginning to be recognized. With the data that will be derived from the comparison between cost of

operation on the Chicago and New York elevated lines, and the result of even more direct experience on the Buffalo-Niagara line, the advocate of electric traction will soon be in possession of facts that will be more efficacious than volumes of a priori considerations, and which will, we believe, have a great influence on the extension of the use of electricity for traction purposes.—*Electrical World*.

The official opening of the Canadian Sault Ste. Marie Canal was had on June 13 inst., the proceeding being of an informal character. The contracts for the canal and locks were let in November, 1888, and those for the entrance works in January, 1889. Water was first admitted to the locks September 25, 1894. The total length of the canal across St. Mary's Island is 4,000 feet, or from eastern to western extremities of the piers about 6,000 feet. With the approaches, the total distance is about three and a half miles. The lock chamber is 900 feet long, 60 feet wide, with depth of water sufficient to pass vessels of twenty feet draught, at the lowest recorded stage of water below the lock. The lock fills in nine minutes, and can be emptied in seven and a half minutes. The canal proper has a surface width at low water level of 152 feet, and a bottom width of 145 feet. At a point about 1,500 feet above the lock it is crossed by a swing-bridge, over which the railway systems of Canada and the United States find accommodation. The works, altogether, cost about \$4,000,000.

Will free trade make you rich? Will the work of straw plaiting and hat making make British women rich, working as they do for 18 cents per day? The Port Hope Guide, contains a letter from a Canadian in England which says:—"With our friend, the parson, we called at some of the cottages in the village of Sundon, and saw the women at work plaiting the straw and making hats. The prices paid are astonishingly small—a penny for a score of yards of plaiting and a halfpenny each for making hats being the present prices—making it difficult for a woman to earn more than ninepence per day. This unfortunate state of affairs is caused by foreign competition—principally from Japan, the result of England's free trade policy."

The Bell Telephone Co., who are re-constructing their telephone system at Toronto, which has been in progress during the past four years, have almost completed the work. A switch-board of most modern type, complete in every detail, has been erected in the operating room of the new Temperance street building, and they are now changing the subscribers' lines from the switch in the Mail building to the new board as above mentioned. They say no outlay of capital has been spared in making the new switch as perfect as possible, and its installation will materially improve the service.

A press telegram from Chicago a few days ago was as follows:—

Mrs. Angelica McInnis, of No. 1,972 Thirty-eighth street, declared in Justice Wallace's court that she could prove that Charles Beagle and Richard Martin conducted a slaughter house in Archer avenue, near Thirtieth street, where they buy sick and disabled horses, kill them and

sell the meat. The defendants were not ready for trial when arranged, and she will have a chance to tell her story to Justice Wallace in a week. She also charges them with larceny, declaring that on May 13 her horse, valued at \$75, was stolen. She sent Joseph Rasbuch to the slaughter house to inform them that they must not buy her horse if offered to them. When Rasbuch arrived there, she says, he discovered that the horse had already been received there, and all that remained of him was his legs and hide. Both Beagle and Martin deny they have ever sold any diseased horse meat, and say that other slaughterers throughout the city have sold and are selling lots of horse flesh, in many cases not telling their customers what it is.

Co-incident with this horse beef incident is the announcement in certain Canadian city papers to the effect that canned and potted meats, prepared in Chicago, were for sale at remarkably low prices in the departmental stores. Of course in this age when cheapness is the all important desideratum, those who desire to purchase cheap meats should not be surprised if they are served with Chicago horse flesh.

Canada cannot fail to take a deep interest in the peace conditions between China and Japan, for if she walks prudently they should mean much to the development of her Asiatic trade. Five new Chinese ports, including Peking, are to be open to foreign commerce, and the Commercial advantages given to Japan are to be shared by other nations under the most-favoured-nation clause. This opening up of China must give an immense stimulus to the trade of the whole Eastern world, and if Canada means to reap the full benefit of her position as a Pacific trading nation with an independent trans-Pacific steamship line, she will not reject the advantages of the Anglo-Japanese treaty.—*Canadian Gazette*.

A few days ago in *The Montreal Herald* appeared the following editorial items both in the same column:—

Dr. Seward Webb, a wealthy summer resident of Vermont, is being made the subject of very offensive remarks by some newspapers, for no other reason apparently than that he has more money than most people; and is not averse to spending it. This *The Rutland Herald* very appropriately calls "pup journalism."

The late U. S. Secretary of State, Mr. Gresham, died a poor man. It is related of him that when at the repeated solicitation of President Cleveland he assumed office his friends knowing his financial position got together a fund of \$25,000 to enable him to eke out his very moderate salary. Mr. Gresham refused to avail himself of the assistance. Now the Secretary of the Treasury, Mr. Carlisle, is considering the advisability of retiring from the Cabinet because politics have made him poor and he wants to get back to his law practice to earn money for his family. We may be a little slow in some things in Canada, but there are mighty few Tory politics have had to get out of it to make money for their families.

The *Rutland Herald* has sized up *The Montreal Herald* in grand style. Our Montreal contemporary is an expert in "pup journalism."

Before the Prison Labour Committee of the British Board of Trade, "Mr. Thornton, L.C.C., who for fifteen years had carried on in the Old Kent road the business of a brush manufacturer, informed the committee that that industry, so far as England was concerned, had been near-

ly put an end to by foreign competition, which had resulted in brushes being placed on the market at prices with which manufacturers who had to employ free labour could not possibly compete." Will free trade make you rich?

Knit goods are selling in Toronto from 25 to 30c. per dozen cheaper than when wool could be had 3c. a pound less than at present. The National Policy cannot protect manufacturers from injuries caused by themselves. *Monetary Times.*

A Montreal paper contains an advertisement offering for sale some 300 acres—over 13,000,000 feet of land in that city—by a person who subscribes himself proprietor thereof, in which it is stated that the property is well located for factories, the Canadian Pacific Railway tracks extending through the centre, and easy of access by electric cars. It is perfectly safe to suppose that this so-called "proprietor" is a non-producer, and never, by his own manual exertion, earned a dollar of what it costs him to live. At a very low valuation this proprietor would consider his land worth several millions of dollars, and he is now waiting for a money return which he never earned. Why not allow this increment of value to revert to those who made the land valuable?

Sir Oliver Mowat, to a certain extent, followed a Conservative policy when he determined to grant a bonus of one dollar per ton on all iron made in this province. Bearing this in mind, our esteemed contemporary, the Vancouver News-Advertiser makes a very pertinent enquiry. It says:—"When he turns to the offers of Mr. Laurier, Sir Richard Cartwright, and the lesser lights of the Federal Liberal party, what does the Liberal elector find? That he is asked to support a policy which will hand over to the United States the supply of all the manufactured articles which Canadians require, that the raw produce of our mines and forests should be manufactured abroad, and that American capital and American labour should get the profit and the wages which rightfully should accrue to the benefit of Canadian employers and Canadian workmen." According to Sir Oliver, if a Liberal statesman wishes to strengthen his position the best course for him to pursue is to steal a little of the National Policy. —Mail and Empire.

We commend to the consideration of our esteemed contemporaries of the Grit persuasion, who have been so vigorously denouncing the Government because it is endeavoring to suppress undervaluation, the following preamble and resolutions adopted at a meeting of the Board of Directors of the Merchants' Association held at Boston, May 10:—

Whereas, The question of undervaluation of imported merchandise at the chief ports of this country has become so alarming to the mercantile community,

Resolved, That the Directors of the Boston Merchants' Association support the Treasury officials in their efforts to prosecute undervaluation, to the end that whatever the rates of duty may be and the penalties following violations of the law shall be impartially and effectually prosecuted; and we recommend to the State Department at Washing-

ton that a circular letter of instructions be sent to the consuls at the different ports of exportation, setting forth the magnitude of this evil of undervaluation, requesting them to inform themselves as to the question of market value, to the end that honest importers and honest American manufacturers may be protected and that the Treasury of the United States receive its just due. Also, that the corps of special agents of the Treasury stationed abroad be placed upon such a basis of efficiency as will insure reliable investigation in regard to the conditions of cost of manufacture and sale in all foreign exporting centers as will assist the local appraisers and United States Board of General Appraisers in the performance of their important duties.

Regarding which the Philadelphia Manufacturer says:—

Even if actuated by no higher motive than self-interest, our importers and manufacturers should see to it that this dishonest practice of undervaluation—which is fostered and encouraged under pernicious system of ad valorem duties—is discountenanced and stamped out. The establishment of branch houses at American ports renders it possible for foreign firms and manufacturers, if so disposed, to make false entries of their products systematically, and with the least risk to themselves of detection, so that foreign goods can very frequently be bought at prices delivered in the United States materially below what the cost of the American importer would be, who purchased f.o.b. abroad, paid the current ocean freight, insurance, etc., and brought his purchases into the United States predicated on an honest current market valuation abroad. There are many merchants, doubtless, in our own organization who could testify from personal experience, not only to the loss of business and unfair competition, but likewise to the diversion of trade from Philadelphia for no other reason than this systematic undervaluation at other ports. So important a factor is the invoiced price in the final cost of foreign goods delivered in American ports, that in many instances not even the inducement of free ocean freight to Philadelphia would have been sufficient to counteract the falsification of valuation.

One bill now before Parliament provides that eight hours shall be the length of the working day for all workmen and laborers employed, either permanently or temporarily, by the Government of Canada, or by contractors or sub-contractors under it. The natural effect of this will be to add about one-fifth to the cost of labor on all public works. It is probably just as well, therefore, that the law is not made to apply to people who work on other than Government jobs. We might have some difficulty raising the taxes that will be required under the new dispensation to make it easy for the favored few.—Montreal Gazette.

It seems to be the idea among labor leaders that the more the hours of labor are shortened the larger the number of laborers will find employment on the job. Thus where a day's work included ten hours, and it is reduced to eight, twenty per cent. more labor will find employment in the latter case than in the former. By the same process of reasoning if the hours of labor were reduced to but five per day, the number of laborers necessary to complete a job would be increased a hundred per cent. In other words the pay that one man would earn working ten hours per day would be divided among two men working but

five hours each. But whether the hours of labor be ten or five, three square meals would be required.

Does free trade make the British workman rich? Hear what the British Trade Journal says:

The boot and shoe trade of the country is involved in a dispute, the result of which is that two hundred thousand operatives are thrown out of work. The workpeople are opposed to the extension of machinery and to the production of boots and shoes in country districts, instead of in towns, and they imagine that they are fighting their employers. They are, however, in reality, engaged in a battle with foreign competitors—workmen who do not object to the use of machinery, or to work in rural districts—and the issue involves the trade of the British masters and workpeople with the Colonies. If the operatives cannot see their way to make boots and shoes as cheaply as their foreign competitors they will lose the export market, and many of their employers must give up business. These are the simple facts of the case, which, unhappily, our operatives will not understand until they have spent their strike money. Fortunately our customers abroad need not purchase elsewhere, for the stock in the hands of manufacturers and wholesale houses in this country is amply sufficient. The extended use of machinery is inevitable, and we have no misgivings as to the ability of the trade in the near future to supply quite as cheaply as any American or Continental house.

In New South Wales, deposits of cobalt have been found

at Bungonia, Carcoar, and Port Macquarie, but the market for the metal being limited, no attempt has yet been made to produce it on a large scale. Tellurium has been discovered at Bingara and in other parts of the northern districts, though up to the present only in such minute quantities as would not repay the cost of production. It has been found also, in association with bismuth, at Captain's Flat. At Berridale, in the Snowy River district, a lode has been tested for wolfram, a compound of tungstate of iron and manganese, which has been found also in the New England district. Zinc is found in the colony, usually in association with silver, lead and copper, but it has not yet been profitably produced. Deposits of various pigments have been discovered near Mudgee and Dubbo, and in the Orange district, where a fair quantity of the raw material, consisting principally of purple oxide and yellow ochre, has been produced. Chromite is found in the northern portion of the colony, in the Clarence and Tamworth districts, and also near Young. It is usually associated with serpentine, but so far very little has been accomplished in the direction of developing these valuable deposits. Graphite of moderate quality has been discovered at Undercliffe, in the New England district, from a lode 6 feet wide.

The people of Canada paid \$19,736.59 last year in customs taxes to brace the suspender industry.—London Advertiser.

Try again, and try to tell the truth.

We cannot replenish the treasury by impoverishing the people. Home prosperity is the key to an easy treasury and a high credit.—Wm. McKinley.



The Scientific Publishing Co., New York, have just issued The Mineral Industries, its Statistics, Technology and Trade from the earliest time to the close of 1893, which, they say, is the only treatise on mining, metallurgy, markets and uses of the commercial minerals and metals that is absolutely up to date. Information regarding the latest and best methods in use for producing, extracting and refining the useful metals and minerals, and the amounts and values of each produced and consumed in all parts of the world can be found in the book. The publishers say that to the engineer, the chemist, the buyer, the seller of minerals and metals, the metallurgist, and to the legislator who should know the resources and conditions of production in every country to legislate wisely for his own, this work is absolutely indispensable.

A new book on Canada, by Dr. Bourinot, will shortly be issued by The Copp, Clark Company, (Limited), Toronto. It is entitled How Canada is Governed, and gives in plain, simple language a short account of the Executive, Legislative, Judicial and Municipal Institutions of the Country, together with a sketch of their origin and development. The book will be illustrated with numerous engravings and autographs, and being the work of so eminent an authority as Dr. Bourinot, will be indispensable to those who wish to be well informed about the affairs of the Dominion.

The Electric Railway as an Investment.

GEORGE WHITE-FRASER, TORONTO, A. AM. INST. ELEC. ENG.

(Continued from issue June 7)

The probable operating expenses of the entire road are somewhat difficult to arrive at, unless there be a particular case under consideration. They are made up of items of which some are quite closely calculable, and will apply to all average cases, while others are very appreciably modified by the local circumstances. Probably the most satisfactory way to state these total expenses is to arrive at the total cost of running one car for one mile, including all wages, salaries, fuel, depreciations, maintenance, everything that is a charge against gross income, before dividends come in. Taking an average road of about six miles of track and three or four cars, and giving a cautious figure, we find, that for all the above, it will cost about 15 cents to run a car a mile, this figure allowing not only of day to day maintenance and repair expenses, but also of the placing to depreciation account a reasonable credit to offset that general wear and tear that eventually necessitates the "scrapping" of track, &c. Hence we see that three ordinary paying passengers, as their equivalent in freight, must be carried for every car mile before the road will pay its expenses; beyond that number brings in dividends. It is usual to allow

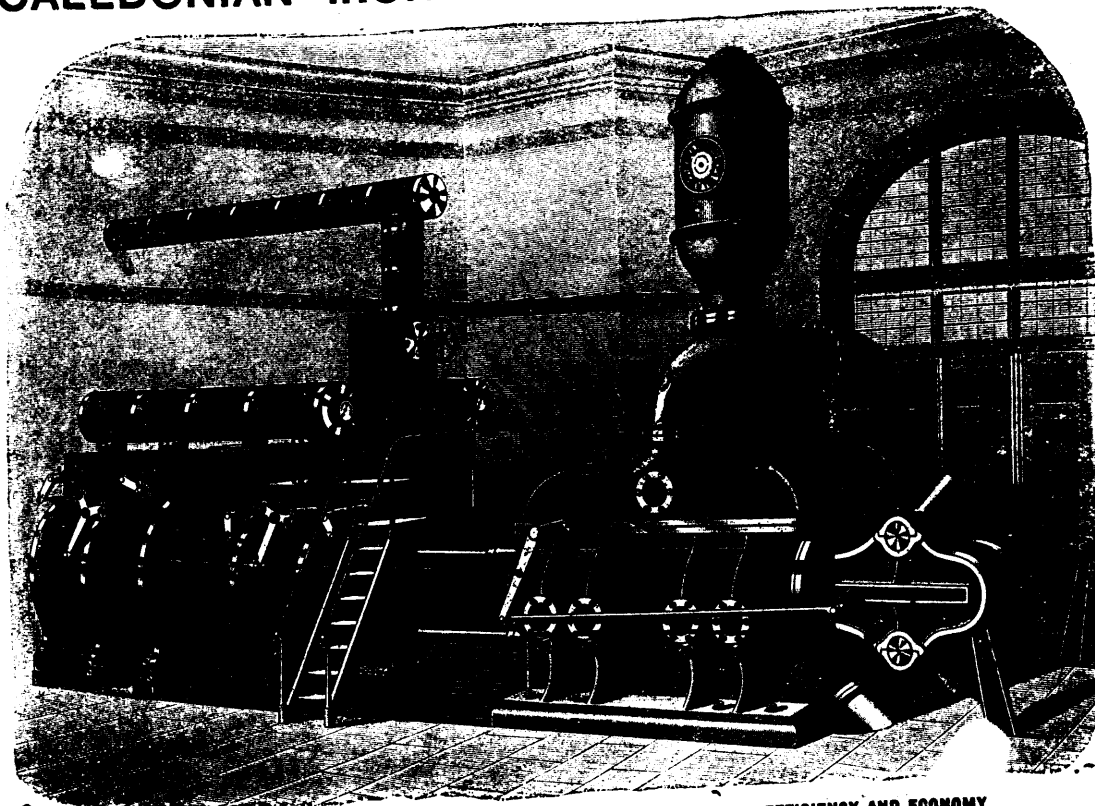
about 100 miles per day for each car, so that there must be 300 fares taken at least per car for equivalent freight to pay expenses. Where a road is intended for purely freighting work, these expenses will not be quite so high, for instead of there being a motorman and a conductor for each car there need be only one set for each train consisting of two or more cars. The above figures will show reasonably closely whether the estimated traffic is sufficient for the support of the enterprise. The utilization of a convenient waterpower will make the difference probably of two cents or so in the cost per mile, which is a saving worth considering. The means for using this cheap power, which may be situated quite a distance from the track, are discussed later.

The Legislative facilities afforded the electric railway investor, cannot be described as very comprehensive, or more than ordinarily valuable. Electric railways and steam railways are placed upon very different footings; so different, in fact, as to suggest, the conclusion that the legislature in its wisdom conceived the operation of an electric railway to be, not a transportation business using electricity as a detail, but an electric business with transportation as a comparatively unimportant side issue. It seems difficult to explain why a transportation business using electricity as a means of propulsion should be hedged around with restrictions as to the powers of its directors to let contracts, to rent power in case of necessity, and above all as to the maximum amount of profit which the company may make; while a similar business using steam as power may do nearly what it pleases, and make all the money it can. Are they not both public carriers? Are they not equally in the public interests? or is it that steam roads are philanthropic institutions, while electric roads are grasping monopolies?

The Ontario Electric Railway Act of '94, under the provision of which all future electric railway extension must be made seems to be the resultant of two factors—one of them a prejudice against electricity, largely based on ignorance that will not be enlightened, the other a grudging spirit of justice that cannot help but see the rights of the matter. In fact the act may be regarded as a sort of "Ticket-of-leave" to a well behaved convict; he may work if he can, but must be on his P's and Q's, must report himself at frequent intervals to the authorities and remember that he is all the time under the strictest surveillance. Taking it up in detail we find that the "powers" given to the company are the same as those given to a steam railway Co., to survey, construct, condemn land along their route and purchase it at a valuation, and "to do all other things and matters necessary and convenient," including the laying out of "a park not to exceed 300 acres." This, however, is far too generous apparently, and must be qualified so that two provisions are inserted, the first limit-

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ing the company to the standard gauge of 4ft. 8½ inches, and the second—paragraphs 14 and 15—stating that although the railway Co. may rent power for their motors from other electric Co's., the agreement to price shall not be valid unless confirmed by a vote of shareholders representing two-thirds of the stock interest. Now the former provision may not be of any special disadvantage, but the latter is distinctly mischievous. Supposing the electric railway Co.'s generator or engine is disabled, then they must either stop their entire road until repairs can be made or else rent power temporarily from a neighbouring lighting or Ry. Co. This latter course may not be taken apparently without getting a two-thirds vote of shareholders called for the special purpose, which means calling persons from different parts of the country at a few minutes' or hours' notice every time a mishap occurs! Is this reasonable legislation, or is it obstruction? Another vexatious annoyance that steam roads are not subjected to is contained in paragraph 17, wherein it provides that the company may make contracts with any parties for construction or equipments, etc., but that such contract shall not be valid unless confirmed by a two-thirds vote as above. At a meeting called for the special purpose, what possible reason can there be for so restricting the powers of the Directors? The Joint Stock Co.'s Act, which is specially made to apply to "forwarding business" states clearly that "Directors may make contracts, etc., without any restrictions," and the Steam Railway Act contains no such withdrawal of power. Apparently as soon as a man becomes the Director of an electric railway, he shows his unfitness to wield the same powers given to the Director of a steam Co. Is this prejudice, or ignorance, or what? The Electric Railway Act contains practically the same provision as the Steam Railway Act as to borrowing powers, surveys, lands and valuation, highways, crossings, bridges, fences, tolls, etc., and the sections affecting Powers of Provisional Directors, Capital, etc., are practically taken from the Joint Stock Act. There are just a few provisions which may be considered. Paragraph 40, section (1) provides for the "bonding" of rails and the establishment of a system of return wires, in order to eliminate electrolytic effects in gas and water pipes, etc. This matter need not trouble promoters of inter-urban railways, and even in cities it can be satisfactorily dealt with by competent electricians. The section that seems most to invite hostile criticism is number 9 of paragraph 13, numbers 10 and 11 of same paragraph are sequels of number 9. It provides that "fares" (which have previously been limited in amount) shall be so regulated that, to state it shortly, the company shall never, no matter how large its business may be, or how great its risks, be allowed to declare a greater dividend than 8 per cent. Any surplus shall go into the "surplus tolls account," which will be a sort of reservoir out of which

will be made up the amount required during any particular year to bring the dividend up to that maximum figure. When (or if) the "surplus tolls, acc.," shall total such a figure that it reaches one fifth of the average annual gross receipts of the company, then the company shall reduce the fares, in a certain proportion. Now 8 per cent. is a fair enough profit no doubt, and taken by themselves, sections 10 and 11 are fair; but one is justified in asking, why make a difference between steam railways and electric railways? The former may keep any profit it makes, the latter may not go beyond 8 per cent. Is there anything immoral about an electric railway? Does it ask or get any special privileges entitling the public to hedge it round with such a restriction? If it occupies the public highway, it pays rates and taxes; if it goes across private lands it pays for them, and if it is not in the public interest, why is it permitted to condemn the land along its route? As a whole, however, the same facilities are given to electric railways as to steam, and the restrictions, while annoying, are not vital.

The electro-technics of an electric railway are of very considerable importance, and should be very carefully gone into. The transmission of large quantities of power over great distances, by means of multiphasal generators, is such an important possibility that no such enterprise should be undertaken without a careful survey of waterpower in the vicinity. It is impossible, of course, to give any figure of general application; but the transmission over 5 to 10 miles is not regarded as any very special feature of engineering, whereas the advantages gained in reduction of subsequent costs of operation by using a waterpower may be very evident. The public are in the habit of jumping to conclusions as to electrical matters, and are apt to think wrongly, so that wherever there exists a possibility of using waterpower, no matter at what distance it may be, reference should be made to a professional man. Multiphasal apparatus is the direct outcome of the demand for long distance transmission, and is brought to a high level of efficiency. The entire construction of the plant, both electric, steam, waterpower, and track, should be of a thoroughly solid, substantial character. The better the roadbed the longer will it last with less repairs; and the easier will be the operating conditions for the rolling stock. Motors and trucks are certainly designed for strength, but are susceptible to damage by rough usage. The condition of the track has an influence on the life of the wheels; the comparative sizes of wheels on the same axle, or on the same truck, has a bearing on the electrical efficiency of the motors. The advisability of getting good material and paying good prices for it is well illustrated in a study of the life of wheels. It may be thought that a "wheel is a wheel"—but it is not always so. A thoroughly good wheel costs money and will run possibly 50,000 miles before it is

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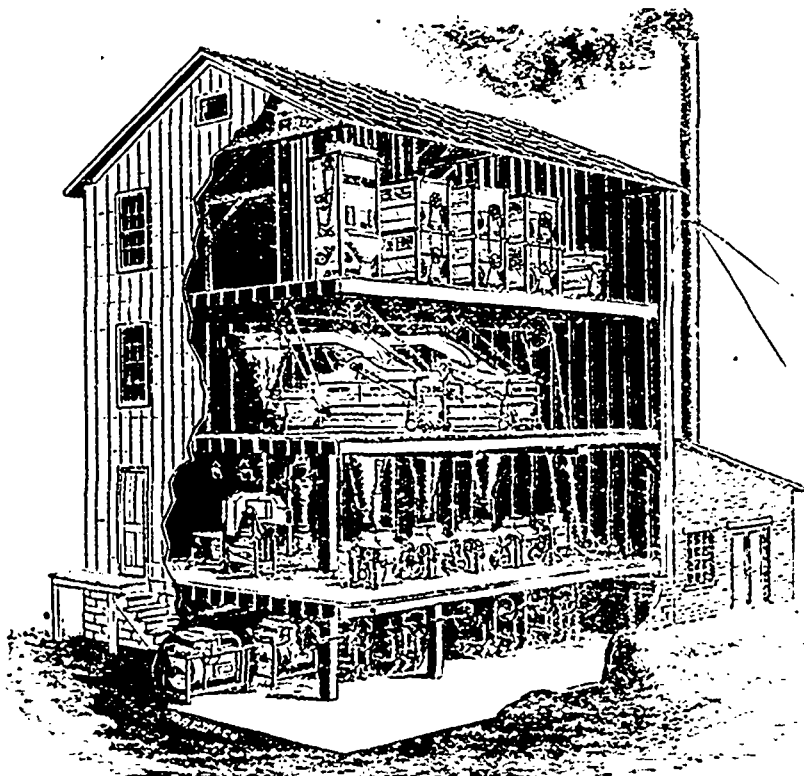
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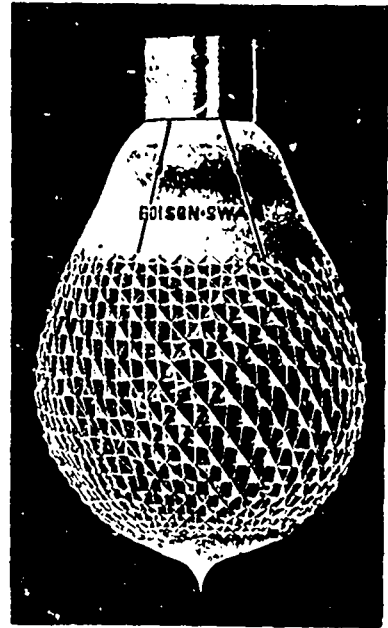
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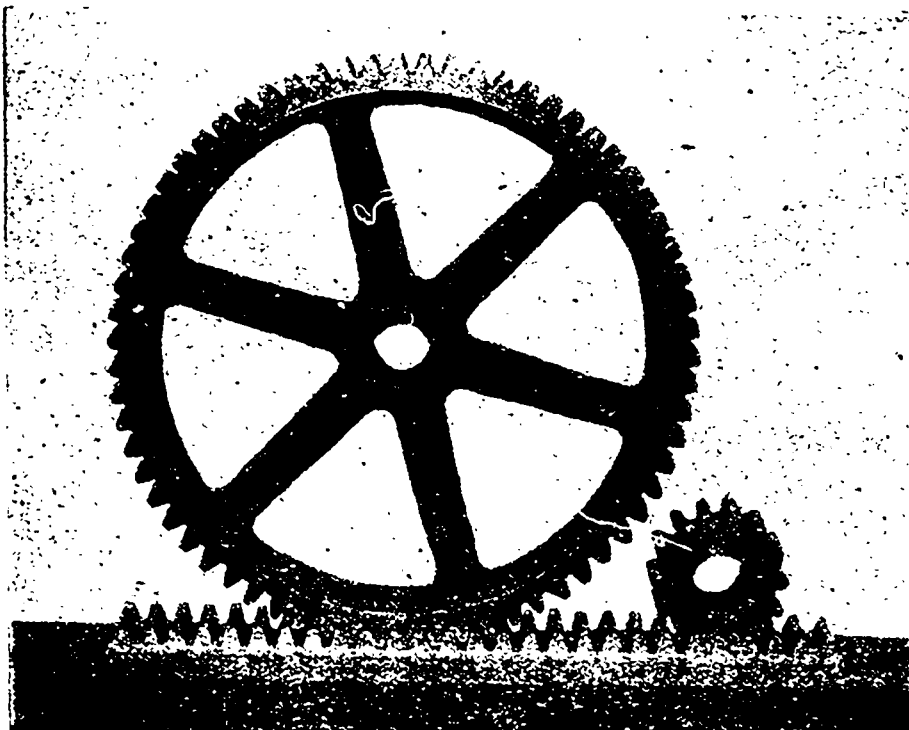
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Correspondence solicited.

worn out; a poor wheel will cost perhaps half as much, and wont run 10,000 miles; it will therefore really cost a great deal more than the expensive one. The same principle holds throughout. Cheap machinery and work means high repair account, probable loss.

Special attention should be paid to the electrical connections of the track. This is the return circuit, and the higher its conductivity the greater the total efficiency of the system. Feeders may, or may not, be required, depending solely upon the particular conditions; careful planning of feeder system may considerably reduce expense of copper. In the power house the same remarks as to solidity apply. Engines may be either high or low speed, simple or compound, as particular conditions determine. There are conditions which are best met by high speed, while a low speed is best under others. It is not a question of individual preference, unless the purchaser is content to lose the advantage gained by using machinery specially adapted for particular service. The same may be said with respect to electrical machinery. Generators and motors are so good now-a-days, and their design is so thoroughly understood, that although agents will each and all claim superiority for their own makes and talk learnedly about magnetic friction and all sorts of other scientific technicalities, the general public may be perfectly content to waive all those matters and to get agents to talk dollars and cents to them on the basis of specifications drawn up by an independent engineer.

It has been quite usual to get a manufacturing company to do the preliminary engineering, and to draw up specifications which are supposed to be "disinterested." Such a specification will, of course, be made so as to suit the particular styles and size of machines made by the company furnishing it, if possible, so as to exclude all machinery of rival make. It is very easy to "cook" specifications in this way, and it has the effect of practically excluding all competition. It can hardly be expected that a manufacturing company will not avail itself of a possible advantage, and so purchasers should be cautious how they place themselves unreservedly in interested hands.

In the matter of long distance transmission, for instance, not all manufacturing companies make proper multiphase machinery, so that any company that does not will be certain to advise ordinary direct current generators, and plenty feeder copper, for the use of a multiphase generator would lose them possible business. And yet, in many cases, multiphase transmission would be far cheaper. A careful consideration of every particular case will always reveal the best system of working, and thereafter it becomes merely a question of specifications and good construction.

The results of the operation of a system of interurban electric

railways, is, of course, impossible of close estimating; but experience has shown that on the average, in well managed roads, the total operating expenses will amount to about 60 to 65 per cent. of the gross receipts, the balance being nett profit.

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.

The Cariboo Company at Camp McKinney, B.C., are putting in a 10 stamp mill.

Ed. Turner, formerly of Woodbridge, Ont., has started a foundry at Stayner, Ont.

The Mattawa, Ont., Electric Light & Power Co., will erect a new brick power house.

The Langmuir Mfg. Co., Toronto, whose trunk factory at that place was recently destroyed by fire are re-building.

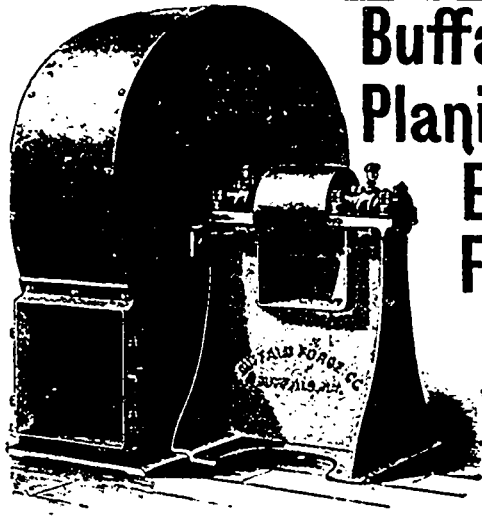
The Anderson Furniture Co., Woodstock, Ont., are applying for incorporation with a capital stock of \$250,000 to manufacture furniture.

The Chanteloup Mfg. Co., Montreal, are applying for incorporation with a capital stock of \$10,000 to manufacture materials necessary for the manufacture of brass, tin, iron, copper works, etc.

R. McMaster, Tremont, N.S., is refitting and thoroughly repairing the McMaster mills which have been closed for some time, and of which he is the owner. They consist of a sawmill, including shingle and stave machines, threshing and grist mill, etc.

Between thirty-five and forty elevators are to be erected at points on the C. P. R., and others on the Northern Pacific and Manitoba and Northwestern, besides two in Winnipeg, Man. The Ogilvie Milling Company will erect a mammoth elevator at Winnipeg this summer, adjoining the mill.

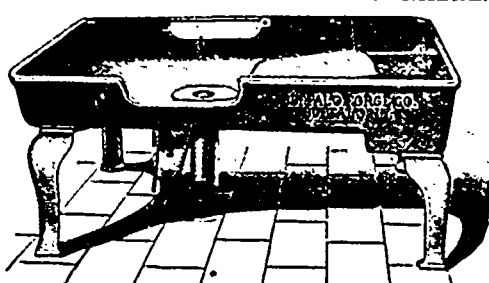
The Trades Journal, speaking of coal operations in Nova Scotia, says: "Some 400,000 tons have already been contracted for in the St. Lawrence, with the expectation of further sales amounting to 75,000 tons. A large proportion of the coal sent this year will be screened. There is little objection to this, as there is a big demand for slack at fair prices. It is hoped to make increased sales this year in the United States."



Buffalo Planing Mill Exhaust Fans

EFFICIENCY UNEQUALLED
DURABILITY UNSURPASSED
SMOOTH RUNNING INCOMPARABLE.

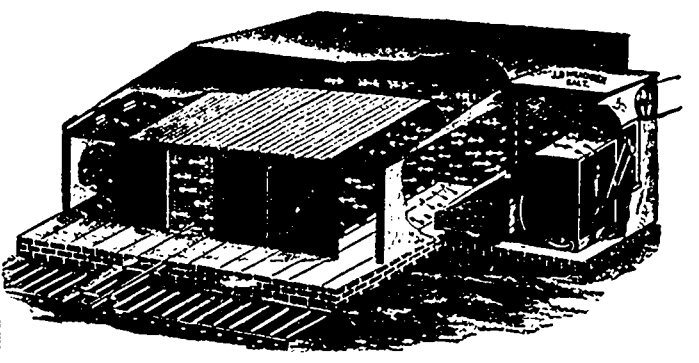
THE LARGEST
FORGE
In the World



Thirty-Eight Other Designs of Portable and Stationary Types.

BUFFALO LUMBER DRY KILNS
Blowers, Blacksmiths' Tools, etc.
SOLD IN
TORONTO, ONT., BY H. W. PETRIE.
BRANTFORD, ONT., BY CANADIAN MACHINERY & SUPPLY CO.
MONTREAL, QUE., BY CANADA MACHINERY AGENCY.
CHICAGO STORE, 22 and 24 WEST RANDOLPH STREET.

McEachren's System of Drying, Heating and Ventilating
Under Recent Patents.



CHEAP AND EFFECTIVE.
Highly approved of by practical men.

The following is a specimen of letters received from customers:

Ottawa, April 1, 1895.

J. D. McEachren, Esq., Galt, Ont.

Dear Sir,—Replying to your enquiry regarding Dry-Kiln purchased from you last summer, we beg to state that our lumber is stained hard wood, principally birch, which is put through a chemical process thereby rendering seasoning a very difficult operation. We tried to have it dried in the several styles of kilns used by factories in this district, all of which failed to take the moisture out of the core of the wood. In August last we put in one of your kilns with a capacity of 10 cars, or 30,000 feet and since that time have seasoned most satisfactorily about 200,000 feet. The boards come out free from checks and warp and we are now thoroughly convinced that it is the only dry-kiln in the market which fills the bill both as to efficiency and economy.

Yours truly,
McRAE BROS. & Co.

For particulars address
McEACHREN HEATING AND VENTILATING CO.,
GALT, - - - ONTARIO.

ELECTRIC LIGHTING,



ELECTRIC POWER TRANSMISSION,



ELECTRIC TRAMWAYS.

AHEARN & SOPER, OTTAWA,
ONTARIO.

Electrical Engineers and Contractors.

Complete Electric Plants Installed.

Dealers in Electric Supplies, Transformers, Motors, Meters, Lamps, etc., etc.

The Packard Lamp. →

WE are prepared to furnish you with the best LAMP in this market, the "PACKARD," at extremely low prices, and can prove our claims.

THE PACKARD TRANSFORMER.

It is impossible to burn out one of our Converters; and in efficiency and regulation they far excel all others.

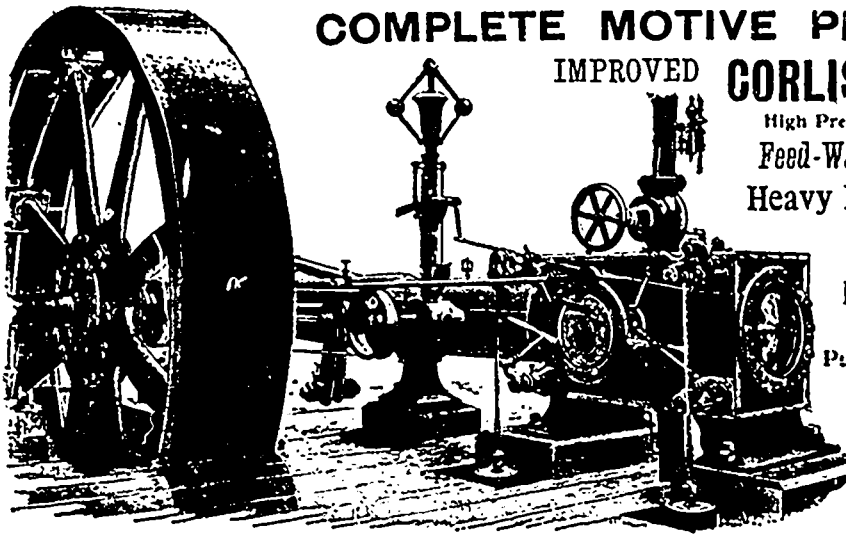
WRITE US FOR QUOTATIONS.

The Packard Electric Co'y, Ltd.

ST. CATHARINES, ONTARIO.

LAURIE ENGINE CO. St. Catherine Street East, MONTREAL, ENGINEERS AND CONTRACTORS.

COMPLETE MOTIVE PLANTS, ETC.



IMPROVED **CORLISS ENGINES**

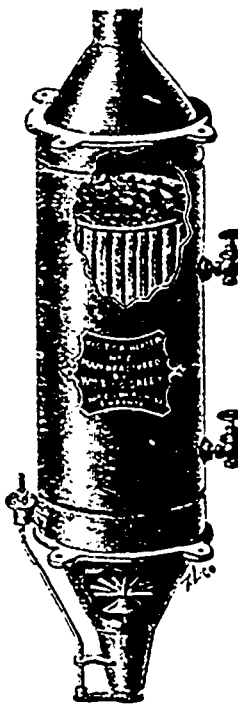
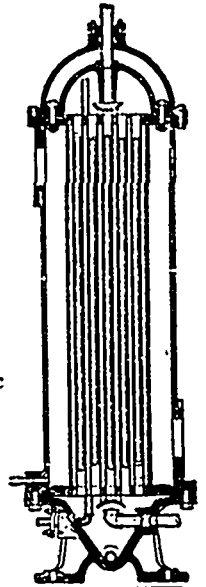
High Pressure, Condensing and Compound
Feed-Water Heaters and Purifiers.
Heavy Fly-Wheels a Specialty.

Sole Agents in Pr. v. of Quebec for
NORTHEY CO. Ltd.

Manufacturers of all kinds of
Pumps, Condensers and Hydraulic
Machinery.

Sole Agents in Canada for the
HOLLY GRAVITY

RETURN SYSTEM



WM. & J. G. GREEY,
TORONTO,
ONTARIO.

Manufacture
THE VICTOR
WHEAT
HEATER,

The benefits
secured are

- WHITER FLOUR,
- UNIFORM GRADES,
- CLEANER OFFALS,
- BROADER BRAN.

FOUNDRY FACINGS

Ceylon Plumbago Foundry
Supplies, Fire Brick, Fire
Clay and Moulding Sand.

Canadian Agents for

COLLIAU CUPOLA FURNACE.

HAMILTON FACING MILL COMPANY,

Hamilton, Ontario.

STEAM TRAPS

- Pipe Machines
- Buffing and Polishing Lathes
- Strapping Machines
- Shafting Hangers.

G. T. PENDRITH

MANUFACTURER,

73 to 81 Adelaide Street West,
TORONTO.

METAL ROOFING.

Those contemplating building the coming season would do well to send for our catalogue. Cheap as a wooden shingle. Will last a lifetime.



Guaranteed to be Water, Wind, Storm, Fire, and Lightning Proof.

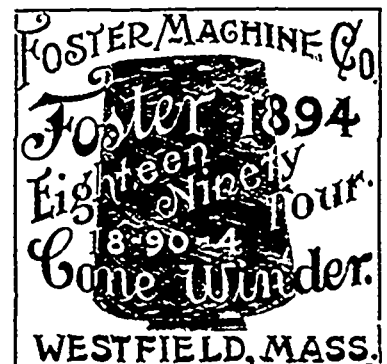
THE PEDLAR METAL ROOFING CO.

Office and Works, - OSHAWA, ONTARIO.
In answering please mention this paper.

BARGAINS MACHINERY
-IN-
NEW & SECOND-HAND

- 22x60 inch Double Corliss Engine, with Condenser, 500 H. P.
- 16x32 inch Double Compound Automatic Engine, 300 H. P.
- 20x30 inch Automatic Engine, 150 to 200 H. P.
- 16x20 inch Buckeye Automatic Engine, 150 H. P.
- 12x20 inch Automatic Engine, 75 H. P.
- 12x12 inch Hall Automatic Engine, 80 H. P.
- 12x15 inch Beck Automatic Engine, 60 H. P.
- 16x26 inch Allis Corliss Engine, 150 H. P.
- 12x24 inch Wetherill Corliss Engine, 50 H. P.
- 10x18 inch Buckeye Automatic Engine, 50 H. P.
- Westinghouse Automatic Engine, 60 H. P.
- 9x12 inch Beck Automatic Engine, 50 H. P.
- 9x9 inch New York Safety Automatic Engine, 30 H. P.
- 8x12 inch Trenton Automatic Engine, 35 H. P.
- Slide Valve Engines, Vertical and Horizontal, 200 to 300 H. P.
- Hoisting Engines, 5 to 20 H. P.
- Yacht and Marine Engines.
- Boilers, all styles and sizes.
- Planers, 24x6 inch, 30x6 inch, 36x9 inch, 72x25 inch, 72x34 inch.
- Lathes, 14x6 inch, 16x6 inch, 20x10 inch, 24x20 inch, 28x30 inch, 36x14 inch, 36x16 inch.
- 24 inch, 30 inch, and 45 inch Drill Presses.
- 24 inch, 30 inch and 4 ft. Radial Drills.
- Universal Index and Plain Milling Machine.
- 26 inch and 18 inch Lodge & Davis Turret Lathes.
- Fox Lathes.
- 300, 600 and 3000 lbs. Steam Hammer.
- Large stock of Steam and Centrifugal Pumps, feed water heaters, tanks.
- 4-foot Vacuum Fan.

FRANK TOOMEY,
131 NORTH THIRD STREET,
WAREHOUSES,
129 AND 161 CANAL STREET,
576 282 BEACH STREET
PHILADELPHIA.



ADVERTISE IN THE
Canadian Manufacturer.

J.B. Runciman, Goderich, Ont., has started a machine shop at Blyth, Ont.

Messrs. Kalte, Poole & Co., have started a machine shop and foundry at Port Elgin, Ont.

The flour mill and bakery at the Trappist Monastery, Oka, Que., was destroyed by fire June 4; the loss about \$4,000.

The Masterman Sulphite Fibre Co., will erect a pulp mill at Chatham, N.B. The mill is intended to turn out 30 tons of pulp per day.

D.N. Russell, late of the milling firm of Alexander, Kelly & Co., Brandon, has made arrangements to erect a flour mill at Wawanesa, Man., upon which he will soon commence operations.

The employes of the preserving factory who were laid off lately, received orders June 1 that they were to resume work again June 3. By this it is inferred that the experiment of shipping frozen lobsters, fish, etc., to England has thus far proven a success, and now it is expected that quite a profitable business will be carried on, which will be a great boon to Dartmouth, as it will give employment to a large number of men.—Halifax, N.S., Chronicle.

Allgemeine Electricitäts-Gesellschaft (The General Electric Co.), Berlin, Germany, have sent us their handsome illustrated catalogue having reference to the overhead trolley system for street railways. It contains very fine engravings of their machinery, wire and rubber works, offices, glow lamp and armature factories. Also illustrations and descriptions of important roads equipped by this system, showing how it may be adapted to all sorts of circumstances and conditions. Views are given of power stations, repair shops, car shops, motor cars with water sprinker, snow sweeper and salt-sprinkler, fitters' car, etc. Messrs. Munderloh & Co., Montreal, are agents in Canada for this concern.

The Lake of the Woods Milling Company is to erect new elevators at once throughout Manitoba. Mr. S. A. McGaw, the general manager said:—"We have already a very large capacity, but found our storage room too small for our purpose. In consequence we have been obliged for two years to ship large quantities of wheat to Fort William and then trade with other dealers who had wheat stored in the province for material for our mills. The increase in our business also demanded more elevators. We will build along the main line of the C.P.R. at Alexander and Moosomin; on the Pembina branch at Altona—a new place between Gretna and Rosenfeld—Winkler, and Manitow; along the Glenboro' branch at Cypress, Treesbank, and Carroll; on the Souris extension at Pipestone and Reston; along the M. and N.W., elevators at Arden, Neepawa, and Franklin, and warehouses at Newdale, Strathclair, Birtle, and Russell; and on the Great North-West Central, at Hamiota, Oak River, and Forest. The additional elevators will increase the storage by 750,000 bushels."

A linseed oil mill with a capacity of 50,000 lbs. of seed a day is shortly to be erected, and will probably be located at Sidney, near Victoria, B.C. The promoter is Mr. M. de Keyser Verbiest, who has interested Belgian capital in the undertaking. Mr. E. L. de Keyser Goethals, a large manufacturer in this business, has decided to move his establishment from Eecloo, Belgium, to Canada. Besides the making of linseed oil, oilcake, and other products, the manufacture of canvas for oil factories and cloth will be added to the mill, which, to begin with will employ 25 or 30 hands. While the supply of linseed will be imported to start with, Mr. Verbiest says that the farmers would do well to turn their attention to the raising of flax seed, which brings easily from \$35 to \$40 per acre. He is quite prepared to give farmers full information regarding its cultivation.

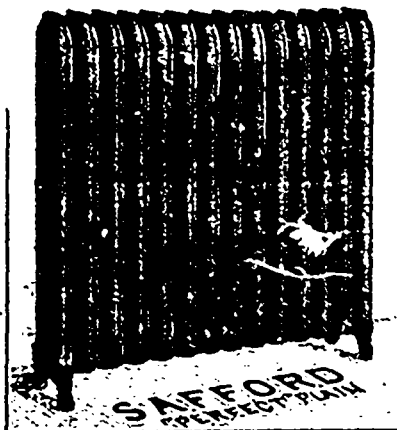
The St. John's, Que., News says that The Dominion Cotton Mills Co. are at present putting in a plant whereby they are to utilize their water power in compressing air which will be transmitted to the engines and used as a motive power in place of steam. The system is that known as the Taylor Hydraulic Air Compressing System, and the success of it will be watched with great interest by all users of power in this country. The system is described as follows: "The air is compressed by the direct action of falling water without the aid of any moving machinery, and practically without expense for maintenance or attendance, after installation. The water is conveyed to the compressor by means of an open flume; or through a pipe supplying a tank pipe round the headpiece of the compressor, where it can attain the same level as the water in the dam or source of supply. Around the headpiece are placed a large number of small, horizontal air-pipes, drawing their supply of air through larger vertical pipes, which extend above the surface of the water and open to the atmosphere. As the water enters the down flow pipe, and passes the ends of these small air pipes, it draws in the air constantly, in the form of small uniform globules, which, becoming entangled in the descending water, are carried down to the air-chamber, at the bottom of the pipe; compressing the air by weight of the water surrounding these globules, according to their depth below tail-race water level, until they reach the point of separation. The pressure on the air is then maintained, so long as any air remains in the air chamber. The receiver or air-chamber at the bottom of compressor is sufficiently large in diameter to allow the air to rise to the surface of the water therein; from thence it is taken through the air pipe for transmission to be utilized as power, or for other purposes. Should the volume of air taken down be greater than that being used, it accumulates in the air-chamber until it forces the water below the lower end of the receiver, and the surplus air passes up with the return water, thereby forming a perfectly automatic safety valve, without change of pressure."

HEATING APPARATUS

Safford : Radiators

RECEIVED THE HIGHEST AWARDS :

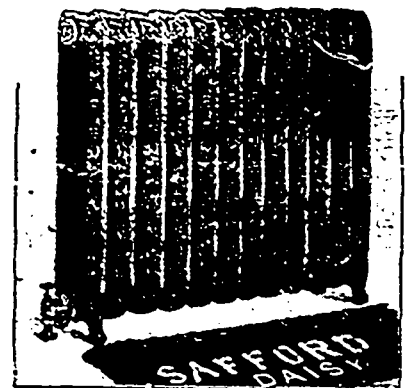
ANTWERP	(BELGIUM)	EXPOSITION	1894.
TORONTO	(ONTARIO)	EXHIBITION	1894.
OTTAWA	(ONTARIO)	EXHIBITION	1892.
SHERBROOKE	(QUEBEC)	EXHIBITION	1897.



ALL IRON.

Largest Radiator Manufacturers

Under the British Flag.



THE TORONTO RADIATOR MFG. CO. LTD.,

Toronto, Ontario.

The Toronto Mineral Wool Mfg. Co. have been incorporated with a capital stock of \$24,000 to manufacture mineral wool.

The Bennet & Wright Co., Toronto, have been incorporated with a capital stock of \$98,000 to manufacture boilers, furnaces, etc.

A despatch from Quebec states that the arrangements between the Montmorency, Que., Cotton Company, whose mills are at Montmorency Falls, and the Canadian Cotton Combine, expire on the 31st of August. No new arrangements have been made and the probabilities are that the Montmorency Company will run its mill independent of the combine. The Montmorency Company have issued a circular to the trade that they will be prepared to furnish goods on their own account on and after September 1st. No mention is made of prices and the members of the combine do not think that the Montmorency people will try to undersell them at present. Their output consists of gray cotton.

A description of the works of the Ottawa Carbon and Porcelain Company may be opportune in view of the fact that they will shortly be completed. From the Elgin, Isabella, Metcalfe, or Jane street elevations, the erections with the high kilns and chimney stacks, present a decidedly manufacturing appearance to the district. The main frontage runs 300 feet parallel to the southern side of the C. A. R. depot, the rails only being separate from the works by the width of Isabella street. This elevation shows a row of brick two-storey buildings, to be used as storage of the new material, such as clay, coke, etc. A continuation of this frontage is the offices of the company, divided by the main cart entrance. At the rear of these buildings there is a space between them and the main works proper. Over this space a siding of the Canada Atlantic will be run for the purpose of conveying coal, coke, fireclay, and other materials, the coal being dumped to the boiler-room by a unique arrangement. The works proper are divided into two sections, the porcelain and the carbon manufactories. To the west end of the central building, which will be two storeys high, and be occupied by the machinery and dynamos, will be the carbon department, whilst to the eastern side will be the porcelain. Both of these departments extend the entire length of the works to the rear, going through their different processes till they reach the immense store room at the back. About a hundred and fifty men will be employed immediately everything is ship-shape, and gradually that number will be increased very considerably.—Ottawa Free Press.

The Easton Boot & Shoe Mfg. Co., Toronto, have been incorporated with a capital stock of \$3,000 to manufacture boots and shoes.

E. E. Collins' agricultural implement works and Wm. Collins' cabinet works, at Simcoe, Ont., were destroyed by fire May 24; loss about \$1,500.

The British Columbia oil and guano factory enterprise, mentioned in the Colonist some time ago, is progressing very favorably. The factory is being erected on the Fraser river, and will be open for business very shortly. I. Watts, the manager, says that the company will be able to handle the business so as to for all time solve the problem of the disposition of offal.—Victoria, B.C., Colonist.

John Starr, Son & Co., have just been awarded the contract for installing a complete telephone exchange for fifty subscribers at Campbellton, N. B., including switchboard, telephones, wires, etc. Messrs. Starr have also just received an order through their Quebec agents for five standard switchboards with the necessary telephones, etc. This speaks well for the superiority of the "Unique" telephones, manufactured by them, as in both instances the above were secured in face of strong competition. This firm have made a specialty of telephones for some time, and their make are well and favorably known all over Canada.—Halifax Herald, N. S.

Messrs. Darling Bros., Montreal, inform us that they have recently shipped the following elevators:—Three power elevator machines for the Granite Mills Co., St. Hyacinthe, Que.; one hand power elevator to G. G. Bryant, Sherbrooke, Que.; four hydraulic elevators for the Montreal Cold Storage and Freezing Co., making a total of nine hydraulic machines to this company; one hand power elevator to Messrs. H. C. Wilson & Sons, Sherbrooke, Que.; one 125 horse power Webster vacuum feet water heater to the Jas. Robertson Co., Montreal; one power hack saw to Messrs. Joseph Robert & Fils, Montreal; one power hack saw to the Sherbrooke Machine Co., Sherbrooke, Que.; and one power hack saw to the Dominion Wire Rope Co., Montreal.

THE ATTENTION of the Woollen Manufacturers is called to **THE TORRANCE PATENT SELF-ACTING BALLING MACHINE** and positive Creel Feed for Wool Cards. The latest and best and only feed on the market that will make yarn positively even. These machines are built by **The Torrance Mfg. Co., Harrison, (East Newark), N.J., U.S.A.,** for the States, and by **The St. Hyacinthe Mfg. Co., St. Hyacinthe, Que., Canada,** for the Canadian market.

FOR SALE

A new and improved method or process for the Manufacture of Crucible Cast Steel of any grade or quality, for all machine tools and other purposes. For terms and particulars

Address: **PRACTICAL,**
Care of The Canadian Manufacturer, Toronto.

.. IMPORTANT .. TO LIGHTING STATIONS.

OUR NEW

ALTERNATING CURRENT INDICATORS

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

WHITNEY

ELECTRICAL INSTRUMENT CO.

Sherbrooke, P. Q., Canada.

Penacook, N. H., U. S.

.. AGENTS ..

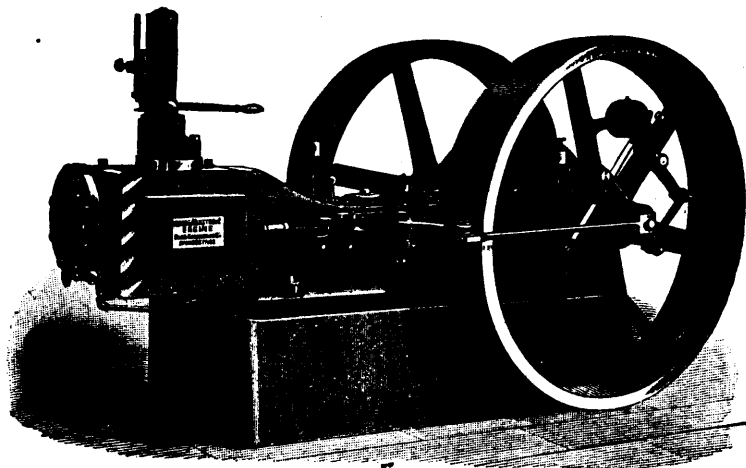
Henry F. Kellogg, General Selling Agent.

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

Robb--Armstrong

= = Automatic Engines

SIMPLE, TANDEM AND CROSS COMPOUND.



The following sizes ready for immediate delivery :

10, 15, 20, 30, 60, 80, 100, 125, 150 and 175 H.P.

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

AGENTS:

The Canada Machinery Agency, 321 St. James Street, Montreal,
Wm. McKay, Seaforth, Ont., Travelling.

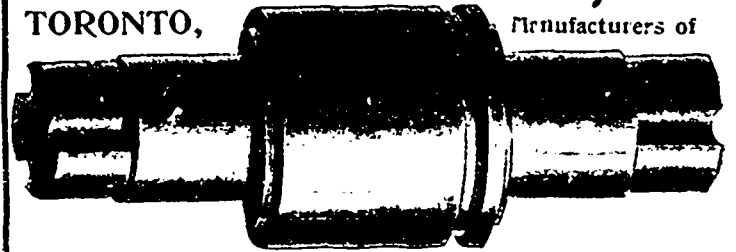
Mr. Eli Chant, Chantry, Ont., will erect a shingle mill.
 W.C. Edwards & Co., Vernon, Ont., propose rebuilding the old saw mill at that place.
 W.C. McDonald, tobacco manufacturer, Montreal, will rebuild his factory which was recently destroyed by fire.
 Messrs. Simon & Henry Brubacher's old sawmill near Berlin, Ont., was destroyed by fire June 2; loss about \$1,000.
 E. G. Lavalie is erecting a sawmill at Notre Dame des Anges, Que., for which Messrs. Carrier, Lane & Co., Quebec, will supply the machinery.
 The Waterloo Knitting Co., Sherbrooke, Que., have ordered for their works a 100 h. p. engine and boiler, new cards, two new mules, and two knitting frames which will cost about \$8,000.
 The tender of Mr. John Perkins, of the Toronto Engineering Works, for the supply of hydrants, was recommended for acceptance by the City Engineer to the Board of Works. The City Council at its meeting a few days ago by unanimous vote, adopted the Engineer's recommendation, and Mr. Perkins will supply all the hydrants required in Toronto for the next twelve months.

President Collier, of the Atlanta Exposition, has closed a contract with H. R. Worthington & Co., of New York, for the pumps to supply the electric fountain at the Cotton States and International Exposition. The capacity of the pumps is 40,000,000 gallons in twenty-four hours, or double the capacity of the Atlanta water works pumps. Worthington & Co. will make, in connection with this, an exhibit covering 3,000 square feet. The electric fountain is designed by Mr. Luther Stieringer, who is consulting electrical engineer for this Exposition, as he was for the World's Fair. John Macdougall, Calendonian Iron Works, Montreal, are general agents in Canada for the Worthington pumps, hydraulic machinery, etc.

Down at the workshops of the Street Railway Company the finishing touches are being put to a new pattern of closed car that will make the people rejoice. It is, in outward appearance, a good deal like "470" the Yonge street palace car, but is a single instead of a double truck car. The vestibule is built in permanent form, and there are guards around the car to keep vehicles from injuring it. The doors of the car are at one side of the ends instead of the centre, and the space between the seats is over a foot wider than in the present pattern. The lighting, the ventilation, the carving, the plush cushions, are all of the best, and "492" will be a big improvement on existing rolling stock. Mr. McKenzie says a number of cars of this pattern will be put on the road next fall.—Toronto Globe.

W.J. Moses is erecting a saw mill at Vernon, Ont.
 Powell & Keltie sawmill, McCool's Siding, Ont., has been destroyed by fire.
 The Royal Pulp & Paper Co. will erect a large saw mill as an adjunct to their works East Angus, Que.
 The Foster Glass Works, Port Colborne, Ont., have lately shipped a very large consignment of glass to British Columbia.
 The Dominion Electric & Mfg. Co., Montreal, have been incorporated with a capital stock of \$50,000 to manufacture wire, rods, cables, etc., of brass, copper, etc.
 Messrs. Livingstone Bros., Baden, Ont., propose building a large linen and fine cordage factory at Buffalo, N.Y. It is said they are the largest flax growers and manufacturers of linseed oil, etc., in Canada.
 The Hastings mills of Vancouver, B.C., are getting out 100 ships' spars, destined for Sydney, Nova Scotia, where they will be used in shipbuilding. They will be carried around the Horn in a sailing vessel due to leave next month. The spars must not be shorter than 65 feet nor exceed 92 feet, and at the centre must have a diameter of from 14 to 22 inches. Each spar will be of clean fir timber and free from cracks, knots, or other defects. They will be squared at the camp to reduce the weight as much as possible.

WM. & J. G. GREY,
 TORONTO, Manufacturers of



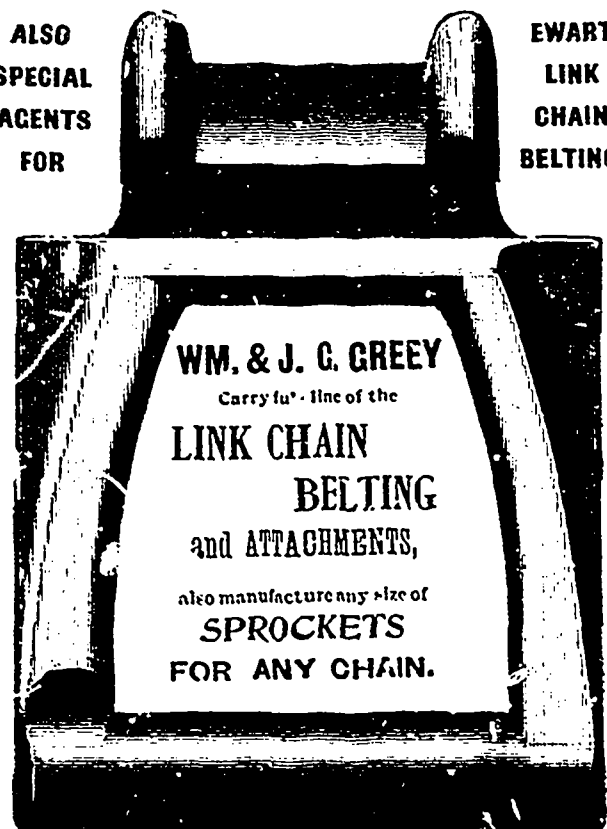
SUPERIOR CHILLED ROLLS.
 FOR ALL PURPOSES.

Perfect Surface, Deep Chill, Hard, Tough, Durable,
 Guaranteed Free From Flaw.

Have the Largest and Most Complete Plant for Grinding and
 Corrugating Rolls in Canada.

ALSO
 SPECIAL
 AGENTS
 FOR

EWART
 LINK
 CHAIN
 BELTING.



WM. & J. G. GREY
 Carry full line of the
**LINK CHAIN
 BELTING**
 and ATTACHMENTS,
 also manufacture any size of
SPROCKETS
 FOR ANY CHAIN.

.....THE.....
Goldie & McCulloch Co.,
 Limited,

Galt, Ontario,
 MANUFACTURERS OF

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 Wood Rim Split Pulleys, Friction Pulleys,
 Friction Clutch, Couplings, etc.

"Dumfries - Foundry,"
 Galt, Ontario, Canada.

The Royal Pulp & Paper Co. proposes to erect a saw mill at East Angus, Que.

The Doon wool stock mills, Doon, Ont., has been bought by Peddar & Cole for \$5,700.

Maddon and Shannon have started work on the flour mill and elevator to be built at Hamiota, Man.

Two of the Wisconsin Malt and Grain Co.'s elevators at Appleton, Ont., were destroyed by fire June 7; loss about \$150,000.

A carload of new machinery has been shipped from Toronto to the Ogilvie mills in Manitoba. The mill at Winnipeg is to receive a large addition.

The Compound Fodder Co., of Ontario, have been incorporated with a capital stock of \$50,000 to manufacture machinery for the manufacture of fodder, etc.

The Ottawa Hydraulic Mining & Milling Co., North Bend, B.C., has been incorporated with a capital stock of \$250,000, to carry on mining business and to erect quartz mills, smelters, sawmills, etc.

The samples of stone received at Ottawa from the lithographic stone quarry at the head of Lake Temiscamingue, owned by B. Kelly, Vanleek Hill, Ont., have been pronounced equal to the imported German stone.

A new duplex compound condensing pump of the Northey pattern is being put in by the Golden Lode Mining Company, South Uniacke, N. S. This pump, it is said, will deliver the water from a vertical depth of 400 feet. Mr. Hayward, the manager, is also having a 50 horse power boiler at the mine.

An encouraging feature of Canadian trade with Australia is the fact that the Canadian Rubber Company, Montreal, is receiving large orders for goods from that country. Considerable orders for rubber shoes, as well as for belting, hose and packing, have been received. The goods are shipped over the Canadian Pacific via Vancouver, and are landed at Sydney, which is the distributing point.

Mining matters are looking up in this district. At Goldenville, Mr. Jas. A. Fraser is erecting a modern plant for the New Glasgow Gold Co. on the Chicago and Meridian areas. When the building is finished this mine will be one of the best equipped in the province. The Stellarton Gold Co. employ about 30 men, and their good returns still show success to be on their side. The Springfield Co. have started anew and look forward to a good season's work. At Wine Harbour, B. M. Davidson of Halifax and Dr. Eames are pushing mining matters.—New C^olow, N.S., Chronicle.

Mr. Copp, Port Elgin, Ont., will erect a grist mill at that place.

Messrs. Livingstone's flax mill, Tavistock, Ont., was destroyed by fire June 3.

Messrs. Rogers & Co.'s woolen mills at Alliston, Ont., were damaged by fire May 31.

Messrs. Paxton & Co.'s cooperage works, Montreal, were destroyed by fire June 2; loss about \$10,000.

The Farmers' Association, Inwood, Ont., are applying for incorporation with a capital stock of \$5,500 to build a flour mill.

The J. McCarthy & Sons Co., Prescott, Ont., have been incorporated with a capital stock of \$100,000 to carry on a general brewing, malting and milling business.

Jas. C. Ross, Lockport, N.Y., has leased the Wingham, Ont., oat-mill from Wm. Clegg for a term of years. He has removed the machinery and is putting in a full set of new manufacturing machinery as well as refitting the engine, boiler, etc.

The Massey Manufacturing Co., Toronto, will erect an extensive addition to their premises for the manufacture of bicycles, the works to employ three or four hundred men. Heretofore bicycles have been imported into Canada in pieces and put together here. But the Massey-Harris Company will make the entire machine.

The Fossil Flour Company is erecting works at Bass river, Nova Scotia. The object of the company is the refining and marketing of infusorial earth, which is found in large quantities at the bottom of several lakes in Colchester and Cumberland. The refined product finds a ready market in the United States, where it is extensively used in the manufacture of dynamite, in making steam packing, and for various other purposes.

Directors J. H. Tilden and John Milne, Superintendent Morehouse and Engineer Strobel, of the Hamilton Iron and Steel Company, Hamilton, Ont., were in Toronto a few days ago closing the deal with Wm. Gooderham, who has taken \$100,000 worth of stock in the smelting works. Mr. Gooderham is largely interested in iron mines at Coe Hill, Hastings county, and at Forsyth, near Ottawa. The ore in the latter mine is of the very finest quality, said to be equal to that of the famous Republic mine in the Lake Superior region. The Coe Hill iron is also of very good quality, but not quite so suitable, being difficult to smelt successfully, unless mixed with a coarser quality. It is probable that the Hamilton smelting works will use these ores, though the Forsyth mine is in Quebec, and consequently the company will not receive the Ontario provincial bonus by using it.

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Joseph Shurr's planing mill at Kohler, Ont., was destroyed by fire June 13; loss about \$5,000.

The Laurie Engine Co., Montreal, are putting in an 800 h.p. engine in the asbestos mines, Eastern Townships.

The Danville, Que., Asbestos and Slate Co. has been incorporated with a capital stock of \$250,000 to manufacture asbestos, slate goods, etc.

Mr. J. N. Haliday has purchased the machinery of the old stave mill in Merlin, Ont., from Mr. Marshall, and is moving it to Glenwood, Ont.

A company to be known as the Dominion Export Company, composed of New York, Boston, and Montreal capitalists, has been formed at Montreal, with a capital of \$5,250,000, to work three million acres of lumber land in Nova Scotia.

Messrs. H. R. Ives & Co., Montreal, have sent us a circular having reference to the Buffalo heating apparatus manufactured by them. This circular contains a diagram of the hot water heating apparatus placed in the Government House, Ottawa, also a letter written by the Governor-General's authority in which it is stated that the boilers and connected heating apparatus have given much satisfaction.

Wright & Cunningham, St. Catharines, Ont., intend to rebuild their foundry shortly.

The Norris flouring mills at Effingham, Ont., will shortly undergo extensive repairs.

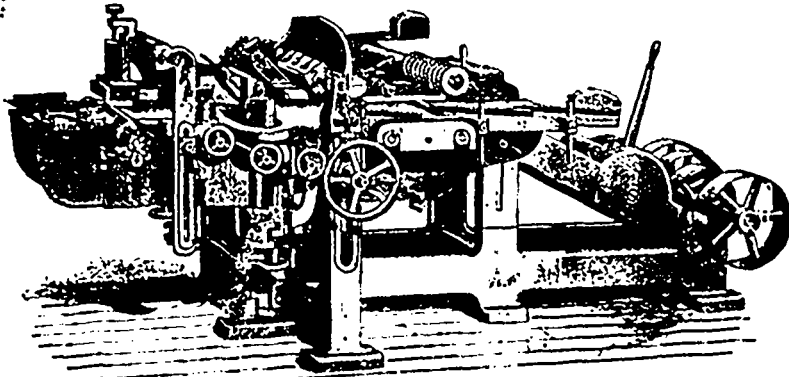
Graham, Horne & Co., are putting an electric light plant in their saw mill at Fort William, N.W.T.

Mr. Whitney, Manager of the St. Anthony Lumber Co., is erecting a large sawmill at Whitney, Ont. It has all the latest improvements of American mills, made of the best material, and constructed under the oversight of expert mill-wrights and mechanics.

Deputy Collector Love, at St. Vincent, Minn., lately received export manifests for over \$13,000 worth of machinery going to Rat Portage Ont., and from there to the Runy River gold mines. The outfit consisted of stamp mills and their belongings, and other machinery needed in gold mines.

The Laughlin-Hough Drawing Table Co., have started their factory at Guelph, Ont. The woodworking machinery, which is all of the latest designs, is the manufacture of the Goldie & McCulloch Co., and includes surface planer, buzz planer, jointers, rip saws, band saws, shapers, turning lathes, dowel machines, etc.

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The Blanchard Organ Co. have erected an organ factory at Elora, Ont.

G. Scott's planing mill, Mount Forest, Ont., was destroyed by fire June 15; loss about \$3,000.

The village of Killaloe, Ont., wants a roller mill so badly that they offer a bonus of \$1,500 to anyone who will build.

The Winnipeg Electric St. Ry. Co., will spend between \$50,000 and \$60,000 in putting in a large plant into their new works. The power house is to be enlarged by an addition which will have brick walls and iron roof. A chimney 150 ft. high will also be erected.

Business is booming at the Canada Carriage Works. The shipments of vehicles average about 65 daily, while on two days this week the number reached 200. An order has just been received from St. Kitts, West India Islands, for six buggies to be sent via Halifax. The company's output is now represented in almost every portion of the civilized world. - Brockville, Ont., Times.

Messrs. O'Rourke, Salem, Mass., and Odilon Beaudoin, of Broughton, two mining engineers, have recently explored the Saguenay mica mines at the instance of a Boston syndicate, at the head of which is Mr. Thos. Fitzgibbon, of Boston. The latter will, it is said, invest over \$100,000 in the several mines he proposes to buy. Mr. Baumgarten, of London, Eng., has also arrived at Quebec on his way to Murray Bay and Lac a Castor, where he will immediately begin work in the mica mines bought from Messrs. B. Hall and Smith, of Quebec. The amount paid for the last mines is said to be \$20,000. All those mines are situated on the north shore of the St. Lawrence.

Diamine New Blue "R" and "G."

Messrs. Wm. J. Matheson & Co., New York, have sent us a card of samples of goods dyed with Diamine New Blue "R" and "G," accompanied with a circular letter in which they say:—

We take pleasure in offering you two new direct dyeing dyestuffs manufactured by our principals, Messrs. Leopold Cassella & Co., which we call Diamine New Blue R. and G. In fastness to light and washing these colors possess advantages over any of the direct blue dyeing dyestuffs now in the market.

Cotton. This is best dyed with 5 per cent. soda and 15 per cent. Glauber's salt. In combination with dyestuffs that go on without the addition of alkali it can be dyed with only common salt or Glauber's salt.

The fastness to light and washing, as above stated, is better than with the other known blue direct dyeing dyestuffs.

The fastness to alkali and hot ironing of the Diamine New Blue G. is very good, but the "R" mark is slightly reddened by ammonia or hot pressing.

Both marks can be easily discharged.

If treated with bluestone, (sulphate of copper) the Diamine New Blue R gains fastness to light and washing, while the "G" mark is dulled by this treatment.

Unions. Diamine New Blue G dyes wool and cotton equally well, and on account of its great fastness to light and facility of mixing with alkali blues in mixtures, should find a large outlet.

Diamine New Blue R gives bright navy blue shades, but dyes the wool a little darker than the cotton.

Half silk is dyed exactly the same as unions.

Wool as well as silk is best dyed with the addition of 10 per cent.

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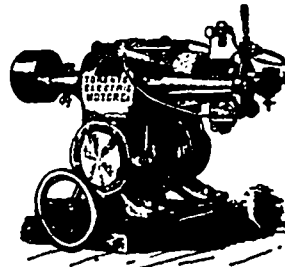
Glauber's salt and 2 per cent. acetic acid, and the Diamine New Blue R. should particularly win favor as producing a navy blue which is fast to washing.

The Rathbun Terra Cotta Works.

A test of the strain-bearing and fire-resisting qualities of the porous terra cotta extensively manufactured by the Rathbun Co., Deseronto, Ont., was witnessed a few days ago, which has claimed for its superiority in these properties over all competing materials. The buildings devoted to the works are 390 ft. long with a wing 190 ft. They contain 200,000 ft of drying floors and the kilns have a capacity of 24,000 bricks or 30 tons per day. For the strain-bearing test six arches of the porous terra cotta had been constructed with star Portland cement, the company's special brand, the dimensions of each with the distributed load carried and the load per square foot being: (1) Nine-inch end construction, 6 ft. 6 in. span, 16,440 pounds distributed load, 633 pounds per square foot; (2) eight-inch vousoir, 5 ft. 6 in. span, 14,640 pounds distributed load, 666 pounds per square foot; (3) eight-inch end construction, 5 ft. 6 in. span, 17,550 pounds distributed load, 799 pounds per square foot; (4) six-inch vousoir, 5 ft. span, 12,240 pounds distributed load, 612 pounds per square foot; (5) six-inch end construction, 5 ft. span, 12,600 pounds distributed load, 630 pounds per square foot; (6) ten-inch vousoir, 6 ft. span, 23,220 pounds distributed load, 968 pounds per square foot. These were the loads already arranged when the test began, and an attempt to find the breaking strain upon the six-inch end construction with a 5 foot span was at once begun, this being selected as the weakest of the lot. The arch was loaded until it was carrying ten tons, or a load of 1,000 pounds per square foot, and finding scarcely any appreciable deflection, at that point the attempt was abandoned, all the experts present being more than satisfied that the qualities of the terra cotta had been absolutely established.

Then attention was directed to an equally interesting fire test, which was of special moment and importance to the Toronto architects, in view of the recent disastrous conflagrations in that city. A chamber 6 ft. x 4 ft. x 5 ft. was constructed of one-inch terra cotta slabs and filled with dried lumber saturated with coal oil. The match

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EIDERDOWN FLANNEL, Etc.

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was then applied, and for 50 minutes a fierce and intensely hot fire raged. At the end of that time the slabs were torn out while red hot and plunged into cold water, when it was found that they were not affected in the slightest by the fire. This was considered a most severe test, and it is claimed that no other material will stand it so well. Another important feature to be noted in this test was that the pine board coating which sheathed the slabs remained untouched until almost the end of the test, showing that the terra cotta is not only impervious to fire itself, but as a non-conductor of heat is a splendid protection to more inflammable material. For this terra cotta, which thus so splendidly stood the ordeal, it is further claimed that it is vermin, cold and noise proof; that it is cheap, light (weighing only a third as much as stone), reliable and beautiful; that it will hold nails and can be sawn, qualifications which in every instance add to its value as a building material. It can be used in floorings, furrings, partitions, ceilings, etc., and has already been placed in the Toronto Bank of Commerce, Board of Trade, Canada Life, Freehold Loan buildings and many others. The Rathbuns started its manufacture some eight years ago on a small scale, and to-day they are filling orders from St. John to Winnipeg, and employing 75 men in the works.

Compressed Air Machinery.

The Magog Cotton Mills Company have ordered their buildings to be fitted up with plant and machinery for the operation of the Taylor hydraulic air compressing system, and very satisfactory results in the direction of economical working are confidently looked for. The invention, which has just been perfected, is for the utilization of compressed air as a motive power, without the necessity for any expenditure beyond the initial cost of the very simple plant required, the expense of working being practically nothing.

The use of compressed air as a motive power is not by any means a new idea, it having occupied the attention of scientific men for many years. Indeed, there are at present in operation, in France and Switzerland, storage systems of tramways which are worked at less rates per car than either horse or electric cars. These air cars carry tanks stored with sufficient compressed air to last a given time. To store these tanks steam or other power is required. Under the new system, however, of which Mr. C. H. Taylor, of this city, is the inventor, no artificial force is required at the outset. The following is the mode of operation:—A shaft is sunk in the ground to a depth varying according to the pressure desired. Down this shaft a pipe is run with a cylindrical or otherwise shaped "receiver" at the end, which is open at the bottom and hermetically closed at the top, around the end of the pipe. The open bottom of this receiver is raised a little

from the bottom of the shaft, in order to allow of the escape of the water. Around the upper end of the pipe is fitted a vessel, called the head piece, which is kept supplied with water by means of a supply pipe. Running into the main pipe, just as far as its opening, are a number of small tubes. When the water, entering the "head piece" by means of the supply pipe, rises above the top end of the main pipe, it immediately begins to fall down through the pipe, to the receiver beneath, carrying with it, in bubbles, the air which is drawn in through the small tubes already referred to, the bubbles becoming entangled in the descending water. Upon falling into the receiver the air and water become again separated; the air rising to the top of the receiver and being compressed there by the pressure of the water, rising upward in the receiver past the end of the pipe, which comes down well into the receiver. The pressed air having, in its turn, been compressed as far as it can be, the water, as it keeps entering the receiver from above, is forced out through the open bottom of the receiver and up the shaft, until it is carried off by means of a tail race. Thus, the pressure being equal on both sides of the pipe, no extra strong material is required for the construction of the latter, there being no danger of bursting. There is now a quantity of highly compressed air in the receiver, and this is brought thence by means of a small pipe provided with a stop cock. A strong, steady stream of highly compressed air is thus produced, which can be directed by means of pipes wherever the power is required.

The whole system is fully protected by patents and is controlled by a joint stock company, and charter granted under the title of the "Taylor Hydraulic Air Compressing Co., Ltd." with a capital of \$500,000, and headquarters at 183 St. James street, Montreal. The gentlemen composing the company, before finally acquiring the rights, submitted the models of different sizes to Prof. John T. Nicholson, Professor of Mechanical Engineering and Thermodynamics of McGill College, who submitted them to one hundred and nineteen tests, extending over a period of six weeks, and concluded his report to these gentlemen with these words:—

"I must admit that any prejudices or doubts I may have had (some of which I expressed in conversation) regarding the feasibility of the undertaking, have now completely disappeared, and I entertain a most favorable opinion of the merits of Mr. Taylor's system."—Montreal Star.

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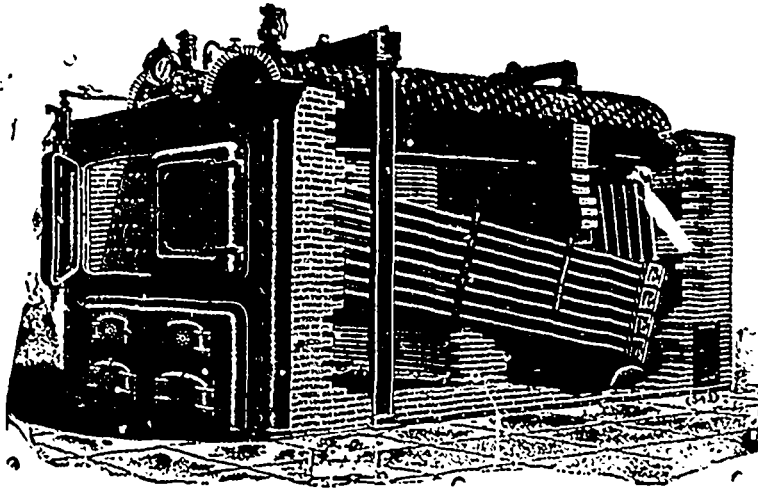
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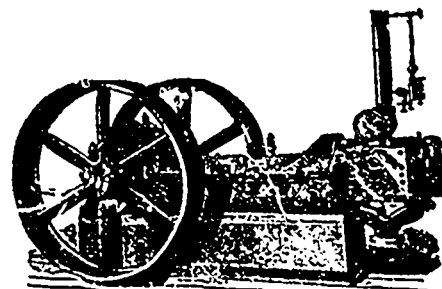
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Steam Pumps
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CANADIAN PATENTS.

The following patents have been issued from the Canadian Patent Office, from to March 12, to April 3 1895.

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

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

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

48,427 Steam boiler, Wm. Y. Fleming & Peter Ferguson, Paisley, Scotland.

48,428 Carrying case, Thos. J. Byers, Eganville, Ont.

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Full information as to the machinery and tool furnished if desired.

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- 48,429 Draft regulator, Jas. J. Lawler, Scranton, Pa.
- 48,430 Machine for manufacturing supplementary metallic shingle strips, Chas. H. Dana, West Lebanon, N. H.
- 48,431 Wagon body fastener, Clinton D. Bradshaw, Derby, Kan.
- 48,432 Bicycle lock, Thos. A. Hilton, Coldwater, Mich.
- 48,434 Rotary show plow, Fred D. Linton, Toronto, Ont.
- 48,435 Spring shackle for vehicles, Hy. C. Swan, Oshkosh, Wis.
- 48,436 Bicycle crank, Ferdinand F. Ide, Peoria, Ill.
- 48,437 Clover seed attachment for mowers, Danl. C., Ennismore, Ont.
- 48,438 Sole trimming machine, Jno. B. Emery, Lynn, Mass.
- 48,439 Churn, Madts Hanson, Blair, Wis.
- 48,440 Smokepipe damper, Benj. Frigon, Montreal, Que.
- 48,441 Butter mould, Napoleon Lefebvre, Montreal, Que.
- 48,442 Anti-rattler for thill coupling, Frank P. Johnson, Danville, Ont.
- 48,443 Device for transmitting power by compressed air or other fluids, Jas. G. Westbrook, Ogdensburg, N.Y.
- 48,444 Wardrobe, etc., Matthew C. Drew, Burk's Falls, Ont.
- 48,445 Washing machine, Abel E. Hammond, Mansonville, Que.
- 48,446 Steam trap, Michael Partington, Fall River, Mass.
- 48,447 Gas engine, Frederick W.C. Cook, Erith, Eng.
- 48,448 Harness, Chas. Rain, Cleveland, O.
- 48,449 Steam engine, Pardon Armington, Providence, R.I.
- 48,450 Composition for use in lettering, etc., Doctor August Kirschmann, and Robt. F. Hogg, Toronto, Ont.
- 48,451 Elevator, Reuben J. Melius, Bath-on-the-Hudson, New York.
- 48,453 Ruler, Frank B. Deming, Calais, Maine.

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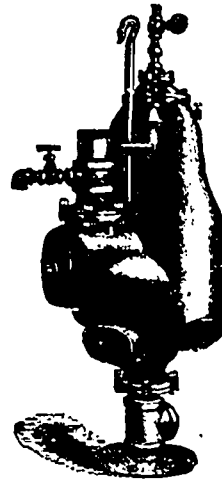
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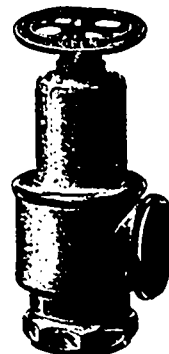
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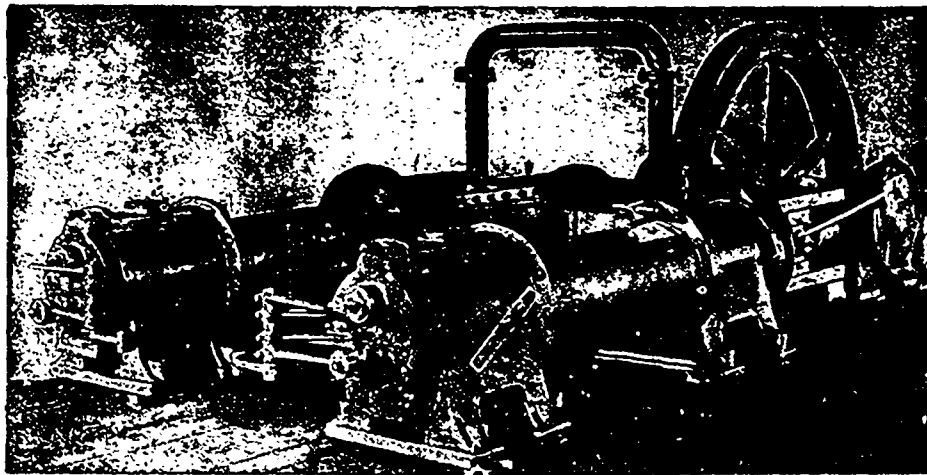
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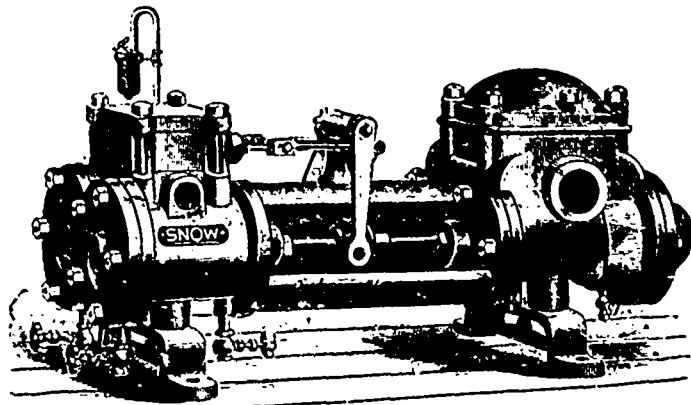
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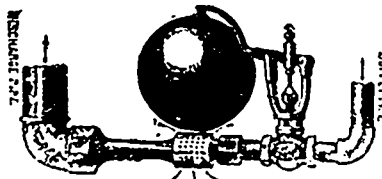
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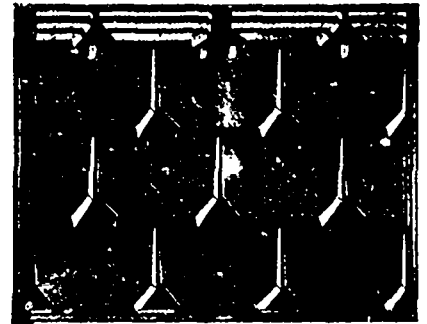


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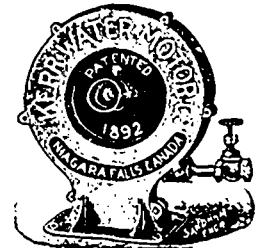
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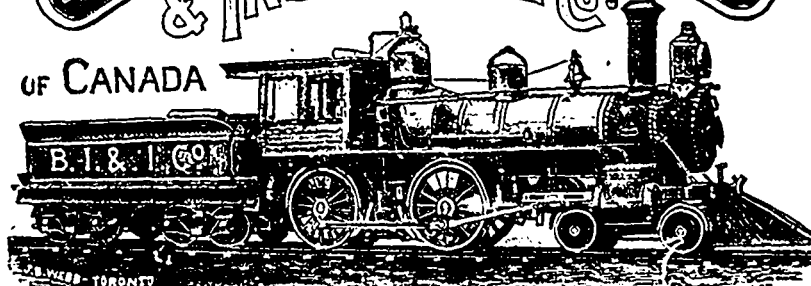
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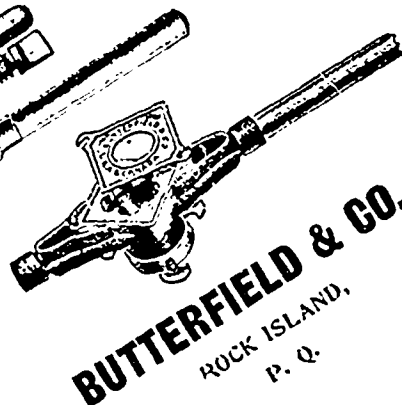
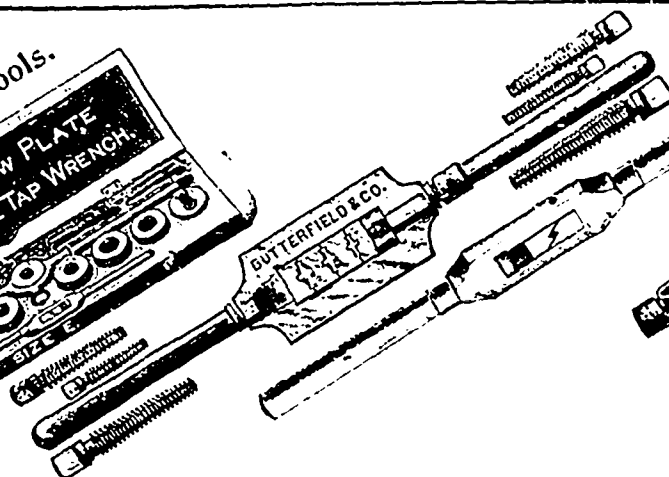


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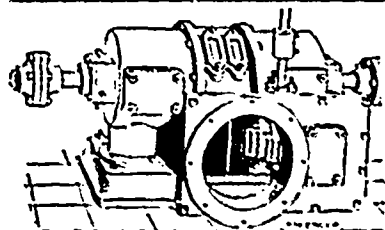
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1 1/4	1 1/4	4.13	1/2 cts.	2 1/4	2 1/4	18.91	4 cts.
1 1/8	1 1/8	5.01	"	3	2 7/8	22.59	"
1 1/2	1 1/2	5.94	"	3 1/4	3 1/8	26.60	"
1 3/4	1 3/4	7.46	"	3 1/2	3 1/8	30.94	"
2	1 7/8	9.83	4 cts.	4	4	42.33	5 cts.
2 1/4	2 1/8	12.53	"	4 1/2	4 1/2	53.57	"
2 1/2	2 1/8	15.55	"	5	5	66.13	"



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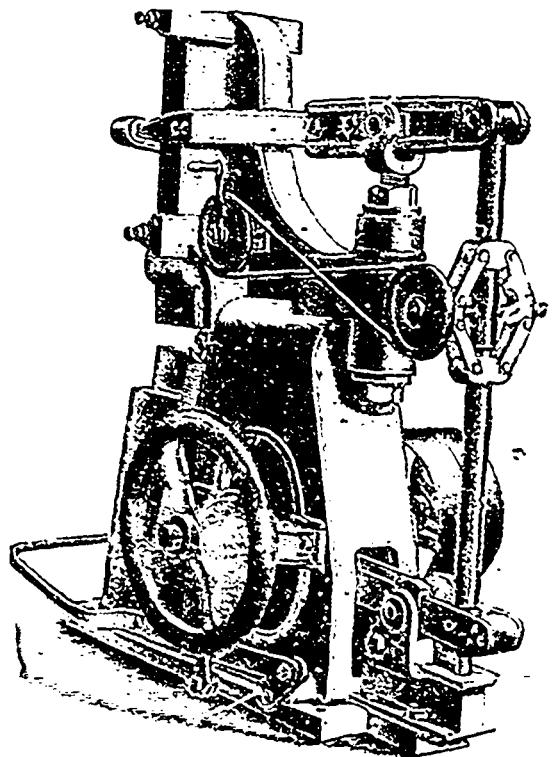
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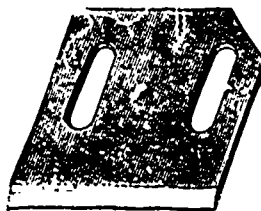
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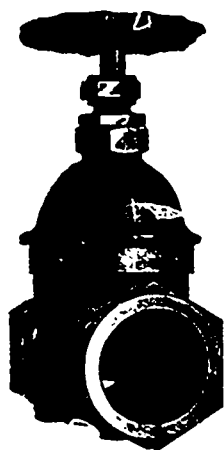
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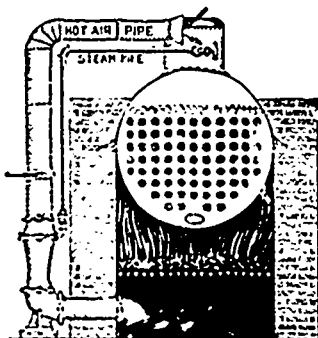
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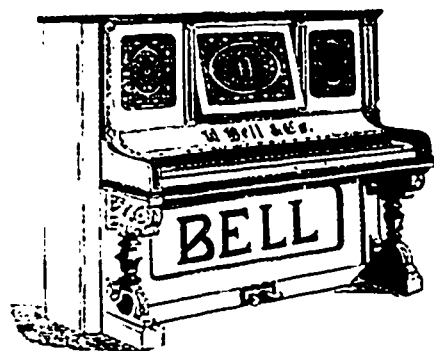
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Cash.....	\$ 6,179 44	Reserve, and on acct. of Policyholders..	\$169,401 00
Bonds and Mortgages.....	238,473 21	Other Liabilities.....	6,834 70
Other Assets.....	58,939 83	Net Surplus.....	NIL
Total.....	\$304,592 53	Income.....	157,351 37
		Expenditure, Total.....	147,368 37
		Insurance in force.....	6,110,100 00
			9,532,560 00

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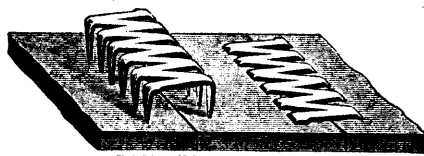
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