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CANADIAN MANUFACTURER
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DEVOTED TO THE MANUFACTURING INTEREST OF THE DOMINION

Vol. 25.

TORONTO, JULY 21, 1893.

No. 2.

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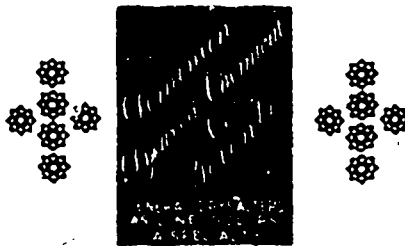
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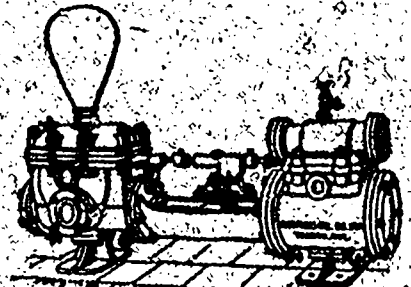
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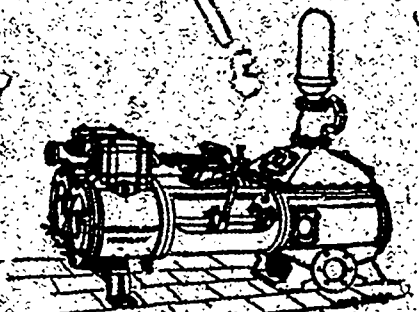
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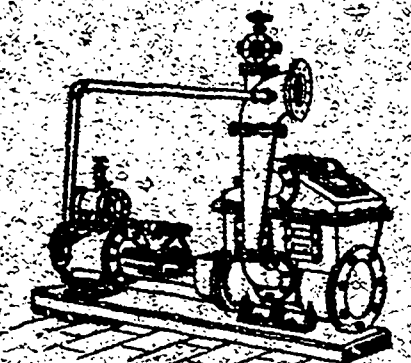


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THE BALANCE OF TRADE.

MR. JAMES M. SWANK, general manager of the American Iron and Steel Association, has published in The Bulletin an extended tabular statement showing the imports and exports of the United States in each fiscal year from 1861 to 1892, and during the first eleven months of 1893, compiled at his request by the Bureau of Statistics of the United States Government; and while Mr. Swank has no theory to present in connection with the table which he gives, he thinks it timely to call attention to some of the facts which it clearly establishes.

The first truth that suggests itself to him from a study of the table is that a protective tariff in and of itself does not guarantee his country against an adverse balance of trade. The balance of trade, both in merchandise and gold and silver has been for and against the country under precisely the same schedules, the changes from one condition to another often being both very sudden and of very wide range. Other in-

fluences in addition to tariff legislation affect commercial exchanges with foreign countries, prominent among which may be mentioned good and bad harvests, not only in the United States but throughout the world, the abundance or the scarcity of European money for investment in American railroad and other securities, and financial legislation both at home and abroad. If, for instance, Europe does not need surplus American agricultural products in a year when the United States has bought liberally from them, the balance of trade will be adverse to the United States, which must be met with financial securities or money, or both. If upon the other hand European harvests have been short, and American harvests abundant, Europe will buy more American agricultural and other products than can be paid for in merchandise, and the balance of trade will be in favor of the United States, and either the money of Europe, or American securities will flow from the east to the west.

Another fact which is forcibly presented in the table is the rapid growth in the United States, under protective duties of both the import and export trade within the period covered by the table, the American imports of merchandise have tripled in value and the exports have nearly quintupled. That foreign trade has therefore not only increased rapidly under protection, but the exports have increased much more rapidly than the imports, showing that protection has not hindered the sale in foreign markets of American agricultural or other products. And this clearly disproves the free trade theory that if there is no buying there can be no selling.

Mr. Swank points out that the cause of what is known as the Jay Cooke panic in 1873, which was the beginning of a period of hard times, lasting until the later part of 1879, has generally been ascribed to the influence of the inflated currency which was created by the civil war; but it will be seen from the table that for several years before the panic mentioned, the United States had been a large buyer of foreign merchandise and a small seller of agricultural and other products, the balance of trade against the country creating a serious drain to Europe of gold and securities. In immediately succeeding years the lack of prosperity and low prices for home products, aided by protective duties, caused the United States to buy less abroad; while the poor harvests of Europe enabled the country to sell more and more of its agricultural products, until in 1879 the exports of specie had so declined, and the general balance of trade had so greatly turned in its favor, that the United States had no difficulty in resuming and maintaining specie payments, with which came a revival of prosperity. Heavy imports and light exports, culminating in 1873, which turned the balance of trade heavily against the country, were the leading causes of the hard times from 1873 to 1879; while light imports and heavy exports brought good times.

Continuing, Mr. Swank says:—

Other influences affecting the balance of trade might be mentioned, but enough has been said to show that Protective duties have promoted our foreign trade, and that they have held in check importations which would have been ruinous. For example, the gold that we have sent to Europe this year would have been doubled in quantity and the country would now be facing general financial bankruptcy if the present tariff were not a strong barrier against excessive importations of foreign goods. As it is, we are importing far too many products of foreign workshops.

It would naturally be expected that the revival of prosperity which was ushered in by the resumption of specie payments in 1879, but which had been made possible only by a turning of the balance of trade in our favor, would continue so long as the favorable balance of trade would continue. But we have since had several years of low prices and declining prosperity when the balance of trade was in our favor, the explanation being that there had been overproduction in periods of prosperity, or that railroad building had declined, or that the farmers did not receive good prices for their crops, or that something had been wrong with our financial legislation, or that general causes affecting the world's industries, like the Baring failure in 1890, had operated to depress the prices of our manufactured products and check our industrial development, or that all these influences had been at work together.

But, while we may not always be prosperous with the balance of trade in our favor, the fact seems to be established from our experience before the Jay Cook failure and during the past year, that we cannot long be prosperous with the balance of trade against us. What a tremendous reaction has taken place in our trade relations with foreign countries in the last twelve months, and how seriously has our prosperity been affected by this reaction. The causes of this reaction are to be found, first, in Europe's poverty and her lack of confidence in our financial future, causing her to send home our securities and to draw heavily on us for gold, and, second, in a great falling off in the European demand for our agricultural products.

The figures of the table showing the transactions for the years 1891-92, entirely within the McKinley tariff regime, tell us that the net imports into the United States during these years were \$1,645,561,994, and the domestic exports \$1,888,002,294, the excess of exports being \$242,440,300. Both the imports and the exports for these two years were very much greater than for any other two years included in the table.

KNOWING BEANS.

It is an old expressive Yankeeism that he who did not comprehend the importance of his surroundings, and the possibilities within his reach, or who did not avail himself of his attainable opportunities, did not know beans. It is an important thing for any man to know beans; and the better he is acquainted with the article the greater the possibilities of his success in life. It might be said of Canada that it knew beans when it adopted the National Policy, which led the country to become a producer of things that it did not before produce, and a consumer of products that could not before be consumed in the country. That was an exhibition of acquaintanceship with beans. Canada knew beans when, in the adoption of the National Policy, it decided that it was not wisdom to place all the eggs in one basket. Previous to that time Canada was an agricultural country, and the agricultural industry was restricted to the production of but a very few articles, and these chiefly for export. It produced wheat, when the home consumption was very small. It produced barley when the chief dependence for remuneration was upon the market of a not very friendly people. It produced lean cattle for a country where the purchasers made big money by feeding their course grains and producing fat cattle for a far-away market. That was the time when Canada did not know beans. The education in this direction was slow, and acquired not entirely within itself. Canada has profited by the unfriendly actions of others. It has found that it is unprofitable to export barley

to a country which imposes a duty of thirty cents per bushel upon the article; and it is finding out that it is not profitable to export poor cattle to countries where the farmers find large profit in fattening them upon their course grains, and where the enrichment of the land, because of the presence of the feeding cattle, is a valuable consideration. This is the requirement of a knowledge of beans. Canadian farmers are discovering that the best use they can make of their long forage and course grains is to feed them to their own lean kine, themselves deriving all the benefit to be had therefrom.

The farmers of Canada are in many respects very like the farmers of the South, who even at this day are not acquainted with beans. Mr. Edward Atkinson, however, has volunteered to instruct the Southern farmer in this direction, and some of his arguments are quite as applicable to Canada as to Georgia or Alabama. He says that Southern lands need beans and other renovating crops rather than hooons, for their development; and he asks "What kind of bean is the best renovator of the soil, and why?" He tells us that the coming agriculturist is the bean farmer—that as truth lies in the bottom of a well, so farming prosperity lies in the bottom of a pit or silo. Time and money have been wasted in the attempt to substitute sorghum for sugar cane, and to divert needed labor from necessary work to the unprofitable occupation of reeling silk when the Chinese are ready to do that kind of work for us at a great deal less cost. This because they do not know beans.

What Mr. Atkinson says regarding the cultivation of cotton in the South is applicable to the growing of wheat in Canada. We know that for a century the growing of cotton was the chief staple agricultural product of the South, and that the prevalent belief in that section that the article could not be produced in sufficient quantities to supply the demands of the world except by slave labor in the Southern States, was a fruitful feeder to the arrogance and presumption of the cotton-planting slave owners which precipitated the war of the rebellion of 1860. But Mr. Atkinson tells us that until 1880 the South was as ignorant about cotton as it is at this time about beans. In 1861 he wrote a pamphlet on "Cheap Cotton by Free Labor," in which he remarked that the free Southern farmer of the future might get from an acre of good land:

500 pounds of clean cotton, at ten cents.....	\$50 00
1,200 pounds seed, yielding 600 pounds of kernel, giving twenty gallons of crude oil, at fifty cents 00 10	
450 pounds of oilcake, at one and one-quarter cents.....	5 02

Total..... \$65 02

This was then considered an extravagant prediction, but since then the remuneration of cotton planting has decreased a great deal.

Mr. Atkinson's comments are continued as follows:

The facts about peas, beans and peanuts are now known in part to many, but is there any general or effective knowledge about the matter? Bean oil, I have reason to believe, is the principal oil of China. Bean meal is a great article of commerce in China, and has been used to fertilize sugar-cane in Formosa for centuries. Mountain rice, which grows on the Himalayas 8,000 feet above the sea, is well known in India and is cultivated without irrigation. The mountain rice of Japan comes up through the snow, and needs no irrigation. I have procured the seed and placed it in the Department of Agriculture. Every rice-fed nation must have beans, else the people would starve for the nitrogen or albuminoids, in which rice is deficient. Is it not true that we as yet know

little or nothing about beans and rice, either in the Department of Agriculture or among farmers in general—always excepting Yankee baked beans?

Among the food plants of India there is one which every farmer of the South, who knows even a little about the nutrient element of food crops, will covet when it is described. In India it yields oil for men, and the cake is fed to cattle, while the refuse of the plant, being rich in nitrogen, is returned to the soil. It is one of the leguminous plants of the pea or bean variety and is called in Hindoo the mung-phullie or buemung. The pod is one and a half inches long, each containing two or three seeds, seventy-five of which weigh one ounce.

In these seeds there are the following elements:

	In 100 parts.	In one pound.
Water.....	7.5	1 oz. 87 gr.
Aluminoid.....	24.5	3 oz. 463 gr.
Starch.....	11.7	1 oz. 382 gr.
Oil.....	50	8 oz.
Fibre.....	4.5	315 gr.
Ash.....	1.8	128 gr.

100

Where maize has a food value at a certain standard of eighty-eight and a-half, buemung has a food value of 151. It is so rich that it must be extended with fodder when fed to stock. The plant is very prolific. Its botanical name is *Arachis Hypogea*.

Another extremely valuable bean very largely used in India and China as food for men and fodder for animals, is known as the bhut or butwan. It has a food value of 105 against eighty and a half for maize.

The analysis, with the husk on or in the pod, for cattle feed is:

	In 100 parts.
Water.....	9.1
Albuminoid.....	40.4
Starch and sugar.....	25.1
Fat.....	15.8
Fibre.....	5.2
Ash.....	4.4

100

After the oil is expressed the cake contains 40.7 per cent. of flesh formers and 7 per cent. of oil. If cut when the pods are first formed it makes a most nutritious hay. It is not attacked by any insect or parasite, and is fertilized with potash.

Another shrub pea universally grown in India, often in the same fields with cotton, is rich in albumen and starch, but very free from oil. It is known as thur or dul.

Others are very hardy, growing far up on the hills. Some are climbers; others, which are bushy and very dense, are planted around the cotton fields for their protection.

Some of them grow on the poorest and sandiest soil. The qualities and values are all well known and defined in India, China and Japan. Those which contain the greatest amount of albuminoids are, of course, the best for renovating the soil, as the nitrogen in them is now known to be drawn from the atmosphere by the microbes that live in the appendages which are found between the stalk and the root.

All these facts are well known in Asia. What do we know in America about beans? Who can tell the Southern farmer what bean or pea to plant for oil? What kind for fodder to mix with corn stalks in the silo so as to make a complete food? What kind to grow for starch? Perhaps all this is now a part of the common knowledge in the South, as well as in India.

I may myself be the man who don't know beans, but the only bean oil I ever happened to hear of is castor oil, and I think there is no general knowledge about bean meal. Who knows beans? Let him reply.

Would it not be well for both Dominion and Provincial Departments of Agriculture to investigate the possibilities for Canada in this direction? Soil, plant, beast and man must alike be nourished in due proportion with the nitrogenous

element in food or in fertilizer. The pea and bean vine derive this element from the atmosphere without cost, but in very different proportions. The pea-vine farmer who knows which kind to choose will make the best soil and the biggest crops.

THE SHIPPING INTERESTS.

The Montreal Herald, speaking of the National Policy and its effect upon shipping interests, points out that the big Canadian shipping companies have been losing money for some years past. At the commencement of their career they made money hand over fist, and the fortunate proprietors accumulated fortunes. These fortunes, it tells us, were built up under a low tariff which gave every encouragement to foreign trade; and that the adoption of the National Policy struck a blow at our foreign trade from which the country has never recovered; that "with all our boasted progress the amount of our foreign trade, per capita, does not even now reach what it did in the last years of low tariff."

If the chief commercial aim of Canada was to build up a foreign trade, then the criticism of the Herald might be appropriate. Such trade consists of exporting the surplus of what a nation produces, and importing such things as it requires that it does not produce, or that it produces in insufficient quantities. Under a low tariff we were not consumers to as great extent of what we produced as we are now, therefore our per capita exports may have been greater than they are now. Then we were a nation of producers of exportable commodities—now we are much larger consumers of them. If it is more desirable to export such commodities than to consume them at home, and this specially with a view to foreign trade—if the shipping interest is the great aim and object of national and commercial enterprise, then the Herald has just cause to lament the decadence of our foreign trade, if such is really the fact. On the other hand, if it is more desirable to import manufactured merchandise such as can be made at home rather than to make it ourselves, and this with a view of giving employment to shipping, then the Herald's grievance is substantial and well-founded.

But there is another side to this question. We contend that while it is well to have the facilities of intercourse with other countries, our energies should not be directed to building up shipping interests as against the internal prosperity of the country. While it is desirable to export our surplus products, that export should consist only of what we cannot possibly consume at home. It is better for the country that our capacity of consumption of home products be increased than to strive only to increase our exports. While it is desirable to import merchandise that we do not produce at home, it is more desirable to increase our capacity to manufacture such merchandise at home as is profitable for us to make here, rather than to abstain from such production for the sake of giving the larger employment to shipping employed in our foreign trade. Of course there are some articles that we produce that we cannot possibly wholly consume, such as some of the products of the farm, the forest and the fisheries, and which it is clearly to our interest to export; and there are some articles that we require that cannot possibly be produced here, such as tea, coffee and cotton, which we must import; but what is the real necessity for foreign goods beyond this?

If we export a certain value of farm produce—wheat, cattle, etc., to meet an obligation to pay for an equal value of say textile goods which might have been made here, our contention is that while shipping interests are benefited by the foreign trade, the greater interests of the country are not benefited. Under one set of conditions the farmer has to pay cost of transportation on his produce to a foreign market where they must be sold in competition with the whole world; and the Canadian consumer has to pay cost of transportation on his textiles which have been made by foreign labor. Under the other conditions the farmer sells his produce to the employees in factories near his own door, and where the money is not sent out of the country, nor paid for two transportations, but kept at home.

Of course the greater prosperity of the country demands that this latter condition prevail. The prosperity of a country like Canada requires that we have a great diversity of industries—that all our eggs are not placed in one basket. With such greater diversity of industries as the acme of prosperity requires—with factories and workshops and industrial establishments employed in manufacturing merchandise with which to supply the necessities of the people, instead of being compelled to confine his operations to a few exportable commodities such as wheat and cattle, the farmer would find it more profitable to diversify his industry and produce poultry, eggs, lambs, fat beef, fruits, vegetables, etc., such as is in constant and remunerative demand in all manufacturing communities. It was recently shown in this journal that the city of Toronto alone, with a population of only about one-twenty-fifth of that of Canada, was an actual consumer of more fat beef and mutton than the entire exports of Canada to the United States. Now, is it really to the interest of Canadian farmers who produce fat beef and mutton that Toronto should exist? With a population of some 200,000 souls Toronto is not a producer of such things but a large consumer; and not only of these but of everything else that farmers produce. Would it benefit our farmers, or would it be to the material welfare of Canada if these 200,000 people living in Toronto were scattered on to farms and were producers of just such things as they now consume? Certainly not? But it would be to the interest of those engaged in shipping merchandise back and forth in foreign trade. And if it is to the interest of Canada and Canadian farmers that Toronto with its 200,000 souls are consumers of farm products, certainly it would conduce equally to the same interest that we should have other manufacturing centres, such as Montreal, St. John, Hamilton, and the hundred of other places that have tall chimneys and workmen who have hungry mouths to feed. When these interests are developed to the fullest extent possible; when we have manufacturing establishments capable of supplying the wants of the country, and agriculturists supplying the employees of them with all the articles of food the country is capable of producing—then the shipping interests will assume a much greater importance than now.

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THE

CANADIAN MANUFACTURER

HOW ABOUT THE REJOICING?

In a recent issue of this journal we quoted an item taken from the Montreal Herald to the effect that Congressman John De Witt Warner had said that in the next American tariff iron ore would be on the free list, and that it was the opinion of the Herald that if this prophecy should prove true there would be rejoicing in Canada. The Herald meant to say that the rejoicing would be on the part of the owners of Canadian iron mines who would then have access to the great American market. We pointed out that there were no well developed iron mines in this part of Canada, and that the iron mines of the United States were in such condition of development as to be able to produce ore enough to make some ten million tons of pig iron per year; but notwithstanding this wonderful development there was much depression in the trade, work in many of the highly productive mines having been suspended. In proof of this we quoted from the Iron Trade Review, a competent authority, to the effect that the monthly payments on ore sold were bringing three times as much money into Cleveland a year ago as was then being received on ore account in that city; that curtailment was going on steadily at the mines: that of the twenty-four Gogebic shippers of 1892 only ten had shipped ore this season, and that great stagnation existed in the business. And we asked the Herald, "How about the rejoicing in Canada?"

We have watched very closely to see what the Herald would say about the rejoicing, but up to the present time it has not told us. Of course the Herald is of that class of journals that always does justice though the heavens might fall because thereof, and no doubt it will soon find time to think over the matter and explain where the rejoicing comes in at, for we are anxious to know. We desire to learn what would be the grounds for rejoicing on the part of owners of Canadian iron mines if iron ore should be placed in the free list in the American tariff. The United States is a big market, containing more than sixty millions of consumers of iron, and if they were dependent upon Canada for iron ore as they are for nickel, no doubt access to that market would be a boon to our mine owners, and the Herald would be quite safe in declaring that to be a fact. But we have no well developed iron mines in this part of Canada, and therefore we would have no ores to sell to the United States, and we are informed by The Iron Trade Review that many of the largest and most productive iron mines in that country are not now being worked simply because there is no profitable demand for the ores. And still the Herald tells us that there would be rejoicing in Canada if iron ore were placed in the American free list.

But since our article to which reference is here made was published iron ore matters in the United States have been going from bad to worse and the distress growing out of the situation is more poignant and widespread than what might have been supposed from what we then said. This is apparent in what a subsequent issue of the Iron Trade Review says of the situation, in an article in which it mentions our discussion with the Montreal Herald. It tells us that the curtailment of production of American iron mines, to which we had alluded, was only a premonitory pattering of the great downpour that has occurred since then. It says:—

The suspension of operations at the Norrie, the cutting off

of the night forces at the Minnesota and Chandler, and last of all, announcements of suspensions at the Cliffs Shaft and the Cleveland mines, on the Marquette range, indicate how little worth fighting for is any market that Lake Superior iron ore might find in the present condition of the furnace industry in tributary sections. Moreover, it is not the 75 cents tariff on iron ore that so much determines the possession of the home market by home producers, as the cost of getting the ore from the mine to the furnace. Another drawback which Canadian producers will encounter in attempting to get a market in the United States is the high grade of Lake Superior ores. In fact, there is not a single advantage on the side of the Canadian mine owner in an open, duty-free competition with Lake Superior mines in the territory which the latter now supply. Cuban and Spanish and African ores have the advantage in prodigiously cheap labor, and of having but little more than ocean freights to pay to get to furnaces near the seaboard. When Canadian iron ore producers can put their product on board vessel at Canadian port at \$2 to \$2.25 for a Bessemer hematite running 64 in iron and .025 in phosphorus, there will be some occasion for Canadian "rejoicing" at the removal of the tariff.

Will the Herald kindly assist us in discussing the question from its own standpoint that there will be rejoicing in Canada if in the next American tariff iron ore will be on the free list.

A CANADIAN MERCANTILE AGENCY.

The Shareholder in a recent editorial discussing mercantile agencies alludes to the statements made by Bradstreet's and R. C. Dun & Co. for the first six months of the current year, and calls attention to the fact that they are widely divergent in the facts they state. It shows that Messrs. Dunn & Co. report the failures in Canada and Newfoundland as 811, with \$8,706,127 liabilities, while Bradstreet's reports the number as 887, with \$8,215,759 liabilities. Dun reports 76 failures less than Bradstreet; but the liability of the smaller number are \$490,368 greater. Were the liabilities reported by Dun proportionally less the conclusion would be that Bradstreet's had the more accurate facilities for obtaining information; but such is not the case, and one is left in darkness as to why and how such discrepancies occur, and how much if any depend. ence may safely be placed in either of them.

Neither Dun nor Bradstreet's are Canadian concerns, both having their chief offices in New York, with branches in the larger cities of the Dominion; and until about a year ago Canadian business men were obliged to rely upon either the one or the other, or both of these concerns for information regarding those with whom they might have commercial transactions. But last year The Legal and Commercial Exchange sprung into existence, with general offices in Toronto, Montreal and Hamilton, and branch offices in all the smaller commercial centres. Those who are managing the business are men of sound discretion, excellent business education, thoroughly conversant with the work they have in hand, assisted by well trained office labor, the important outside work of gathering the information for which the company was organized being in the hands of men who have had years of experience and of mature judgment. And there is abundant capital in the concern.

Under these circumstances there is no reason why this Canadian concern should not succeed; and it is succeeding in a manner that gives great satisfaction not only to its promoters, but to its commercial patrons also. It has the con-

fidence and the patronage of many of our most prominent bankers, wholesale merchants, manufacturers and business men generally. The company have also reliable correspondents in the United States and Europe; and a valuable feature of their business is their department for the collection of accounts both in Canada and everywhere else in the world. A notification sheet is issued daily from the Toronto office by which subscribers are in the most prompt manner made acquainted with all changes being made in commercial life in Canada. This concern cannot but be of the utmost value to our manufacturers in their commercial transactions; and being a distinctive Canadian concern is entitled to their consideration.

AN IMPORTANT INDUSTRY.

In previous issues of this journal allusions have been made to Canadian industries where lines, plasters and cements were the products, and many of these industries were named and located. Our principal object was to show that Canada is abundantly possessed of the material for the manufacture of such goods, that Canadians abundantly possessed of skill and capital to produce them, and that evidently through ignorance of the fact that these goods are of most excellent character and equal to the best made anywhere else, they were not used as generally as the manufacturers of them might reasonably hope for. This is accentuated by the fact that already this season more than 70,000 barrels of Portland cements have been received at Montreal from English and European ports.

In view of the fact here stated that Canada possesses practically inexhaustible stores of the materials from which the best qualities of cements may be made, and that there is a very large and ever increasing home demand for the article, it may be interesting to know somewhat of the chief sources of supply from which our imported cements come.

The first known cement factory in England was at Northfleet, on the Thames; another was built about 1825. For many years the manufacture of Portland cement made no advance. Owing to the crude processes then used, this product was looked upon with suspicion. In 1850, four factories only were engaged in the manufacture of it; but from 1860 the industry increased until the quantity now manufactured in England now exceeds 8,300,000 barrels a year. The process of manufacture used is very much the same as it was twenty years ago, and few improvements have been made. The raw materials are chalk and clay, both very pure and readily soluble in water. The quality of the raw materials is considered defect, and this explains how with inferior methods English manufacturers succeed in producing a satisfactory cement. Only one quality of cement is made in English factories, and this includes the whole output of a kiln, less the under burnt clinkers picked by hand with more or less care. But there are different commercial qualities of cement according to the fineness of grinding. Until a few years ago the English cement was put on the market just as it comes from the mills. The sifting operation did not exist, and the result was that the cement usually left a residue of fifteen to twenty per cent. on the No. 50 sieve, and twenty-five to thirty per cent. on the No. 80 sieve. The progress in grinding made in other European factories led English manufac-

turers to improve their own grinding facilities, but still the English cement, as a rule, is far from being as finely ground as the German and French article.

The manufacture of Portland cement was introduced in Germany by Bleibtreu, who, in 1852, established works at Stettin, which made from 25,000 to 30,000 barrels a year until 1856. He built at about the same time another cement mill at Obercassel, and these two establishments produce yearly from 160,000 to 200,000 barrels. New works were built soon after, and there are now no less than sixty large Portland cement works in that country. The annual production in Germany is about the same as in England, 8,500,000 barrels. The development in Germany of the cement industry is not due, as in England, to the favorable quality of the raw materials; on the contrary, in many of the German works the materials used are difficult to handle, but German manufacturers have made great efforts to produce an article of reliable quality, and to develop in their work the most progressive methods of manufacture. They have organized themselves into a public association; they admit foreign manufacturers among them, and in their meetings they discuss questions relating to the manufacture and quality of cement. Thus the researches and studies made in one establishment serve all others. This association of manufacturers is one cause of the development of the cement industry in Germany during the last few years.

In France the Portland cement industry did not grow as rapidly as in England or Germany. In 1880 the whole production hardly exceeded 760,000 barrels a year; it is now however, 1,800,000 barrels. It was only in about 1850 that Portland cement commenced to be used in France, when Dupont & Demari started their manufacture at Boulogne-sur-Mer in the North. They had previously spent several years in experiments to find out the best way to use the chalk marl in that vicinity, which is still the raw material they use. In a comparatively short time Demari succeeded in finding a process so perfect that it is still followed, and the composition of the cement has not been changed. The reputation of this cement is inferior to none in Europe. The works of this Company alone produced about 800,000 barrels a year, being the largest of the kind in the world.

In Russia the first cement works were built at Polen in 1857. There are now twelve of importance; eight of them make Portland cement, the others natural cement. The total production of Portland cement in Russia is about 900,000 barrels a year.

In Belgium there are four cement works, making altogether about 800,000 barrels a year; the largest being those of the Societe Anonyme de Niel, Ruppel, making 400,000 barrels yearly.

In Italy the manufacture of Portland cement does not properly exist. Several works make a kind of natural Portland cement by burning cement rock to a little higher point than common cement. The two largest factories are located at Cazale and Bergamo. In Switzerland there are several Portland cement works, but a so-called natural Portland cement is mostly what they manufacture. In Austria there are only a few establishments producing Portland cement, and their product has acquired little reputation. There are five Portland cement works in Denmark, and their output

reaches 300,000 barrels a year. In Sweden four factories produce annually 425,000 barrels. One establishment makes 80,000 barrels.

The total annual production of Portland cement in Europe is estimated at 20,000,000 barrels.

We do not understand that there are any other factories in Canada at which either Portland or natural cements are made, other than those to which we have heretofore alluded, with the exception of that of the Albert Manufacturing Company at Hillsborough, N.B. This is the largest concern in the Maritime Provinces and one of the largest in Canada, and the products find large demand as far west as Western Ontario. The sales of plaster from these works have increased from 4,000 barrels per year in 1876 to 40,000 in 1893.

HOW LOWMOOR IRON IS MADE.

WE take the following extracts from the inaugural address of E. Windsor Richards, President of the British Iron and Steel Institute, May 25, 1893.

The puddler is not yet dead, for we find in last year's statistics of the British Iron Trade Association that, in spite of very bad trade, the country produced 1,500,000 tons of puddled bars; but so little has been said in this Institute of late years on the manufacture of iron that it may interest you to hear something of the mode of making a material which has the highest reputation, and which, so far, for certain purposes, nothing has been able to dislodge. In speaking of the best Yorkshire iron I am only able of my own knowledge to describe the process of manufacture at Lowmoor, and as no general description has, I believe, ever been given, I trust the information may be found interesting. As my active connection with the manufacture of iron and steel must, in the natural order of things, ere long cease, you will acquit me of any desire to take advantage of the position you have placed me in if I describe methods and processes in which I am personally engaged.

Cold-blast pig-iron—really cold-blast—has always exclusively been made at Lowmoor. It contains from 1 to 1½ per cent. silicon and .3 phosphorus; a very rich gray forge quality is preferred. The whole of the pig iron is passed through the refining process. There is no pig iron puddled. The refinery eliminates the whole of the silicon and reduces the process to .1 by constant practice with materials of very slight variation, the refiner knowing how to leave the carbon untouched. The puddlers, therefore, have only to perform the duty of eliminating carbon and the small remaining quantity of phosphorus in order to obtain a practically pure lump of iron. As it is of vital importance that the puddling should be as nearly perfect as possible, and that the shingling under the steam hammer be equally well performed, rewards and fines are established in order to procure even quality of workmanship.

The method of inspection of the puddled and hammered lump is as follows: The foreman every day chooses from each man's work any heat he desires to test, and has one or more pieces broken through. The fractures of these lumps are carefully examined and numbered according to the degree of perfection attained. These numbers are added up at the week end. The workmen having the most numbers representing

the worst samples in evenness of quality have to stand out, or, in other words, are not allowed to work on the following week, whilst the men who have the least numbers, representing the best samples of work during the week, are rewarded by money prizes. This system necessitates the keeping of surplus men, who are waiting to be taken in when others are turned out. The decision of the foreman when judging the samples is never disputed; the samples are exhibited, so that the men have every opportunity of examining for themselves the work they produce, the figures showing each man's work being posted up daily, so that the men are satisfied that no partiality is shown, no errors of judgment made. This system has been strictly carried out day by day, and every day over many years, and creates a very desirable competition, keeping the men's attention concentrated on their work. The puddler works 10 heats of refined metal of 3 cwts. each per turn.

The puddled balls are all worked under 50-cwt. steam hammers into slabs about 12 by 10 of varying thickness. Each slab bears the puddler's special mark. These slabs are then piled and repiled to make the required weight for rolling into the various sizes of finished iron, whether plates or bars. All these weldings require the greatest care in heating and hammering; the iron bears a very high heat without any deterioration of quality. In plate rolling the greatest care, too, has to be taken to avoid laminations and blisters; the purer the iron the more difficult it seems to be to prevent them. Careful examination is made when rolling by having jets of water playing on the surface of the plates to detect blisters or unwelded portions. The inspection is continued when the plate is cold by rapping all over both surfaces with a hammer and noting the sheared edges all round the plates. The workmen, having inherited their fathers' positions, have done no other work all their lives but manipulate the same class of materials to produce the same results. Only one quality of iron being made, the same methods of working having been pursued over very many years, each workman is especially skilled at his respective task. The result of all this care and skill and good materials is a soft, ductile and reliable iron.

Best Yorkshire iron has attained its high reputation by reason of its power to withstand many sudden shocks without fracture, its reliability and its welding qualities.

AN OPENING FOR CANADIAN ENTERPRISE.

An important notice was recently issued by the British Secretary of State for India, which is of special interest to Canadian manufacturers. Rewards are offered by the British Government for the production of designs and models best adapted for mule carts for the transport use of the British Army in India. The awards are to be made after a practical test in India of a full sized specimen by a jury consisting of the Quartermaster-General of the Army of India, and five other military and technical officials. There are five prizes, the first being \$3,750, the second \$2,500, the third \$1,875, the fourth \$1,250 and the fifth \$625. The object desired by this competition is the production of a design, accompanied in all cases by the working model, for a military transport cart adapted to conditions which make the use of interchangeable metal parts for all important portions of the cart absolutely indispensable. Intending competitors wishing for the fullest

details as to the kind of cart required are directed to apply to the Director-General of Stores, India Office, Westminster, London, S. W., England, or to the Secretary of the Government of India Military Department, Calcutta, British India. Foreign competitors may obtain further information on application to the Secretaries of British Embassies or Legations at their respective capitals, but are recommended to apply to London or Calcutta. The competition closes on Sept. 30, 1893, by which time all designs and models must have reached Calcutta, which is twenty-four days from London.

One of the main sources of trouble in British military operations in Asia has always been transportation, and on several occasions important strategical movements have been rendered nugatory by the failure of the transport service. This is true not only of special campaign work beyond the Indian frontier, but also of operations in India itself. The character of the country to be contended with is plainly suggested by the explicit details given as to the construction of the vehicles in the Government notice. The object is evidently to design a military transport cart for a mountainous country, with absolutely no local resources in the way of skilled labor or constructive material. It must be equal to the roughest handling, as the existing unmetalled roads in India are steep, narrow and rough. Although throughout the Indian empire there are many good roads, there are whole kingdoms without a yard of macadamized road. It is apparently with a view to opening out new lines of travel that the authorities propose to strengthen their transport facilities, as the "instructions" set forth that "carts would further be largely employed on unbridged and unmetalled tracks newly opened along hill sides and stony river beds to meet the exigencies of military operations." The carts are to be made almost entirely of metal. As the effects of rough handling and jolting on loose joints and fittings, and bad workmanship generally, combined with the difficulty of making efficient and timely repairs, have in times past been found to be the main causes of transport carts breaking down, machine boring and turning with perfect fit and interchangeability of parts is absolutely insisted on, so that every broken part in any cart can be immediately replaced by a similar part, without any shaping, fitting or skilled labor whatever. The necessity of this restriction as to material is peremptory when the abnormally dry air, the scorching sun, the freezing winds, and the frequent variations in temperature of from 185° above to 15° below zero (Fahrenheit) are taken into consideration. No matter how well seasoned wood may be, it shrinks and warps in such a way that its use, except, perhaps in the poles and shafts, floor boards and sides, is absolutely debarred. A side light on the thieving propensities of the native laborer and camp follower is derived from the strong injunction to dispense with wood, even in the secondary parts, "as it is liable to be stolen and burnt as fuel."

While no restrictions are placed upon the use of any metals whatever, designers are warned that for such parts as tires, forgings, boxes, etc., which it may require specially-skilled labor to manipulate without injury from over-heating or burning, mild steel, wrought, cast and malleable cast iron, copper and brass are preferable to special qualities of steel, phosphorus and Uchatius bronze, and are, moreover, more familiar to native workmen. As the merits of a design will be largely judged from its prime cost, competitors are recommended to consider how far light and strong, but possibly

very expensive, metals should be used in place of commoner material, having special regard to the importance, in the matter of durability, of the cart itself not being unduly light with reference to the load it has to carry. The weights quoted for the cart are 656 English pounds as a maximum and 492 pounds as a minimum, but a designer can make a lighter cart provided it be of sufficient strength. It is evident that the carts are to be worked entirely by natives, as the mules are to be led by a man on foot, a driving seat being inadmissible. No kind of overhead covering is necessary. Laden carts will practically never be driven faster on level ground than at four miles an hour. As carts will often be loaded in railway trains by night, special importance attaches to ease and rapidity in dismantling and re-erecting the carts, and to facilities for the compact railway packing of constituent parts. This would indicate the use of removable poles or shafts. Great stress will be laid upon facilities for tightening up parts on the march, and for replacing tires, spokes, etc., with ease and rapidity and without skilled labor.

The importance of the subject is shown by the magnitude of the prizes and the fact that the competition is thrown open to the whole world.

EDITORIAL NOTES.

A NEW, struggling and badly handicapped Canadian industry is that recently started in London for the recovery of such gold and silver as may be contained in the floor sweeping of establishments where jewelry is made, of photograph galleries, etc. Those who are at all conversant with the matter know that these accumulations are very valuable, and that the manufacturers would sustain constant losses if the precious metals could not be recovered. A few months ago an item went the rounds of the jewelry and the other journals showing the large value of precious metal recovered from the floors and other portions of an old building that had for many years been used as a jewelry factory. The old lumber was carefully cut up and burned in a furnace prepared for the purpose, and the metal, which would otherwise have been lost, was recovered from the ashes. We know that in mints where coin is made, the sweepings of the floors are carefully preserved, and that even the overalls worn by the workmen are also, with the sweepings, carefully burned and the precious metals contained therein thus recovered. There are a number of concerns in the United States where the precious metals contained in sweepings is recovered. Agents for these concerns constantly visit jewelry shops and factories and similar places, and have these sweepings sent to their refineries, and a profitable and satisfactory business is thus conducted. These visits are usually extended to Canada; and although such a refinery has been put into successful operation in London, under the management of a skillful and experienced assayer and refiner, American purchasers are constant in their visits for Canadian sweepings. On the other hand, the London concern is constantly seeking sweepings for refinery purposes, and if it could be kept in constant operation employment would be given to quite a number of highly skilled workmen—the capital has already been invested in the plant. Gold and silver bullion is on the free list both in Canada and the United States, and on duty whatever is charged upon sweepings entering the lat-

ter country. This should be the fact in Canada also, but it is not; for under what we think a strained and far-fetched interpretation of the tariff, the Customs Department classifies sweepings as an unenumerated article of jewelry, and as such liable to the same duty as manufactures of gold and silver, or as jewelry of gold or silver. The precious metals contained in sweepings are nothing more nor less than the salvage obtained from the waste of factories and workshops, and are entirely valueless until recovered by smelting and refining, and to impose a duty upon such stuff is a travesty upon a system which should be purged of such an incongruity.

At the recent convention of the Liberal Party in Ottawa, a platform of principles was adopted, and that plank having reference to the tariff states that the customs tariff of the Dominion should be based, not as it is now upon the protective principles, but upon the requirements of the public service, or, a tariff for revenue only. This is the opposite of the principles of the Conservative Party, which adopted and adheres to the National Policy of tariff protection to Canadian manufacturing and farming industries. This system has not disappointed the masses of the people who inaugurated it and have contributed to support it, and they are not prepared at this time to declare against it, or in favor of a free trade policy. Thus the issue between the two political parties of the country is clearly defined. There are incongruities in the tariff that should be corrected; and there are changes that must be made. But these corrections and changes will be made by the friends of protection, and the enemies of the National Policy will not be called upon to destroy it.

THE Hamilton Spectator produces the following as its ideal of a franchise act:

Every male person, being twenty-one years old and a British subject, resident in a polling sub-division thirty days before the date of election, shall be entitled to be registered as a voter, and, being registered, shall be entitled to vote at such election.

It should have gone further and stated that no man should have more than one vote under any circumstances.

WHILE the National Cordage Co (the Binder Twine Trust) is in the throes of bankruptcy and reorganization, Kentucky newspapers teem with advertisements of Kentucky hemp binder twine. Farmers are being encouraged to raise more hemp, and likewise to use the twine made therefrom in preference to imported jute. Kentucky hemp binder twine is being retailed at nine cents per pound, namely, about three cents per pound less than the jute twine.—Louisville, Kentucky, Manufacturer.

A MOST commendable departure on the part of an employer is that made by Alfred Dolge, of Alfred Dolge & Son, of Dolgeville, N.Y. Mr. Dolge has instituted among other co-operative features in his establishment a system of life insurance by which each employee receives a policy of \$1,000 after five years consecutive service, another \$1,000 after another five years of such service, and a third thousand after the third term of five years of such consecutive service—the firm, of course, paying the premiums in such policies.

BREAD has never been so cheap in England within the memory of man as it is at the present time, when the wheaten loaf of four pounds is supplied by contractors to great institutions at two pence half penny, that is a little over a cent a pound. That is a great deal cheaper than in Canada, whence people export both wheat and flour to Great Britain. It is said that Minneapolis flour can be obtained in the ports of Great Britain at as low a price as Manitoba flour can be obtained in Montreal. That is probably partly because Minneapolis flour in the British markets finds a competitor in the Manitoba flour, which has a monopoly of this market, or, at least, is protected by a duty. The farmer gets little, or none, of the benefit of the duty, for the price of wheat is governed by the price paid in the British market for the surplus which is sold there. No. 2 Chicago wheat for delivery in July was quoted yesterday as low as 69 cents. There is no one bold enough now to set a limit to the possible minimum price of wheat. All predictions of that kind have been utterly belied.—Montreal Witness.

Bread has never been so cheap in England as at the present, under free trade, and bread was never so difficult to obtain. What matters it to the British workmen if bread is but a little over a cent a pound, if he is out of work and therefore has no money with which to buy it. Bread may be cheaper in Great Britain than in Canada, but if it is, the Canadian workman, thanks to the National Policy, has the wherewithal to buy. If the Manitoba flour is worth more in Canada than Minneapolis flour is worth in Great Britain, the Manitoba farmer reaps the difference, thanks to the National Policy, and the duty of fifteen cents per bushel on wheat imposed by the tariff. The Witness has intelligence sufficient to comprehend that the Manitoba farmer pockets the difference in price in Canada as between American and Canadian flour, and its effort to cloud this fact is not creditable to its honesty.

THE American Economist has asked a large number of workmen engaged in manufacturing establishments to give their opinions of the effect of changes in the tariff such as are proposed by the so-called "tariff-reformers." A great many letters have been received in response to this invitation, and in every case the writer declares that reduction of duties will result in reduction of wages in his particular industry. One man, born an Englishman, shows how he brought over to the country, and found situations for in the mill in which he works, two of his relatives, both of whom at once obtained from twenty-five to forty per cent. better wages than had been earned in England. All of these men perceive clearly that their better wages are secured to them by the tariff, and that when the duties go down, wages must also go down. Not one of them holds the opinion, urged by the free traders, that the employers are engaged in robbing the workmen. Not one of them agrees with Mr. Cleveland that the larger wages are wholly absorbed by the larger cost of living. There can be no doubt that the men who have written to the Economist accurately represent the convictions of the mass of the workmen in the manufacturing industries. We doubt if five per cent. of such laborers favor changes in the tariff, and some who voted with the "reformers" in November last, now regret their folly.

COLD storage for farm produce is gradually developing an entirely new feature in the marketing of farm supplies. Heretofore it was always compulsory upon the farmer to market his perishable stuff just as soon as he possibly could.

Milk, butter and eggs if not sold would spoil, and their forced sale always tended to depress the market unduly, such sales sometimes resulting actually in a loss to the farmer. But now that the idea of cold storage is being entered into more largely on lines that have several times been suggested by The Homestead, the prospects are better for good prices. By checking an oversupply at any one season, perishable goods can be held till the market is more bare, and although the cold storage produce does not bring as high a price as strictly fresh goods, still the average returns are better through the maintenance of a more steady market. The same idea can be equally applied to fruits, and there is no reason, except that of lack of proper cold storage, why consumers in large cities such as Boston and New York, should not be able to purchase good fresh peaches, plums, early apples and pears, cherries and such things at Christmas time, which would command good prices during the holidays, and would be bought at such a season by those who could afford to pay for them. What is more to the purpose is that while placing his goods in cold storage the farmer is not compelled to wait till they are sold before receiving any returns, because money can be borrowed on butter, cheese, chickens and other stuff that will keep, from the banks, which are always willing to advance on warehouse receipts. The best plan would be for farmers to co-operate in their own localities and erect their own cold storage warehouse. They might even co-operate in the work of building it just as easy as they can co-operate in storing the ice. The farmers can thus secure their advances at home, watch the market closely and sell on a rise, instead of almost giving away their products to commission merchants who would do the storing and reap the benefit of the higher prices. The cost of storage, if the idea were carried out by farmers on the co-operative plan, need be next to nothing, sufficient only to cover interest on the building, with very little more in the way of other charges because the farmers themselves would cut, haul and store the ice, also deliver and receive their own goods.

FARM AND HOME, an American agricultural paper, draws this strong picture of one phase of the sixty million market to which Canadian farmers are invited:

The national association of retail implement dealers is the meanest kind of a trust. One of its ironclad rules is to buy no goods of a manufacturer who retails any of his wares direct to the farmer. This is nothing more nor less than a trust and conspiracy in restraint of trade, which is a direct violation of the federal anti-trust law. We invite those who know anything about this matter to submit full particulars to Farm and Home, that we may prepare a case to be submitted to the United States attorney-general. If the real facts are proved beyond doubt, we shall have no difficulty in securing a verdict from the United States courts annulling this infamous trust. Every manufacturer of implements and every farmer is equally interested in suppressing this conspiracy. The national association of implement dealers is composed of a gang of middlemen who are leeches on both the producer and consumer of farm implements. They demand large commissions, which of course take the form of a heavy addition to the retail price of an implement, that the farmer has to pay, while on the other hand many of them are very slow to remit to the manufacturers of whom they buy their goods. This is why such a large number of manufacturers are yearly finding it more and more to their advantage to sell direct to customers by advertising in the agricultural journals. Evidently the time has come for the

manufacturers and consumers to unite with the agricultural press in knocking out this outrageous implement dealers' combine. Farmers should refuse to buy of any dealer who as a member of the combine refuses to handle the goods of manufacturers who sell direct to farmers, and should send direct to such manufacturer. Such cases of refusal on the part of dealers form one of the most important kinds of testimony that Farm and Home desires to secure in its legal fight against this monstrous monopoly. Instead of empty talk against this illegal combination, let us move on its works with a concentrated power and force that will entirely rout the trust. Farm and Home is ready to lead in this immense undertaking if the farmers and manufacturers of the country will back it up.

THE Niagara Falls Park and River Railway, extending from Queenston to Chippewa, Ont., was opened to the public a few days ago and is proving a grand success. The road is operated by electricity, the chief source of power being obtained from the falls in the park, supplemented by energy derived from dynamos driven by a steam engine at Queenston. Queenston, be it known, is at the head of steamer navigation on the Niagara River approaching from Lake Ontario, and Chippewa is on the Chippewa River, about a mile from where it falls into the Niagara River at the south end of the rapids above the great falls. At Queenston the elevation of the escarpment where Brock's monument stands is about 350 feet, and this is attained by the road by a winding approach involving a grade of about one and a half miles in length, and a rise of five feet in each hundred. The elevation having been attained, the balance of the road, about a dozen miles, closely follows the winding of the river, and around the brink of the famous whirlpool, a better and more continuous view of the river, the rapids, the whirlpool and the falls being had from the cars than is possible in any other manner. The road and its equipment seems to be all that could be desired—that is if the brakes on the cars are all right and will always answer their purpose under all circumstances. But if the brakes of a car, loaded with passengers, going either up or down this phenomenally steep grade should fail to act, and if the trolley wheel should leave the wire at the same time, unfortunate results might occur similar to the disaster at Lookout Mountain a few years ago.

AND should the Federal Government not interfere with the sugar-bounty system established by the Congress before last, but on the other hand give the assurance that the system will be maintained for the fifteen years for which it was originally fixed, there seems to be every prospect, from the immense development of the industry which has already taken place, that every ton of sugar needed for home consumption would be produced within the sole limits of the United States by the year 1905.—New Orleans Times and Democrat.

THERE is well-spread and general suffering in the several established iron ranges of the Lake Superior district, says a St. Paul dispatch. It is the worst since the black days of 1872. There is scarcely a mine on the Marquette, Menominee or Gogebic ranges that is not either completely closed or greatly curtailed in operation. Miners have been thrown out of work for the past three weeks, and now the number of idle men in these ranges is at least 8,000 greater than it was less than a month ago. This tremendous non-employed force decreases in like ratio the business of the railways in that sec-

tion and also of the stores and dependent industries. It is probable that 12,000 men in the upper peninsular of Michigan and Northern Wisconsin are to-day out of work by reason of the closing of these mines. Miners, in many instances, were the sole support of the whole town. There is no other possible source of income, agriculture and manufacturing being practically unknown. Most of these mines that have suspended operations are still shipping the ore that they mined and put on stock piles. Some few are continuing mining operations with day shifts. Some, however, are so completely shut down that the pumps have been taken out and the mines will be allowed to fill with water.

ONE of the latest uses of aluminum is for cooking utensils. An expert of the metallurgical laboratory of Lehigh University says after two years of actual experience, that in point of lightness, cleanliness, durability and all-round adaptability, vessels of aluminum are the perfection of cooking utensils. He instances two boilers which have been in daily use for cooking all sorts of food, for preserving, stewing fruits, and the like for two years, and are to-day as bright as new and have not lost a fraction of weight. One weighs 1 pound 12½ ounces, and the other 1 pound 11 ounces.

FOR some time past the superintendent of motive power of the south-west system of Pennsylvania lines west of Pittsburg has been using oil furnaces in his blacksmith shop at Columbus, remarks an exchange. These furnaces are designed for heavy work, and have proved so successful and well adapted for the work required of them that others are being installed in other shops of the same system. One feature of this furnace that may surprise those who have not had much to do with oil furnaces of such size, is the absence of any stack or other means for carrying off the product of combustion. It has been found by actual experiment that when a stack is placed on such furnaces the temperature cannot be maintained to as high a point as desired. Without a stack it is evident that the flames and products of combustion have a tendency to creep out wherever there is an opening. For this reason the doors in the front of the furnace are carefully fitted, and it is found necessary to protect the buckstuffs in the immediate vicinity of the doors extending out a rib of firebrick from the front wall. These furnaces when first installed gave an economy of about fifty per cent. over that of the coal furnaces, and an increased output of twenty-five per cent. The economy was not wholly due to the difference in the cost of fuel, a portion of it being accomplished by the reduction of labor—there being no wheeling and shovelling of coal and ashes. While the increased output is maintained, the economy has in a measure fallen off: not due to the performance of the furnace itself, but because of the increase in the market value of oil since the furnaces were first installed.

DURING the discussion following the reading of certain papers on 'erra cotta, before the Royal Institute of British Architects, Sir Henry Dalton said: "As to its durability, I may perhaps mention two examples which occur to me as within my own observation. The figure of 'Britannia' on the top of the Exchange, at Liverpool, was made a hundred years ago at Lambeth, and also the figure of Sir John Crosby, which was made when I was a little boy

at Lambeth. These, especially the figure of 'Britannia,' though exposed to adverse influences, are as perfect to-day as on that of their erection. There happen to be two large statues on the triangular piece of ground opposite St. Thomas' Hospital, brought there recently, also made at Lambeth, which are ninety-six years old, and which have been quite untouched by time. There is no reason why terra-cotta should not be imperishable."

UNDER the caption "Triumphant Industries," The Forum prints a highly eulogistic resume of the advancement in electrical mechanism and invention, and its embodiment as evidenced by the stupendous industry carried on in the United States under the title of the General Electric Company. From this article we quote as follows:

"Emerson once said that steam was half an Englishman. With equal felicity and more truth it might be affirmed that electricity is half an American. That which our philosophic countryman noted as a characteristic phenomenon was the creation of a modern England with immense factories, great lines of railroad, and a ubiquitous mercantile marine, operated by an agency all-predominating and irresistible. Such it remains to this day. But no agency that seconds human effort need be so exclusively adopted as to prove at last seriously obstructive of further advances. One good custom soon corrupts the world, and progress must ever find new ways and new tools. In America, with all the resources of a virgin soil to open up: with greater distances to overcome: with a larger population more widely distributed to be kept in closer touch: with a keener appreciation of economies in time than those in mere coin; with a pervading belief that novelty is apt to have merit simply because it is new, the nation has been swift to approve and to adopt each discovery in the electric arts.

A distinguished English physicist is credited with the remark that he did not care to do anything by electricity when he could do it some other way. Even Bismarck, though willing to be night telegraph editor, grumbled sourly at the instantaneous effectiveness of the wire and keys as spoiling all the stately traditions of diplomacy. But the average American citizen is of quite different temper and spirit, always preferring the prompt, direct electric method for aught that concerns him and his kind.

It is thus that the humble beginnings of Morse have fructified in a continental network of telegraphs. It is thus that the Atlantic cable—the one idea of a plain New York business man—came into successful operation. It is thus that the inchoate, frontier city, still smelling of raw lumber and fresh paint, has more telephones than a proud and dignified Old World capital. It is thus America has become the great centre of production and use of electric light and power, and exports her lamps, her dynamos, her motors, and her electric cars to every quarter of the globe."

THE Duke of Veragua, who was recently in Toronto, where he received high social honors, and who represented the Government of Spain at the opening of the World's Columbian Exhibition at Chicago because he is a lineal descendant of Christopher Columbus, after having all his travelling expenses paid by the United States because he was a guest of that nation, has returned to Spain to discover that he is a bankrupt. It has been given out in his behalf that during his absence an unjust steward squandered some \$350,000 of his money in gambling; and now Yankee sympathizers with the noble Duke are asking contributions from their pecunious countrymen to be given Mr. Veragua to enable him to maintain his accustomed style and dignity. It is not denied that the Duke

owned a high toned gambling hell, and that his income was derived chiefly from the losses sustained by his victims. Being a noble Duke, however, and a descendant of the great discoverer of America, his financial methods were not considered of a character to deny him access to the best society in the United States, or in Toronto either. It has never been shown that Mr. Veragua ever earned an honest dollar in his life, and he is not a young man, nor ever did any act by which the world was made any the better for his having lived in it. Yet no doubt his Yankee acquaintances will reimburse the Duke for his gambling losses, but we have not heard recently of any large contributions in that country to the eleemosynary institutions there which stand so much in need of money.

THE recent Canadian ruling regarding the towing of Canadian logs with Canadian tugs and boomsticks was discussed at a meeting of lumbermen, held last week, at Bay City, and a committee consisting of E. T. Carrington, Benjamin Boutelle, and E. J. Smith, of Duncan City, was appointed to confer with the Canadian authorities to secure a modification of the rule. Should it be enforced, it will drive American tug owners, and to a large extent American lumber dealers, out of the Canadian trade.—Cleveland, Ohio, Marine Record.

THE display of cotton goods made by Canada at the World's Fair has attracted considerable attention and received many compliments. The correspondent of the New York Journal of Commerce thus refers to the exhibit:—

"Canada makes an excellent display of cotton goods as it does of almost everything else at the Fair. In two large cases, each 75 by 20, are the exhibits of the leading cotton manufacturers of the Dominion. They embrace sheetings, shirtings, prints, ginghams, webbing, bindings, tickings, dairy cloths, flannels, and nearly every kind of fabric made in this country or Great Britain. The Montreal Cotton Company, whose works are at Valleyfield, show as many kinds of goods as are produced in any establishment in this country or Great Britain, and to all appearance they are of excellent quality."

The protective system has made it possible for Canada to become a large producer of all kinds of cotton goods, supplying the home market with the product of our own mills at prices low enough to meet the slimmest purse.

THE Department of Finance has issued an interim statement of revenue and expenditure for the twelve months ending June 30th last. The revenue for the period in question is given as \$37,183,255, as against \$35,902,028 last year, or an increase of \$1,281,000. The expenditure for the past year is placed at \$30,652,653, as against \$31,267,221, or a decrease of about \$600,000. The nominal surplus at the present time is \$6,530,603, as against \$4,634,807, the amount recorded when the departmental statement was issued twelve months ago. It must be borne in mind, however, that the figures just published represent only the receipts and payments which have passed through the books of the Finance Department up to June 30th. There are receipts and payments on account of the last fiscal year still to be made, and until all the returns are received from various parts of the Dominion the exact comparison of our financial position with previous years cannot be ascertained. From present appearances the

revenue for this year just closed will likely exceed \$38,000,000. The principal item of expenditure still to be made is the interest on savings bank deposits, and this with minor items will, it is thought, amount to about \$5,000,000, which would leave a net surplus of \$1,500,000 for the year's transactions. This was the estimated amount which Hon. Mr. Foster, the Finance Minister, arrived at in his budget speech on the 14th February last. Last year the surplus fell to \$155,977; but it will be recollected that the sugar duties, amounting to \$3,000,000, had been abolished, and it speaks well for the administration of affairs by the present Government.

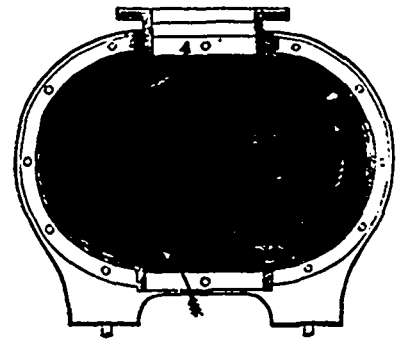
The statements of the two great mercantile agencies for the first six months of 1893 are before the public, and, like their former ones, are widely divergent. Messrs. R. G. Dun & Co. report the failures for Canada and Newfoundland as 811, with liabilities of \$8,705,127, while Bradstreet's reports the number at 887, with total liabilities of \$8,215,759. The former agency reports seventy-six failures less than the latter, but the liabilities of the smaller number reported by it are \$490,368 greater than those of the larger number reported by Bradstreet's. Were the liabilities proportionately less, the conclusion would be that Bradstreet's had more accurate facilities for obtaining information than have R. G. Dun & Co., but such not being the case, all we can do is to wonder how it is that such wide divergencies can possibly exist. Can either of the statements be relied upon? We think not, and it would only be a waste of time to carry the comparison any further. Mercantile agency statistics to be of any use should be reliable. It is clear to us from the foregoing that they are not so. Whatever the cause of their wide divergence, they ought for the sake of decency, if for nothing else, to make some effort to furnish reliable figures, otherwise their usefulness is gone.—The Shareholder.

MR. ROBERT H. LAWDER, who has investigated the subject of trade relations between Canada and the States with much patience and intelligence, makes a pregnant remark in the current issue of *The Week*, in which he says: "Canada feels that in her magnificent canal route, via St. Lawrence to the ocean, she has it in her power to grant or withhold from the United States a privilege of greater value to that country than Canada can derive from a free market for her products in the United States." There is a great truth in this. We have never derived anything like the full benefit from our canals because the whole system was not deep enough. In a few years a uniform depth of fourteen feet will work a revolution in carrying grain from Lake Superior to the Atlantic. The Western States farmer will look upon that route as a priceless boon. It will be a necessity for him, and he will instruct his rulers at Washington to see that every obstacle to its use is removed. With a depth of fourteen feet others besides our farmers and foreigners will benefit, because there must spring up an internal commerce which will enable vessels doing a coasting trade to steam into Toronto harbor. Canadians are justified in looking upon the completion of the canal works, therefore, as a promise of great expansion of trade as well as a potent factor in cheapening the carriage of food products to the markets of Europe.—Cleveland, O., *Marine Record*.

The *July Wide Awake* has a leading article by George Bradford Bartlett, devoted to a description of Concord Dramatics, or private theatricals in Concord in the days of the "Little Women" and the "Philosophers." Maud R. Burton and Elizabeth Cummings have good Fourth of July stories, and the national element is further recognized by verses by Lillian Crawford True and Mrs. J. T. Greenleaf. Caroline Ticknor's story of "Fantine" is timely and suggestive; Marietta Ambrosi has a description of Carthage, "An Old Spanish Town"; Etta B. Donaldson describes "A Unique Farm in Africa," (for the raising of ostriches), and J. P. H. Gastrell tells of "Electric Tricks." Jeannette A. Grant furnishes a delightful account of that portion of the Scottish highlands which some readers have traveled in fancy "With the Lady of the Lake." The *Wide Awake* Athletics article is by John Graham, and is devoted to "Out-of-door Gymnastics." 20 cents a number. At the news stands, or direct from the publishers, D. Lothrop Company, Boston.

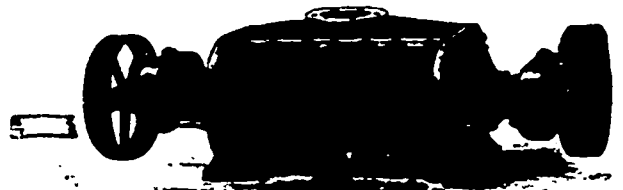
ROOT'S POSITIVE BLOWER.

By examining the accompanying illustrations it will be noticed that the Root's positive blower is simple, durable and efficient. The case of the blower is made entirely of iron, steel and bronze, all parts of which are either turned, planed, or faced to fit each other with perfect accuracy without any packing. The cylindrical parts are bored out with the same accuracy as the cylinders of a steam engine. The gears are cut on gear cutting machines of the most modern construction and enclosed in oil tight housing and run constantly in oil, so that the friction and wear are reduced to the minimum and the durability increased in the like ratio.



As the Blower is positive in its action, displacing its entire contents of air each revolution, it is evident, if the outlet is closed, the machine must stop. It is therefore necessary for smith-shops and other purposes where a variable blast is required, that an escape valve should be placed on the Blower so that when a part, or all of the blast is shut off from the fires, the surplus air can escape at the valve, a uniform pressure being thus attained. For foundries and similar purposes, where a uniform blast is used, the valve is not needed and is not put on the blower.

The Root's blower does not operate on the principle of a fan, that is, by imparting momentum to the air by running at a great velocity, but by a regular displacement of the air at each revolution, whether it runs fast or slow. When the air enters the case at the opening for induction, and is closed in by the wings of the revolvers (see cut) it is absolutely confined and positively forced forward until brought to the eduction pipe, when it must be discharged or the machine stops.



The internal operating parts consist of only two revolvers, each of which is operative.

The external parts consist of the case, four journals and journal-boxes, four cut gears, and oil tight housing and two driving pulleys.

Owing to its simplicity, fewness of parts, slow speed, its being perfectly balanced, good mechanical construction, and their being no internal friction or wear this blower does its work with fifty per cent. less power than required to drive a fan.

The Root's positive blower is now used for numerous purposes and any one now interested in those machines can get full particulars from The Hamilton Facing Mill Co., Hamilton, Ont., who are sole agents for Canada.

Inventions.

CANADIAN PATENTS.

The following patents have been issued from the Canadian Patent Office, from June 24 to July 6, 1893, inclusive.

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

MECHANICAL.

- 43,336 Liquid discharging nozzle, J. B. Thies, June 24th.
- 43,337 Hot air pipe, A. Miller, June 24th.
- 43,338 Attachment to sectional mechanism for spring actuated shades, E. T. Burrowes, June 24th.
- 43,339 Grain separating screen, Closs & Howard Manufacturing Co., June 24th.
- 43,340 Twist drill milling machine. The Whitman & Barnes Manufacturing Co., June 24th.
- 43,341 Railway car seat, E. Julien, et al, June 24th.
- 43,342 Smoke consuming furnace, J. F. Chuzatte, et al, June 24th.
- 43,343 Clothes drier, W. J. Coulter, June 24th.
- 43,344 Bracket, S. R. Scottron, June 24th.
- 43,345 Wrench, E. B. Smith and J. W. Pickel, June 24th.
- 43,346 Potato planter, A. G. Gekeler, June 24th.
- 43,347 Combined drag and circular saw mill, H. T. Chalifour, June 24th.
- 43,348 Hot water boiler for heating purposes, T. Brooks, et al, June 24th.
- 43,349 Vehicle wheel, W. W. Valentine, June 24th.
- 43,350 Hanging for window sashes and the like, A. James, June 26th.
- 43,352 Combined culinary pots, H. H. Erlam, June 26th.
- 43,353 Car heating, Consolidated Car Heating Co., June 26th.
- 43,354 Running gear, W. & D. McKee, June 26th.
- 43,355 Separator attachment for threshing machines, R. Keeling, June 26th.

- 43,356 Packing case for bottles and the like, H. J. S. Brown, et al, June 26th.
- 43,357 Hardening steel, G. F. Simonds, June 26th.
- 43,358 Hardening steel, G. F. Simonds, June 26th.
- 43,359 Water wheel, C. W. Nicholson, June 26th.
- 43,360 Saw handle, E. A. Burns, June 26th.
- 43,361 Car wheel, J. A. Webber, June 26th.
- 43,362 Waterback for furnace, J. Tittle, June 26th.
- 43,363 Toy target, J. M. Edson, June 26th.
- 43,364 Printing device, F. Cudney and F. M. Stanton, June 26th.
- 43,365 Power hammer, Laird & Sweeney Manufacturing Co., June 26th.
- 43,366 Clothes line, J. Grignon, June 26th.
- 43,367 Locking the seats of blinds, V. P. E. Martinette, June 26th.
- 43,368 Bridle, W. Friedrich, June 26th.
- 43,369 Cycle or other wheel tire, O. Lagarie, June 26th.
- 43,370 Relief valve for balanced slide valves, D. Kiley, June, 26th.
- 43,371 Pulling stumps and trees, J. F. Edwards and G. H. Francis, June 26th.
- 43,372 Mixing machine for concrete, mortar, etc., J. Skinner, June 26th.
- 43,373 Dumping car, W. McMahon, June 26th.
- 43,374 Self regulating liquid discharge for closed vessels, T. A. and A. H. Schlueter, June 26th.
- 43,375 Protecting plate for boots and shoes, J. A. Whittier, June 26th.
- 43,376 Sheet metal roofing, A. C. Kanneberg, June 26th.
- 43,377 Driving gear for locomotive engines, D. S. Patterson, June 26th.
- 43,379 Check spring for doors, S. S. Allin, June 26th.
- 43,380 Burner for crude oils, J. Dick, June 26th.
- 43,381 Straw carrier, W. E. White, June 27th.
- 43,382 Space bars for line casting machine, W. S. Scudder, June 27th.
- 43,383 Device for preventing water pipes from freezing, J. Krumschied, June 27th.
- 43,384 Coffin, W. J. Leonhardt, June 27th.
- 43,385 Tellurion, S. M. Reavis, June 27th.
- 43,386 Nut lock, B. Porter, June 27th.
- 43,387 Ventilation of cars, S. G. Curry, June 27th.
- 43,388 Vehicle hub, P. F. Rachal, June 27th.
- 43,389 Car replacer, H. G. Kanson, June 27th.
- 43,390 Sulky cart, W. J. Hamill, June 27th.
- 43,391 Lumber carrier, H. Hawkins, et al, June 27th.
- 43,392 Seeding machine, Massey-Harris Co., Ltd., June 27th.

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CIVIL ENGINEER AND ARCHITECT
Associate Member Can. Society Civil Engineers. Member of the Society of
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and Counsellor in Patent Causes

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| 43,393 Tyro of the wheel of waggons and carriages, J. Lones et al, June 27th. | 43,421 Steam generating boiler furnace, R. H. Alexander, June 29th. |
| 43,394 Disinfecting apparatus, B. McEvoy, June 27th. | 43,422 Drain pipe, A. W. Cram, June 29th. |
| 43,395 Thill coupling, C. C. Bradley, June 27th. | 43,423 Amalgamator, N. L. Barber, June 29th. |
| 43,396 Rail brace, G. H. Mason, June 27th. | 43,424 Heating furnace, J. B. Sheridan, June 29th. |
| 43,397 Garbage receptacle, etc., J. L. Macleod, June 27th. | 43,426 Button drilling machine, H. W. Crouse, June 29th. |
| 43,398 Boot and shoe levelling machine, M. V. Bresnahan and J. J. Keys, June 27th. | 43,427 Button making machine, H. W. Crouse, June 29th. |
| 43,399 Cultivator, T. H. Noxon, June 27th. | 43,428 Button forming machine, H. W. Crouse, June 29th. |
| 43,400 Feed water heater, J. D. McEachren, June 28th. | 43,429 Steam boilers, J. Patterson and G. W. Jones, June 30th. |
| 43,401 Pick, W. K. Birkinshaw, June 28th. | 43,430 Converting a reciprocating into a rotary motion, J. Jackson et al, June 30th. |
| 43,402 Construction of wheels cast in iron or steel for railway and other purposes, F. H. R. Wanner, June 28th. | 43,431 Gage running attachment, D. G. Hobby, et al., June 30th. |
| 43,403 Nut lock, A. H. Read, June 28th. | 43,432 Steam boiler, R. Joy and T. P. Kingsford, June 30th. |
| 43,404 Portable hammock, W. F. Phillips, June 28th. | 43,433 Jointing shingles or short boards, G. Clish, et al, June 30th. |
| 43,405 Wind mill, A. Bradford, et al, June 28th. | 43,434 Horse collar and hame, J. Morrison and B. S. Van Tuyl, June 30th. |
| 43,406 Forming pearl buttons, Standard Pearl Button Co., Ltd., June 28th. | 43,435 Saw, J. V. Hotchkiss and H. Kehlenbeck, June 30th. |
| 43,407 Manufacturing pearl buttons, H. W. Crouse, June 28th. | 43,436 Steering device for road engine, R. Fullerton and Wm. Matthews & Co., June 30th. |
| 43,409 Treatment of beer, J. Uhlman, June 28th. | 43,437 Combined water heater and shower bath, J. and R. Pellow, June 30th. |
| 43,410 Protecting the hungways of barrels and other packages, M. Anthony and W. C. Savage, June 28th. | 43,438 Lounge or couch bed, Boston Couch Bed Co., June 30th. |
| 43,411 Piano hammer covering machine, M. Kolniges, June 28th. | 43,439 Garbage receptacle, J. C. Roth and S. E. Hopkins, June 30th. |
| 43,412 Paper roll holder and cutter, J. A. Armstrong and C. A. McNaughton, June 29th. | 43,440 Spinning top, N. McLean, June 30th. |
| 43,413 Burial case, D. E. Southwick and G. W. Rowell, June 29th. | 43,441 Self basting, roasting and baking pans, H. Mianus, June 30th. |
| 43,414 Process of making soap, W. J. Palmer, June 29th. | 43,442 Metallic tube, Dominion Tubular Lamp Co., June 30th. |
| 43,415 Cleaning the type of type writing machines, J. H. Stackhouse, June 29th. | 43,443 Weaving cross wires in wire fence, H. Carter, June 30th. |
| 43,416 Display rack, J. H. Best, June 29th. | 43,444 Adjustable curtain and blind roller or rod, F. and C. Otto, June 30th. |
| 43,417 Folding bed, R. Piper and D. D. Whitesell, June 29th. | 43,445 Box fastener, S. Stephenson and G. Flewelling, June 30th. |
| 43,419 Horse blanket fastener, E.H. Danforth and E. A. Jordan, June 29th. | 43,446 Gas regulator, The Union National Gas Saving Co., June 30th. |
| 43,420 Self measuring pump, J. S. Becker, June 29th. | |

Equalled by Few**Excelled by None**

CANADA'S GREAT INDUSTRIAL FAIR

And Agricultural Exposition

TORONTO

SEPTEMBER 4TH TO 16TH, 1893

\$150,000 Expended in Improvements in 1892, and \$125,000 being Expended this year. No Standing Still

The Best and Largest Exhibition in the Dominion of Canada,

And Attended Annually by over 300,000 Visitors. The Newest and Best Attractions Attainable. Brighter and Greater than ever. The best time to visit the Metropolis of Ontario.

CHEAP EXCURSIONS AND LOW RATES ON ALL RAILWAYS, Etc.

ENTRIES POSITIVELY CLOSE AUGUST 12th.

For Prize Lists, Entry Forms, and all other Information, address

J. J. WITHROW, President.

H. J. HILL, Manager, Toronto

- 43,448 Shingle machine, G. Clish, et al, June 30th.
- 43,449 Garbage cremating furnace, J. F. Chazotte, et al, July 3rd.
- 43,450 Vehicle, H. L. Boyle, July 3rd.
- 43,452 Bicycle tire, H. J. Caultfield, July 3rd.
- 43,453 Blacking outfit, A. C. Barber, July 3rd.
- 43,454 Last, H. Goodrick, July 3rd.
- 43,455 Duster or polishing cloth, D. Scott, July 3rd.
- 43,456 Folding rocking chair, J. T. C. Cove, July 3rd.
- 43,457 School desk and chair, G. A. Robrick, July 3rd.
- 43,458 Sheep shearing machine, H. Bland, July 3rd.
- 43,459 Composition for preventing or obstructing the passage of heat through bodies and for the deadening of sounds and methods of applying the same. F. A. Pemberton, July 3rd.
- 43,460 Wood heating furnace for heating buildings, R. W. Bigger, July 3rd.
- 43,461 Valve for fire plug and hydrant, H. Thomson, July 3rd.
- 43,462 Wheel tire, J. T. and A. H. Smith, July 4th.
- 43,463 Tubular lantern, F. Dietz, July 4th.
- 43,464 Dress stay, M. P. Bray, July 4th.
- 43,466 Tongue support, D Ward and A E Gressier, July 4th.
- 43,467 Water-pump, J Bilodeau, July 4th.
- 43,468 Vulcanizing wood, S E Haskin, July 4th.
- 43,469 Scrubbing device, J W Roots, July 4th.
- 43,470 Automatic car coupler and brake, P Pelton, July 4th.
- 43,471 Filter, V H McConnell, July 4th.
- 43,472 Can crimping machine, The Roberts Tinware Co, July 4th.
- 43,473 Circular knitting machine, J E Gearhart, July 5th.
- 43,474 Construction of boats, J. J. & W. Robertson, July 5th.
- 43,475 Car coupling, L N Suigin, July 5th.
- 43,476 Car coupling, H R Dore, July 5th.
- 43,477 Car coupling, E Surpremant, July 5th.
- 43,478 Car coupling, F Harvey and J Kane, July 5th.
- 43,479 Car coupling, F B Woodman, July 5th.
- 43,480 Fastening for cigar boxes, J. J. Brady, July 5th.
- 43,481 Convertible chair, C. N. Wonsen and D. W. Palmer, July 5th.
- 43,482 Box, J. M. Baker, July 5th.

ALEX. P. MENDE, 14 Water St., New York

Manufacturer of

One Dip Blues and Black for Wool

Fast to Fulling and Atmosphere
Send for Samples and Prices

WOONSOCKET SHUTTLE CO., 157 North Main Street Woonsocket, R.I.

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OF EVERY DESCRIPTION.

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We can make any size and thickness
to order on short notice. Mill Boards
and Pulley Boards always in stock.

Special attention to letter orders.

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Core Compound, Ceylon Plumbago, Foundry Supplies and Moulding Sand

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Root's Positive Blower

Colliau Cupola Furnace

HAMILTON FACING MILL CO., Hamilton, Ont.

M. & L. SAMUEL, BENJAMIN & CO.

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METALS

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TO LET! FACTORY FLATS

With power to suit

From two to fifty horse power. Apply

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PATON MANUFACTURING CO.

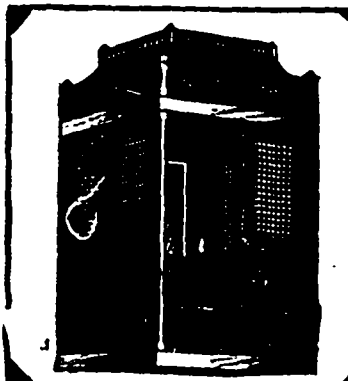
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WORSTED KNITTING

AND

FINGERING YARN



ELEVATORS

FENSOM ELEVATOR WORKS
52-54-56 DUKE ST
TORONTO.

ELECTRIC HYDRAULIC
STEAM & HAND-POWER
PASSENGER & GOODS
ELEVATORS. DUMB WAITERS

- 43,483 Automatically displaying advertisement, pictures and the like, G. Cook and C. K. Marr, July 5th.
 43,484 Leather skiving machine, A. J. Tewksbury, July 5th.
 43,485 Combined car and air brake coupling, The Mable Automatic Car and Air Self-Coupler Co., July 5th.
 43,486 Combined wash stand and dressing case, A. Wettervik and J. A. Olsson, July 5th.
 43,487 Power driven tool, F. H. Cathcart, July 5th.
 43,488 Egg crate, W. F. & C. H. Fisher, July 5th.
 43,489 Cigar bunching machine, A. Gordon, July 5th.
 43,490 Printing glass and apparatus therefor, J. Budd, July 5th.
 43,491 Hay press, D. Phialcofsky and M. Hiebert, July 5th.
 43,492 Trace buckle, G. V. Martin, July 5th.
 43,493 Wheel of road vehicle, H. Moore, July 6th.
 43,504 Nail, E. Perkins and J. Penler, July 6th.
 43,495 Heading water boilers and other cylindrical vessels, J. Morrison, July 6th.
 43,496 Stave trimming and jointing machine, W. J. Wright et al, July 6th.
 43,499 Means for exhibiting optical illusions, The Electrical Wonder Co. (Ltd.), July 6th.
 43,500 Centrifugal liquid separator, D. H. Burrell & Co., July 6th.
 43,501 Centrifugal liquid separator, D. H. Burrell & Co., July 6th.
 43,502 Perfected sanitary houses for all climates, W. Van der Heyden, July 6th.
 43,503 Extracting fat from wool, W. T. Cutler and C. J. Luce, July 6th.
 43,504 Garment clasp, J. Blum, July 6th.
 43,505 Floor flange for closet, H. W. Parker, July 6th.
 43,506 Stop cock, J. G. Smith, July 6th.
 43,507 Construction of tanks, W. Forgie, July 6th.
 43,508 Fermented wine, F. Rey, July 6th.
 43,510 Packing vessels and method of packing the same, H. C. Hunter, July 6th.
 43,511 Waggon holster standard, A. Miller and H. Rowan, July 6th.
 43,512 Bridle for brushes, C. Boeckh, jr., July 6th.
 43,513 Plug, W. Morrison, July 6th.
 43,514 Railway passenger car, adapted for sleeping without diminishing the number of places, C. Ber Ginzburg, July 6th.
 43,515 Latrine, W. Clark, July 6th.
 43,516 Type writing machine, E. A. Ford, July 6th.

SCIENTIFIC PROCESS.

- 43,465 Deoxidizing, melting and puddling iron ores, H. A. Jones, July 4th.
 43,497 Separating solid or fluid, substances dissolved in alcohol, ether or chloroform without evaporation of the solvent, C. Weitenkamp, July 6th.
 43,498 Separating solid or fluid, substances dissolved in alcohol, ether or chloroform without evaporation of the solvent, C. Weitenkamp, July 6th.
 43,509 Separating copper from cupriferous nickel ores, J. Douglas, July 6th.

ELECTRIC.

- 43,351 Insulator bracket, W. N. Eichberg, June 26th.
 43,378 Transmission of alternating currents of different phases, M. Von Dolivo Dobiowski, June 26th.
 43,408 Electric current, W. J. Still and R. MacDonald, June 28th.
 43,418 Electrical switch device, The Automatic Telephone and Electric Co. of Canada, June 29th.
 43,425 Electric lamp, J. Waring, June 29th.
 43,447 Underground electric railway, Columbian Underground Electric Traction Co., June 20th.
 43,451 Insulator, L. McCarthy, July 3rd.

THE HATHAWAY PATENT FENCE WIRE.

The accompanying illustration is of the Hathaway patent fence wire, manufactured by the Collins Manufacturing Company, 84 Adelaide Street, East, Toronto.

It is composed of two main strands or cables, and a filling or brace wire, all No. 14 best galvanized steel wire, forming together a panel nearly two inches wide, as shown in illustration.

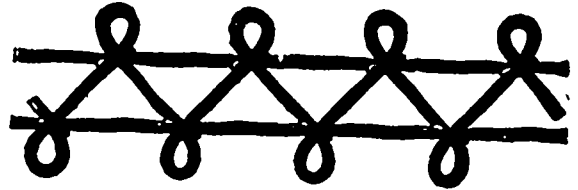
This fence weighs about 1½ pounds to the rod. Taking into consideration the width of the panels, the manufacturers claim that it is the cheapest fence made; three strands being equal to and

used instead of four, four strands instead of six, and five instead of seven of any other fence. It is neatly put up in rolls weighing from 80 to 110 lbs., and is thus in convenient shape for handling and for shipment.

It is a perfect farm fence, and yet handsome enough to ornament a lawn. Double the strength of other fences, it will neither sag, crush, nor get out of shape.

This fence wire is designed especially as a farm and field fence, and for this purpose it is claimed to be unequalled for the following reasons: It is humane, because it can in no way injure stock,

Pat. Nov. 19, 1889.



Above Cut is One-half Actual Size.

and being a visible fence, stock will not run against it, thus doing away with the necessity for barbed wire. Where barbed wire fences are already erected, the stretching of this wire along the top of the fence will warn the stock of a barrier, and protect them to a great extent from injury.

It is double the strength of other fences, owing to the main strands being thoroughly braced by the intermediate wire, making a fence that cannot get out of shape no matter what strain it is subjected to. It is, therefore, not only stronger but much more durable than other fences.

It is ornamental in design and makes a most attractive fence. This is certainly a matter worthy of consideration by those who desire to have their farms and grounds present a neat appearance.

It is more quickly put up because it forms a perfect splice in itself. Other fences have to be spliced with soft wire by weaving, and whenever so spliced they present anything but a neat appearance. This is entirely obviated in the "Hathaway" patent fence wire, simply by hooking the end of one strand into that of the other, which in no way changes the appearance of the strand; can scarcely be discovered, and is done in a moment. Such a splice is equally as strong as the strand itself.

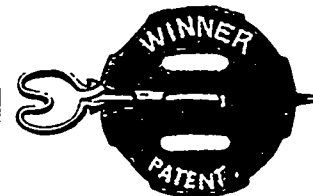
It is cheap. Measuring nearly two inches in width it will go further than other fences—in fact, four strands of this fence will make a better and stronger fence than six strands of barb wire, a saving of 33 1-3 per cent. It is therefore cheaper than other wire or wood fences.

As an ornamental lawn and garden fence, it forms a very attractive border for the protection of lawns and gardens, or as a division fence between houses. Ornamental wooden posts can be used in erecting this fence of one or more strands, and when put up in this way it makes a handsome, ornamental fence of great durability at a very low cost.

THE WINNER STOVE PIPE DAMPER.

The illustration herewith shown is of the Winner patent stove pipe damper, manufactured by Mr. C. Rehder, Paris, Ont.

As will be observed, the spring, which constitutes the handle, is of cast iron, and engages in the hole in the pipe in which rests the spindle of the damper. This spring, being on the outside, will not burn out or become worthless by having the temper drawn by the heat. An objection to other dampers is that they do not remain in the position desired, but are very liable to turn shut, thereby impeding or entirely



obstructing the draft, causing the escape of gas. When such escape occurs in a dwelling at night the health of the occupants of the house, if not their lives, is in danger. The blowing of a strong wind is a frequent cause of the turning shut of a stove damper; but the construction of the Winner damper is such that it cannot be made to turn shut by any wind or strong draft that may occur. This has been proven. The 6 inch and 7 inch dampers are made of cast iron; and the spring handle is finished either plain, nicked or bronzed, and is both substantial and ornamental. In larger sizes, such as for furnace pipes, etc., this damper is made of malleable iron. For samples, prices and further information, apply to Mr. Rehder, at Paris, Ont.

Captains of Industry.

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

THE Graham Nail Works, Toronto, have added necessary new machinery and are now making full lines of wire nails. They always proffer this advice: "Ask for the Graham nails."

THE Merchant's Dyeing and Finishing Company, Toronto, are running their works to full capacity, and are turning out some exceedingly fine specimens of finished dress goods. The establishment of this concern in Toronto has proved to be of great advantage to the dry goods importing and jobbing trade.

THE Macfarlane Shade Company, Toronto, who recently erected a fine new factory on Liberty street, are now compelled by increase of business to considerably enlarge their works. This they are doing by adding another story to their factory, 200 x 50 feet, and building an addition 50 x 50 feet. When these improvements are completed their floor space will be increased to 32,500 square feet, nearly double the former capacity.

THE Northey Manufacturing Company, Toronto, manufacturers of pumping and hydraulic machinery, etc., have occupied their new shops near the subway in King street west.

MESSRS. MUNRO BROS., New Glasgow, N.S., manufacturers of wire goods, are supplying the springs for the seats of the new cars being built for the railway cars to be operated on the line between Windsor and Annapolis, N.S.

THE Ontario Bolt and Forge Company are building a 170 x 50 ft. addition to their factory.

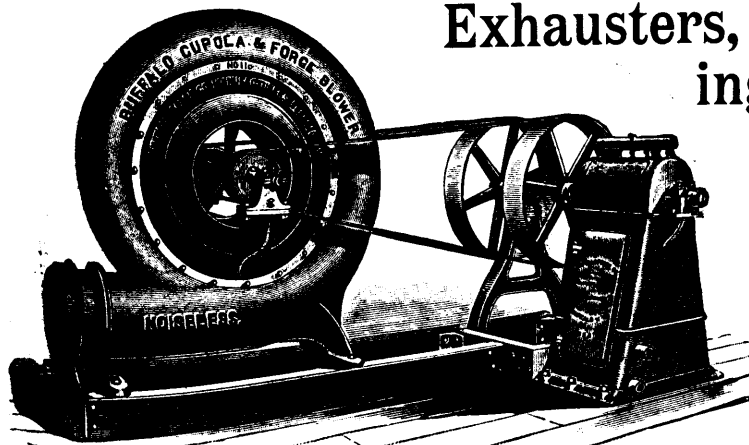
HAMILTON, Ont., has voted a bonus of \$25,000 towards the construction of the Hamilton, Grimsby & Beamsville Electric Railway.

THE Gurney Scale Company, Hamilton, Ont., have just built another 50 ton track scale for the Alberta Railway and Coal Company, to be placed at Lethbridge, N. W. T. The uniqueness of its construction consists in the length of the platform upon which the cars are to be run. This is 66 feet long, almost double the length of the longest ordinary track scale. It is constructed in six sections, with the huge beam at the centre. The system of leverage is so accurate that at any point from end to end of the track the balance is uniformly the same, and 10 pounds turns the beam with the full load. Of the levers 22 are used, the longest measuring 13 feet 6 inches. There are 74 bearings, and over 6,000 feet of timber is contained in the platform and frame. The platform rests upon chairs framed together with heavy angle iron, the whole resting upon a solid stone and cement foundation. The largest beam records weights by 1000 pound notches. Attached to it is a baby beam, which is notched from 10 pounds up to 1000. The third beam completes the 50 tons, or 100,000 pounds.

MESSRS. I. MATHESON & COMPANY, New Glasgow, N.S., on 17th inst. launched the steamer Mulgrave, said to be the first iron steamer ever built in the Maritime Provinces. Both the hull, machinery and equipments were built by Messrs. Matheson. The vessel is 122 feet long, 34 feet beam and 16 feet deep. Her engines are compound of 600 h.p. She is to be operated in connection with the Intercolonial Railway as a ferry between Port Mulgrave and Port Hawkesbury.

LETTERS patent have been issued incorporating the Trojan Coupler Company, of Montreal, with a capital stock of \$300,000, to manufacture the Trojan car coupler and other railway appliances.

THE Toronto and Scarboro Railway is nearly completed for traffic.

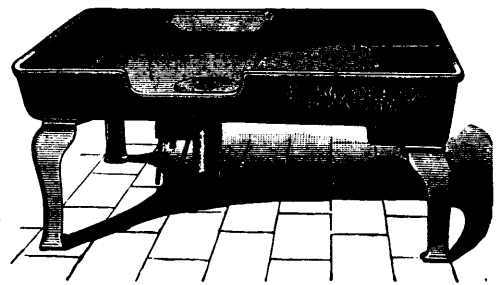


For Foundry Cupolas, Forge Fires and all duties requiring high pressures of air. Blower on adjustable bed, combined with double upright enclosed engine.

Exhausters, Fans, Heating, Ventilating and Drying Apparatus

BUFFALO FORCE CO., Buffalo, N.Y.

The Largest and Heaviest Forge in the World.



LAMKIN'S PATENT



A GREAT LOSS!

If you have any Pipes or Boilers uncovered you are losing on same at the rate of 80 cents every year on each square foot of surface exposed. By having them covered with our Mineral Wool Sectional Covering you will save 85 per cent. of this loss. The saving thus effected in fuel will in one year more than pay the cost of covering, which we guarantee to last as long as the pipes.

Our covering is the best fuel saver on the market.

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Wrought Iron Loom Crank Shafts
Forged by Special Machinery from one bar, without welding, and of all length of sweeps from
Two to Two and a-Half Inches
or more, to fit all makes of cotton looms. Write for particulars.
GOVEL MACHINE CO., Fall River, Mass.

Messrs. J. W. Ross & Company, Oxford, N.S., who operate a flour and feed mill, have just put in machinery and will manufacture excelsior for upholstery and packing purposes.

The Penberthy Injector Company of Detroit, Mich., report that in spite of the dull times in that country, their business is steadily increasing. Since completing the additions to their factory, they have added eight new speed and monitor lathes to their plant, also a new Reed engine lathe and a universal milling machine to their tool room outfit. The capacity of their work is now 2000 machines a month, and they are yet unable to accumulate any stock, but are frequently behind their orders.

The Port Dalhousie, St. Catherines and Thorold Electric Street Railway Company is being incorporated at St. Catherines, Ont., with a capital stock of \$100,000, to construct and operate an electric railway connecting the above named places, etc.

The cars for the electric street railway service at Kingston, Ont., have been ordered from Messrs. Patterson & Corbin, St. Catherines, Ont.

The Southerland-James Company is being incorporated at Chatham, Ont., with a capital stock of \$500,000 to manufacture coeprage stock, etc.

The Dodge Wood Split Pulley Company, Toronto, have closed another contract with The E. B. Eddy Co. of Hull, Que., for another large rope drive of 400 h.p. as well as a number of large belt pulleys for driving the machinery in their new mill now in course of erection.

Work is being pushed rapidly forward on the electric street railway at Peterboro, Ont. The work of placing the ties in position and laying the rails is completed from the Hilliard Mills to Smith street, on Water street; over half a mile being completed in all.

The Dodge Manufacturing Company of Mishawaka, Ind., originators and patentees of The Dodge Wood Split Pulley, had the honor of being awarded the contract, and supplying all the shafting, hangers, coupling, and main driving pulleys used throughout the machinery halls of the World's Fair Buildings at Chicago. This was of course a very large contract and eagerly sought after by all the large shafting men, and it speaks highly for the standing of The Dodge Co. as leaders in the line of power transmission machinery. The order amounted to over 20 car loads, and included over 8000 ft. of turned steel shafting from 3 to 6 inches diam. The Dodge Wood Split Pulley of Toronto, handle and control all the Dodge Co's Canadian patents.

FIRE! - FIRE! - FIRE!
THE ONLY TRUE FIRE-PROOF
PAINT MANUFACTURED IN CANADA

Write for the testimony of eighty witnesses who have made personal tests, and be convinced.

The R. J. DOYLE MFG. CO.
 Lock Drawer 464 Owen Sound, Ont.

BASEMENT Window Guards

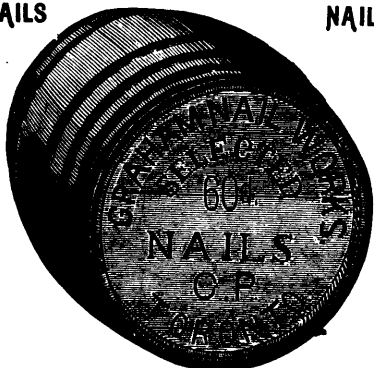
- Factory and Mill Window Guards
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- Lettered or Plain

Write for Catalogue and Price List

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The B. Greening Wire Co.
 LIMITED
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CUT NAILS ALL SIZES WIRE NAILS



ASK FOR THE GRAHAM NAILS

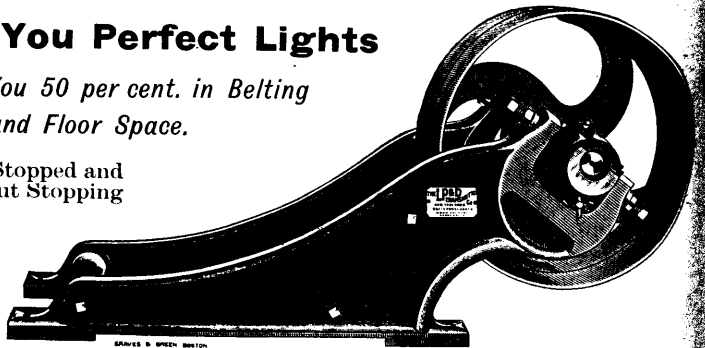
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Will Give You Perfect Lights

Will Save You 50 per cent. in Belting and Floor Space.

Dynamo can be Stopped and Started without Stopping Engine.

It is used by some of the largest companies in Canada and the States.



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 Sole Makers for Canada.

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but hard work, and having had twenty years experience we know how to get steam out.

Dye Houses and the largest possible product from Dry Rooms

Our Compound Wheel is the most powerful in the world, and if we can't be of actual value to you we don't want your money.
 Send for Circular and Information **BARNEY VENTILATING FAN CO., 70 Pearl St., Boston, Mass., U.S.A.**

THE CANADIAN OFFICE & SCHOOL FURNITURE CO.
PRESTON, ONT.

FINE BANK, OFFICE, COURT HOUSE & DRUG STORE FITTINGS
OFFICE, SCHOOL, CHURCH & LODGE FURNITURE
SEND FOR CATALOGUE.
J. L. JONES TORONTO

MESSRS. SYER & MAHEW, Thamesville, Ont., have installed a new 75 h.p. engine in their flour mill.

MESSRS. SCOTT BROS., Dumfries, Ont., have put in a Holt's patent middling purifier into their flour mill.

MESSRS. CANT BROS. COMPANY, Galt, Ont., shipped a car load of planers and matchers to Province of Quebec and New Brunswick last week.

THE Keewatin Power Company, Keewatin, Man., with a capital of \$1,000,000, is applying to the Ontario government for a charter to supply hydraulic and electric power for the said purposes, to acquire from the Keewatin Lumber Company and other parties Timme Island and other islands in the waters of the Winnipeg River and Lake of the Woods, and other islands and lands on the adjacent shores, and to improve the same and utilize the powers in respect of the water area incident, by law or otherwise, to the ownership so to be acquired.

THE National Electric Tramway Company, Victoria, B.C., has completed the purchase of the lighting plant from F. H. Osgoode, of Seattle, who has controlled and operated it for the last two or three years. The consideration was about \$50,000, and the equipment purchased consists of dynamos, 30 miles of wire and 3,700 lamps installed. It is the intention of the tramway company to treble the capacity of the lighting plant immediately, its plan involving the employment of Goldstream water power for the generation of both tramway and light currents.

THE City Clerk of Hamilton, Ont., has received a letter from the president of the Hamilton & Dundas Railway Company, inclosing a petition asking that the city by-law under which the road is operated be amended, so as to empower the working of the line by electricity on the trolley system. The present by-law provides that the motive power shall be dummy steam engines, and restricts the company to a single track. It is proposed that the road be almost rebuilt as a double-track system, or with double tracks over the whole or any parts of the road in the city that the directors may decide upon. The privilege of erecting all the necessary poles, wire, etc., is asked for, with the additional privilege of running wire to Ainslie Park for the lighting of that resort by electricity. The new privileges asked for, it is proposed, shall extend from July 1, 1893, over a number of years, to be decided upon by the City Council.

MESSRS. CLARE BROTHERS, Preston, Ont., are now operating the electric light system for the town.

THE Canadian Office & School Furniture Company, Preston, Ont., are very busy working overtime trying to keep up with their orders.

THE Montreal Street Railway Company have called for tenders for the building of a power and boiler house.

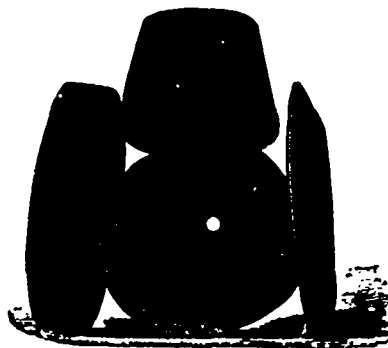
WILSON, Ont., is troubled with her electric light engine, and must either go in the dark or put in a new engine.

THE Chairman of the Finance Committee of Calgary, N.W.T., Mr. J. S. Fehan, will receive tenders up to August 1 from parties willing to contract for lighting the town with electricity for a period of five years.

THE machinery of the Toronto Drop Forge Company, lately of New Toronto, has been bought by Mr. George Gillies, of Gananoque, Ont., and it is rumoured that he will start a branch of his business in New Toronto.

Michigan Emery Wheel Company

194 Catherine Street, Detroit, Mich.



Solid Emery

AND

**Corundum
Wheels**

To Run Wet or Dry Special Shapes



**PERFECTION
SAW GUMMERS**



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SPECIAL DESIGNS MADE TO ORDER
IN RED, BUFF OR BROWN

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WHEN WERE
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BOILERS
LAST
Inspected?

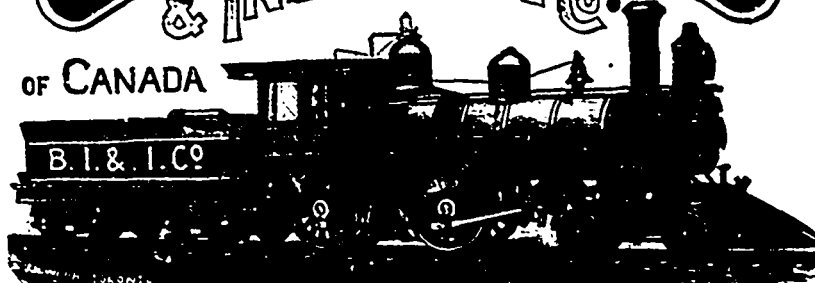
CONSULTING ENGINEERS:
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Head Office: TORONTO.

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Sure
THEY ARE
SAFE
AND IN
GOOD
CONDITION?

The announcement that the winey mill will in all likelihood soon be started up once more is another evidence of the prosperity of industrial Brantford. This town is going ahead at a great rate these days, and it has manifestly reached a period in its career when continued progress is inevitable. The National Policy has showered its blessings alike on the just and the unjust, in other words on the Grit as well as the Tory manufacturer, and Mr. W. Paterson, M.P., is prospering as much as any of the others in the general record of increasing business and enlarged premises. Every prospect pleases so far as Brantford is concerned, and the local Reformers are forced to display evidences of an ever increasing welfare in spite of themselves. Brantford Courier.

At the recent annual meeting of the Chaudiere Electric Light and Power Company, held in Ottawa, the old board of directors was re-elected as follows: G. P. Brophy, J. W. McRae, Thomas Workman, W. Y. Soper, T. Ahearn, R. Hurdman, W. G. Hurdman, Wm. Scott, and Wm. Hutcheson.

The Lethbridge Waterworks and Electric Light Company, Lethbridge, N.W.T., have now completed all arrangements for putting in their electric light service. The plant has been for a long time ordered, but there was considerable delay in procuring the necessary plans for the foundations for the engines and dynamos. These have at last been secured and the contract for their construction have been awarded.

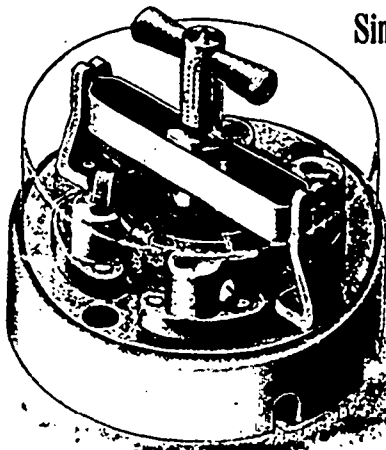
An electric street railway will shortly be an accomplished fact in Kingston, Ont.

The Hamilton Electric Railway Company, Hamilton, Ont., has been formed to construct and operate a series of electric railway lines to connect Hamilton with the towns and villages surrounding the city. The work of building the various lines and supplying the wire, electric machinery and plant necessary for conveying the power from Niagara Falls to Hamilton, will be given to the Siemens & Halske Company, of Germany. Work will be commenced immediately.

LONDON, Ont., is again making strenuous exertions to have the car shops of the Grand Trunk Railway centralized in that city. The city council have decided forthwith erect shops for that purpose at a cost of \$100,000.

The electric cars are running permanently on St. Denis Street, Montreal. There are now 30 electricies on the different routes. This number will be increased to 60 as soon as all the generators in the Cote street power house are in operation. So far this season new tracks have been laid past the Windsor hotel, and soon the double track on St. Catherine street from St. Lawrence street to St. Matthew street, will be completed. A mile of single track has also been laid east of St. Lawrence on St. Catherine street, and a double track from the city limits to Greene avenue, Cote street, Antoine. On St. James street a line had been built from Windsor to Fulford street, and on Notre Dame street from Chaboille street to St. Lambert Hill. A double track from St. Catherine street to Sherbrooke and from Pine avenue to the Exhibition grounds has also been built this season. There are at present 600 men on the work, and by the end of the summer the company hope to have its lines in good shape.

The Electric Street Railway Company at Ottawa, whose motor power is now obtained from the Chaudiere Falls for running its dynamos, has decided to put in a steam plant to be held in reserve. The low water in the river last March gave the company a great amount of trouble.



Single and Double Pole
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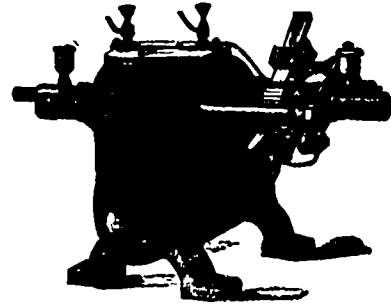
PERKINS' ELECTRIC SWITCH MFG CO.

Hartford, Conn.

For Sale by the Canadian General Electric Co., Toronto.

KAY ELECTRIC CO.

Manufacturers of



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FOR

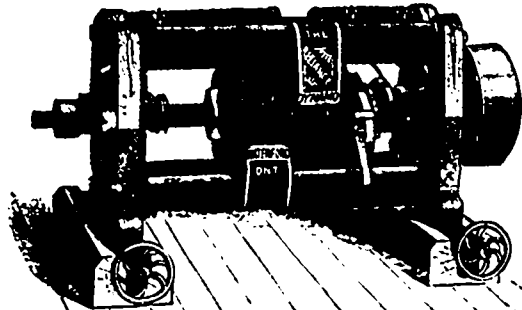
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PLATING MACHINES, MEDICAL BATTERIES

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HAMILTON, ONT.



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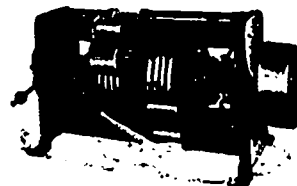
Manufacturers of The Reliance System of Arc and Incandescent Lighting

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MENTION THIS PAPER

MR. HUGH RUSSEL, Temple Building, 185 St. James Street, MONTREAL

The Royal Oil Company, Toronto, have enlarged their warehouse at the foot of Sherbourne street.

The Standard Woolen Company, Toronto, have enlarged their mill by the addition of a three story and basement building, 70 x 50 feet.

The Canadian General Electric Company, Toronto, have ordered two 175 h.p. cross compound engines from Messrs. E. Leonard & Son, London, Ont., for their new incandescent light and power plant at London, Ont.

The Dominion Cotton Company, who are the lessees of the Haldale water power near Brantford, Ont., will improve that power at a cost of probably \$20,000, and will again start up their winey mill there.

SIXTEEN years ago Mr. James Goldie of Guelph, Ont., purchased from Geo. F. Haworth, the Toronto leather belting manufacturer, a double leather main driving belt 36 inches wide and 100 feet long. This belt has been in constant use ever since, and we are told that it has had no repairs whatever. The Haworth Belting Company are now overhauling and lengthening this belt, and they inform us it will, when finished, be good for another ten years or more. This will give one an idea of the long life of a first-class double leather belt when carefully made of suitable material and properly cared for.

The new electric light works at Waterloo, Que., have been finished and put in operation.

The Breithaupt Tanning Company have just placed a new 25 h.p. steam engine in their tannery at Listowel, Ont., built for them by Messrs. Goldie & McCulloch, Galt, Ont.

The city of Brantford, Ont., is discussing the propriety of granting a bonus of \$30,000 towards the building of an electric road between that city and Paris, Ont.

The Canadian Packing Company, an English concern which recently began the pork packing business in London, Ont., have just made their first shipment of five car loads of bacon to London, Eng.

The Waterous Engine Works Company, Brantford, Ont., some time ago sent a lumber mill to Costa Rica, as was noticed in these pages at that time. This mill has given so much satisfaction that they are now building another larger mill for the same destination.

The Delhi Canning Company, Delhi, Ont., are putting in a machine for handling their pack of green corn, which cooks the corn, fills the cans, places the caps thereon and secures them, and keeps an accurate count of the work done, saving the labor of at least a half dozen hands. This stroke of enterprise, by which canned green corn will be cheapened to consumers, will be good Grit evidence that the N.P. is a failure in that with the new and improved machinery, the factory does not require as much labor as previously.

MESSRS. WEDDELL & COMPANY, Trenton, Ont., have been awarded the contract for building the new iron bridge at the Narrows, near Peterborough, Ont. The structure will cost about \$13,000.

MR. ALEX. P. MENDE, 14 Water Street, New York, manufacturer of fast colors and black dyes for "one dip" dyeing, and direct printing in cotton, wool, mixed fibres, leather, etc., have sent us samples of his one dip blue and one dip black for wool. The one shows the color after dyeing and the other after fulling. Those interested can inspect these samples at this office.

Machinists' Fine Tools

Drills, Chucks, Reamers, Etc.

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Screw Cutting

TOOLS

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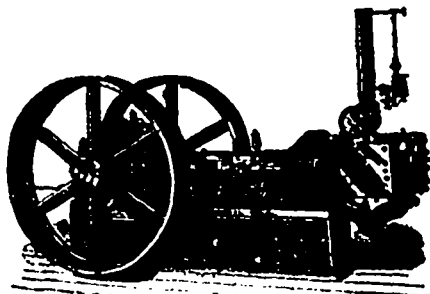
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STEAM PUMPS
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-AND-
General Machinery

Nie & Lynch, (Write for Prices.) Hamilton, Ont.



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RATCHET BRACES UNEXCELLED

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122, 124, 126 Washington St.
Buffalo, N.Y.



Messrs. JOHN M. FRENCH & Co., Toronto, manufacturers of paint, varnishes, etc., have acquired the patents pertaining to a method of painting articles by the submersion of them in tanks containing the paint, instead of laying on the paint with the brush in the usual way. The result by this new process is quite as satisfactory as when acquired in the old way, and the work may be done about ten times as fast.

THE Niagara Manufacturing Company is being incorporated at Niagara Falls, Ont., with a capital stock of \$900,000 to manufacture threshing machines and steam engines for running the same, and agricultural implements generally. Mr. R. P. Slater and a number of Buffalo gentlemen are interested in the concern.

THE Vale Barrel Machine Company of Hamilton, Ont., is being incorporated with a capital stock of \$250,000 to manufacture a new patent machine for making barrels, etc. Hon. W. E. Sandford is at the head of the Company.

THE William A. Fraser Manufacturing Company is being incorporated at Thorold, Ont., to manufacture collins, caskets, etc.

In another item, allusion is made to a neat little publication issued by the Penberthy Injector Company, Detroit, Mich., having reference to the injector manufactured by them. The book contains a number of letters from steam users and steam supply houses, and traction engine manufacturers in the United States and elsewhere, those from Canada being from Sawyer & Massey Co., Hamilton; Waterous Engine Works Co., Brantford; A. R. Williams, Toronto; J. Matheson & Co., New Glasgow, N.S., and Garth & Co., Montreal.

Messrs. JOHN SMITH & SONS, lumber merchants, Callendar, Ont., have installed an arc and incandescence electric light plant for lighting their mills and yards. The plant was supplied by The Kay Electric Works, Hamilton.

MONCTON, N.B., is agitating for an electric street railway service. It is estimated by those who have the project in hand that, say, three miles belt line, double track, six cars, could be provided at an expenditure of \$75,000.

MR. JAMES M. PRUITS, Toronto, has installed a 10 h.p. Kay motor in his flour and feed mill.

THE Shelden Company, Toronto, have put in an electric motor for running their elevators.

MR. JACQUES ENFRIED, Montreal, has installed a Kay electric motor.

THE Kay Electric Works, Hamilton, Ont., have lately supplied plating machines to the J. & J. Taylor's Safe Works, and to the Gendron Manufacturing Co., Toronto, and to the Ontario Silver Company at Humberstone, Ont.

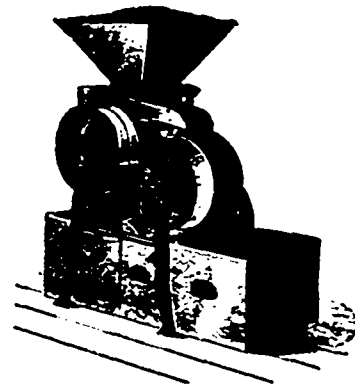
THE Restigouche N. B. Telephone and Electric Light Company has lately organized, with headquarters at Campbellton. The provisional directors of the company are James Reed, Geo. Moffat, W. W. Doherty, Kilgour Shives, A. E. Alexander, J. P. Mowatt and David Richards. It is the intention of the company to extend the line to Dalhousie, a distance of sixteen miles, and to Metapedia, a distance of twelve miles, thus taking in the principal points on the Restigouche River.

THE Robb Engineering Company, Amherst, N. S., have received an order for three Monarch economic boilers to be placed in the new electric light and power plant at London, Ont.

MAGNETIC METAL

SEPARATORS

(B. Fitt's Patent)



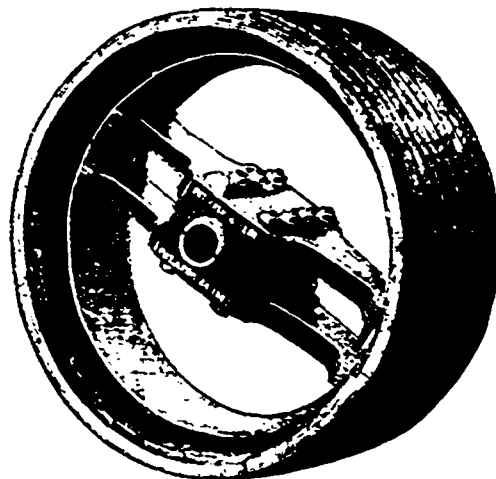
For separating Iron Turnings, Filings, etc., from Brass and other metals. Made in two sizes: No. 1, price \$135; No. 2, price \$225. No. 2 is more than double the capacity of No. 1.

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Dodge ^{PATENT} **Wood Split Pulleys**

33 1/3 Per Cent. More Power
with Same Belt
Over
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50 to 75 Per Cent. Lighter
Than
Iron Pulleys
and Much Cheaper

Remember that every Pulley is fully guaranteed by us. Rim of our Pulley is Thoroughly Nailed, as well as being glued and pressed up, making it the only perfect Wood Pulley made. We fill all orders on day received. We solicit your orders knowing we have the best Wood Split Pulley in the World. Send for Catalogue.

DODGE WOOD SPLIT PULLEY CO., Toronto

COL. JAMES M. CLARK, of Windsor, Ont., promoter of the South Windsor & Amherstburg Electric Railway, was recently at London, Ont., in connection with the construction of an electric street railway for that city.

MESSRS. GAULT, the proprietor of the beet Sugar Works at Farnham, Que., have commenced the building of a new dam which is to cost about \$10,000.

MR. A. LEGUIS has bought the mill privileges from Mr. W. B. Meigs at Farnham, Que., and will erect a large flour mill there.

A COMPLETE survey of the proposed water works system between Cowansville, Que., and Bull Pond, is being made by Mr. Huskings, C.E., of Cookshire, Que.

MESSRS. CUNNINGHAM & WALKER, St. Catharines, Ont., have received an order for machinery for the Ontario Peat Fuel Co., Toronto.

MESSRS. STEVENS, HAMILTON & COMPANY, Galt, Ont., have recently built for the Northey Manufacturing Company, Toronto, to be placed in their new works, four large engine lathes, and a radial drilling machine, a new extra heavy and powerful 25 inch lathe being in course of construction. They have also recently supplied Messrs. A. B. Jardine & Co., Hespeler, Ont., a heavy milling machine and a heavy automatic turret lathe. Messrs. Stevens & Hamilton inform us that they are in receipt of numerous orders for their high speed sensitive drill attachment, recently illustrated and described in these pages.

MESSRS. JAMES PENDER & Co, St. John, N.B., have sent us a circular having reference to the patent "Bulldog" steel wire nails manufactured by them, the illustrations showing the large variety of styles and sizes in which these nails are made. Messrs. Pender tell us that this is the coming nail, because it combines holding power equal to the cut nail, which is over 50 per cent. greater than the bright wire nail, with all the good points of the latter. This result is obtained by finely roughening the surface of the nail so as to give the wood adhesion to the wire and make it hold. Whereas the smooth surface of the bright nail prevents the wood getting sufficient adhesion to make it hold enough, the rough points on barbed nails break the fibres of the wood in driving, making a hole larger than the nail, and surrounding it with broken wood, both of which help to make them easily drawn. The roughened surface of this nail is so fine as not to be noticeable except by the color, which is dark; but for this reason it is more effective than roughening produced by barbing, as shown by numerous scientific and hand tests. Messrs. Pender's method of roughening is secured by letters-patent both in the United States and Canada. The difference in count, as compared with cut nails, runs from 20 per cent. to 60 per cent., according to size, and averages about 30 per cent. in favor of the wire nail. This difference fully offsets the difference in price, but the waste in cut nails will average 4 per cent. more than in wire nails, or 10 cents per keg. Wire nails being 40 per cent. lighter and much sharper pointed, can be driven fully 25 per cent. faster, and the cost for labor in driving nails by hand being about half their value, the saving in this respect in favor of the wire nail amounts to over 25 cents per keg, making them much cheaper.

A MANUAL OF INSTRUCTION IN HARD SOLDERING. By Harvey Rowell. 57 pp., 12mo, cloth, illustrated. 75c.

THE COOKING RANGE, its failings and remedies. By F. Dye. 32 pp., illustrated, 6mo, paper. 20c.

SPON'S MECHANICS' OWN BOOK. The book for every handy man, mechanic or amateur. Part of contents:—Casting and foundry, sheet metal work, cabinet making, carving and carpentry, mechanical movements, gilding, staining, marbling, polishing, warming, ventilating, road and ledge making, drains, foundations, earth walls, colonial house, log huts, bell hanging, gas fitting, whitewashing, plastering, etc., etc. 702 pp., profusely illustrated, 8vo, cloth. \$2.50.

PRACTICAL ELECTRICAL BELL FITTING. A treatise on the fitting up and maintenance of electric bells, etc., etc. 137 pp., 111 illustrations, 12mo, cloth. \$1.25.

THE FIREMAN'S GUIDE. A hand book for the care of boilers. By P. Dahlstrom. 12mo, cloth. 50c.

THE CORLISS ENGINE, and management. By J. T. Henthorn and C. P. Thurber. 6mo, illustrated, cloth. \$1.00.

A MANUAL OF LIME AND CEMENT, their treatment and use in construction. By A. H. Heath. 215 pp., one folding plate, 12mo, cloth. \$2.50.

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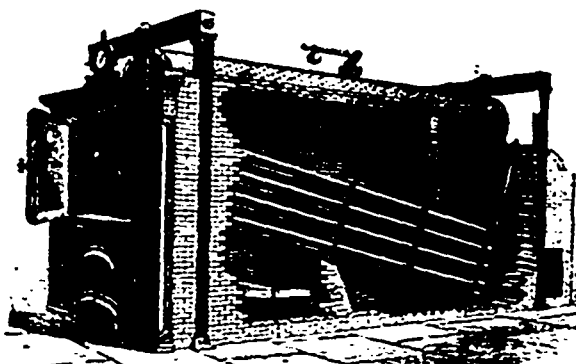
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Steel and Brass Wood Screws, and
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Brass Jack Chain.

2 and 4 POINT BARB and PLAIN TWIST FENCING.

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Ginghams, Zephyrs, Cravenettes, Bedford Cords,
Cheviot Suitings, Flannelettes, Dress Goods,
Skirtings, Oxfords, Shirtings, Cotton-
ades, Awnings, Tickings, Etc.

See samples in Wholesale Houses : NOW READY

D. MORRICE, SONS & CO., Agents

MONTREAL AND TORONTO

The Brockville Carriage Company, Brockville, Ont., have recently made shipments of their goods to Jamaica, West Indies, to Scotland, and to Ireland.

Work upon the foundry of the Moffat Stove Company at Weston, Ont., is being pushed. It will be a large building and equipped with every desirable appliance.

Tenders will soon be called for the erection of an iron bridge connecting Hull, Que., and Gatineau Point.

The magnitude of the undertaking of building an addition to the Chaudiere Electric Light Company's station at the Chaudiere, is much greater than is apparent to the ordinary onlooker. Although a large staff of men has been employed taking out rock for some time past, it is estimated that only a little over one-third of the excavation has been completed. A large quantity of the stone being taken out will be used in the walls and foundations of the company's proposed new steam power-house near the Chaudiere terminus of the C. P. R. railway. Ottawa Citizen.

The Toronto Railway Company will acquire land in Frederick street upon which to erect an iron foundry where all their castings will be made. Their machine shop in that street is rapidly approaching completion, and it will be one of the best and most thoroughly equipped works of the sort in Canada.

The Ottawa Electric Street Railway Company at its annual meeting decided to start car shops as an independent enterprise for the manufacture of electric cars. Cars built there under the supervision of the electric railway management have already found their way to Montreal, Windsor, Winnipeg, and other cities.

The Waterous Engine Works at Brantford, owing to increasing business must enlarge their works, necessitating the employment of 100 additional workmen. The machine shop to be erected will be 120 feet inside and 400 feet long, with a height of two stories or 50 feet. In addition, a foundry of 125x100 feet will also be built, and besides new engine, boiler and other finishing shops, a large and fully equipped blacksmith shop will be erected.

The longest telephone circuit in the world is now projected by the Automatic Telephone and Electric Company of Canada, Halifax, N. S., which intends to lay a line from Halifax to Vancouver. This is a distance of 3,500 miles. The circuit will be in sections, and available for communication to many intermediate points.

PRESIDENT MOLSON, of the Molson Bank, who has just returned from British Columbia, says the electric railway service between Vancouver and New Westminster would be a credit to the oldest and richest state in the world. It is the longest straight line in Canada, and runs a portion of the way through the primeval forest and past the loveliest scenery. Moreover, it is thoroughly equipped and its system so perfected that never a hitch can happen.

MESSRS. MARLATT & ARMSTRONG, Oakville, Ont., owing to the increase in their business will make an addition to their tannery, and add more machinery.

THE Oakville Basket Company, whose factory was burned a short time ago, have rebuilt and are now running full time. They have added improvements and are now in better shape than ever.

THE Electric Railway Company at St. Stephens, N. B., is ready to undertake the building of a new road as soon as the Town Councils of St. Stephen and Milltown locate the line as required by the terms of the company's charter. The road will be built in Calais, Maine, no matter what action is taken on the St. Stephens side.

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The handiest, simplest, and most efficient steam pump for general Mining, Quarrying, and Contractors' purposes.

**MUDDY OR GRITTY LIQUIDS
HANDLED WITHOUT WEAR.**

Descriptive Catalogue, with Prices, furnished on application.

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WATCHMAN'S ELECTRIC CLOCK

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THE WATERSPOUT

PATENT

Pulsating Steam Pump

The most Durable, Handy, Economical Pump in the World

PRICES AND TESTIMONIALS FROM

The Waterspout Engineering Co.

MANCHESTER, ENG.

U.S. and Canadian PATENTS on sale



MESSRS. PATTERSON & COBURN, St. Catharines, Ont., are busy on cars for The Niagara Electric Railway, Kingston Electric Railway, and the Peterboro Electric Railway. They have just completed another addition to their works and will put up another at an early day.

THE McKimmon Dash and Hardware Company, St. Catharines, Ont., will be ready to manufacture buckles by the beginning of September. The machinery is now on the way and will shortly be in place.

THE James Morrison Brass Company, Toronto, have installed two Kay electric motors for motive power for two of their departments.

THE Kay Electric Works, Hamilton, Ont., have just shipped a 50 light dynamo for the mines at Rat Portage, Ont.

THE Central Methodist Church, Toronto, have installed a Kay electric motor for pumping the organ. The churches are catching on to the electric motor business.

MR. THOMAS COOK, Richmond Hill, Ont., has installed a 25 h.p. Kay generator, and a 20 h.p. motor for transmitting power from the water falls to his mill.

MR. JAMES H. ETHERINGTON, St. Catharines, Ont., is running his carpet factory to its full capacity on art squares, three ply, ingrain, all wool and union, working 38 hands on 25 looms. He is about building an addition to his factory to be used as a dye house and dry room, and he will add six more looms. Three years ago Mr. Etherington began manufacturing carpets in Paris, Ont., with one loom, which was set up in his dwelling house. His success is remarkable, and is to be attributed to the N. P.

"As others see us" is the title of a neat pamphlet issued by the Penberthy Injector Company, of Detroit, Mich. It contains letters from many of the largest steam supply houses and traction engine manufacturers in the United States and Canada, all speaking in the highest terms of the celebrated Penberthy automatic injector. They are letters which carry weight as they are from persons who have sold and used this machine for from three to six years.

MESSRS. RITCHIE & RAMSAY, New, Toronto, have equipped their factory with electric light.

THE Ottawa Car Company, with headquarters at Ottawa, are applying for incorporation with a capital stock of \$200,000 to manufacture railway cars, street cars, snow ploughs, etc. Messrs. Ahearn & Soper, electricians, Ottawa, are of the incorporators.

THE La Foree Pneumatic Bicycle Tyre Company of Toronto, is being incorporated with a capital stock of \$13,500 to manufacture bicycles, etc. Messrs. Hyslop & Caulfield, and Mr. A. W. Dingman are incorporators.

MR. JOHN WHITESIDES' sawmill at Huntsville, Ont., was destroyed by fire July 9, loss about \$10,000.

THE stove mill of Messrs. D. H. Taylor & Sons, at Dutton, Ont., was destroyed by fire July 7, loss on mill about \$1,000.

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Durable Try Them

PATENT
ROCK
EMERY
MILLSTONES


Grind Every-
thing

Emery Face Never Dressed

HARD NEVER GLAZE

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Brunner, Mond & Co., Ltd.

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Guaranteed 38 Degrees.

Equal to 48 per cent. Carbonate of Soda. The Strongest and Purest form of Soda Ash in the Market

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Glass, Paper and Soap Makers

CONCENTRATED CRYSTAL SODA

Purest and Cheapest Form of

WASHING SODA

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Write for full particulars of our **NEW WOOLEN REED**

NEW DYE STUFFS.

The Dominion Dyewood and Chemical Company, Toronto, are sole agents in Canada for the German dye stuffs manufacturing concern alluded to in the following notices found in a foreign exchange:

The Farbenfabriken vorm. Fr. Bayer & Co. are always to the fore with new dye stuffs. We have before us three new patents which they have just taken out. Of late years quite a new class of azo dyes have been brought out—cloth red, Clayton cloth red, aurotin, Gambine yellow, chrome orange, etc., etc., which have the property of forming colour-lakes with chromium, and which, therefore, will dye wool which has been mordanted with chrome; or they can be used in printing on cotton or wool by means of a chrome mordant. From the researches of various chemists, this valuable property is due to these colouring matters containing two hydroxyl groups in what is known as the ortho-position to each other; or a hydroxyl and carboxyl group in the same relative positions, or two carboxyl groups. Dyestuffs having this property can be obtained from amido-benzoic acids and analogous acids, such as amido salicylic acid; as, for instance, an orange from amido benzoic acid and naphthol mono sulpho acid, this, when printed on cotton with a chromeacetate mordant, gives orange shades, fast against washing. From red to black colouring matters are also obtained by combining the amido benzoic acid with other naphthol acids, resorcin, and dihydroxy naphthalene, while amido sulpho salicylic acid and *beta*-naphthol gives a bluish claret red. Amido phthalic acid also yields dyestuffs having similar properties, and varying from orange through red to black in the colours they produce on the fibre. Some of these dyestuffs have probably been brought out in the firm's series of "chrome" colours.

The Farbenfabriken were the first to pay attention to the production of direct colours for cotton, basing their researches on some experiments made by Peter Griess; and since they first placed benzopurpurine on the market, they have never ceased bringing out some new members of this very valuable series of coal-tar colours. A recent patent describes the production of a green direct colour. Although the direct dyes known must number above a hundred, yet only two greens (benzo-olive and diamine green) are numbered among them, and these yield but dull shades. The Farbenfabriken have found a true green, formed by a sulpho acid of dehydro-thiometa xylidine, combining this with amido-

naphthol-ether sulpho-acid, and this again with monosulpho-acid of dihydroxy naphthalene. A similar dyestuff is formed by starting with dehydro-thiometa xylidine and combining this with amido-naphthol-ether sulpho-acid, and this again with dihydroxy naphthalene sulpho acid. By using other products than the dihydroxy-naphthalene sulpho acid, a series of dyestuffs dyeing unmordanted cotton greyish green, and pure green to greenish black, are obtained. It is to be hoped that the new products will have the desirable property of fastness.

So far, all the acid dyeing azo-colours have been reds, oranges, browns or violets. No good azo blues are known, nor is a true azo green on the market. This latter void in the range of azo colours is, however, likely to be filled, for the Farbenfabriken describe in one of their patents a dyestuff dyeing wool in an acid bath a beautiful green. It is formed by combining naphthylamine with amido-naphthol-ether sulpho acid, and with dihydroxy-naphthalene-disulpho acid as a disazo colouring matter. This is, therefore a true azo dye, as in croceine or biebrich scarlets. Whether this green is fast to acids, alkalis, soaping, and light—all very desirable properties in a dyestuff—the patent does not state: it is to be hoped it is thus fast.

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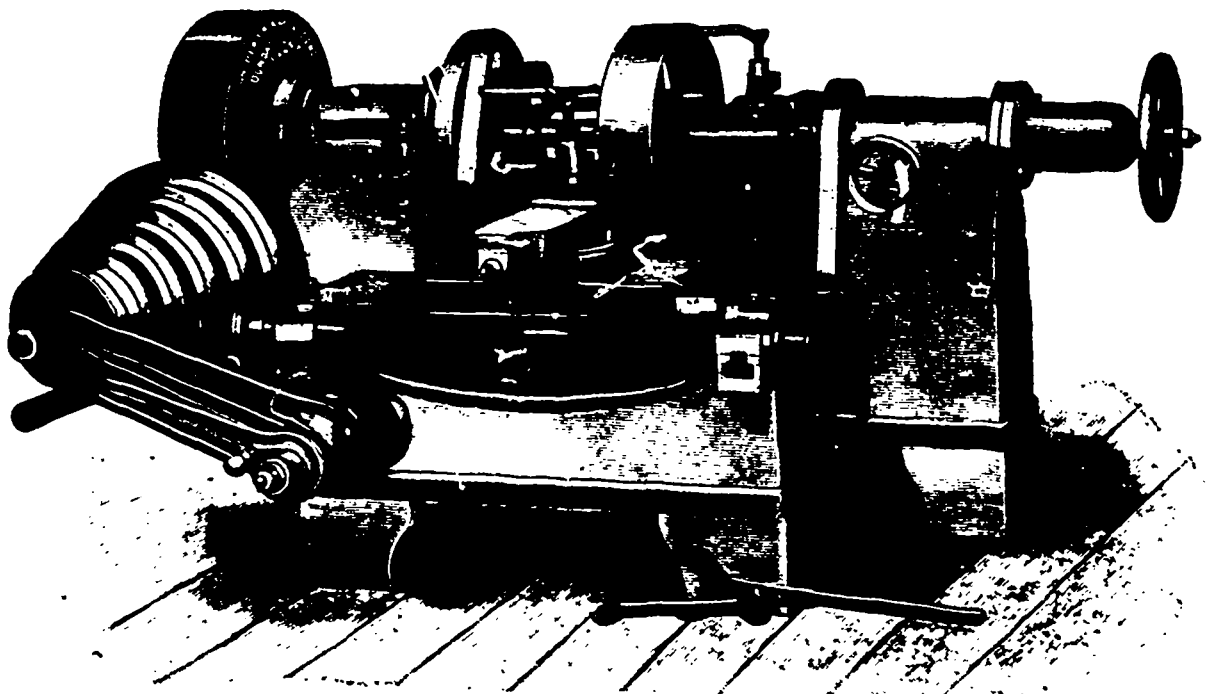
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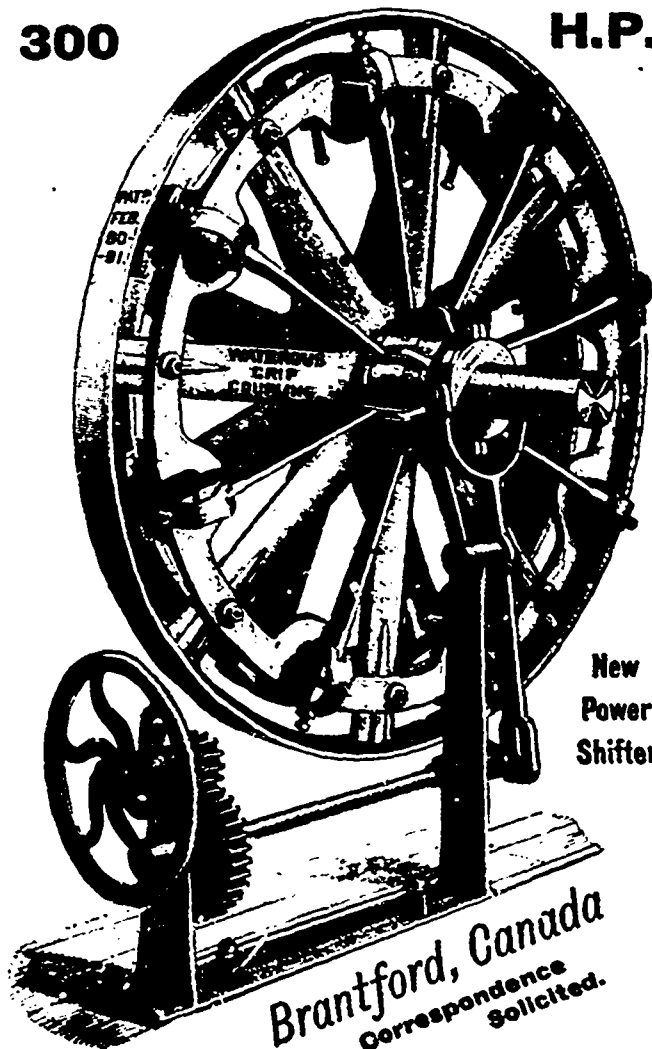
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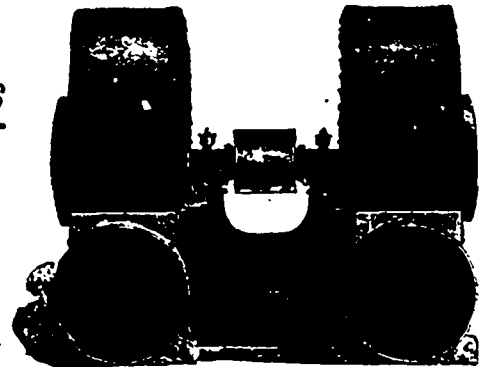
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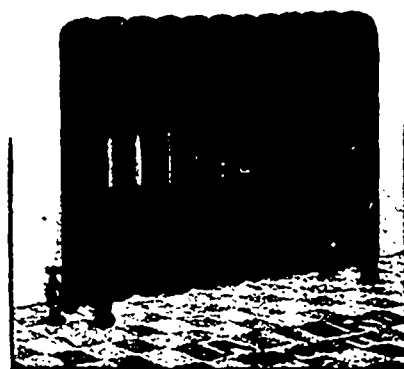
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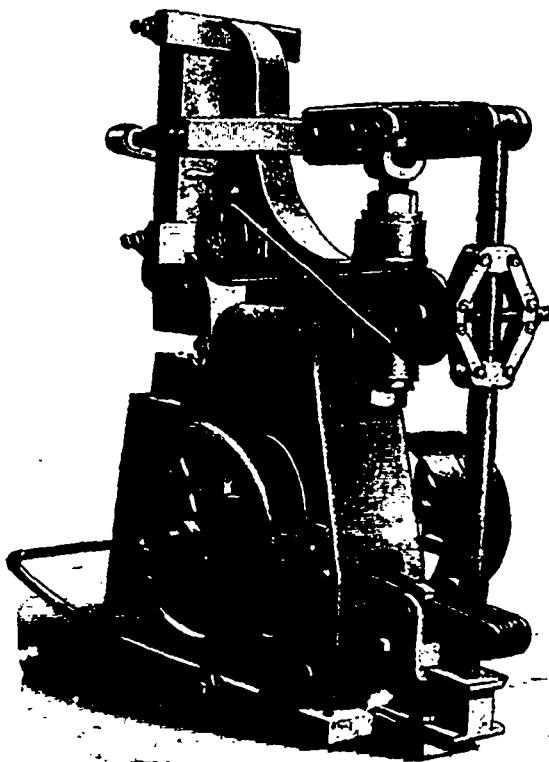
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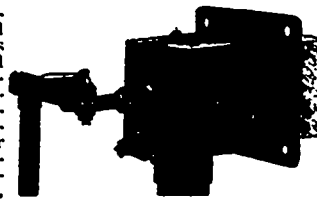
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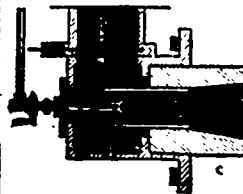
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	30 "	523.70	445.96	242.32	523.44	447.00	190.60	130.28	111.72	55.32
	3 mths	519.12	549.20	350.84	551.84	448.20	349.56	257.88	214.00	134.24
	9 "	654.52	626.20	394.76	539.72	530.20	308.24	326.40	311.80	178.68
Average tensile strength of 25 to 50 lb. neat Cement rammed in mould.	7 days	606.16	646.56	not given	629.36	601.20	406.88	353.96	370.20	199.76
	30 "	686.76	648.60		644.00	615.96	428.28	367.96	383.02	221.00
	3 mths	376.12	467.70	394.80	434.72	343.32	196.78	206.92	172.02	69.92
	9 "	421.22	512.30	375.40	532.40	423.88	277.08	131.02	164.16	60.77
Cement, 1 in. sq., neat Cement rammed in mould.	7 days	537.94	544.30	420.60	688.20	510.24	417.58	314.76	293.92	153.06
	30 "	614.74	623.40	427.60	633.84	542.88	472.76	393.36	400.32	236.82
	3 mths	637.24	601.12	408.20	648.52	546.08	484.84	389.98	389.32	264.00
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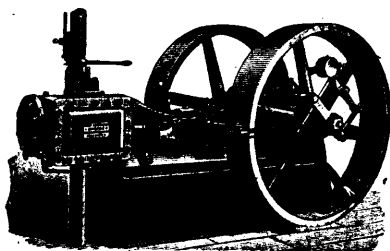
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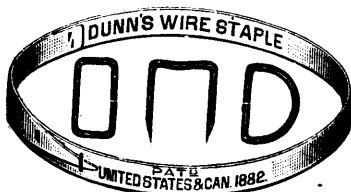
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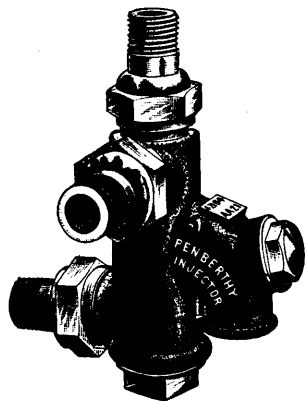
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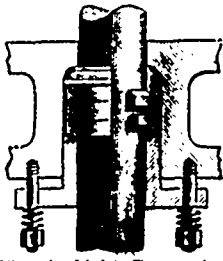
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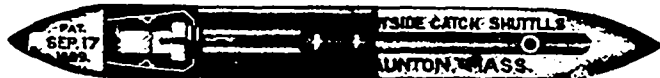
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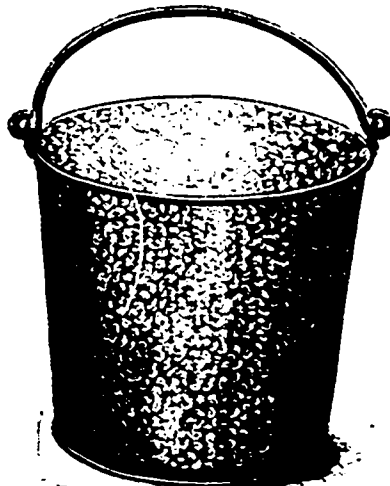
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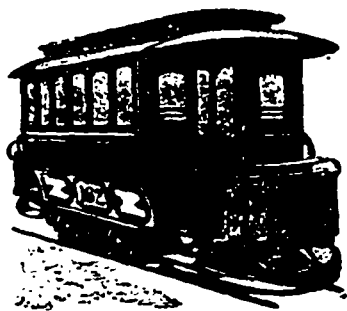
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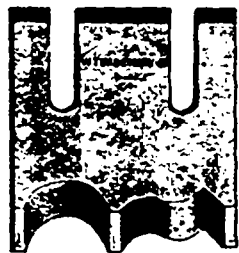
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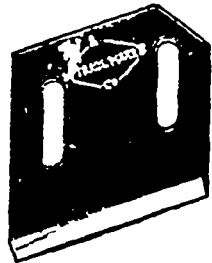
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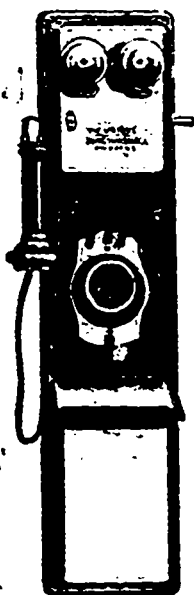
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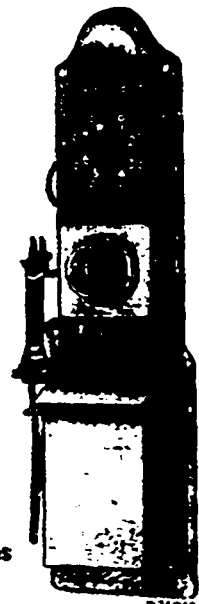


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The report was adopted and the retiring Directors unanimously re-elected. The Board of Directors are now constituted as follows: James Goldie, Guelph, pres.; W. H. Howland, Toronto, vice-pres.; H. N. Bant, Toronto; Wm. Bell, Guelph; Hugh McCulloch, Galt; S. Neelon, St. Catharines; George Pattinson, Preston; W. H. Story, Acton; J. L. Spink, Toronto; A. Watts, Brantford; W. Wilson, Toronto.

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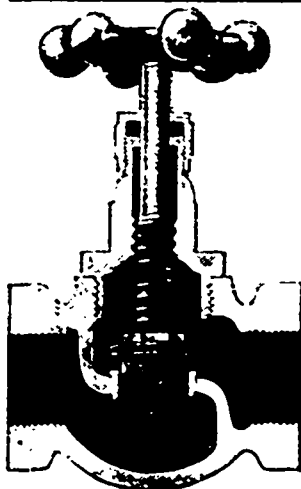
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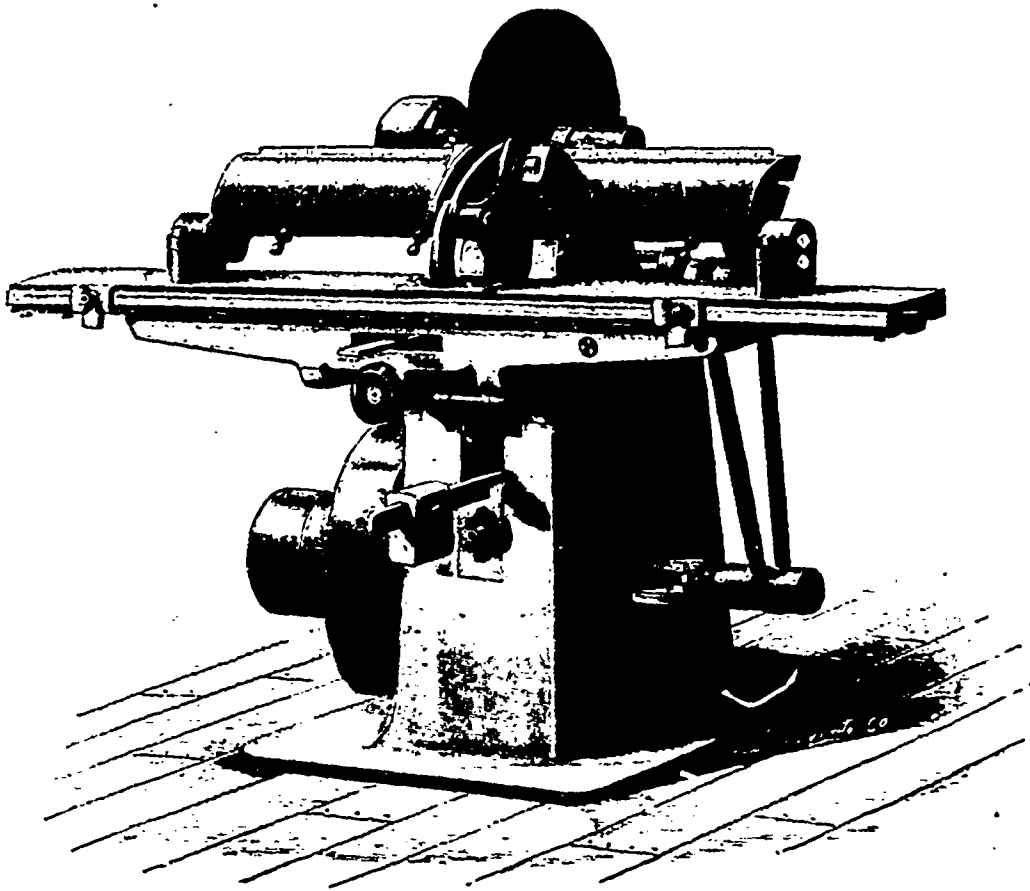
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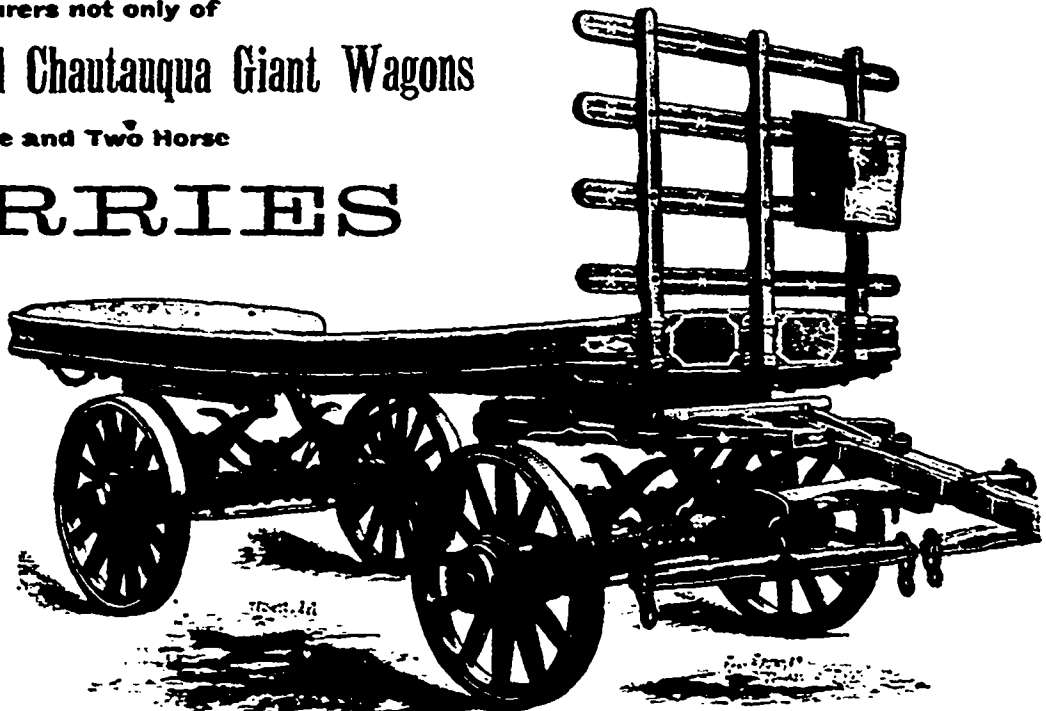
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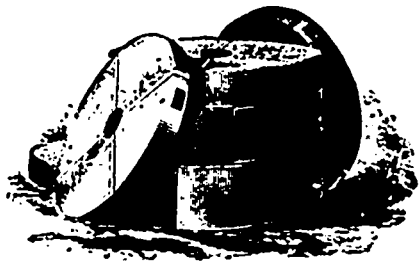
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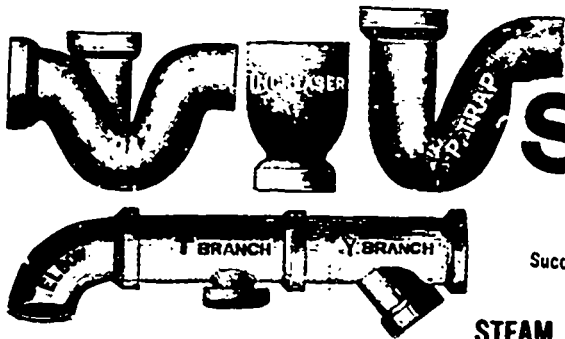
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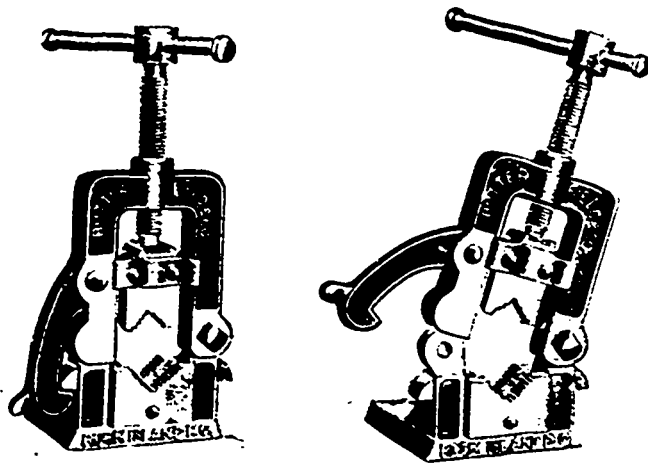
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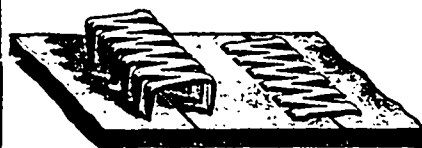
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