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**CANADIAN MANUFACTURER**  
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 DEVOTED TO THE MANUFACTURING INTEREST OF THE DOMINION

VOL. 29. TORONTO, FEBRUARY 1, 1895. No. 3.

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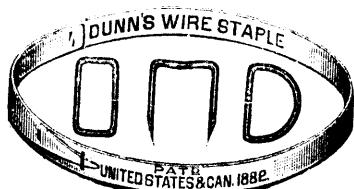
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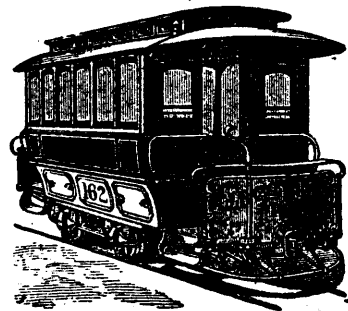
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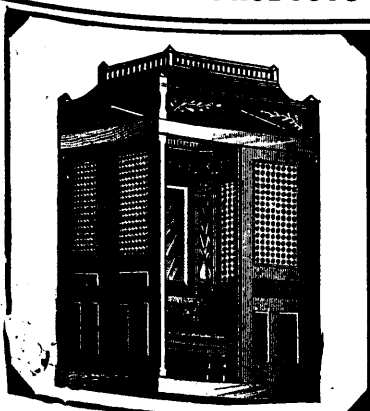
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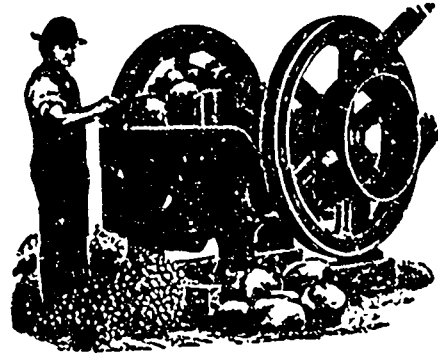
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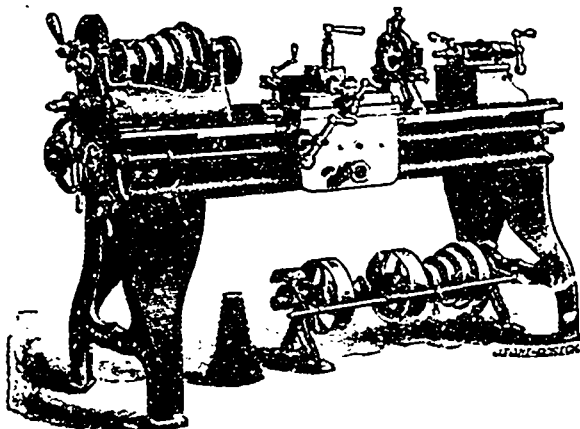
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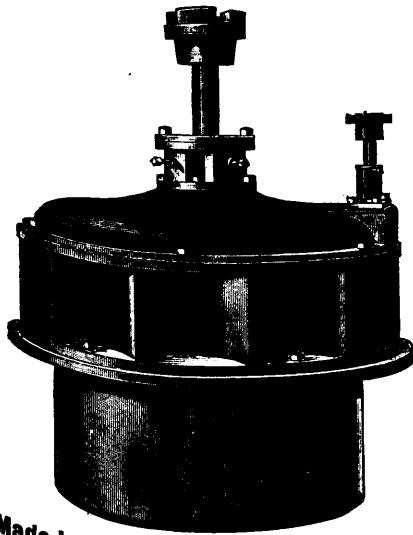
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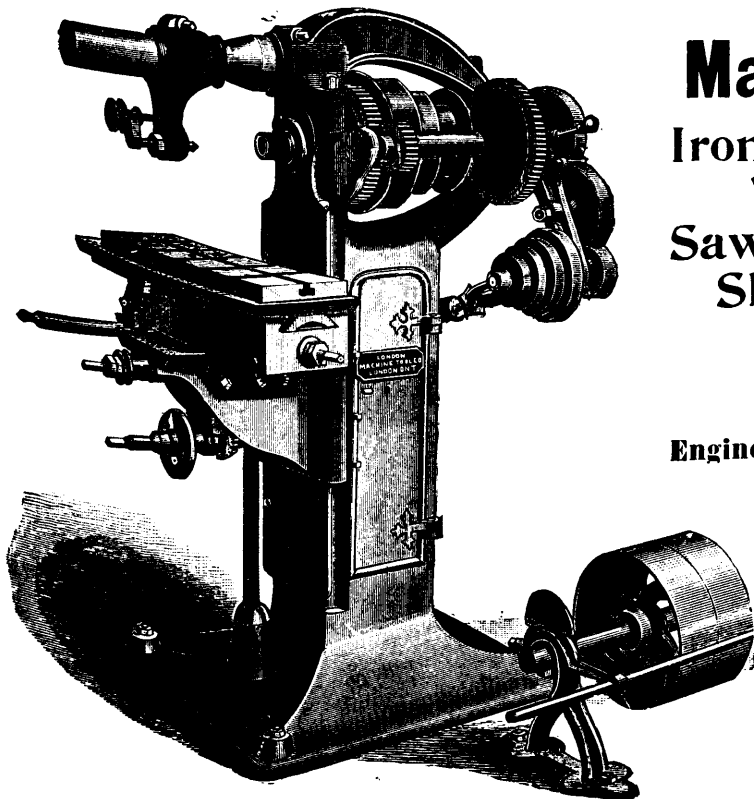
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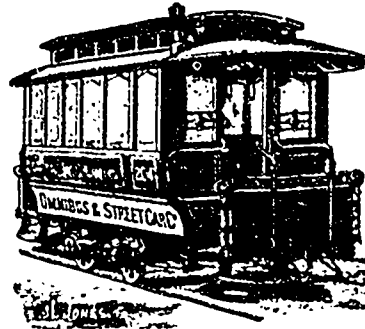
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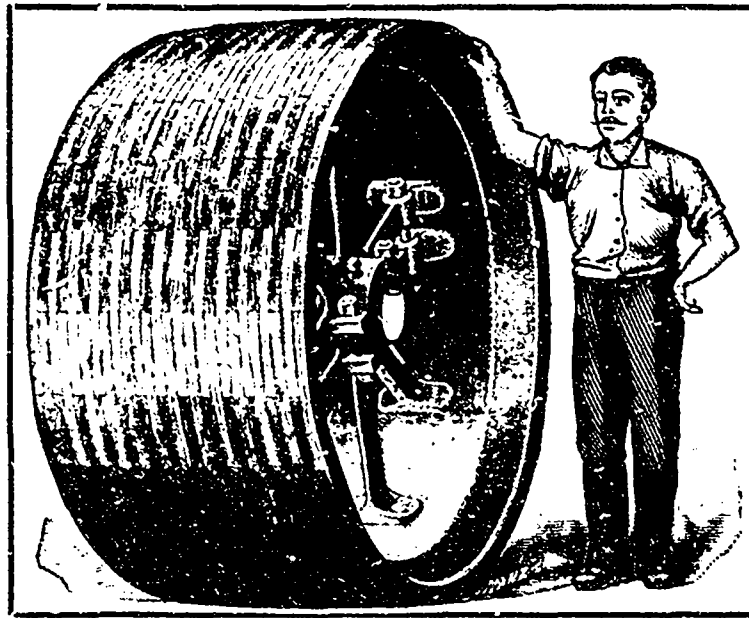
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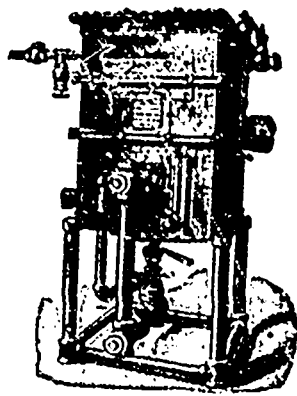
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**7 PLACE D'ARMES, MONTREAL**

**NOTICE**

Manufacturers and Capitalists Patent Acts of 1872,  
and Amendments, Section 28.  
NOTICE is hereby given to all persons do-  
sious of practicing the invention in the  
manufacture of Aluminum and Alloys  
thereof, for which certain letters patent of the  
Dominion of Canada were granted on July 9  
7th, 1889, to Chas. Martin Hall, assignor to the  
Pittsburg Reduction Co., to wit, Nos. 31, 512,  
31,513, 31,514, 31,515, 31,516, 31,517; and also the  
invention in aluminum alloys and manufac-  
ture thereof, for which certain letters patent  
of the Dominion of Canada were granted on  
July 24th, 1892, to John W. Langloy, assignor  
to the Pittsburg Reduction Company, to wit,  
No. 39,492 that the undersigned is prepared to  
grant licenses upon reasonable terms under  
each and all of same letters patent, and other-  
wise place the patent inventions in possession  
of the public in accordance with the provisions  
of the above recited act.  
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**400,000 Horse Power AGGREGATE SALES 400,000 Horse Power**



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THE **WATER HEATER AND PURIFIER :**

It is the only Vacuum Heater made.  
It is the only Heater that returns the condensed steam and drip  
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It is so constructed that it can be cleaned out in a few minutes  
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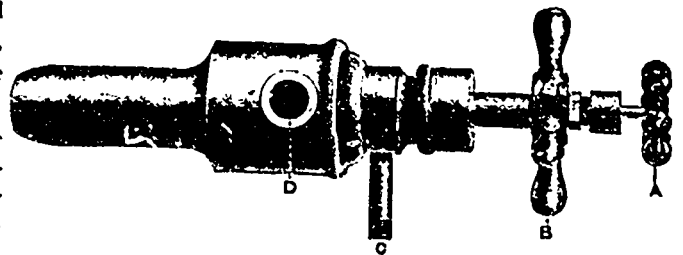
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process.



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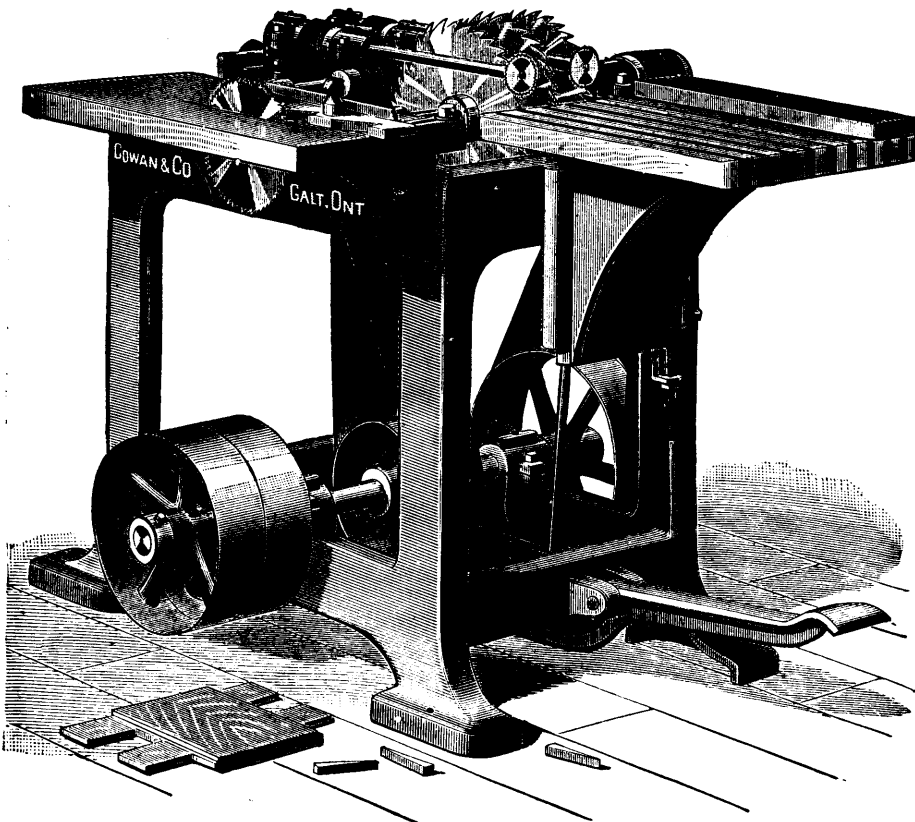
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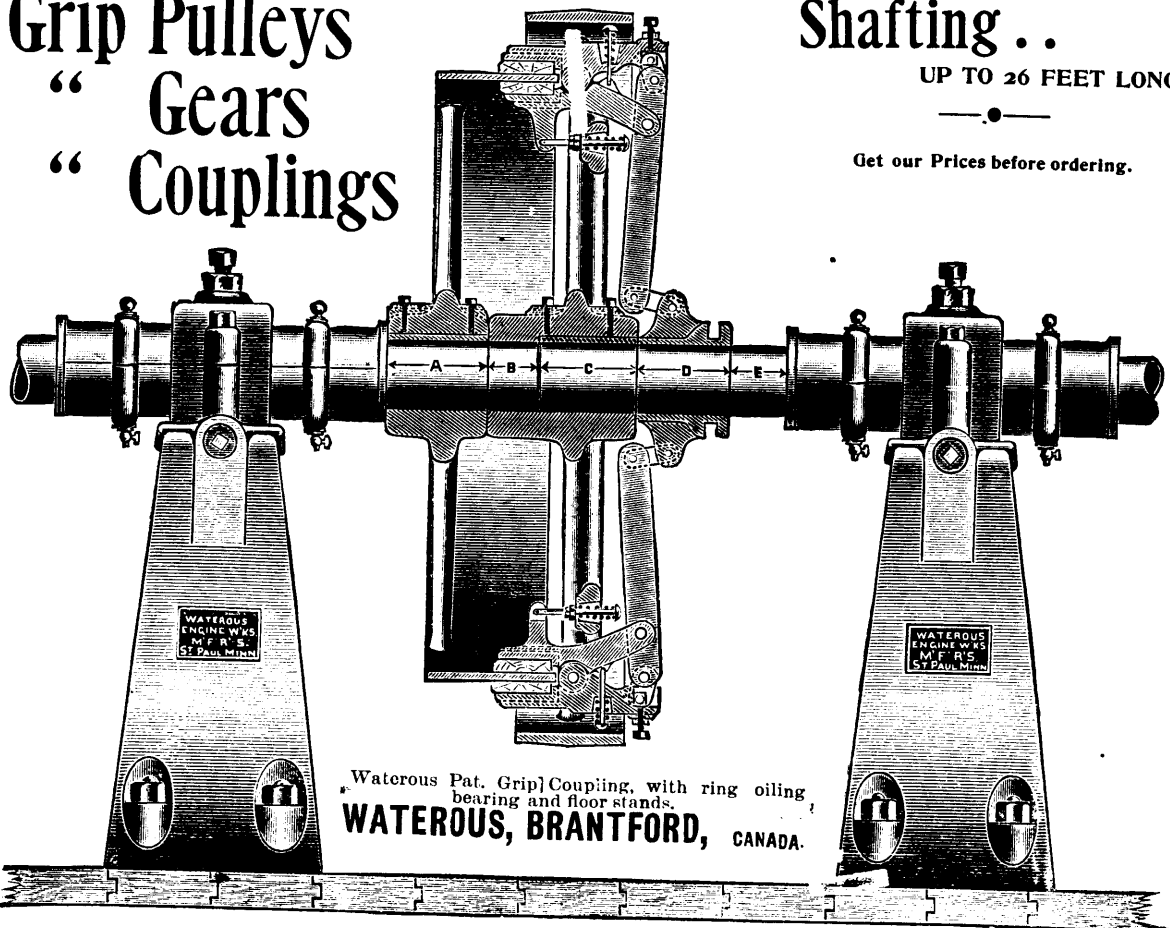
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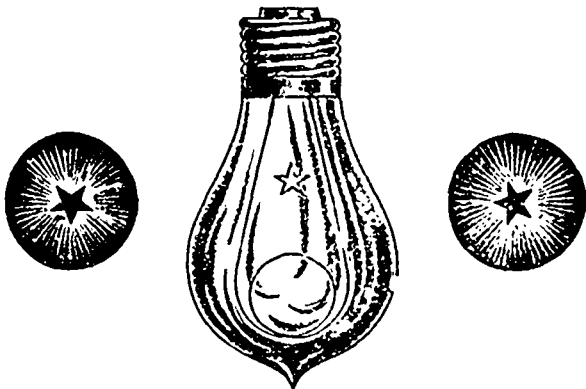
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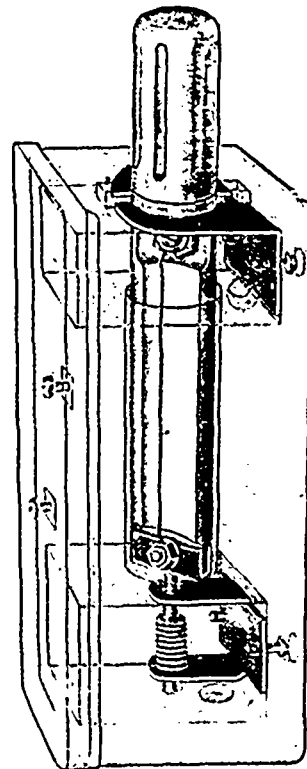
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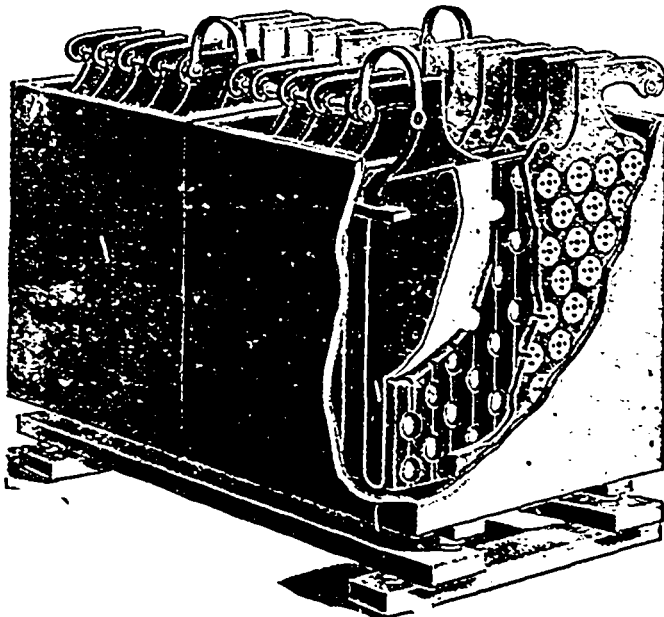
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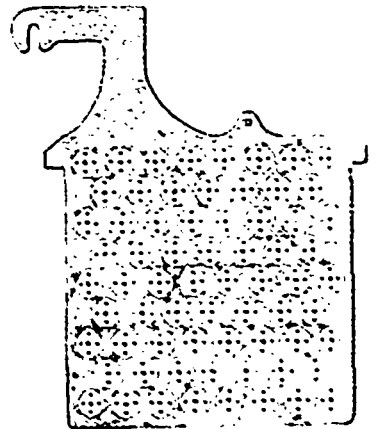
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## NOTES ON THE PIG IRON TRADE OF 1894.

At the annual meeting of the General Mining Association of the Province of Quebec held in Montreal, January 9, Mr. George E. Drummond, vice president of the Association, read a paper on the Pig Iron Trade of 1894 which undoubtedly possesses a great deal of interest for our readers, and we are under obligations to Mr. Drummond for a corrected and revised copy of the same.

It should be noted that as regards some of the Canadian furnaces, the particulars of which are given by Mr. Drummond, particularly those of the Canada Iron Furnace Company, at Radnor Forges and Drummondville, Que., and of

the New Glasgow Iron Coal and Railway Co., the public would not have been able to obtain this information from Government returns for some months to come. It is the aim of the Mining Association of Quebec to have the returns from the various branches of the mining industry each year at a date not later than January 10.

Following is Mr. Drummond's paper :

The year 1894 is not likely to go down to history as a year of unparalleled success in the iron trade of the world. In common with nearly all other leading industries, that of iron has been working on "rough ground." In the United States, now the leading iron market of the world, the shadow of the panic year of 1893 seems to have darkened every avenue of trade and commerce, and not least of all the iron industry. The exhaustion following on so severe a shock, of itself prevented any very rapid recuperation at the commencement of the year. At the commencement of 1894 the outlook was gloomy enough, and as the year wore on it brought with it a long series of troubles calculated to prevent reviving confidence and enterprise.

Among the difficulties referred to, the depletion in the Government gold reserve, beginning in January, led to enormous issues of bonds, which, of course, went to prolong the season of depression. Then the coal and railway strikes and finally the great uncertainty of the tariff question. This combination of adverse circumstances all tended to bring about an unparalleled shrinkage in values, affecting everything in the iron line from the raw material to finished product, and of course served to restrict the purchasing power of the people.

New and economic methods of production were introduced wherever capital permitted, but withal the work from the first has been unprofitable to capital and labor. Many works have been kept in operation simply to keep the men employed, even if at what a year or two ago would be called starvation wages.

Despite all this the feeling of hopefulness has never died out, and, at the close of the year the output of pig iron in the several districts reported shows an increase over the production of 1893, with many more furnaces in operation.

There is a more hopeful feeling abroad, brought about in a great measure by the result of the recent elections in the United States, and 1895 opens with numerous enquiries from consumers, who are not unlikely to be good buyers in the near future. While the experience of the last two years in the iron trade, and in fact all other trades in the United States, has not been a pleasant one, yet the enforced "breathing spell" is not unlikely to prove a blessing in disguise. Great economy has been practiced in all branches of trade and this must result in good. For instance, the Railway Companies have been so economical that their rolling stock has run down to a great extent, and they must very soon come into the market as large buyers. When they do the whole tone of the iron trade will be strengthened, and it is hoped that capital and labor will be able to earn at least a fair return.

The course of the British iron market during 1894 was marked by the great strike among the Scotch coal miners, which lasted for several months, beginning in July and not coming to an end before October. It appears to have been altogether uncalled for, and did not awaken the public

sympathy as did the English coal strike of the previous year. The result, however, was that the Scotch iron trade was brought almost to a standstill while it lasted, and it will be a long time before the loss of trade can be made up. For over three months hardly a furnace was in blast in Scotland, but, owing to the fact that the great proportion of the foundries, rolling mills, and other consumers of pig iron were also idle for want of coal, the local demand for iron was light, and prices did not advance to any appreciable extent. Warrants remained stationary about 42- to 43/- and the closing price on 31st December was close on 42/-. The effect, however, on special or shipping brands of iron was to advance the price of these about 5/- to 7/6 per ton, owing to their scarcity. No. 1 "Summerlee" was sold as high as 58/6 in Glasgow, the highest point it has touched for the past two years. Several brands were entirely unobtainable. It shows that the Scotch market no longer controls the iron trade of the world, for such a scarcity happening ten or twenty years ago would have sent prices up to an alarming extent. As it was, however, the production and consumption of iron for 1894 shows a large decrease on the previous year, the figure being as follows:

Official returns show that the Scotch pig iron production in 1894 was . . . . . 655,614 tons  
as against, in 1893. . . . . 783,867 "

a decrease of . . . . . 128,253 "

The consumption also shows a decrease, and whilst taking all British made iron into the calculation the consumption only fell 41,657 tons behind that of 1893, yet the decrease in the consumption of Scotch iron, owing probably to the strikes and consequent high prices of coal, was 125,657 tons.

Stocks—At the close of 1894 the stock in Connell's store amounted to . . . . . 287,886 tons  
as against in 1893. . . . . 320,851 "

a decrease of . . . . . 32,965 "

Stock in makers, hands at the close of 1894 . . . . . 70,713 tons  
as against, at the close of 1893. . . . . 60,936 "

an increase of . . . . . 9,777 "

English irons, that is those made in the Middlesboro' district, remain almost unchanged, and a large quantity finds its way into Scotland.

Bar iron and manufactures of mild steel, such as plates, angles, etc., have remained practically unchanged during the year, but, owing to the quiet state of trade prices, closed a few shillings lower than the opening figures of the year. The change that has come over the trade in these goods is very marked. A few years ago almost the entire requirements of the country in mild steel, and all the bar iron that was not produced in this country, came from Great Britain. During the year just ended the importations of these goods from Great Britain were practically nothing. Prices on the American side have been forced down, by keen competition, to such an extent that all the steel plates, and the great proportion of the angles and other shapes now come from Pittsburgh, at prices which the English manufacturer cannot touch.

The same general features of restricted production and consumption brought about by the depression in trade,

obtains in the iron markets of Germany, Sweden, France and Belgium, with the exception that the returns from Belgium evidence an increase in the output, although the consumption has been unsatisfactory.

In sympathy with the condition of the iron trade elsewhere the Canadian iron industry has felt the depression in some degree. The battle over the tariff question that was fought at Ottawa throughout the winter months, had the effect of retarding the progress of the industry, and it may be safely claimed that the first half of the year was, to a certain extent, lost in uncertainty.

Happily the Dominion Government decided that the industry should be encouraged. This restored confidence, and the iron masters took up the work promptly. The effects, however, of the depression in the United States had a very marked effect on the trade of the last six months of 1894. The overstocks of the American iron furnaces were thrown into the Canadian market, and American pig iron found its way as far east as Montreal, at prices that, under ordinary circumstances, would be quite impossible, and that certainly did not return any profit to the American manufacturer. In many cases the bankrupt stocks held by American banks were thus unloaded, presenting a formidable competition to Canadian iron masters. Aside from this, the general depression affected the largest consumers in Canada, such as the railways, and the consumption fell short of the ordinary requirements.

Under the existing circumstances, and compared with the state of the trade in the United States, Great Britain, and elsewhere, the Canadian iron industry made very good progress in 1894, at least demonstrating that those now interested in the manufacture of iron have thrown themselves heartily into the work of development, even under most adverse circumstances.

In Nova Scotia the New Glasgow Iron, Coal and Railway Co. have kept their furnace in full blast from the beginning of the year, and their record of output for 1894 compares most favorably with that of 1893. The records are as follows:—

Coke used . . . . .	39,521	net tons
Coal " . . . . .	2,857	" "
Ore " . . . . .	60,817	" "
Lime " . . . . .	22,928	" "
Iron produced . . . . .	28,142	" " 1600 lbs.

The affiliated company of New Glasgow have gone on steadily extending their operations in the Steel Department.

The Londonderry Co., who seek their principal market for pig iron in Ontario, have perhaps felt the American competition more keenly than the New Glasgow Co., but they have done comparatively well for the times.

The Pictou Charcoal Iron Co., at Bridgeville, were in operation for several months of the year, and, although closed down at the present moment, will show a fair output.

The same applies to the work at Drummondville in the Province of Quebec.

At Radnor Forges, the operations of the Canada Iron Furnace Co. in all branches will surpass the record of 1893. In the Charcoal Iron department the output is practically the same as last year.

In August last the Company, after a continuous cam-

campaign of nearly two years, found it necessary to shut down for relining of the furnace, and the campaign for 1894 was from this, and similar causes, reduced to a period of a little over nine months. In this nine months the Company produced of high class

Charcoal Iron.....	7,178 net tons,	660 lbs.
Ore made.....	15,866 "	1033 "
Charcoal.....	663,269 1/2 bushels	
Cordwood.....	23,363 1/2 cords.	

An average of some 650 men and 300 horses were employed throughout the year, in the field and at the works.

The work of prospecting has been carried on vigorously as in the past, and the ore fields extended and perfected over a very large territory.

The Company have found competition very keen during the year, but the high quality of their iron has commanded a steady market for it. The auxiliary businesses in connection with the Company have all shown progress, and the value of the industry to the Province, and especially to the farming community, has been more than ever demonstrated.

Aside from the difficulties experienced by Canadian iron masters in meeting the panic prices of their American rivals, another grave difficulty has recently arisen by the passage at Ottawa of an Order-in-Council, 2nd Nov., 1894, entitled, "Re drawbacks on import goods used in Canadian manufactured articles, and exported." This Order-in-Council was passed with a view of encouraging the exportation of agricultural implements to foreign markets. The principle of encouragement was perfectly correct, but the way in which the enactment is framed, and the manner in which it works, are most detrimental to the development of the Canadian iron industry in its broadest sense.

As it stands to-day it obliges Canadian consumers to use foreign raw material before they can avail themselves of the encouragement offered by the Government, and it bars out altogether the use of Canadian raw material. A striking illustration of this was given a few weeks ago, when a Western plow manufacturer wrote to one of the iron furnace companies, and said that much as he desired to use Canadian material at competitive prices with American, yet, inasmuch as he exported largely to Australia and Great Britain, he was compelled to use American iron and steel, so as to take advantage of rebates from the Dominion Government.

Another Canadian manufacturer when absent from home recently, received a letter from his house reading somewhat as follows:—

"We beg to advise having just received an order for plows for shipment to Australia. The shipment must be made by outgoing steamer, and we deeply regret that we have been compelled to use Canadian steel, as we have no American steel in stock, hence we must sacrifice the ordinary rebate."

It is quite evident that the manner in which the Dominion Order-in-Council was drawn up, and is now being acted upon, is merely an error, but it is one that should be rectified immediately, as it simply serves to nullify the protection and encouragement to the Canadian iron industry granted by the Dominion Government itself at the last Session of Parliament.

To be entirely consistent with their policy of encouraging the manufacture and use of Canadian iron made from Canadian ores, the Government should so frame the Order-in-Council in question that manufacturers of agricultural implements be entitled to what the duty would have been had they imported the raw materials used in their machines, but leaving them entirely free to use Canadian raw materials, in other words, the encouragement should rather take the form of a bonus than an actual rebate of duties.

So long as the Order-in-Council remains as it is to-day, and the present condition of the American iron market exists, Ontario agricultural implement manufacturers will prefer to confine their purchases to American iron and steel, so that they will be relieved from the trouble and annoyance of locating specific importations of iron and steel necessary in making out papers calling for the rebate of duties.

Among other important Legislative enactments of the year is one passed by the Liberal Government of Ontario, and which reflects great credit on the wisdom of the Legislators of that Province. For some time back the Ontario Government have been making a very full investigation as to the importance of the pig iron industry in the proper development of the mineral wealth of the Province. Their investigation has finally culminated in the passage of an Act, now in the Statute Books of Ontario, entitled "An Act relating to mines and mining lands," by which Ontario appropriates the sum of \$125,000 to aid miners and producers of iron ore in developing the ore deposits of that Province.

Clause 12 of the said Act authorizes the Treasurer of the Province to pay out to miners, or producers of ore, upon all ores which shall be raised or mined, and smelted in that Province, for a period of five years from 1st July, 1894, the equivalent of \$1.00 per ton on the pig metal products of such ore, this to a maximum amount of \$25,000 per annum.

In better times the effect of this Act would likely have been ere this the formation of companies for the erection of several furnaces in Ontario. As it is, a coke furnace of large capacity is now being erected at Hamilton, Ont., and it is expected that it will be in blast during the ensuing summer. Other furnaces are talked about, and there is not the slightest doubt but that Ontario, hitherto so dilatory about developing one of the greatest natural wealths that she possesses, will very shortly, under such wise legislatures as the Act referred to, come to the front in the manufacture of iron in Canada.

It will be in the best interests of Quebec if its Legislators will meet the action of Ontario promptly, and not only preserve to the Province the credit of having been the first iron producer, but to-day the largest producer of high class charcoal iron within the limits of the Dominion.

Quebec possesses such a great wealth of the very highest class of ores and wood necessary for the manufacture of charcoal, that it only remains for her Government and people to give the industry every sympathy, and at least give the same support as that offered by her sister Province Ontario.

## AMERICAN PRODUCTION OF PIG IRON IN 1894.

The American Iron and Steel Association have received from the manufacturers complete returns of the production of pig iron in the United States in 1894, and also complete returns of the stocks of unsold pig iron in the hands of makers or their agents at the close of the year. The following facts are obtained from The Bulletin of that Association:—

The total production of pig iron in 1894 was 6,657,388 gross tons, against 7,124,502 tons in 1893, 9,157,000 tons in 1892, 8,279,870 tons in 1891, and 9,202,703 tons in 1890. The production in 1893 was 2,032,498 tons, or over 22 per cent. less than in 1892, and the production in 1894 was 467,114 tons, or over 6½ per cent. less than in 1893. The production in the first half of 1894 was 2,717,983 tons, and in the last half it was 3,939,405 tons. In the following table is given the production of pig iron by half years during the last four years, in gross tons.

Periods.	1891.	1892.	1893.	1894.
First half. . . . .	3,368,107	4,769,683	4,562,918	2,717,983
Second half. . . . .	4,911,763	4,387,317	2,561,584	3,939,405
Total. . . . .	8,279,870	9,157,000	7,124,502	6,657,388

The production of pig iron in the last half of 1894, large as it was as compared with that of the first half of the year, was not so large as in the first half of 1893, or in either of the half years of 1892, or in the second half of 1891, or in either of the half years of 1890, or in the second half of 1889. The total production of pig iron in 1894 was the lowest yearly production since 1888.

The number of furnaces which were in blast on June 30, 1893, immediately after the panic of that year, was 226; by December 31, 1893, the number in blast had fallen to 137; on June 30, 1894, there were only 108 in blast; on December 31, 1894, the number in blast had increased to 185.

Statistics of unsold stocks of pig iron do not include pig iron sold and not removed from the furnace bank, nor pig iron manufactured by rolling-mill proprietors for their own use. The stocks of pig iron which were unsold in the hands of manufacturers or their agents on December 31, 1893, and which were not intended for their own consumption, amounted to 662,068 gross tons; on June 30, 1894, they had fallen to 517,036 tons; on December 31, 1894, they had risen to 597,688 tons—an increase from June 30 of 80,652 tons. The increase in stocks since June 30 has been chiefly in the charcoal State of Michigan, in the Lehigh Valley, in the Shenango and Mahoning valleys, and in Allegheny county, Pennsylvania.

In addition to the stocks of pig iron above noted as unsold on December 31, 1894, there should be added 63,640 tons in the yards of the American Pig Iron Storage Warrant Company which has passed out of the hands of the makers, making 661,328 gross tons which may be said to have been then on the market, against 575,866 tons which were similarly held on June 30, 1894. The total quantity of stocks in warrant yards on December 31 was the largest yet recorded, amounting to 1,111,200 tons.

There has been a steady increase of unsold charcoal stocks in the hands of makers during the last four half-yearly periods, as will appear from the following figures:—

June 30, 1893, 184,536 tons; December 31, 1893, 207,181 tons; June 30, 1894, 229,705 tons; December 31, 1894, 250,183 tons.

## A CHAPTER ON SUGARS.

The Monetary Times has what it calls a chapter on sugar, that contains many facts and suggestions that should impress themselves upon the minds of the public. After giving quotations which Toronto jobbers are now offering sugars to the trade, and which, we understand, are lower than ever before, we are told that the reduction, in face of the already low prices at which domestic sugars have been selling, might have excited comment were it not for the fact that everyone knows that the product of German refiners has been gradually replacing domestic sugars, in spite of the low prices at which the latter have been offering.

Following our contemporary:

But the Canadian refiners are made of stern stuff, and are not willing to stand idly by and see their product driven from the market. They have sought to meet the Germans with their own weapons, viz., low prices. As a result the trade never bought sugars so cheaply as to-day. The German refiners have the advantage of a bonus upon exports amounting to 21½c. per 100 pounds, which goes a long way in reducing the protection (64c. per 100 pounds) afforded Canadian manufacturers by the tariff. And although there may be some difference of opinion as to the advisability of a protective tariff for Canada, there can be but little question that to remove protection from those industries in which other countries are offering a bonus upon exports, is to but bring about the annihilation of the home manufacture of these goods.

There is a surplus of granulated sugar in Germany at present. When the German government began to assist the sugar refining industry, the natural consequence was a plethora of refineries arising on every hand. When the talk arose of free sugar in the United States, additional encouragement to refine sugar was given to the Germans, and still more factories were built; and the capacity of the German refineries is now several times greater than the needs of the home market. Prices of granulated sugar in Germany have sunk to a hitherto unheard-of level, and in order to relieve, if possible, the home market, the large refiners have been ferreting out every possible source of outlet. In consequence scarcely a vessel arrives in New York from Hamburg that does not carry several hundred bags of granulated sugars shipped upon Canadian account.

The German granulated beet sugar—at least that sent to our markets—does not compare in quality to the extra standard grades of Canadian granulated. But this is an age of cheap commodities. Price, not quality, is the consideration uppermost in the consumer's mind when making a purchase, and the merchant himself is not loath to buy goods "at a bargain" when he has the opportunity. But two can play at the game of making cheap goods, and one of the refineries has very recently placed an "off granulated" sugar upon the market. It sells as low as the German article, and those jobbers who handle this grade quote it at 3⅞ cents per pound. This sugar stands a good test, rising so high as 96, it is said; and the one difference between it and sugars of the first grade lies in appearance. When placed side by side, the comparison is very disadvantageous to the latest arrival upon the sugar market.

There are those in the trade who predict trouble in the future because of the manufacture of this low grade article. But the whole blame must rest with the retail trade and the public. The call has been for cheap sugar, and they

have it now both as regards price and quality. The company who refine this sugar consider that they have done all in their power to prevent a confusion of grades by plainly marking the nature of the contents of each barrel. But some confusion must nevertheless inevitably arise. In respect to package, this second grade domestic granulated sugar is superior to the German article, as it is put up only in the best Canadian barrels, while the German sugar arrives either in bags or large unwieldy barrels which poorly stand so long a voyage.

It should be borne in mind that sugar is sugar, that is to say, there is no distinguishable difference between refined sugar whether made of cane or beets; and also that the consumer, all other things being equal, does not discriminate between them. Taking samples of each sort, cane and beet sugar, standard granulated, and experts can discover no difference.

The Monetary Times tells us the reason of sugar being so cheap now is because Germany bonuses the export of refined beet sugar to the extent of 21½ cents per 100 pounds, and that Canadian refiners, who are made of stern stuff, are not willing to stand idly by and see their product driven from the market—that they meet the Germans with their own weapons, viz.: low prices. Of course the Canadian refiners do not propose to lose money in their business, even if they do cut prices; but it is evident, as this journal has for years contended, that the refiners made more money in their business, because of the high tariff, than they ought to be allowed to make. We have repeatedly shown that refining sugar could be laid down in Canada quite as cheaply as in the United States; that Canadian refined has always been as good as American refined, and better than German refined, and that the cost of refining in Canada is quite as low as in the United States; and yet The Empire calls the McKinley tariff, that imposed a duty of only \$10 per ton on refined sugar, the most objectionable kind of class legislation, and opposed to the true interests of the country, but has nothing but praise for the Canadian tariff that gave Canadian refiners protection to the extent of \$16 per ton. It is said that the American refiners became lords, barons and millionaires from a business that was protected only \$10 per ton; and it was the profits Canadian refiners have made by a duty of 60 per cent. greater than the American duty by which they are now showing the stern stuff they are made of by making an inferior grade of refined sugar and selling it at very low prices, hoping thereby to drive cheap German sugar from the Canadian market. This is an exhibition of unselfish patriotism that the sugar consumers of Canada will value at its true worth.

We are told, too, that the German export bounty of 21½ cents per 100 pounds goes a long way in reducing the protection of 64 cents per 100 pounds afforded by the tariff to Canadian refiners. Our contemporary should bear in mind that it was but quite recently that the Canadian duty was reduced from 80 cents per hundred pounds; the difference being much greater than the McKinley duty of 50 cents.

Mention is made of the fact that there is a surplus of granulated sugar in Germany at present, that when the German Government began to assist the sugar refining industry, the natural consequence was a plethora of refiners arising on every hand. Our friend seems to misapprehend the situation, and we will state for its information that for

many years Germany has been carrying a surplus of sugar—in fact has been manufacturing it for export; and if the abundance of refineries in that country may properly be called a plethora, it is just what Germany has been struggling for. It does not require the memory of an old man to remember the time when England and Scotland about supplied the world with refined sugar, and how that British industry has almost ceased to exist. The German Government discovered that the agricultural industries of the country were not in a flourishing condition. They had previously discovered that the soil and climate were well adapted to the cultivation of the sugar beet; and it had been demonstrated that that article could be made a paying crop. At that time Germany was dependent to a large extent upon Great Britain for sugar—cane sugar, and it was a question whether, instead of sending money out of the country to support British refineries and Colonial and Spanish cane fields, it would not be better to establish an industry that would give increased employment to the people, keep the sugar money at home, and finally to export sugar. The latter was the course adopted, and we know the result. The German system of bounty on the export of refined beet sugar produced in the country included a graduated scale which at first was very much higher than it is now, is gradually being reduced, and will soon be extinguished; and this system is one of the grandest exhibitions of the benefit of protection ever presented to the world.

It is a mistake, too, to say that the talk of free sugar in the United States induced Germany to give additional encouragement to the home production of beet sugar; and it does not exhibit intimate acquaintance with the facts to suppose that the German system included producing only for the home market. The Germans do not have to ferret out sources of outlet for their sugar. They intended to become masters of the situation, and that is what they are to-day. German activity has given a wonderful stimulus to the production of sugar all over the world; and it is this enlarged production, together with new methods of cultivating both the beet and the cane, and of transforming their saccharine matter into edible sugar that has made the article so cheap.

The Monetary Times condones the act of the Canadian refiners in producing an inferior quality of sugar for the purpose of meeting in this market an equally inferior quality of German sugar. It tells us that this is an age of cheap commodities; that price, not quality is the consideration in the mind of the consumer, and that as two can play at the game of making cheap goods, one of the Canadian refineries has placed an "off granulated" on the market. It also tells us that this inferior article when placed side by side with first grade, shows to great disadvantage, the refiner considering that he has done all in his power to prevent confusion of grades by plainly marking the nature of the contents of the barrel. This is gratuitous information to any one visiting stores where sugar is sold, for dealers loudly proclaim in the papers and otherwise that they are retailing standard Canadian granulated sugar at lower prices than such sugar can be bought for from the jobbers, and the public are asked to believe the falsehood when the containing barrel is shown almost



identical in appearance with that which contains standard sugar, a scheme well calculated to deceive the unwary, and to which the refiner aforesaid has willingly and knowingly lent himself. It is nonsense for the defenders of this fraud upon consumers to place their hands upon their hearts and declare that they have done all in their power to prevent confusion of grades, when the inferior Canadian article is put up in the best Canadian barrels, as the Monetary times says it is, while the German sugar comes packed either in bags or large unwieldy barrels.

The remedy for this deception is for Canada to do just as Germany has done and is doing - to bonus the beet sugar industry until we can supply our own wants at least.

### GROWTH AND POPULARITY OF ELECTRIC RAILWAYS.

The rapid strides which have been made during the past decade to the practical application of electricity, in almost a multitude of ways, and especially in electric transit, give to the trolley system a supremacy over all local and suburban systems, which at once commands universal recognition from every quarter of the globe.

Writing of the unparalleled development of the trolley system, Mr. W. C. Sherman, of Toronto, says :

Until very recently the name and history of the inventor of the electric railway has been wrapt up in almost complete obscurity. Authentic reports credit the priority of invention to Thos. Davenport, a self-educated blacksmith, of Springfield, Mass., who as early as 1835-37 constructed a model of an electric railway, which model still exists. To give details of his struggles, successes and failures would mean to occupy much valuable time and space entirely beyond the scope of this article. Following Davenport's invention, in the same year (1837), came the electric telegraph by Prof. Morse, thus marking, at this period, the first important era in the history of electrical development. In 1840, now over fifty years ago, Mr. Davenport published in New York a weekly journal, known as *The Electric Magnet and Mechanic's Intelligence*, which was printed on a press driven by one of his own electro-magnetic engines. When Mr. Davenport arrived in New York he was offered for his railway model \$250,000, but refused it with the hope of doing better in Europe. He consequently took his model to England, and, having set it in operation, gained the attention of Michael Faraday, who became deeply interested in the invention. One day it occurred to Mr. Faraday to test the power of the machine, so he took a broom that was in the room, pressed it against the fly-wheel and stopped the motor. After this Mr. Faraday refused to invest, or to recommend it to others, so Mr. Davenport had to bear the expense and receive nothing for his trouble. Though many promising experiments were made shortly after Davenport's failure ; still the name of electro-motor had become a synonym for humbug and fraud, and it was consequently impossible to find any who were willing to invest capital in its development.

The invention of the electric railway in its modern form has been ascribed to Stephen D. Field, now of Stockbridge, Mass., who in 1877 completed plans for equipping the electric railway which has been regarded by competent

judges superior in many respects to any system which has yet been brought before the public. At that time there were no dynamos made in America suitable for furnishing sufficient power to run an electric railway. He accordingly ordered one from Europe which, after a long time, was completed and shipped to San Francisco on a sailing vessel. The ship was wrecked on her voyage and his machine went to the bottom of the sea. Not yet discouraged he ordered another one, which eventually reached him in good order and enabled him to commence his long delayed experiments. He tried first an electric elevator in which he was successful. In 1879, having exhausted his resources, he came to New York, bringing with him plans, with which he hoped to enlist capital to continue his work. He was not successful in obtaining sufficient means to properly develop his invention ; he became involved in tedious, harassing and expensive litigation with wealthy corporations, and his health failed him at a critical time, so that for years he was incapacitated from active work and was consequently unable to complete his plans.

The name of the late Charles J. Van Depoele, perhaps, stands next in importance to that of Field, in the development of the electric railway in its modern form. Although he had experimented with electric motors as early as 1874, and had satisfied his friends in regard to the feasibility of electrical traction, he seems to have given no public demonstration of his system until 1883, when he exhibited a car in operation in Chicago. The year 1885 saw the completion and successful operation of the first road at South Bend, Ind., where he ran trains of five cars, thus demonstrating in actual practice a principle that had been almost universally denied in theory. He afterwards sold his patents to the Thompson-Houston Co. and entered into their employment, where he spent the last few years of his life.

Throughout the annals of the world's industrial history, the development of the trolley system stands without a parallel. The first electric road in the United States, running regular trips, was set in operation in the city of Cleveland, July 27, 1884. At the Toronto Industrial Exhibition in the same year (1884), a train of cars driven by a thirty horse-power electric locomotive was successfully operated, carrying thousands of people, from the entrance of the grounds to the main building, a distance of about 3,000 feet. Although in the year 1886, there existed throughout the whole world a limited list of only twelve or thirteen electric roads including all systems, the electric railway did not become a practical commercial success until 1888, when Frank Sprague opened for traffic, at Richmond, Va., a road built upon a large scale, overcoming the difficulties of lengths, grades and curves, which up to this date had been considered as the greatest obstacles in the successful operation of electric railways.

In this age of high pressure and keen commercial competition there is perhaps no one factor which has such an important bearing upon the growth, progress and prosperity of our towns and cities as a developed street railway. The call for an efficient and rapid transit, at a moderate cost, can only be satisfied by the trolley system. While the average rate of a horse car is from four to six miles per hour, the rate of an electric car will vary in the same time from six to twelve miles. In comparing the two rates of

speed, a person would travel in one hour (at the lowest calculation) at least three miles farther by using an electric car, or would gain in actual time 15 minutes. To a business man this means considerable. It not only means a vast saving of time, but it also gives him a greater radius from his place of business in which to select a home. With these advantages, along with many others which space will not allow us to consider, we are not at all surprised to learn that the trolley system has practically superseded every other form of street railway propulsion.

When we consider that the street railways in the United States carry twice as many passengers as all the steam roads combined, and that the ratio of increase in local traffic exceeds that of population, we can form a just estimate of the importance that should be attached to a rapid, efficient and safe service. The total street railway traffic in the United States for the year 1890 alone exceeded by many thousands the total population of the globe. To-day considerably more than one-third of the total street railway mileage of the United States is operated by electric power, or, in other words, in over 500 cities throughout the Union the trolley system has superseded all other systems heretofore in use.

While the trolley system has made unbounded strides in the United States during the past three years, the progress made in Canada has been proportionally as great if not greater. The following statistics, gathered from reliable sources, show the development of electric railways in Canada during the past three years.

In September, 1891, the total number of miles of street railways in Canada was 203. Of these 164 miles were operated by horses and 39 miles by electricity. The total number of cars in Canada was 624, of which 562 were run by horses and 62 by electricity. The total number of roads in Canada was 21, of which 14 were run by animal power and 7 by electricity. The total number of horses was 3,076, motor cars 44, and trailers 18. Comparing the above statistics with those of November '94, we find that the total street railway mileage of Canada has increased from 203 to 372 miles, or 169 miles. The electrical mileage has increased from 39 to 343 miles. The mileage operated by horses has decreased from 164 to 31 miles. The total number of cars has increased from 630 to 1,006. The number of electric motor cars has increased from 44 to 505. The number of horse cars now in operation is 178. The total number of lines in Canada has increased from 21 to 28. In the principal cities of the Dominion, the trolley system has superseded animal power, while seven new roads have been constructed, electricity being adopted in every instance. There are now only 153 horses used in Canada for street railway work. There are 130 motor cars in operation in the city of Toronto alone.

When we consider that this great development in Canadian electric railways has been accomplished in the short period of three years, can we not form an ideal picture of industrial progress which during the next ten years will be of a most radical and revolutionary character.

#### NEWSPAPER INADVERTENCE AND OVERSIGHT.

Several days ago a most offensive advertisement appeared in many of the newspapers of Canada, particularly the

daily papers of Toronto, which has called forth a severe and merited rebuke from the gentleman whose name was most unwarrantably used. The nature of the offense consisted in what purported to be a telegram from Ottawa in which the name of Dr. Montague, a member of the Dominion Cabinet, who has recently been ill, was coupled with a certain patent medicine, the owner of which claims will cure such diseases, and which the telegram stated the medicine had cured. It was a gross breach of propriety to thus publish the name of a gentleman without his consent, and no interpretation of the ethics of journalism will countenance it. Three or four days after the commission of the offense a telegram was sent out from Ottawa to the effect that the previous one had created a feeling of intense disgust there (the place of residence of Dr. Montague) and that he had instructed his solicitor to issue writs against the parties issuing the advertisement and also against the papers publishing it; and it was only then that to save themselves from damages some of these delinquent papers found time to plead the baby act. The Globe has this to say of the incident:—

The Globe regrets exceedingly that in common with other newspapers it inadvertently admitted into its columns on Saturday last an advertisement in which the recent serious illness of Dr. Montague, M.P., was made an excuse for mentioning the name of that gentleman.

And The Empire this:—

[As this advertisement was, through oversight, not scrutinized before insertion, it got into print without the manager of the paper being aware of it. It is needless to say The Empire thoroughly agrees that such a reference to a public man in a patent medicine advertisement was most indecent and improper, and regrets that the advertisement slipped into these columns—Ed. Empire.]

And that is about all they could say. These journals profess to be great sticklers for the proprieties of the profession, and often declare in loud tones that they are the champions and upholders of newspaper ethics; yet here we see perhaps a dozen or more of the virtuous ones lending themselves to the publication in their columns for a money consideration, of stuff that the office boy would have had sense enough to deposit in the waste paper basket. The Globe charges the delinquency to inadvertence and The Empire to oversight. Queer, isn't it, that the intelligent managers of so many newspapers should have been guilty of delinquency and oversight in the admission of objectionable advertisements when there was money in it for them, no matter how much annoyance it might occasion others. It is a lamentable fact that Toronto daily newspapers particularly have adopted just this plan to advertise the business of their customers, as may be observed at any time, where among news telegrams and items of general interest are interspersed cunningly worded business advertisements of patent medicine vendors, or any others who may be willing to pay for such preferred locations at so much money per line. Funny, too, that the intelligent editor, business manager and all the rest of the staff of these papers could not discover their offense, although several days had intervened, and not until a solicitor had been instructed to enter suit for damages. This is an occasion that ought to be taken advantage of by the Canadian Press Association to make a strong effort to amend the code of newspaper ethics. The old one seems to be irreparably in tatters.

### ARCHITECTS AND ARCHITECTURE.

The Ontario Association of Architects held a meeting in Toronto a few days ago, at which some papers relating to the guild were read, some discussion had thereon and on the recent fires in this city, a dinner was indulged in, an election of officers had, and also an adjournment.

We collate a few notes from facts stated in the city newspapers while the meetings of the Association were being held.

The Association appointed a committee to draft a new building by-law requiring more perfect conditions for the prevention of fire. The Council of the Association has extended this committee, and when it formulates suitable conditions, these will be submitted to a general meeting of the Association in Toronto, before offering them as a suggestion to the City Council.

Speaking to a representative of the press, a member of the Association said: "Our object is to raise the standard of proficiency in our profession, and we are seeking to bring that about by an amendment to our Act of incorporation, which will render an examination compulsory for those who seek admission to the profession. This step we consider is mainly in the interest of public safety. We do not object to builders putting up houses, so long as they do not call themselves architects, or attempt to practise as such; but we do say that where there is so much at stake, it is nothing but right that measures should be taken to allow none but those who are properly qualified to undertake the duties of an architect."

About this time an inquest was being held by the Coroner to discover the causes leading up to the death of fireman Bowrey, who was killed by the falling of a wall of The Globe building when that structure was destroyed by fire early in January. During the inquest William Stone, manager of the Toronto Lithographic Company, which occupied the second and third flats and parts of the first and fourth, deposed that there was about 40 tons' weight of machinery on the third flat. When the building was reconstructed in 1890 an inside framework of iron and wood was put up, and iron pillars ran down the length of each flat. Witness remembered speaking to architect Knox as to the strength of the building, and he said all the machinery in Toronto could be put on that third flat with perfect safety. The vibration had been very slight. The Globe had also had the building inspected by Mr. Burke, and he had said it was perfectly safe. John W. Siddall of the architect firm of Siddall & Baker, who succeeded to the business of Knox, Elliott & Jarvis, the architects of The Globe building, produced the plans of the building, and gave details as to the method upon which it had been reconstructed. The whole weight of the floors and their contents was carried on an inside iron and wood framework running clear from the basement to the roof, and entirely independent of the walls. In his opinion the building was perfectly safe for the purposes for which it was used, and in case of fire as safe as most buildings in the city. It was not claimed to be a fireproof structure, and many non-fireproof buildings were safer than those said to be fireproof.

Here we see that one architect, Mr. Knox, declared that all the machinery could be put upon the third flat of The

Globe building with perfect safety. The building had been inspected by another architect, Mr. Burke, who declared it perfectly safe. In the opinion of Mr. Siddall, another architect, the building was perfectly safe for the purposes for which it was used, and, in case of fire, as safe as most buildings in the city. Mr. Siddall's testimony was given after the destruction of the building.

It was in evidence that within twenty minutes after the first alarm was given almost the entire north wall of the building fell into the street, and the entire structure was a total wreck.

The architects whose names are here mentioned as having expressed opinions regarding the architectural sufficiency of The Globe building are, or have been, members of the Ontario Association of Architects, and all stand high in their profession. These gentlemen considered a building perfectly safe that tumbled into the street in twenty minutes after the appearance of fire within its walls, yet they consider themselves competent to formulate a new fire by-law which they want the City Council to adopt. They are the ones, too, who want an amendment to the Act of Incorporation of their Association which will compel all builders who construct houses to undergo an examination as to their proficiency as architects. They are very generous, however, in stating that they do not object to builders putting up houses so long as they do not call themselves architects or attempt to practise as such.

In view of the facts one might naturally enquire who are properly qualified to undertake the duties of an architect?

### THE GROWTH OF MANUFACTURES.

Mr. George Johnson, Dominion statistician, replies to The Globe in regard to the census of the growth of manufactures, saying that in its recent article it has forgotten that there were only four Provinces in 1871, and has in consequence most amusingly compared the development of the mechanical and manufacturing industries in 1881 in all the eight Provinces with the results as obtained in 1871 in four Provinces. Of course, the growth in 1881 as compared with 1871 under this comparison would show a greater percentage gain than would the growth of 1891 in the eight Provinces when compared with the eight Provinces in 1881. Mr. Johnson proceeds to state the matter correctly. Making the year 1871 the datum line, the manufacturing and mechanical industries of the four Provinces of Ontario, Quebec, Nova Scotia and New Brunswick increased in the twenty years 1871-1891 as follows:—

	Per cent.
Capital invested.....	333
Hands employed.....	84
Yearly wages.....	129
Value of raw material used in manufacturing... ..	94
Value of products.....	102

Between 1871 and 1881 the capital invested in manufacturing and mechanical industries in the four Provinces increased 163 per cent., leaving 220 per cent. as the increase in the next ten years, 1881-91.

Between 1871 and 1881 the number of hands employed increased 30 per cent., leaving 84 per cent. to

represent the increase in the last ten years of the twenty-year period.

Between 1871 and 1881 the yearly wages paid increased 39 per cent, leaving for the increase in this item 100 per cent. in the ten years 1881-91.

Between 1871 and 1881 the value of the additional raw material used consequent upon the development of manufacturing was increased by 40 per cent., leaving 54 per cent. to represent the increase which took place in the last half of the twenty-year period.

Between 1871 and 1881 the value of the products made in the mechanical and manufacturing establishments of the four Provinces increased 35 per cent., leaving 67 per cent to represent the increase of the last half of the twenty years.

Taken in the large these figures show that the manufacturing and mechanical industries of the four Provinces did about double the business in the last half of the twenty-year period that they did in the first half.

The following are the figures upon which these results are based:—

FOUR PROVINCES.

Capital invested.....	1871....	\$ 77,964,020
" " .....	1881....	158,447,681
" " .....	1891....	329,906,977
Hands employed.....	1871....	187,942
" " .....	1881....	244,262
" " .....	1891....	345,355
Yearly wages .....	1871....	40,851,009
" " .....	1881....	56,874,749
" " .....	1891....	93,643,999
Value of raw material.....	1871....	124,907,846
" " " .....	1881....	174,821,595
" " " .....	1891....	242,373,549
Value of products.....	1871 . .	224,617,773
" " .....	1881....	299,795,917
" " .....	1891....	447,930,556

CHARCOAL AND ITS BEARING ON THE UTILIZATION OF OUR FORESTS.

One of the most interesting papers read at the recent meeting of the General Mining Association of the Province of Quebec, held at Montreal, January 9, was that prepared by Mr. T. J. Drummond of that city, and read by Mr. George E. Drummond, vice president of that Association, upon the manufacture of charcoal and the utilization of Canadian forests which, and is as follows:

In asking the attention of this Mining Association to a paper on a forest product, I think perhaps it is best at the outset to remind you that, as so far charcoal is the only known fuel natural to this Province for the smelting of iron ore; this important product of the mine must be governed by the product of the forest. If we cannot produce cheap charcoal, and if we cannot see a supply ahead, then any attempt to establish an iron industry in this Province, on anything like an extensive scale, would mean failure. The importance of this question of the production of charcoal and its encouragement, and the conservation of woods for its manufacture, therefore, cannot well be over-estimated. Canadians have truly a magnificent national asset in their forests, and every care and thought should be given to the question of how it may be utilized.

It will be unnecessary for me to dilate on the forests of

the Dominion. While the variety of trees is not as great, still the area under timber in Canada is certainly equal to that of the United States, and the woods are useful and valuable. In our own Province there are probably not more than fifty or sixty species, but they have already yielded a large revenue to the country, and with proper care they will continue to do so for generations to come. In fact, with a climate like ours, our supply should be unending, as it is in every way favorable to the growth of forests, and if a proper system of cutting is followed, and due care given by the government through a system of inspection, new forests will spring up to replace the timber removed, where the land is not put to agricultural or other purposes. To preserve these forests, and to utilize them to the best advantage to the country, should be both a national and provincial care and, if necessary, vast districts should be set aside and reserved for this purpose, over which the Government should exercise full control.

We have forest wealth now, and so, as I have said, what we must consider is how we can utilize this to the best advantage to the nation. In considering this, it seems to me that as in the case of private assets, we must consider each class of wood separately, and try and find out in what way these woods can be utilized so as to return the greatest benefit in cash and labor, and in my opinion, we should not be content to be simply "hewers of wood" and allow others to reap the benefits derivable from the labor that may be employed in bringing any of our woods to a higher state of finish and value, but should encourage, by legislation and otherwise, the manufacture within our own boundaries of whatever articles the variety of woods of our forests may be suitable for.

If we are to advance in wealth and population, if we are to build a nation, we must be able to offer fair work and fair wages, and to do this we must develop our natural resources, more especially in those directions that require the greatest amount of labor. When we have labor and the producing power of the earth working together, whether in agriculture, mining, or the utilizing of our forests, we are doing this, and the higher the point to which we can bring the earth's product, with the consequent increase of value through extra labor expended within our own boundaries, the better for our country. So, I reason, that if instead of shipping our forest products in practically a raw state, we can carry the process of finishing to a higher stage, then our forests will of a necessity yield us so much greater benefit. To a very large extent the value of a forest tree is the value received for the labor expended in hewing it into square timber, sawing it into boards, or turning it into an article of furniture, and it stands to reason that the tree that was by Canadian labor transformed into furniture, has yielded more than its fellow that was exported in the form of square timber, or that a spruce tree shipped in the form of paper yields more than if it had left Canada in the form of sawn logs or even pulp. As with our soft or merchantable woods, so with the unmerchantable or hard woods. If we burn these woods to clear the land, it means dead loss, or if we use them for domestic fuel, the return is small, and if we turn them into charcoal and export the charcoal in that shape, the value to the country will not be very great; but if we

use these woods in such a manner as to develop an industry that must otherwise be non-existent, then we have obtained something worth while, and so I hold that by burning into charcoal and using that coal for the smelting of iron, the value of the cord of wood to the country becomes the value of the labor expended in producing the amount of pig iron that quantity of wood will smelt, in other words, the value of a cord of wood for domestic purposes to the farmer would be say \$1.50 to \$2.00, and would yield nothing beyond that to the country. But if that cord of wood is burnt into charcoal, and by that fact an iron industry becomes possible, then as it takes from two to two and one-half cords of wood to obtain sufficient charcoal to produce one ton of iron, so it must be plain that a cord of wood utilized in this way brings through the labor consequent on raising the ore, flux, etc., and smelting, say from \$6 to \$9 per cord, according to the class of ore smelted and wood used. In making this statement, I am, of course, dealing principally with our Province of Quebec, where the conditions are such that without charcoal an iron industry cannot be commercially established, and where, with proper attention, consideration, protection and encouragement towards the utilization of what are known as unmerchantable and waste woods, insuring a long and regular supply of charcoal, a charcoal iron industry can be developed as great and as important to the Province and the Dominion as that industry has been, and is, to Sweden and the United States.

Now that I have given in a general way my ideas as to the utilization of our forests, and the bearing those forests

have on the iron industry in this Province, I will, in as few words as possible, explain the different systems of manufacture of charcoal generally followed, giving particularly the practice adopted at the works with which I am identified.

In cutting wood for pit burning, the custom in Sweden is to cut the logs in about 9 foot lengths, but in our own experience we have found it better to cut to shorter lengths for reasons hereafter given.

For kiln burning, the general practice in the United States is to cut to 4 ft. lengths. Formerly the cutting to lengths as well as the felling was done with the axe, but latterly the saw has been brought into general use, with a view not only to quicker work, but to prevent waste. The value of the saw in cutting the cord wood to length is considerable, for the axe chips represent a very material loss. The axe seldom makes a cut at an angle less than 45 degrees, so that in practice as much wood is cut away as remains in the two adjacent points, and the loss of chips in cutting to four foot lengths with the axe, amounts to fully from 8 per cent. to 10 per cent. according to the size of wood cut.

In the Province of Quebec, when we first took up the charcoal iron industry, we found that the practice was to work wholly with the axe, and to cut to 3 ft. lengths, and we saw that this must be changed, as the loss was considerable in labor through cutting to such short lengths, and as already pointed out the loss in chips also was naturally very great. We had a great deal of prejudice to overcome, but we are now making for kiln purposes solely

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4 ft. wood and our men are using the saw for cutting to length. And we find that not only do we effect economy for reasons given, but our men are able to earn, working in pairs, with the saw, better wages than they formerly could, working singly, with the axe.

In burning into coal two systems are generally followed, viz., pit or meiler burning and kiln burning, and in the United States retort burning has been attempted. This is carried on, I believe, on a small scale at present, but I do not think it has ever proven to be a commercial success although perhaps if given full trial it might be found to be more economical than it has so far proven to be.

Two styles of kilns are generally used, the rectangular and the beehive. The latter has been found to be the most satisfactory, and has practically superceded the rectangular kiln. In our own experience, the rectangular kilns have given us good results both as to durability and the making of coal, but we have found them more difficult to keep air-tight than the beehive, and that they also require more experience and care in handling, being more subject to cracking and opening through being affected to a greater extent by expansion and contraction. They have also to be well bound with heavy frames of wood, which are affected by weather and time and require replacing.

Our present battery of rectangular kilns is, however, in first-class condition, although it has been in operation about twenty-four or twenty-five years. This is perhaps mostly due to the fact that they have been carefully looked after, and repairs promptly made when necessary.

When in operation, it is necessary that the burner watch the rectangular kilns very closely, owing to there being a greater liability to burn down to the centre than in the beehive kilns. The form of the latter giving solidity while the action of expansion and contraction from heat and cold is not so great, and the beehive kiln is therefore easier to keep air-tight, and for these reasons the coal produced in the beehive is more uniform.

Apart from the question of coal, the beehive kiln is much easier to keep in repair, as it is not necessary to have any wood frames or binding. The wood can also be handled somewhat cheaper and faster in the beehive than in the rectangular and owing to their greater liability to straining from expansion and contraction already referred to, the rectangular kilns require about two or three days longer to cool, and therefore cannot be turned over as often as the beehive, and for general results the latter has been found to be the most suitable.

In our rectangular kilns, an opening is left from the front door to the centre of the kiln. This is made by piling the cord wood in such a manner that a canal of say 12 in. square is left in the middle of the kiln leading from the door to the centre. At this point a sort of crib work is built, known as a chimney, leading to the top of the kiln. On all sides of this dry wood, or brands, is piled so as to fire easily. A small quantity of split brands is then placed in the hole in the centre. The wood on all sides is ranked in the same manner as cord wood and is piled as closely as possible. Along the top of the kiln the lighter wood is laid, and this for two reasons. First, it is easier

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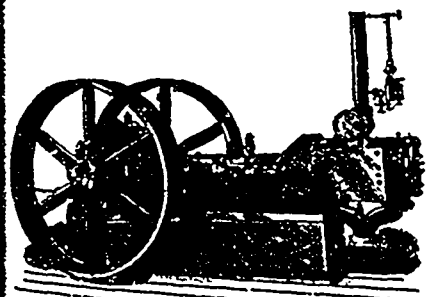
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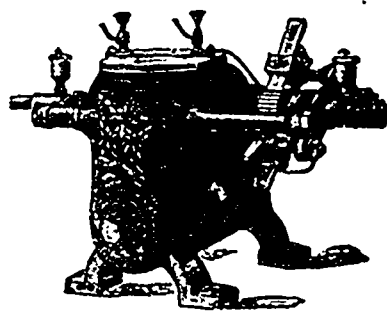
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to handle, and secondly, the fire will run through it quicker than through the heavy timber which is left in the centre of the kiln, then a fair quantity of light wood (or brands) is placed along the bottom and at the ends. When the kiln is closed and ready for firing, the top door is opened, and a piece of oily waste is inserted by means of a long pole to the centre of the chimney. The draft to the top of the kiln carries the fire upward and along the top, and once fairly started, the top door is closed and the air is allowed to draw down to the lower vents, three rows of which are open around the base of the kiln. These vents are operated by the burner in such a manner as to draw the heat from point to point of the kiln, and thus to cook the whole mass. The direction and force of the wind have a large bearing on the manipulating of the heat, and will drive it from one side of the kiln to the other, hence the holes have to be closed and the windward side protected to prevent combustion, as otherwise the wood would become overheated and be reduced to ashes. The condition of the coal in the kiln when approaching the finishing point is generally determined by the color of the smoke and sometimes by the insertion of an iron rod at various points to ascertain by feeling the condition of the wood or coal. This latter mode is only occasionally resorted to.

The same mode of piling and firing applies to the beehive kilns as described in regard to the rectangular. The fire is started at the bottom and allowed to burn upwards. Once fairly started among the light or dry wood, the kiln is closed, and as the gases escape from the wood they practically supply sufficient heat to cook the entire

mass. Care must be taken at all times to prevent too great a supply of air to the kiln, and thus cause combustion.

The properly cooked kiln should contain only the ashes made by the wood that surrounds the chimney with a little from the dry or light wood on the top, the combustion of which has supplied sufficient fuel to heat the mass and cause the drying and evaporation of water and gas in the whole.

What a charcoal burner must keep before him all the time is that the wood is to be cooked and not burned, so that every care must be taken to prevent combustion and sufficient heat must be introduced into the kiln or the chimney or canal leading to it, or by the combustion of a small quantity of light or dry wood on top to cook the whole mass. The light wood, of course, will be consumed, but in the meantime it should have imparted sufficient heat to the rest to draw off the water and the lighter gases.

The burning of charcoal is more or less a process which distills or throws out the undesirable gas leaving the mass of wood charred to the centre. If this could be carried out to perfection, the coal should be solid without any breaks or cracks or tendency to fall to pieces.

Both our beehive and rectangular kilns have a capacity of about 55 cords, and they generally take from ten to fourteen hours to fill, according to the class of wood handled, and from five to six days to burn, which is again largely governed by the class of wood. The beehive kilns take about eight days to cool and can be easily dis-

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charged in one day. The rectangular kilns generally take two or three days longer to cool, as already stated, owing to their being more affected by expansion and contraction. In our kiln work we use cord wood all the way from a limb of 2 1-2 in. in diameter up to the trunk of the heaviest tree that is too solid or knotty to be split with the axe, so that in our practice there is practically no waste wood, as we use tops, lops, and everything.

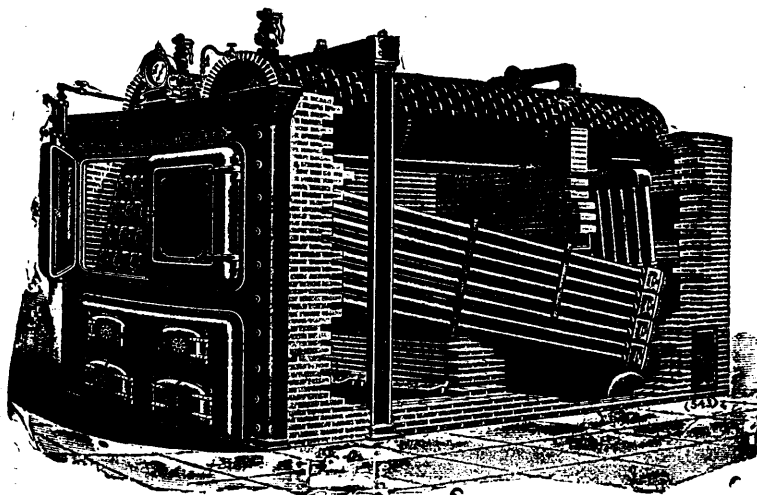
In Sweden the coal is very largely manufactured in pits and this has been carried on on quite a large scale also in the United States. One advantage of the pit system is that farmers and others can do coal burning on their own lands and obtain the results of the labor, and at the same time the cost of transportation is naturally greatly lessened, as forty bushels of charcoal can be transported for considerably less than a cord of wood, of which it is an average equivalent. In general results throughout the United States it would seem that the quantity of coal per cord obtained by pit burning has not been equal to the quantity obtained in the kilns. The general average seems to be about thirty-five bushels per cord from pit burning as against about forty bushels from the kilns. In my opinion this is very largely due to lack of care or knowledge on the part of the pit burner, as with the same care and attention, and with a thorough knowledge of the work, there does not seem to be any good and valid reason why the results as to quantity should not be about equal. Apart from this, however, in our own experience of pit burning, the coal produced was of a better quality than that obtained in the kilns, (i.e., where the work was well

done.) We found the coal dense and close, and practically solid to the centre, and this class of coal develops at least 15 per cent. to 20 per cent. more gas than the ordinary coal obtained in kiln practice. It will not consume as rapidly, and gives a greater and more enduring heat, and has proved itself as economical even where an equal quantity per cord was not obtained, as compared with kiln practice. In manufacturing coal in pits, the process of firing is practically the same as that practiced in kilns, a canal being made to the centre in which to insert the fire and a chimney built on the top along which light wood (or brands) is placed.

The whole is then covered with eight or ten inches of evergreen branches, leaves and sand or earth. After the fire is thoroughly started, the top or the centre over the chimney will fall in, owing to the total consumption of the wood at that point, and a supply of hard wood is kept on hand, which is driven into this hole as soon as the covering shows a tendency to fall in. After it is thoroughly refilled, a fresh covering is put on, then vents are opened along the sides towards the base. The condition of the coal inside is ascertained by feeling with an iron rod, and as the burner finds it at any point properly cooked he can open it and withdraw a portion of the coal covering the balance rapidly and carefully again in the same manner as at first. This process is kept up until he knows by the color of the smoke and by the inserting of his try rod that the whole is properly cooked. It is all then carefully covered in and allowed to cool and die out.

This mode of burning coal requires very careful and

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constant watching, owing to the liability to fire. As I have already said, the practice in Sweden is to use wood for pit purposes in nine or ten foot lengths, and when we took up the question of getting the farmers and others in our district to make coal in this manner, we had them follow the usual Swedish process in cutting, but from various reasons, principally owing to the density of our woods, the burning of shorter lengths has proved more satisfactory, and our best results have been obtained from wood cut in four or five foot lengths, and a portion of it split, and also by using smaller pits.

The pits which we first operated contained as much as forty-seven to fifty cords, but the results were unsatisfactory, the process proving too slow and too many brands being made. The coal obtained, however, was fairly good. Our burners then resorted to smaller pits containing from 20 to 25 cords of 4 ft. wood. These burned faster and gave better coal. Where our men had had experience in the work, the coal was clean and solid, and as pointed out, gave better results in the furnace than ordinary kiln coal.

In pit and kiln practice, we have used the following woods:—Maple, birch, beech, soft maple, white birch, tamarac, hemlock, balsam, and in point of value they can be reckoned in the order named. Our principal consumption has been in maple, birch and beech, with which our district abounds. In practice in kilns and in pits both, we have found it possible to use 25 per cent. to 30 per cent. of soft wood, but for furnace purposes we prefer not to go above that as the coal made from the softer woods is more friable and will not carry a heavy burden of ore.

In the United States attempts have been made to manufacture charcoal in retorts or closed vessels in which the wood is placed, and the charring done by external heat. In a report on this system made by a prominent expert, he mentions that one system is to erect a furnace, and supply it with a number of vertical cylindrical vessels, which are handled with a crane. The vessels are filled with wood, tightly sealed, lifted into the furnace, and connected by means of nozzles with conduits leading to condensers. After the fire has been maintained a sufficient length of time to properly char the wood, the vessel is lifted out and allowed to cool, another taking its place in the furnace. In this method the retorts serve also as cooling vessels, but they must be handled, and the outlets for gases must be disconnected and closed at each change.

Another plan consists of a cylindrical retort hung from trunnions over a furnace. It is raised to a vertical position to receive the charge of wood, and reversed to discharge the charcoal into the cooling vessel, where the process is completed. The difficulty in filling these retorts and maintaining them, makes this plan undesirable.

A system largely employed in North Pennsylvania and South New York, consists of a series of cylindrical vessels set permanently in a horizontal position over furnaces. These retorts are filled with wood either thrown in, or, in improved retorts, placed in a crib which has been previously loaded. When the carbonization has proceeded sufficiently, the coal is withdrawn into a cooling tank, which is hermetically sealed, until such time when the danger of the mass taking fire is greatly reduced.

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Other forms have also been followed, but as far as I can ascertain, none of them has ever proved commercially successful, and the old-fashioned kiln and pit system still seems to be for general charcoal purposes the most economical, and in fact, the only system by which charcoal can be successfully manufactured for general commercial purposes, or at least for the manufacture of iron.

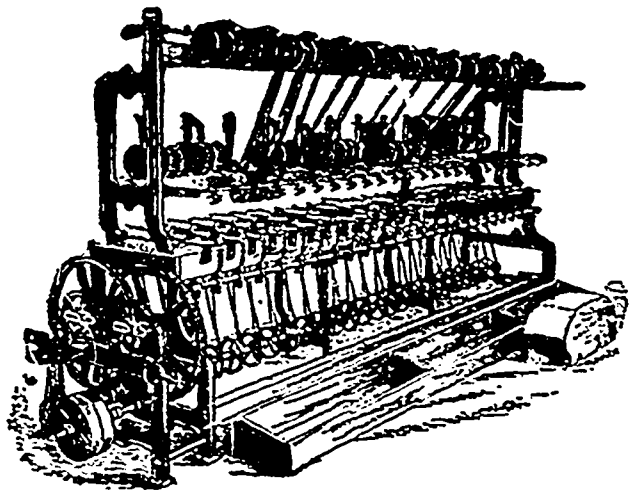
Of late years considerable attention has been given to by-products obtainable in the manufacture of charcoal, and it has been found that with a chemical plant attached to a battery of kilns, that every cord of wood can be so handled that the exact weight that went into the kiln will practically be taken out, when everything is taken into consideration. What by-products can be drawn from a charcoal kiln would be too numerous to mention. In fact there seems to be very little that cannot be taken out of the wood in this way, but for commercial purposes the principal by-products, and those to which most of the companies using a chemical plant have given their attention, is the production of wood alcohol and acetate of lime, and these have been found to be, I believe, profitable, and it is very probable that within a very short time every battery of kilns will have its chemical plant adjoining, and the smoke that is now wasted will be drawn down and distilled, so that nothing will be lost. When this is done, the value to the country of a cord of wood will naturally be largely increased.

Now that I have roughly outlined the systems followed in the making of charcoal, I must ask your permission to touch on the value of the country, and to this Province in

particular, of charcoal making, and the principal industry connected with it, and on the difficulties in the way of its development, and to ask your consideration and assistance towards overcoming those difficulties and developing the "Charcoal industries."

In colonizing our wooded lands, the value of the charcoal industry will be readily seen. Heretofore, and with good reason, the settler looked upon the wood on his lands, (from which as a general thing, the lumbermen had removed the merchantable timber) as a detriment, and he (the settler) had very little to hope for until he had made a respectable clearing and put in seed for his first crop. If he was within one or two miles of railway communication, it might be possible for him to sell a certain amount of selected wood to cord wood merchants. They did not take the run of the forest, nor would they accept branches or knotty sticks, or anything of that kind, so that at the outside he could very seldom afford to team the wood more than a mile or two, and even then, owing largely to the amount of waste, his remuneration was very small. With the charcoal iron industry in the district, all this is changed, and the settler, on taking up a piece of wooded land, finds ready at his hand a crop that will yield good returns from the day he first swings an axe, whether he delivers his wood at kilns for burning, or at the nearest railway station in the form of cord wood, or whether he burns it himself, he can utilize practically everything, as the furnace companies can take practically all classes of wood grown in this Province, and they are ready to accept the tops and branches, the large knotty

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sticks that cannot be split, and everything in the shape of sound wood. In our long winter months he can fell trees, saw them into cord wood, and team to the nearest wood depot, or he can, with the assistance of his sons, and what help can be obtained, burn the wood on his own farm in pits, and he can work at it all the year round if he desires, or during his slack season, and earn good wages whether he makes cord wood or coal.

When I speak of the importance of the fact of charcoal kilns or pits being able to utilize tops and branches and knotty pieces, etc., I think you will understand how very important this is to the settler when I say that as an actual fact, in the average forests only about one-third of the wood felled is fit for merchant cord wood, and of the balance the settler can use a portion for his own purposes, but the great bulk has to be chopped into suitable size for piling and burning, and then watched carefully in the spring, or almost as much attention given to it by a careful settler, as if he was burning for charcoal purposes, owing to the danger to the surrounding forests from fire, so that the making of merchant cord wood cannot be considered as remunerative to the settler in comparison with the making of wood for charcoal purposes. Then, too, there is this burning of refuse, and I think you all understand what the danger in that is. If the settler is careless, his spring "bonfire" means the destruction of miles of valuable timber, for the settler's "cleaning up" fires have certainly been instrumental in causing more forest fires than anything else we know of.

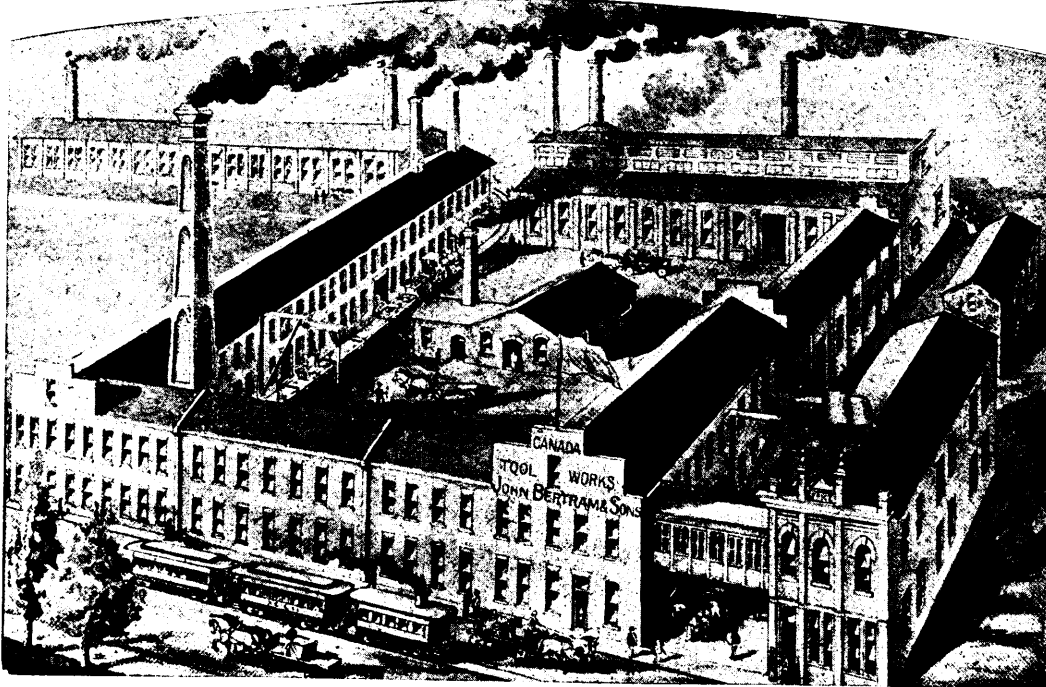
Where the charcoal iron industry exists, the wood that

was formerly a detriment becomes a valuable asset to the settler, and he realizes it, and knowing it to be an assurance of abundant and remunerative labor, he becomes a caretaker of our forests instead of a danger, for with good cause the owners of timber limits have grown to look upon the settler as something to be kept out if possible, through fear of the effects of his spring burnings.

Where wood can only be sold in the form of merchant cord wood, as I have already pointed out, it would scarcely pay the settler to locate further back than say two miles from the railroad line, if he was looking forward to obtaining anything for the wood he cut, but where charcoal iron industries exist, the better average price obtained allows of his teaming his wood greater distances, and if he burns into charcoal, he can afford to transport that material even farther.

The value of the charcoal industry to the farmers of the district is, of course, the same, to a large extent, as that derived by the settler. During slack seasons they can make wood and coal on their own lands at remunerative figures, or they can arrange to work on adjacent lands, and use their horses during the winter months for teaming their own wood or coal, or that of neighbors, and where they are not desirous of working on their own lands, they and their sons can find work in contractors' camps, either felling, or teaming, or burning.

The charcoal iron industry is essentially a farmer's industry, and affords, both from coal and ore, steady and remunerative labor from one end of the year to the other, if necessary, and certainly in all slack seasons. Our farm-



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ers have, unfortunately, a good many slack seasons, and I think it is largely due to this fact that farming has not been as remunerative as it might be. There are so many months in the year when there is nothing for the farmer to do, and he has to live during those on the results of the other months. Now if he is an industrious man, and here is a charcoal iron industry in the district, he can fill in every day of his off seasons. As I have said, in winter he can fell wood, burn charcoal, and team either on his own or neighboring lands, and in early spring time, if he has confined himself to cutting wood during the winter, he can burn his coal then, and in the summer time, from seed time to harvest, he can find employment in the ore fields, raising ore and teaming, and in our own St. Maurice district he can, in most cases, make and wash ore on his own land, and the result in that district is that both settlers and farmers are prosper us, and reports which we have received direct from the farmers themselves, and from the cures of the district go to show that since the establishment of our works in the St. Maurice district the agriculturists have reaped large and lasting benefits. They have obtained plenty of remunerative labor during off seasons, and a good market for whatever produce they have raised on the farms.

The Province of Quebec, as I think was very fully pointed out in a paper last year, has very natural requirements for the production of charcoal pig iron, and the value of such an industry to the Province and the Dominion must be fully recognized by everyone. We have the iron ore, and while we have neither coal nor natural gas, we have

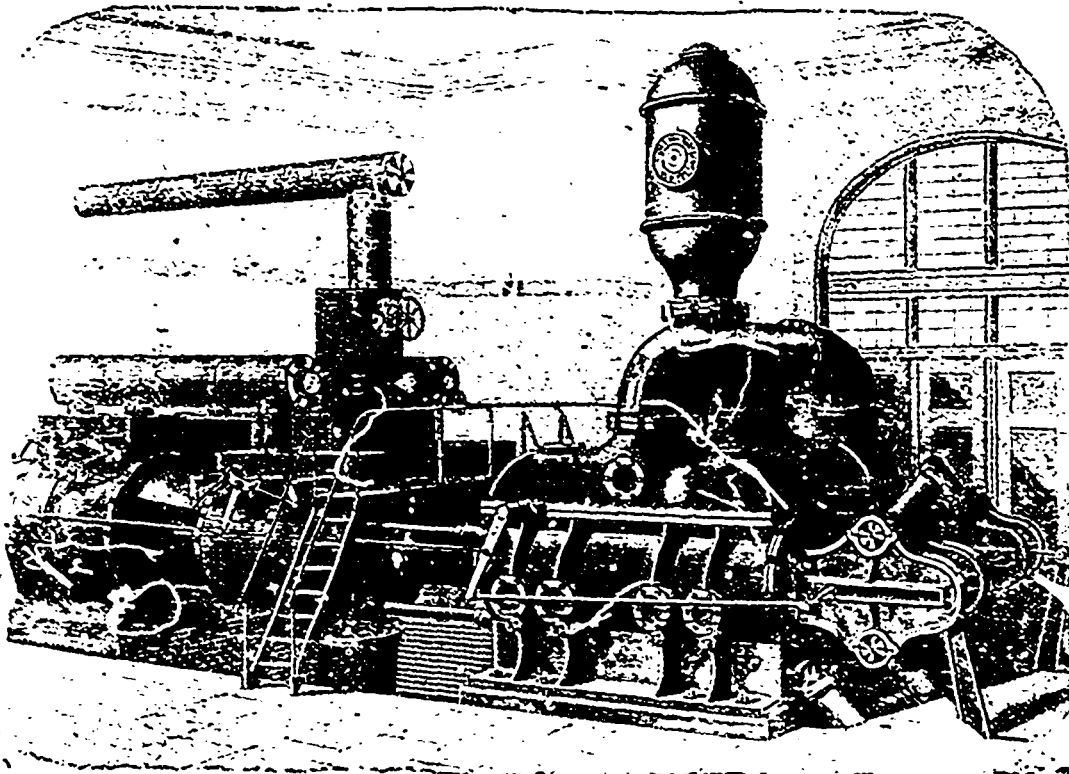
plenty of hard and unmerchantable, or waste woods, and this fact makes it possible for the establishment of an iron industry of the greatest value, and I see no reason why such an industry should not be carried to a successful issue, as it has been in Sweden and the United States. What is wanted, however, is the assurance of an adequate supply of charcoal, both for the present and the future. To do this, some steps must be taken by our Government to conserve certain woods or portions of forests, so that this industry can be established on a permanent basis. How this can be done is something that will have to be carefully thought out, but if it is done, the value to Canada will be great. If it is not, then we will have wasted a very large proportion of our forest wealth, for that is wasted which is not used to the best advantage, and I hold that more profit can be derived from our unmerchantable and waste woods by utilizing them and conserving them to the development of the charcoal iron industry, than in any other way. If this is done, the establishment of the industry is possible and certain, if it is not, then it can only be carried on in a very desultory way.

One of the principal difficulties that stand in the way of the establishment of the charcoal industry in some of the districts is the fact of large tracts of land being held by limit holders. Limit rights were originally intended to convey an area valued for its merchantable timber alone, yet the limit holders, even in cases where the merchantable timber has been removed, still retain possession and control, with the result that the hard and unmerchantable wood cannot be utilized. The only way by which these

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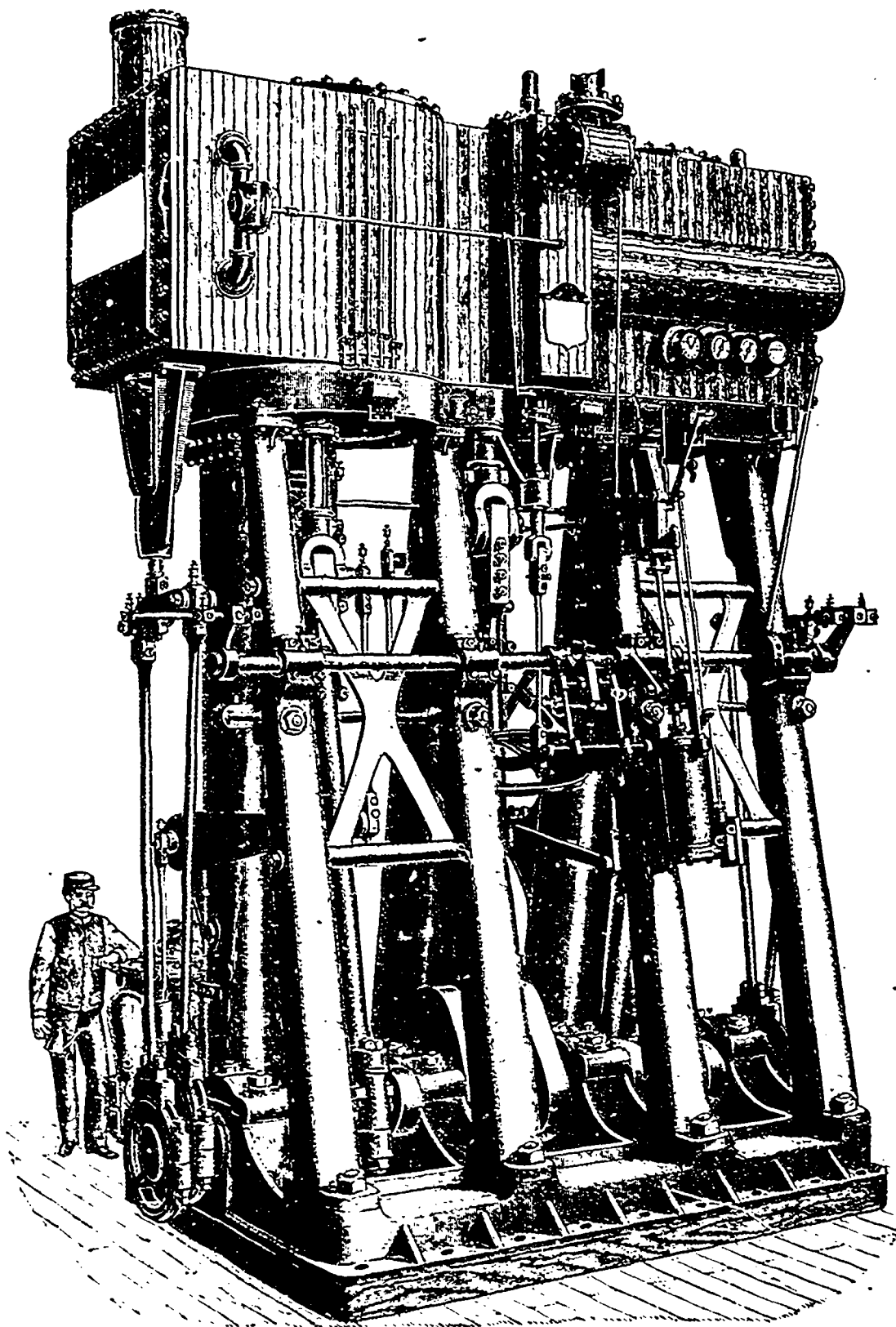
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woods can be diverted is by actual settlement, and, as in a great many cases, the land may not be suitable for agricultural purposes, the wood, if these conditions are to exist, is practically inaccessible.

Another great difficulty is the lack of knowledge in regard to charcoal burning. Of course, so far as kiln practice is concerned, men can be readily obtained, or educated to good practice, but for pit burning it is necessary that a much broader system of education than could be carried on by a private enterprise should be adopted, as a knowledge of pit burning would be of the greatest value to our settlers and farmers in the wooded districts.

Now, these two questions are, I hold, Provincial and National ones, and these difficulties should be considered and overcome by our Governments.

In Sweden there are national schools for charcoal burning, which have done and are doing good work in training men and spreading information throughout the country as to the most economical systems of making charcoal, especially in pits. Both the Dominion and Provincial Governments should follow this example, and disseminate useful information on the subject among the agriculturists, especially in the wooded districts and where charcoal consuming industries have been or can be established. This should be done by lectures, papers, and in every practicable manner. The practice especially of pit burning should be taught in our agricultural institutions, and certainly no mining school should be without a course in charcoal burning, and when development comes, as it surely should come in a land of wood and iron, national

schools should be established, as in Sweden. Our Governments have spent large sums in this way on dairy practice, and we all know that the results have been profitable and satisfactory, and I believe that if the same course is adopted in regard to charcoal making, which is a farmer's and practically a domestic industry, the results will be also to the national good.

Steps should also be taken to prevent the locking up by speculators or others of woods suitable for charcoal purposes, and where this evil exists, as in the cases I have referred to, it should be overcome by just changes in the present laws if necessary. I do not believe that in the case of the limits any value was considered or paid for, nor was it intended to convey to the limit holders the unmerchable woods for which lumbermen and others purchasing these limits have no use. This is proven by the fact, I consider, that at all times the Government has reserved the right to settlers taking up any portion of the land, the only reservation in favor of the limit holder being in regard to the merchantable wood, which he is given a certain time to remove. I therefore hold that under all circumstances, and especially where the lands are not suitable for agricultural purposes, and the unmerchable wood cannot be realized on through the settler, the Government should have the right to divert unmerchable wood to other purposes when and where it is deemed advisable.

When an enterprise that requires this fuel can be started in any district, it should be especially encouraged by the setting aside of wood lands to insure a continued supply

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and by assistance in teaching the principals of "burning" to the inhabitants of the district, and by rebating of stumpage dues where the wood is used for charcoal purposes, and encouragement given in every practicable manner within the powers of the Dominion or Provincial Government.

The industry is, and must always be, if successful, a settler's, a farmer's, and a people's home industry, and for this reason it is especially deserving of national support and encouragement.

Our farmers should be taught and enabled to use to their own and the nation's profit, everything the land has to give, and here are mighty crops wasting, burning, and rotting, that properly used might here in Canada, and especially in the Province of Quebec, be made as in Sweden, the mainstay of a nation.

This is a "burning" question. Let us hope it will not remain a "burning shame," but in the near future become a "burning" success.

#### EDITORIAL NOTES.

A National Rural and Agricultural Exhibition will be opened March 1st at Montevideo, under the auspices of the Uruguayan government, to which also foreign built cars, wagons, axles and carriage parts will be admitted, says an exchange. Section 27 of the exhibition will be devoted to these exhibits, which will be classified as follows: Wheelbarrows, carts with two wheels, carts with four wheels, vans, cars; other apparatus corresponding with them in

the vehicle line. In order for Canadian manufacturers to exhibit it would be best for them to send such goods as they deem most suitable for that country in care of the British Consul marked "Exposition Nacional, Montevideo," in addition to their own marks, and stating particulars, prices, discounts, commissions allowed to dealers, and such other information as may be deemed necessary. They should also authorize the Consul to place the goods in proper hands to represent the manufacturers at the exhibition, and thereafter if suitable and necessary. This, of course, will involve expenses, to cover which provision would have to be made by the consignors. United States Consul Schramm, at Montevideo, believes there is a good field for the sale of American carriages in that country, and this exhibition will afford an opportunity to bring such products before the Uruguayan public to the very best advantage.

Nobody wants to see the German system of prosecutions for lese majesty transferred to this country, but it must be admitted that our American way of treating our National Chief Magistrate in political caricature goes to the opposite extreme. If the rule in the Kaiser's dominions is harsh and oppressive, our pictures of our President descend from disrespect to ribaldry. After all, the President is President, and it hardly becomes us to portray him, day after day, in posture and apparel, not merely ridiculous but insulting. It may be effective, and no doubt is, in spreading irreverence,—but respect for the law and its officers certainly needs no diminution in this country at present.—The Manufacturer.

This method of caricature of public persons is quite as offensive in Canada as it is in the United States

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—it could not be worse. It is not long since it was introduced, but it has become an intolerable nuisance, if not a curse. It is usually used as an adjunct to the editorial department of journals that are deficient in brains, the object being to effect by pictorial innuendos and ridicule what cannot be done by words. No personal character is too high or elevated to escape the venom of the caricaturist, and the method is a sufficient shield from legal or other punishment that would be quickly followed if the offense was perpetrated in cold type. The toe of the boot of public opinion should be vigorously used in kicking the papers that thus indulge out of decent society.

Mr. George Johnson, the Dominion statistician, has been commissioned by Mr. Stanford, the well-known publisher of geographical works at Charing Cross, London, Eng., to write a work on Canada, to be published in the series known as the "Compendium of Geography and Travel."

The financial statement of the Toronto Railway Company was submitted to the shareholders at their annual meeting last week. The past year's business showed a net profit of \$250,695.18, as against \$212,859.81 in 1893. It has been the policy of the company to expend their surplus earnings in sufficiently providing power, cars, car houses, machine shops, etc., so that in the extensions of the road, bonds of the company, which can be issued at \$35,000 a mile, would provide sufficient capital for its requirements. As a result of this, when present contem-

plated expenditures are completed, for which the company has funds on hand, the company will have 50 per cent. more power than ordinarily required, as well as 30 per cent. more cars, sufficient tools and machinery and ample car houses. The Toronto and Mimico Electric Railway and Light Company's property, valued at \$35,924.46, has been purchased and paid for out of the surplus earnings of the company. This property paid a 5 per cent. dividend on its cost, and a surplus of \$2,502.58. The gross earnings in 1892 were \$820,098; in 1893, \$900,232, and in 1894, \$958,370. The net earnings in 1892 were \$229,765; in 1893, \$302,035, and in 1894, \$440,665. The operating expenses in 1892 were 71.9 per cent.; in 1893, 59.07 per cent., and in 1894, 54 per cent. The company carried 2,609,338 passengers, as compared with 2,125,010 in 1893. The number of transfers issued in 1894 was 7,438,171, against 8,477,147 in 1893.

Considerable discussion is being had as to whether the bounties granted by Germany on exports of sugar are fixed amounts, or varying according to conditions, as was formerly the case. Up to August 1, 1888, the factories paid a material tax upon all the beets worked, and certain rebates were allowed on all sugars exported. The bounties consisted of the difference between the material tax paid and the rebate granted, and this difference varied according to the percentage and quality of the sugar obtained from the beets. Hence the bounty was an indirect one. This law was repealed, and a new law came into force on August 1, 1888. By that Act the old material

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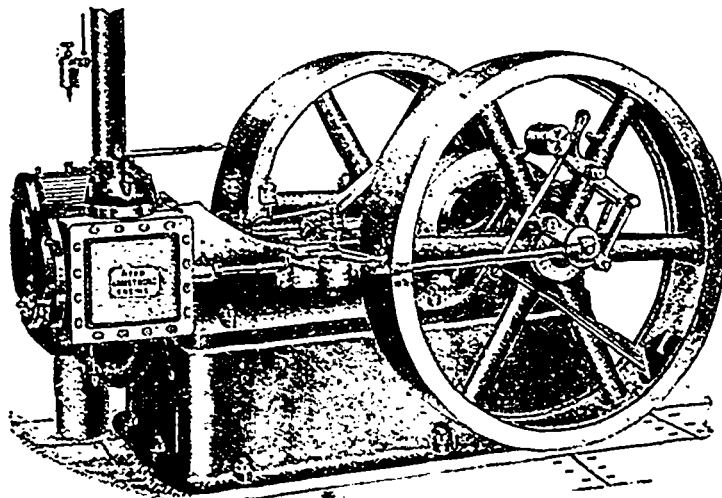
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tax on the beets was abolished, and a direct tax of 18 marks per 100 kilograms (about \$1.94 per 100 pounds) was imposed upon all sugar retained for home consumption. A fixed rebate was established on exports of sugar, which for the four years from August 1, 1888, to July 31, 1892, was estimated to be equal to 2.12 marks per 100 kilograms of raw sugar, about 23 cents per 100 pounds. From August 1, 1892, to July 31, 1895, the rebate was established at 1.25 marks per 100 kilograms or 13½ cents per 100 pounds of raw sugar not under 95 deg., and on refined sugar not under 98 deg., 2 marks or 21½ cents per 100 pounds. From August 1, 1895, to July 31, 1897, the rates of bounty are to be further reduced to 11, 15 and 19 cents, respectively. After 1897 no bounties are allowed.

China is seeking peace with Japan. Commercial restrictions are said by experts to constitute an effective preparation for war, but they seem to have been of little use in the case of China.—Toronto Globe.

Sure enough. But China never profited by her opportunities and Japan did. Thus the difference. The opportunity was of great use in the case of Japan.

It is not often that it is possible for us to present to our readers the statistics of the production of pig iron in both Canada and the United States for a calendar year so soon after its expiration as we are able to do in this issue, where the production in Canada in 1894 is given in detail in the report furnished us by Mr. George E. Drummond, of the Canada Iron Furnace Company, that of the United

States being obtained from the statistics gathered by Mr. James M. Swank for the American Iron and Steel Association, and published by him in The Bulletin of the Association. In view of the political situation in both countries this information regarding this great staple industry cannot but be of great value.

The farmers in the vicinity of Grand Valley, Ont., have agreed to cultivate some 300 acres of flax for the next two years to encourage the erection and operation of a flax mill at that place; and they have called a meeting to be held at that place on February 2, to make arrangements, if possible, with any available person to erect such a mill. All persons in that vicinity are invited to attend the meeting, the understanding being that if no suitable arrangement is then arrived at, a committee will be appointed to look after the matter. In the meantime information concerning it may be obtained of Mr. John Park, East Luther, Ont. We are informed that the soil in that vicinity is eminently well adapted to the cultivation of flax. Grand Valley has a population of about 1,000 persons. The CANADIAN MANUFACTURER hopes that the proposed mill will be built, and that from this beginning it will rapidly grow and become a large factory for the production of binder twine and other cordage, and thus give employment to a large number of people, not only in the growth of the flax, but also in its manufacture into cordage, yarns, etc.

In a recent article in these pages re the Condensed Milk Industry, the opinion was expressed that the Truro

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Condensed Milk Company, at Truro, N. S., were the only concern in Canada manufacturing the article. A correspondent called our attention to what was said to be a fact that the Aylmer Canning Company, of Aylmer Ont., were also producers of condensed milk, but application to that concern for information does not confirm the report. It is quite remarkable that Canada with all the possessed facilities for the business, and in the face of a large and lucrative foreign demand, can boast of but one large condensed milk factory.

Of the McKinley Act The Empire says it "was not protection but class legislation of the most objectionable kind." Here is a distinction without a difference. The Globe.

Of course it was class legislation of the most objectionable kind to impose a duty of \$10 per ton on refined sugar as was done in the McKinley Act, but it was the supreme of exalted statesmanship to impose a duty of \$10 per ton on the same sort of sugar, as was done in the Canadian tariff. Under the objectionable class legislation of the McKinley tariff the poor man in the United States could have free sugar on his breakfast table, because unrefined brown sugar of number 16 Dutch standard, which is a wholesome and edible article, was admitted duty free in that country; but not so in Canada where no higher grade than number 14 Dutch standard, an article entirely unfit for food until refined, was admitted free. The obnoxious class legislation of the McKinley tariff promised a bonus of two cents per pound for fifteen years to American farmers to encourage the sugar beet industry, but Canadian

farmers never had any such promise extended to them. Mrs. Malaprop stated a pungent fact that comparisons are odorous. The Empire should be careful about drawing comparisons.

A telegram from Ottawa a few days ago states that Mr. Andrew Onderdonk, to whom has been awarded the contract for the construction of the Balsam Lake division of the Trent canal had signed the same in which is a clause which obliges the contractor to employ none but British subjects on the work. The matter of some such arrangement was pressed upon the minister by several members of parliament, and Hon. Mr. Haggart was not slow to adopt a suggestion which so forcibly commended itself to his judgment.

The Hamilton Herald agrees with The Peterboro' Times that the Conservative policy needs "bright young Conservatives with political aspirations." The Herald says:

If there is one thing more than another that the Conservative party is in urgent need of just now it is new blood, and the young Conservatives with political aspirations should get themselves ready to take a hand in the game when the cards are dealt for the coming elections. Death has made such sad havoc in Conservative ranks of late, and is so likely to make more at no distant time, that it is obvious that there must be a great many important changes in the personnel of the leaders of the party when the new Parliament meets. It is only stating a generally recognized fact to say that there is not one man on the Conservative side of the House of Commons who is of really conspicuous ability.

The interest that the free trade Grits take in the personnel of the protectionists in Parliament is just too sweet and

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kind for anything ; yet it is remarkable that, composed as the Conservative delegation in Parliament is of hoary heads, their constituents continue to return them just as often as election day occurs. It is true, though, that if Toronto at the next election should return a few live, energetic youngsters who can discuss the National Policy from a practical standpoint, and not from that of the pedagogue and the old fogey, the situation would be much improved.

The first number of the Imperial Institute Journal has just been issued. Its object is to supply the Fellows of the institute with information of the prospective arrangements in regard to meetings, etc., and to enable those unable to attend the institute to peruse reports of the various lectures and addresses that are delivered. Another important feature is to publish the data obtained by the commercial intelligence department, which was formed some time ago, with the object of encouraging, as far as possible, the development of trade between the Mother Country and the colonies. Considerable attention is also devoted to emigration matters, and there is no doubt that in this connection the colonial exhibits will be most useful as supplementing the information so widely distributed by the various colonies. It cannot be said that The Journal is likely to form very light reading, but the facts and figures that it will circulate must prove useful in furthering the objects for which the institute was organized.

The Patrons of Industry are making a sensible move in proposing to add the manufacture of agricultural imple-

ments to the business of the Farmers' Binder Twine Company. The biggest part of the price of a farm implement goes into the hands of the manufacturer and selling agent, and high interest on the notes that are given in lieu of cash, and into a variety of other channels, all of which would be stopped up were the farmers to purchase directly from a co-operative concern. A lower tariff on agricultural implements will not, as far as we can see, give them cheaper machines, at any rate not the farmers in Ontario. But co-operation in production ought to make a great difference in the price. The Patrons can bring down the price of farm implements from 25 to 50 per cent. if they organize a system that will dispense with manufacturers' profits, agents' profits, advertising and such like charges. —Toronto World.

Why not ask the Ontario Government to manufacture agricultural implements in Central Prison, the same as binder twine? The Toronto Globe tells us that although the manufacture of binder twine by prison labor is "somewhat socialistic," yet it is "beneficent socialism;" and if it is a beneficent act to make binder twine by convict labor, why not extend the beneficence to include agricultural implements and everything else that the farmer requires?

Dr. Parkhurst starts out as a writer for women in the February Ladies' Home Journal in a way which promises to be most interesting. For his first article he coins a new word, *Andromaniacs*, by which he designates the type of woman who wants to be manish and apes the ways of men. That he is not in sympathy with them is evident, and his promise of discussing the women who want to vote, who want to preach and who desire to be in business in his future Journal articles gives further evidence of his deep interest in humanity. Reginald de Koven, the composer of Robin Hood, is prominent with his new song, *Roses of Love*, of which the full music is given. Arthur Warren is likewise excellent in an interesting and beautifully

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Illustrated article on Queen Marguerite, of Italy, which shows this favorite Queen at close range in her home life. John Kendrick Bangs is very funny in his Paradise Club, while another humorist, Robert J. Burdette, departs from the humorous and tells the tender love story of his wife and himself in The Woman Who Most Influenced Me. The famous and funny Brownies are on a lark on a raft this time. A beautiful page of Empire embroidery is given, and will be timely in this wave of Napoleonic interest. The cover is also Empire, showing a gun of the Directoire, by Alice Barber Stephens. The Ladies Home Journal is certainly worth its nominal price of ten cents.

Outing for February presents a choice variety of seasonable reading. The contents are as follows: -With Gun and Palette Among the Redskins, Blind Parisians Awheel, by Fannie Edgar Thomas; A Jamestown Romance, by Sara Beaumont Kennedy; Ma Pute Philomene, by Therese Guerin Randall; An Adventure with a Tarpon, by Fred J. Wells; A Virginia Turkey, by Arundell Mulville; Irish Hounds and Hunting, by Thos. S. Blackwell; A Junior Promenade, by Walter Camp; Miniature Yacht Modeling, by Franklin Bassford; Graeco-Roman Games in California, by Arthur Inkersley; Lenz's World Tour Awheel, Curling in the Northwest, by Hy. J. Woodside; National Guard of New York State, by Capt. E. E. Hardin; Witch Kate, by Robert G. Demig and the usual editorials, poems, records, etc.

Scribner's Magazine, in its February number, has begun George Meredith's The Amazing Marriage—the latest novel of the man who stands to-day at the head of the English writers of fiction. The second article in The Art of Living series, by Robert Grant, discusses the question of The Dwelling; shall it be in city, or suburb, or in the real country; the disadvantages of being a commuter, and what the daughters of the family gain by it. John R. Spears has an article entitled The End of the Continent, describing a recent voyage which he made in the wake of the old-time South Sea peddlers and pirates along the coast of Patagonia, through the Straits of Magellan and along the waters of the Cape Horn Archipelago. Dr. Charles L. Dana, in an article entitled Giants and Giantism, announces an important discovery, the result of several years of investigation—that is, that "giantism" is a disease. The number has a poem by Bret Harte entitled A Question of Privilege, in which he returns to the manner of his youth and reports the proceedings in the unique language of Truthful James. The frontispiece of the number is a portrait of the late James Anthony Froude, engraved by Gustav Kruehl.

One of the most energetic and wide awake journals that reaches this office is the Petroleum Advertiser. In November it came as a special edition very profusely illustrated and exceedingly attractive in appearance, and later, in December, in its Christmas edition it

was quite up to the standard of any of the big city papers, the half-tone work being very fine and beautiful. Of course such work cannot be produced in any but a first-class printing office with first-class materials and by the hands of first-class workmen and we congratulate our contemporary upon having demonstrated that its office embodies these essentials to a first-class publication. The Advertiser is devoted to the dissemination of information regarding the oil producing region of Petrolea, and is reliable authority in that respect; and those who desire to learn anything concerning the oil-producing capabilities of Canada should read the Advertiser.

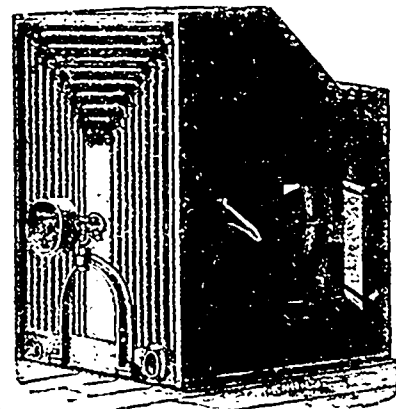
"The Inventions, Researches and Writings of Nikola Tesla," by Thomas Commerford Martin, published by The Electrical Engineer, N.Y., has met with remarkable success. The first edition appeared during January, 1894, and the second was completely exhausted before the close of the year, several orders now being in hand for the third, which is now about being issued. It is rarely that technical books have such a reception. The welcome accorded to the work abroad has also been most cordial. It has been favorably reviewed by the technical press of England, Germany, France, Russia, Italy, and other countries; and an authorized German translation is now being brought out by the well-known house of W. Knapp, of Halle. The book embraces all Mr. Tesla's inventions and researches made known up to date, and includes his oscillator, or new electrical generator, which he is rapidly bringing to a high pitch of efficiency and economy. The more important parts of the book have had the benefit of Mr. Tesla's personal revision. It may be added, for those interested in the career of the young inventor, that an article on him, by Mr. Martin, appeared in the Century Magazine for February, 1894.

### 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.*

At the next session of the Ontario Legislature the corporation of the City of Hamilton will apply for power to build, equip, and operate electric railways through and from the said city, etc.

## McEachren's System of Heating, Ventilating and Drying



**SOMETHING NEW**

Cheap and Effective.

Highly approved of by practical and unbiased men. The following is a sample of letters I get from customers.

For Particulars Address

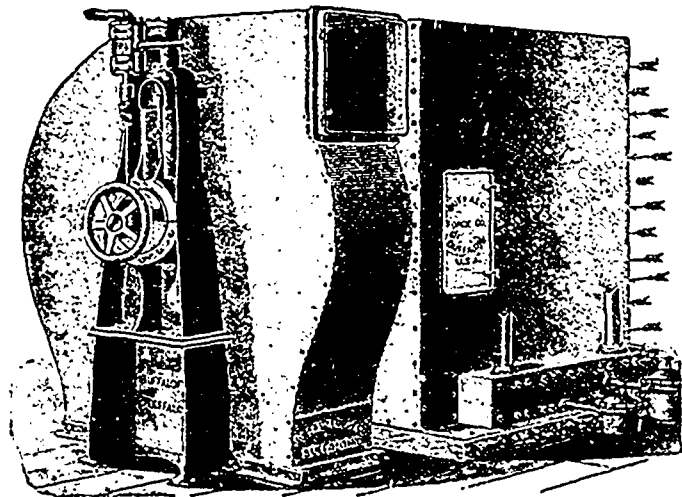
**J. D. McEACHREN, Galt, Ont.**

J. D. M. Eachren, Esq., Galt.  
 Dear Sir - Replying to your enquiry of the 21st inst., we may say the HOT BLAST HEATING SYSTEM we purchased from you about 15 months ago is giving entire satisfaction. Our factories contain about 200,000 cubic feet of wood which we heat with exhaust steam, except in very severe weather when we use live steam in one half of the heater in the morning only.  
 As regards the DRY KILN, the Heater and 42 inch Fan you supplied us, they are doing excellent work. We dry about 5 carloads of weather-seasoned lumber, chiefly 1, 1 1/2 and 2 inch walnut per week. We use exhaust steam exclusively in the dry kiln and that during working hours only. It does not require much power to run the fans and they handle a very large quantity of air. We find yours to be a great improvement on the old system of heating with pipes around the factory and under the lumber in the dry kiln.

Yours truly,

W. DOHERTY & Co.,  
 Organ Manufacturers.

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The Largest Drier in America is equipped with a "BUFFALO" Hot Blast Apparatus.

THE OWNERS ARE ENTHUSIASTIC

All Users of Buffalo Kilns write letters similar to this one  
 "The Kiln answers every purpose to perfection; the Dry Rooms are run with exhaust steam at more nothing in the way of cost, compared with the old way. Your arrangement is very simple and easily managed, besides being a money saver in operation. We are able, with the Kiln you sent us, to dry soft woods in three days, and hard woods in five days. That's good enough for anyone."  
 -SMITH BROS., Sayre, Penn.

Send for Catalogue.

## BUFFALO FORCE CO., Buffalo, N.Y., U.S.A.

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.

The Williams-Hurlburt Co., of Collingwood, Ont., has been incorporated with a capital stock of \$11,000 to manufacture all kinds of hosiery and knitted goods.

The Standard Shirt Co., of Montreal, are applying for incorporation with a capital stock of \$200,000 to manufacture shirts, collars, haberdashers' supplies, and men's, women's and children's clothing, etc.

The H.F. Sharpe Dry Plate Co., Toronto, Ont., has been incorporated with a capital stock of \$2,000 to manufacture photographic plates, aristotype, and other papers, and all kinds of photographic supplies.

The Darrien Plating and Mfg. Co., of Toronto, are applying for incorporation with a capital stock of \$10,000 for the purpose of carrying on the business of plating in gold, silver, brass, copper, nickel and other metals, etc.

The Diehl Manufacturing Co., of Toronto, Ont., are applying for incorporation with a capital stock of \$50,000 to manufacture, trade and deal in lumber, mantels, furniture, piano keys and other articles composed wholly or in part of wood or ivory and also in tiles and grates used in or about the construction of buildings, etc.

The Peterborough and Chemong Park Railway Co. are applying for incorporation with a capital stock of \$100,000 to construct an electric railway in the County of Peterborough from the town of Peterborough to Chemong Park and also any other municipalities in the said County of Peterborough that may be found desirable.

The South River Mercantile Co., of South River, Ont., are applying for incorporation with a capital stock of \$25,000 for the purpose of carrying on the business of general merchants and to purchase and sell all pulpwood, tan bark, and railway ties, and for the purchasing, getting out and selling of all kinds of forest produce, or the manufacture of the same, etc.

The Brantford, Port Dover and Galt Radial Electric Railway Co., are applying for incorporation with power to construct and operate both or either of the following lines of electric railway: - From the city of Brantford, through the township of Brantford and through or near the town of Paris to a point in or near the Town of Galt in the County of Waterloo. From the city of Brantford, from the townships of Brantford, Oakland and Townsend to a point in or near the town of Simcoe, in the County of Norfolk and thence to a point in or near the village of Port Dover in the said Norfolk County; and with power to purchase, manufacture or otherwise acquire electric power and plant, etc.

Messrs. Cassidy, Bonner & Co., leather belting manufacturers of Montreal, are making all the belts to be used in the new Montreal Steam Laundry in that city.

The large boiler shops on Wellington street, Ottawa, heretofore operated by Messrs. J. Powers & Co., have been purchased by Messrs. Law Bros. & Co., of that city, who will operate them in connection with their Foundry and Machine shops on a more extensive scale than heretofore.

The A. R. Williams Machinery Co., of Toronto, Ont., are applying for incorporation with a capital stock of \$300,000 to manufacture and deal in engines, boilers, motors, and all kinds of machinery and machinery supplies, and also to manufacture and deal in steamships, etc.

Application will be made to the Ontario Legislature for an Act to incorporate the London Radial Electric Railway Co., with power to construct an electric railway from the city of London to the village of Lucan or Granton; from the city of London to the town of Parkhill or the village of Ailsa Craig; from the city of London to the village of Delaware or the village of Mount Brydges; from the city of London to the villages of Belmont, or Harrietsville, with power to operate the same by electricity.

The Natural Gas and Oil Co., of Ontario, are applying for incorporation with a capital stock of \$500,000 for the purpose of acquiring in Essex, Ont., and elsewhere in the province, lands on which to sink wells for natural gas, oil and other minerals; the constructing of all appliances and machinery required in sinking wells and the obtaining of gas, oil and other minerals, and of storing, refining or otherwise treating the same, of selling and otherwise disposing of and supplying the same through pipes, etc., for heating, lighting, manufacturing and other purposes; and generally to carry on the business of obtaining and manufacturing and disposing of natural and other gas, oil, etc. The chief place of business to be in Walkerville, Ont.

Application will be made to the Ontario Legislature for an Act to incorporate the London and Western Ontario Electric Railway Co. with a capital stock of \$1,000,000 for the purpose of operating and constructing electric railways from the city of London to the city of St. Thomas and from thence to the villages of Aylmer and Port Stanley; and also from the said city of London to the village of Dorchester and to the towns of Ingersoll, Woodstock, and Tilsonburg, and also from the said city of London to the villages of Delaware, Mount Brydges and Glencoe and town of Stratroy; and also from the said city of London to the village of Lucan and to the town of St. Mary's and city of Stratford, with the right to sell electric power for all purposes, etc.

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

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

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SEVEN QUALITIES OF INGRAINS

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CORDAGE and Carpet Size  
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The Industrial Economizer Apparatus patented, for reclaiming the valuable products from waste waters. Apparatus in operation at our works, Patented June 26th, 1894.

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**Fine and Medium TWEEDS.**

The Featherstone Piano Company, Montreal, are applying for incorporation with a capital stock of \$50,000 to manufacture pianos and other musical instruments.

The Taylor Hydraulic Air Compressing Co., of Montreal, are applying for incorporation with a capital stock of \$500,000 to acquire the Letters Patent of invention recorded in the Patent Office under No. 46,092, and to manufacture compressed air, etc.

Application will be made to the Ontario Legislature for an Act to incorporate the St. Thomas Radial Electric Railway Co., with power to construct an electric railway from the city of St. Thomas to the villages of Union, Sparta, Port Bruce, and Port Stanley, and from the city of St. Thomas to the villages of Fingal, Wallacestown, Dutton, Bismark, and Rodney, and from the city of St. Thomas to the town of Aylmer and the village of Port Burwell, with power to sell and lease electricity, etc.

The annual meeting of the shareholders of the Eureka Woolen Manufacturing Co., limited, was held at Eureka, Pictou Co., a few days ago, and the following named officers elected. President, M. H. Fitzpatrick; vice president, Wm. D. Cameron, manager, C. A. Clarke; secretary, J. P. McLennan. The report showed that after making full allowance for depreciation of machinery, etc., a good dividend would be paid on the year's operations. A substantial sum was added to the reserve. The present company was organized two years ago, and the gratifying amount of business transacted shows what shrewd and practical management can accomplish. The demand for the goods of the company extends over the maritime provinces. The orders have so greatly exceeded the company's capacity that new machinery has been ordered and will soon be in position. -- Halifax Herald, Jan. 16.

In virtue of a by-law, which was favorably voted upon by the property holders of Sherbrooke, Que., a few days ago, a bonus of \$30,000 with twenty years' exemption from taxation was granted the Jenckes Machine Company of that place. The Company binds itself to expend \$25,000 in new buildings, \$50,000 in plant, securing a bona fide subscribed capital of \$150,000, and employing at least two hundred men for a period of twenty years. The Jenckes Machine Company, of which Sylvester B. Jenckes is the president and manager, and J. M. Jenckes is the secretary, has gradually developed an industry of the first importance to Canada, and especially to the miners, whom they supply largely with most of the various machinery they require. It is understood that work on the new buildings, which are to be completed within eighteen months, will be begun at once and finished much before the fixed period.

The R. S. Williams & Sons are applying for incorporation with a capital stock of \$500,000 for the manufacture of pianos and other musical instruments. The chief place of business will be at Toronto.

Mr. R. C. Buchanan, son of Mr. Brock Buchanan, Bank of Montreal, has just accepted the position of manager of the establishment of Mr. Paul Galibert, leather manufacturer of that city. This deserved promotion will be learned with great pleasure by his numerous friends. Mr. Buchanan has enjoyed a thorough business experience in the leather trade.

The Montreal Bridge Company have called for tenders for the erection of what the promoters claim will be the most gigantic structure erected in Canada since the completion of the Victoria Tubular Bridge. It consists of a bridge across the St. Lawrence from a point near Dalhousie Square Station to Isle Ronde, and thence to the southern shore of the river. To be built on the cantilever system, it will afford not only railway communication with the city, but also will enable the country traders and pleasure seekers to come and leave the city at pleasure. The bridge is to be of gigantic proportions. Its length will be about two miles, divided in spans as follows: One cantilever span of 1,250 feet, two side spans of 500 feet each, 15 viaduct spans on the south side of 250 feet each, and 18 viaduct spans on the Montreal side of 240 to 260 feet each. The height of the carriage road on the large cantilever span above the water level will be about 150 feet, a higher altitude than that of the great Brooklyn bridge. The bridge will be so constructed as to allow of a double line of railway track, a double track for electric tram-cars, two roadways for carriage vehicles, and footpaths for passenger traffic. Over the main cantilever all these will be on the same platform, but on the other portions of the bridge separate roadways, one above the other, will be provided for the railroad and vehicle traffic. The termini will be graded to such an extent that the ascent and descent of the bridge will not prove arduous nor of a great angle. The whole cost of the structure is estimated at about \$6,000,000, exclusive of terminal facilities, which will increase the expenditure by about \$2,000,000. The bridge is not intended to be used by any one railway or corporation, in fact, it is expected that all the railways converging at Montreal will be able to secure the right of way over the mighty structure. The bridge is to be practically an auxiliary to the Atlantic and Lake Superior Railway, which is about to build an extension of the present terminus of the Baie des Chaleurs Railway to deep water at Paspebiac, where connection will be made with St. John's, Nfld., by a line of ocean steamers. Work is expected to commence on the St. Lambert-Levis section during the coming spring.

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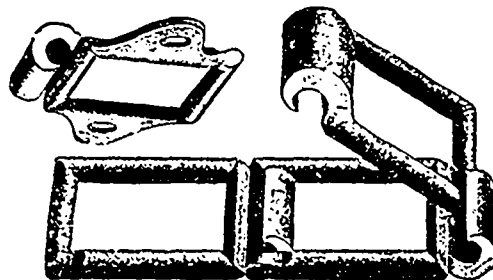
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MANUFACTURERS : 383 Washington St., Boston, Mass.  
FINE WATCHES & CLOCKS : 41 Maiden Lane, New York, N.Y.  
: 34 Washington St., Chicago, Ill.

SAMUEL LITTLE, Pres. RUFUS B. CARR, Gen. Mgr  
ARTHUR M. LITTLE, Treas.

The corporate name of the F. E. Dixon Belting Co., Toronto, has been changed to "The Beardmore Belting Co."

The Massey-Harris Co., Toronto, manufacturers of agricultural machinery, are asking for supplementary letters patent to extend the powers of the company so as to enable it to carry on its business, objects and purposes within Canada and the United Kingdom and elsewhere; and to establish branches and agencies in any foreign country or state.

Messrs. A. C. Leslie & Co., Manufacturers' Agents, who have heretofore maintained offices in both Montreal and Toronto, have sent us a circular bearing date Toronto, January 23, 1895, in which they say: "As you may already know, it is our intention to close our Toronto office at the end of this month. Kindly note that after that date all correspondence should be addressed to us at 445 St. Paul Street, Montreal. This does not mean that we are in any sense giving up our Western connection, as we will make arrangements to be well represented in Western Ontario. For the present, our Mr. W. S. Leslie, who has been in charge of our Toronto office, will cover the ground. We are now in a position to place import orders for all kinds of iron and steel, as well as American fencing wire, to better advantage than ever before. Our samples of cutlery are also excellent value, and we intend to devote special attention to this line and hope to improve it still further." This concern have had offices in Toronto for nearly eight years, and have a large connection with both merchants and manufacturers all through Western Ontario.

The Packard Electric Co., Montreal, have sent us a neat little pamphlet of some 60 pages having reference to the Packard lamps, transformers, appliances, etc., manufactured by them. In a preliminary chapter regarding lamps we are informed that the Packard lamp has been on the market since 1890, in which time it has gained an enviable reputation as a high grade lamp. It is one of the articles that remain sold, and their customers are always their friends. No second-hand material whatever is used in the construction of this lamp, and the makers pledge themselves to always maintain its quality and give the consumer an article that "one's faith can be pinned to." Packard lamps are never sold under any other name, and can be obtained only from the company or their authorized agents. Do not be deceived, they say, by the representations of irresponsible agents that they can furnish the Packard lamp with another label or no label on it, or the "same lamp as the Packard." These representations are false and intended to mislead. The book, which is got up with exceedingly good taste and attractiveness, gives illustrated descriptions of the Packard goods, also codes by which they may be ordered.

The Standard Silver Company, which some months ago bought out the plant and business of the Acme Silver Company, Toronto, have started operating the same. Mr. A. T. Thomas, who is president of the Manhattan Silver Plate Company of New York, is president also of the Toronto concern; the vice president, Mr. G. C. Edwards, is president of the Holmes and Edwards Mfg. Co., silverware manufacturers of Bridgeport, Conn., and Mr. William K. George is secretary and manager of the Standard Silver Company.

Mr. Peter Hay, Galt, Ont., manufacturer of machine knives, has sent us his 1895 illustrated catalogue and price list having reference to his products. The articles alluded to include planer knives, small straight knives, moulding knives, nutreing, tenoring, shingle jointer and other irregular shaped knives; Crossley stave jointer, tobacco and splint knives; shaper, matcher, stave and stave jointer knives; veneer, cheese, box, hoop and paper cutting knives; gauge lathe knives, leather splitting knives, leather knives single, or both sides, beveled; shear blades for cutting metal, straw and ensilage cutting knives, bark grinding and bark peeling knives, wood chopping knives, rag knives, meat chopping knives, circular cutters, mortise chisels, and special knives of all kinds.

The Toronto Steel Clad Bath and Metal Co., Toronto, have sent us a handsome morocco bound memorandum book, such as they distributed to the members of the Ontario Architects' Association at their convention recently held in this city. It is very tasty and contains many suggestions as to the excellence of the goods manufactured by this company. Regarding the desirability of their metal bath, the memorandum contained a small pamphlet which says:— "The fact that the least possible woodwork in a bath room is a "desideratum" is instanced by the use in all better classes of houses and buildings of slate, tile, marble, porcelain, etc., not alone in the fixtures but also on the floors and walls of bath rooms and lavatories. Why is this? Because woodwork, be it ever so carefully seasoned, oiled or treated, will in the humid and changing atmosphere of a bath room absorb some of the moisture and harbor impurities, which a non-absorbent material cannot do. This is especially noticeable when wood is used in the actual construction of the bath itself, such as the old style "boxed in," the fibre, and kindred kinds. To obviate all these difficulties the steel-clad bath was designed, and it is amply fulfilling all expectations. It is all metal (except the narrow wooden capping on top) and is therefore free from any objections urged against other baths as above cited. No woodwork (other than above exception) is used or necessary in connection with these baths, and this is the fact which it is the purpose of this little pamphlet to emphasize. The perfection of sanitary science is demonstrated by the steel clad bath.

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**CANADIAN PATENTS.**

The following patents have been issued from the Canadian Patent Office, from November 12 to November 28, 1894, inclusive. Information regarding any of these patents may be had on application as follows:—

- |                        |                            |           |
|------------------------|----------------------------|-----------|
| Fetherstonhaugh & Co., | Bank of Commerce Building, | Toronto.  |
| Ridout & Maybee,       | 103 Bay street,            | Toronto.  |
| A. Harvey,             | Central Chambers,          | Ottawa.   |
| J. A. Grenier,         | Imperial Building,         | Montreal. |
- Copies of American patents corresponding to Canadian patents can be procured from either of these attorneys for the sum of twenty-five cents each.
- 47,451 Fire extinguisher, C.R. Macomber, Worcester, Mass.
  - 47,452 Steam steering apparatus, Edward Heyde, East Saginaw, Mich.
  - 47,453 Puzzle, H.H. Sargent, Fort Bowie, Arizona.
  - 47,454 Treadle, Daniel Peglow, Buffalo, N.Y.
  - 47,455 Bell ringing device, W.J. Going, Amsterdam, N. Y.
  - 47,456 Knife Handle, Jacob Oefinger, Meriden, Conn.

- 47,457 Cooking utensil, A.W. Obermann, New York, N.Y.
- 47,458 Steam engine, W.S. Wilhelmshole, Hesse Nasseau, Germany.
- 47,459 Sash fastener, L.C. Miller, St. Louis, Mo.
- 47,460 Dredge, The Mining & Dredging Power Co., New York, N.Y.
- 47,461 Process of purifying water, Bernhard Remmers, and Alex. P. Mende, New York, N.Y.
- 47,462 Bicycle, Stanley Cooper Peuchen, Toronto, Ont.
- 47,463 Chocolate dipper, Cyprien Gousset, New York, N.Y.
- 47,464 Rendering tank, Emil Holthaus, Canarsie, N.Y.
- 47,465 Process of obtaining iron derivatives of albumen, Friederich Engelhorn, Waldhof, Germany.
- 47,466 Process of obtaining iron derivatives of albumen, Friederich Engelhorn, Waldhof, Germany.
- 47,467 Paper roll holder, W.H. Clarke, Columbus, Ohio, and Frederick Wurtsbach, jr., Minneapolis, Minn.
- 47,468 Danger signalling device, Jno. B. Hall, Toronto, Ont.
- 47,469 Sectional necktie, David Sanguinette, St. Louis, Mo.
- 47,470 Union garment and method of making the same, W.A. O'Brien, Boston, Mass.
- 47,471 Garment supporter, E.N. Gaillard, Brooklyn, N.Y.

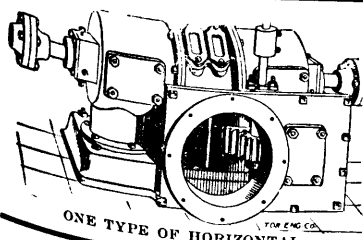
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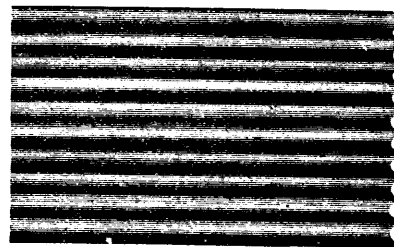
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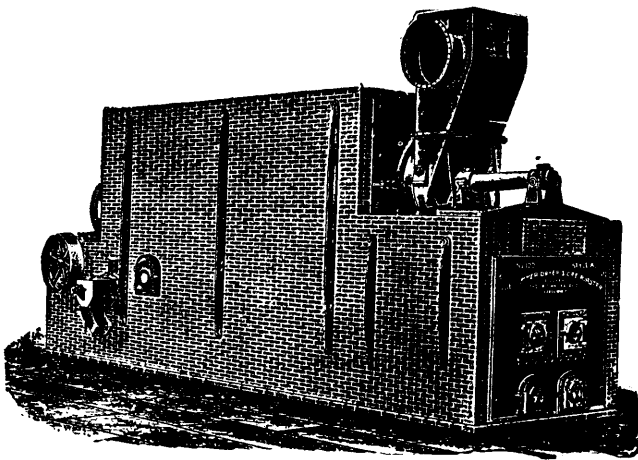
Montreal Office 409 Board of Trade Building.

Toronto Office, 33 Melinda Street.



- 47,472 Can cap fastener, G.J. Record, Conneaut, Ohio.  
 47,473 Gate, S.J. Smith, Paris, Texas.  
 47,474 Machine for scattering manure, Edward Scheiblich, Kibitzberg, Germany.  
 47,475 Stovepipe thimble, Archibald Fairgrieve, Toronto, Ont.  
 47,476 Fish hook, B.S. Martin, Angola, N.Y.  
 47,477 Tobacco pipe, W.E. Trott, Brooklyn, N.Y.  
 47,478 Folding litter, Max Nehemais, Hamburg, Germany.  
 47,479 Can-labelling machine, E.W. Cornell and F.H. Knapp, Adrian, Mich.  
 47,480 Can-labelling machine, E.W. Cornell and Frederick H. Knapp, Adrian, Mich.  
 47,481 Fish trap, R.J. Hodge, Medford, Mass.  
 47,482 Plate glass, J. H. Crosbegg, and Joseph Locke, Pittsburgh, Pa.  
 47,483 Machine for closing cans, C. R. Austin, New Westminster B.C.  
 47,484 Sheet separating and printing machine, Casper Reising, Southington, Conn.  
 47,485 Compress and poultice protector, I. M. Hemsteyer, Chicago, Ill.  
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 47,490 Mop wringer, J.B. Cleghorn, Toronto, Ont.  
 47,491 Method of driving saws, Robert Hunter, J. W. Hackett, and David Robertson, Vancouver, B.C.  
 47,492 Wagon, J.H. Jackson, Keady, Ont.  
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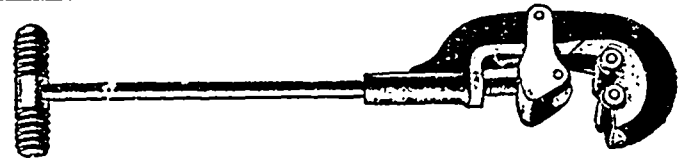
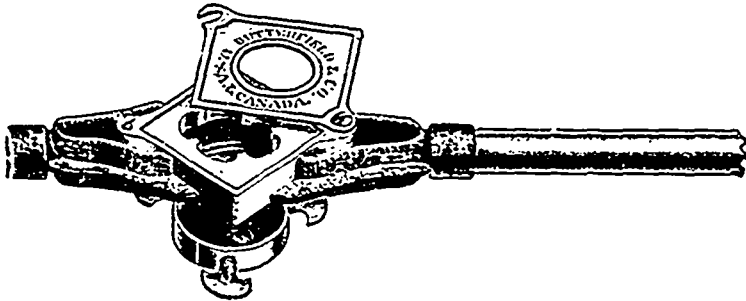
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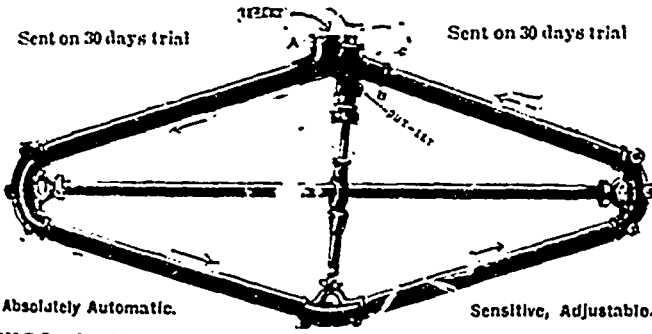
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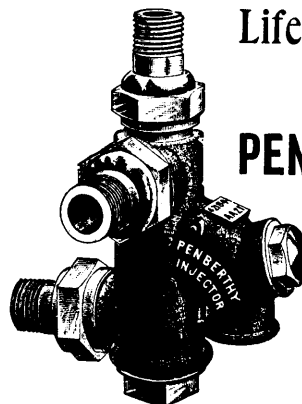
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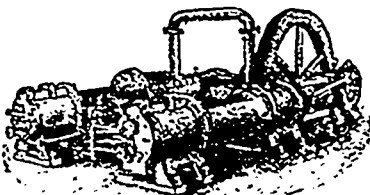
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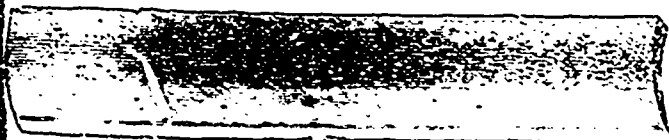


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1 3/8	1 3/8	5.01	"	3	2 1/2	22.59	"
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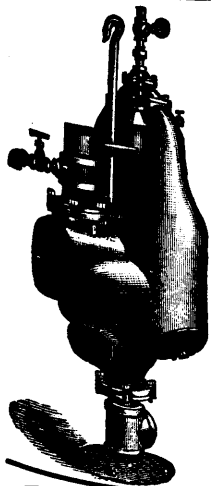
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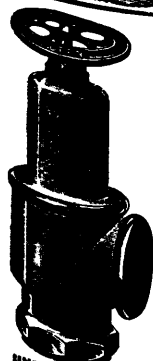
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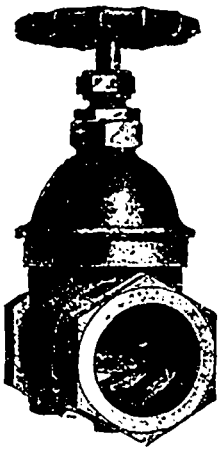
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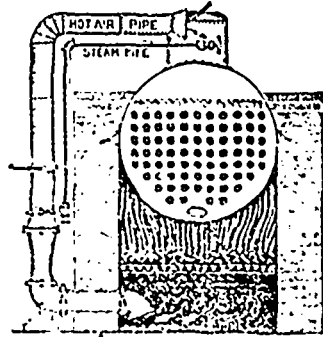
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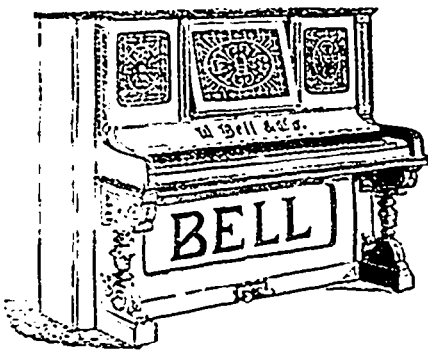
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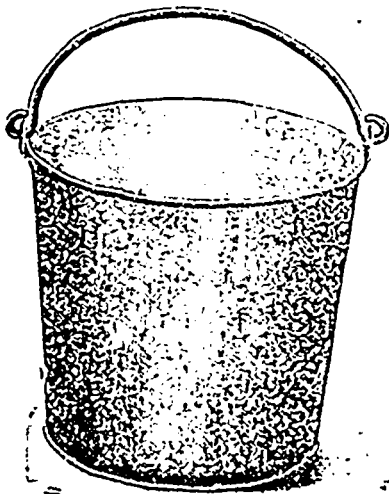
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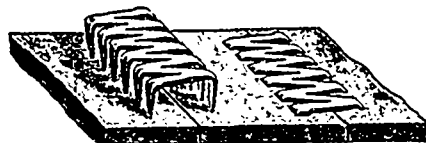
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