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# CANADIAN MANUFACTURER

AND INDUSTRIAL WORLD

DEVOTED TO THE MANUFACTURING INTEREST OF THE DOMINION

Vol. 24.

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No. 9.

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**AS TO PIG IRON IN ONTARIO.**

As intimated in the last issue of this journal, on April 24th, a deputation of the Ontario members of the Canadian Manufacturers' Association waited upon Sir Oliver Mowat, premier, and other members of the Provincial Government, to request that a bonus of \$2 per ton be given upon the production of pig iron in Ontario, and that this be continued for a term of ten years. The memorial was as follows:—

The Canadian Manufacturers' Association beg to represent to you that the membership of their Association is composed of persons engaged in a great diversity of manufacturing industries carried on in all parts of Canada. Those of them doing business in Ontario are particularly desirous of seeing the Province enjoying the very highest degree of prosperity. They feel that the prosperity of the industries in which the people may be engaged, both agricultural and mechanical, is dependent in a greater or less degree upon the prosperity of all the other industries; that if prosperity attends the efforts of any class or section of the community, it will certainly favorably affect all classes; and they believe that the greater the number of industries in which the people may be employed, the greater the prospects for the general prosperity.

The Association observe with very much pleasure the interest that has been awakened, and the efforts that are being made, looking to the establishment of an iron furnace industry in Ontario. Many of the members of this Association are

workers in iron. They are manufacturers of machines and machinery composed wholly or in part of iron; and whatever may in any manner relate to the iron question affects them. They believe that in all our manufacturing industries it is desirable that where possible the raw materials which they consume should be produced in the country. And this applies specially to pig iron. This article is the foundation of an almost endless variety of articles which enter into the everyday use of the people, or is essential in the production of them. It may be that our manufacturers have not yet undertaken the production of some special forms of iron, such as fine cutlery, surgical instruments, steel rails, etc., but in many other lines, such as agricultural implements, steam engines and boilers, iron-working machinery, wood-working machinery, etc., they have achieved a most gratifying success. But there is a drawback in conducting these manufacturing enterprises, which consists in the fact that not one pound of the iron that enters into the manufacture of these products is made in Ontario, and but a very small proportion in Canada. With practically inexhaustible supplies of rich ore within her borders; and with surroundings eminently calculated to conduce to the success of the enterprise, no pig iron has ever been smelted in this Province. The object of this delegation waiting upon you at this time is to ask that whatever the Ontario Government can do towards encouraging the establishment of a blast furnace industry, be done.

It is well to bear in mind that although for many years the Dominion Government have imposed a duty of \$4 per ton on imported pig iron, and have also bestowed a bonus of \$2 per ton upon such iron as had been made in the country, yet the stimulus has failed to induce capitalists to erect and operate any blast furnaces in Ontario. Since the adoption of this policy sufficient time has elapsed in which to thoroughly investigate the possibilities; and it is well known that such investigation has been made repeatedly; and the conclusion is forced that if Ontario is ever to have a blast furnace industry, it can only be made to materialize under different circumstances than those which now prevail.

And here it may be proper to enquire why the inducements offered by the Dominion Government have not been sufficient to establish a large pig iron industry in Canada—in Ontario; what else may be done to effect it, and who shall do it. We know that Ontario possesses vast stores of valuable ores; that they are easily worked; that some of them are now quite accessible, and that others of them could be cheaply and easily marketed by the expenditure of certain sums of money in extending our railroad facilities; that material for charcoal is abundant and contiguous to the most desirable locations for blast furnaces; that unlimited supplies of limestone are also in close proximity to such locations, and that there is a steady and reliable demand for all the charcoal pig iron that is likely to be produced for a number of years under the most advantageous circumstances. We also know that our existing railroad facilities are such that where it is desired to manufacture coke iron, the fuel can be laid down at furnace quite as cheaply as at many of the most successful furnaces in the United States, and cheaper in some instances.

We are confronted with the fact that the tariff imposes a duty of \$4 per ton on pig iron; that there is a Dominion bounty of \$2 per ton; that ores, fuel and fluxes are accessible and cheap; that there is a demand for iron, and that, not

withstanding these, we have no blast furnace industry. On the other hand, we know that capital is conservative and timid, and we cannot hope to see it invested in blast furnaces and steel plants in Canada without a certainty that the circumstances under which it is invested will not be unfavorably changed, at least for a time sufficiently long to give a guarantee of the remuneration to which it is entitled.

It is the uncertainty that has always surrounded the question that has been a salient factor in preventing the investment of capital in the blast furnace industry in Ontario. Many students of the question are of the opinion that an additional bonus should be offered as an inducement to capitalists to embark in the business; but an equally important consideration with them is the continuance of the time during which these inducements will be continued. It will not be satisfactory to them to remain in darkness on this most important point. They must know not only how much inducement is offered, but also how long it will be continued. Unlike banking, and similar monetary transactions, where capital can be called in and quickly transferred to another country if necessary; or unlike merchandising, where goods may be disposed of and the proceeds thereof under immediate control, when capital is invested in such an enterprise as a blast furnace it will be an almost total loss unless the works can be operated vigorously and continuously for a number of years. If, then, any encouragement is offered for the establishment of such an enterprise, if a bonus is promised on the production of pig iron, it should be accompanied with a guarantee that it will be continued for a definite term of years. A consensus of opinion shows that if the Ontario Government should deem it wise to aid in the establishment of this industry, the bonus should be \$2 per ton upon the production of pig iron, and that it should be continued for the term of ten years.

### STEEL RAILS.

It has heretofore been shown in these pages that if we are to have an iron making industry in Canada our tariff must be scheduled along lines which will make it possible to consume at home all the pig iron our blast furnaces would be able to produce; and in that connection we have shown the necessity of making the duty on scrap iron practically prohibitory. We will now discuss this matter from the standpoint of steel rails.

The Railway Statistics of Canada for 1892, prepared by Mr. Collingwood Schreiber, Chief Engineer of Railways and Canals, and just issued from the press, shows the following fact:

Miles of Railway completed (track laid).....	14,870
Miles of Siding.....	1,923

Total Mileage ..... 16,793

The rails used in the construction of our Canadian roads average in weight not less than 70 pounds per yard, and to iron this extent of mileage with 70-pound metal would require 2,068,900 net tons, which is at about the rate of 123 tons of rails per mile of road. In 1882 we had 7,530 miles of road, since which time—in ten years—we have added 7,058 miles, an average of over 700 miles per year, requiring an average of nearly 85,000 tons of rails per year for the construction of new roads.

Not one of these rails was made in Canada: but our importation of rails, and the value thereof was as follows:

	cwt.	value.
1890.....	1,781,922	\$2,204,085
1891.....	2,521,310	3,197,280
1892.....	1,654,935	1,738,661
	5,958,167	\$7,140,026

This is the equivalent of 333,657 tons of steel rails imported into Canada at an average value of \$21.30 per ton, the average annual importation being 111,220 tons, valued at \$2,380,000. Of this 111,220 tons, some 85,000 tons was appropriated to construction of new road, and the balance for repairs.

It is reasonable to suppose that for many years to come our annual construction of railroads will not be less than what it has been during the last ten years. If this should be the case; if during the next ten years we build 7,000 miles of road, the requirement for rails will be not less than 850,000 tons. The life of steel rails is estimated at about twenty years; the depreciation being at the rate of about five per cent. per annum; therefore ten years hence the renewals of rails now in use will have required over a million tons. This quantity, together with the new roads to be built during the coming ten years, will require some 1,850,000 tons, or perhaps 2,000,000 tons, or about 200,000 tons per year.

At the inauguration of the National Policy a grievous mistake was made in not placing an import duty on steel rails. If a great railway system was to be built up; if the continent was to be spanned from Halifax to Vancouver; it was a mistake not to build up at home an industry that would supply the rails for the purpose, instead of having to depend on works three thousand miles away with an intervening ocean. It might be argued that at that time the conditions were not favorable to the building up of a steel rail industry in Canada; but an answer to that is, that as far as the Canadian Pacific road was concerned, the money to build it, or much the larger portion of it, had to come out of the Dominion treasury, and that it would have been quite as well to have increased the expenditure but very slightly and have built iron furnaces and rail mills in Canada. As it is we have no rail mills and no iron industry; and every rail that is laid must of necessity be brought from abroad.

If at the time of Confederation it had been determined that Canada should have a steel rail industry; that it should be built by Government aid if necessary; and that to secure it a duty of, say \$10 per ton should be imposed upon imports of rails, and a bonus of \$5 paid on the production of rails at home, this bonus to be continued for a term of ten or fifteen years, every rail now in use in this country at this time would have been the product of Canadian mills. This would have been the result if we may judge by the course of events in this line in the United States. The manufacture of steel rails was begun in that country in 1867, in which year the production was 2,277 tons, and the value \$166 per ton. The duty was only 45 per cent. ad valorem, but in 1872, when the duty was raised to \$28 per ton, the production increased to 84,000 tons. Since then the industry has progressed wonderfully; and since the establishment of it upon a firm and reliable basis, the cost of production has been lowered to a point almost, or quite equal to the cost in Great Britain, the duty at this time being but \$12 per ton.

Under the existing policy respecting steel rails it is impossible that we shall ever have rail mills in Canada. We have shown the large demands of the country for the article and the

most obtuse can form some approximate idea of the lucrative employment that would be afforded to the people if all these rails were made in Canada. With the evidence of blundering before them, and seeing the necessity of giving increased occupation to the people, it is a good and fitting time now for the Government to take such action as may be necessary to establish a steel rail industry. This can be done by imposing a duty of, say \$10 per ton upon rails, and giving a bonus of \$5 per ton upon their production, this to be guaranteed for a term of ten or fifteen years. Who but the railroad companies would object? No one. It would be popular with all classes. It would be a powerful impetus in establishing a blast furnace industry. In a very few years we would not only have blast furnaces, but enough of these to supply all our requirements for pig iron; puddling furnaces enough to produce all the hammered and rolled iron the country would need; rail mills to give us all our rails; and steel plants which would turn out the thousand forms of mild steel that is now so largely required in our manufacturing enterprises.

#### CANADA'S GREATEST DEFICIENCY.

In a paper read before the Geological and Mining Section of the Canadian Institute, in Toronto, a couple of years ago, by Mr. W. H. Merritt, upon the production of iron and steel in Ontario, in discussing the possibilities of the industry in this country, and showing what had been and was being done in this direction in the United States, alluding to the fact that the total production of iron in Canada in 1889 was but 25,921 tons, it was stated that "in the United States they produce .67 of a ton of pig iron per capita of the population, while in Canada we produce .005 of a ton per capita; that in the United States each person has 134 times as much pig iron manufactured for him in his own country as he would have if he lived in Canada." This comparison was drawn not for the purpose of belittling the efforts of those who were striving to build up our metallurgical industries, but to invite attention to the disparity which is exhibited in the working results, and which no one can believe legitimately exists in the possibilities of the two countries. "I boldly make the assertion," said Mr. Merritt, "that Canada's greatest deficiency lies in not producing her own iron and steel." He cited the fact that we had built magnificent railroad systems and created splendid steamship lines, and that these great works were creations of iron and steel. What if we had produced it all in Canada, and were now manufacturing that which would be used in all the projected railroads and steamships, to say nothing of all the multitudinous requirements of every day consumption of the king of metals? Certainly the population of Canada would be at least a million greater than what it really is. One who has never visited an iron producing country cannot conceive the stupendous scale of each member of the family of industries that goes to make up the creation of iron and steel. First the underground world teeming with miners to bring forth the ore and coal; the busy neighborhood where the forests supply charcoal; the great traffic in these products to the railroads to central points for smelting; the men employed day and night about the blast furnaces; the swarms of workmen puddling and rolling the products, if iron, or converting the pig into steel and rolling it into desired forms. In all of these

occupations the consumption of nearly every other product is so prodigious that a thousand other trades are permanently benefited, from the farmer who produces food for the workman, to the weaver who makes the materials for his clothing.

It will be remembered that a few years ago a controversy was carried on in the magazines between Mr. Blaine and Mr. Gladstone, touching the great economic questions of protection and free trade. In that discussion Mr. Blaine wrote the following forcible truths which should never be allowed to sink into oblivion. He said: "Mr. Gladstone may argue for Great Britain as he will, but for the United States we must insist on being guided by facts and not by theories. We must insist on adhering to the teachings of experiments which have been carried forward by careful generalizations to well grounded conclusions. \* \* Mr. Gladstone boldly contends that keeping capital at home by protection is dear production, and is a delusion from top to bottom. I take direct issue with him on that proposition. Between 1870 and the present time considerably more than a hundred thousand miles of railroad have been built in the United States. The steel rails and all other metals connected therewith involved so vast a sum of money that it could not have been raised to send out of the country in gold coin. The total cost could not have been less than \$500,000,000. We had a large interest to pay abroad on the public debt; and for nine years after 1870 gold was at a premium in the United States. During those years nearly 40,000 miles of railway were constructed; and to import English rails and pay for them with gold bought at a large premium would have been impossible. A very large proportion of the railway enterprises would of necessity have been abandoned if the export of gold to pay for the rails had been the condition precedent to their construction. But the manufacture of steel rails at home gave an immense stimulus to business. Tens of thousands of men were paid good wages, and great investments and great enrichments followed the lines of the new roads, and opened to the American people large fields for enterprise not previously accessible. I might ask Mr. Gladstone what he would have done with the labor of these thousands of men employed in manufacturing rails if it had been judged practicable to buy them in England? Fortunately he gave his answer in advance of the question, for he tells us that we produce in America more cloth and more iron at high prices, instead of more cereals and more cotton at low prices." This is a lesson to which Canada should take heed. A few days ago the Trades and Labor Council, of Toronto, very unthoughtedly passed a free trade resolution; and commenting upon this action the Globe says: "It is almost a rule that where profits are high wages are low. The delegates have learned that they are now exposed to the free importation of labor from Europe, and that it is the importation of labor which cuts down their wages. The importation of goods necessitates the export of other goods to give in exchange, and does not decrease the demand for labor. Keeping up prices by restricting imports lessens the consumption of goods, and consequently decreases the demand for labor. The application of this theory to the manufacture of steel rails shows the ridiculousness of it. It was a mistaken policy that placed steel rails upon the free list; and because no duty was imposed; because no tariff restriction was placed upon the article, no steel rail was ever made in Canada. There has been no steel rail industry, and consequently no high profits nor even low wages. As far

as steel rails as concerned the free trade desired by the Trades and Labor Council and the Globe has prevailed; and in consequence thereof the labor that has been performed in the production of all the rails ever imported into Canada has been by foreigners in foreign lands. The importation of steel rails necessitates the export of gold, or its equivalent in farm product, in exchange; and the employment that the members of the Trades and Labor Council would, under a duty on rails, have found in making rails in Canada, must of necessity be diverted to the production of farm produce or other equally unremunerative labor. More than 2,000,000 tons of steel rails are now in use on Canadian roads; and Mr. Blaine's remarks indicate what would have been the benefit to this country had they been made at home.

Regarding the amount of consumption of iron in Canada, Mr. Merritt in his paper referred to the report on the geological survey for 1887-88, in which it is stated that during the years 1886-87 there were imported for consumption into Canada the equivalent of 345,000 tons of pig iron and 283,000 tons of steel. If to this were added the amount of pig iron consumed as such, it will be seen that, excluding all the iron and steel entering into such highly manufactured articles as cutlery, surgical instruments, etc., there was a total consumption equivalent in pig iron in 1886 and 1887 respectively, to about 415,000 tons and 356,000 tons. Of course the consumption now is greater than it was in the years alluded to. If made in Canada this quantity of pig iron would represent to the makers at actual prices a value of about \$5,000,000. It would necessitate a yearly supply from Canadian mines of 1,000,000 tons of ore, and before this ore could be made into pig iron, and further transformed into different merchantable articles of iron and steel, which are now imported, it would also require about 3,000,000 tons of coal. Taking this amount, say 400,000 tons, it would represent the product of probably 27 or 28 blast furnaces.

The lack of a comprehensive and efficient blast furnace industry is Canada's greatest deficiency.

#### A PROFOUND ECONOMIC MYSTERY.

OUR esteemed contemporary *The Week* has discovered a marvellous thing—a profound economic mystery in the statement made by the delegation of the Canadian Manufacturers' Association who recently asked the Ontario Government to grant a bonus of \$2 per ton upon all the pig iron produced in Ontario for the next ten years. This marvellous and profound economic mystery was found hidden in the following paragraph of the memorial presented to Sir Oliver Mowat:

"Ontario possesses vast stores of valuable ores; they are easily worked; some of them are now quite accessible, and others of them could be cheaply and easily marketed by the expenditure of certain sums of money in extending our railroad facilities; material for charcoal is abundant and contiguous to the most desirable locations for blast furnaces; unlimited supplies of limestone are in close proximity to such locations; there is a steady and reliable demand for all the charcoal pig iron that is likely to be produced for a number of years under the most advantageous circumstances. Existing railroad facilities are such that where it is desired to manufacture coke iron, the fuel can be laid down at furnace quite as cheaply as at many of the most successful furnaces in the United States, and cheaper in some instances.

*The Week* explains what it considers a marvellously profound economic mystery as follows:

For two or three elementary forms of iron the Province is paying annually from two to two-and-a-half millions of dollars, showing that there is no lack of a market for the products of a blast furnace. There is a tariff of four dollars a ton by way of protection to Canadian producers of the article, and this is supplemented by the Dominion Government with a cash gift from the people's purse of two dollars for every ton produced. And yet the Manufacturers' Association send a very influential deputation to assure the Ontario Government that capital is so conservative and timid that they cannot hope to see it invested in blast furnaces and steel plants in Canada save under the stimulus of an additional cash bonus of \$2 per ton from the Provincial chest, and an engagement that this handsome gratuity shall be given annually for a period of ten years. What will happen when the ten years have expired we are left to guess. We are mystified indeed. There must be something wrong. The conclusion does not seem to fit the premises. Can the deputation by some blunder have got hold of the wrong arguments? Why are English, American and Canadian capitalists, including the gentlemen of the Manufacturers' Association, so blind to one of the finest chances for investment that this or any other country can offer? Can nothing but spectacles with two gold dollars for lenses enable them to see the handsome margin of profit that must reward the investor for every ton of pig iron he can produce under circumstances so exceptionally favorable as those indicated by the above extracts from the Memorial of the Manufacturers' Association.

The delegation of the Canadian Manufacturers' Association as they were bound to do in explaining their reasons for asking the Ontario Government for this concession on behalf of a much to be desired pig iron industry, showed that notwithstanding the existing duty, and the bonus paid by the Dominion Government, no blast furnace had ever been erected in Ontario, and that in all probability none would ever be built unless some guarantee was given that the industry would not be interfered with to its detriment for a specific term of years. The argument presented to Mr. Mowat was very distinct and clear, and embodied the ideas of the situation as very generally entertained by all who have given intelligent attention to the question. It is to be regretted, then, that the intelligence of our contemporary is not sufficiently acute to comprehend what was said in very plain English. The delegation furnished the argument, but it was impossible for it to furnish *The Week* with sufficient intelligence to comprehend it.

The whole question depends upon the question as to whether an iron producing industry is to be desired in Ontario, and whether, to obtain it, it is worth the cost as indicated by the suggestion of the delegation who waited upon Sir Oliver. We have spoken of the "arguments" in the case, but really we should more properly have said "facts." We know for a fact that there is a duty on pig iron; we know for a fact that a Dominion bonus is paid upon the production of pig iron in Canada, and we know for a fact that no pig iron has ever been made in Ontario. We know for a fact, also, as *The Week* puts it, that for two or three elementary forms of iron Ontario is paying annually from two to two and a half million dollars, showing that there is no lack of a market for the products of blast furnaces. These facts constitute the chief arguments why something more should be done than has been or is being done if we are to have the industry. There is no blundering to getting hold of wrong arguments at all. Neither are English, American nor Canadian capitalists blind to such

a fine chance for investment. There is no doubt about the handsome margin of profit that would reward the investor; and there is no doubt but the investments would be made very promptly if capitalists could be assured that there would be no change in the economic conditions of the country within a reasonable time after the investment had been made. If we had a pig iron industry the millions of dollars that are now going out of Ontario every year for only two or three elementary forms of iron, would be retained at home, which means that hundreds and thousands of Canadians would find profitable employment in mining ore, in quarrying limestone, in cutting wood and burning charcoal, in additional service on railroads, in attendance on blast furnaces, and in more labor in rolling mills. If no iron was made no bonus would be paid; but if the iron was produced, would Ontario be the sufferer in the bestowment of the bonus for a few years, considering the remunerative employment that the industry would afford? This is the gist of the matter.

### PROTECTION—BONUS ON IRON.

A VERY general but very absurd argument urged against the policy of protection, is the plausible but unfounded assertion that this policy must inevitably impose upon the consumers in the protected country, the payment of an extra price upon the home-made goods equal to the amount of the customs duty levied upon the like merchandise if imported. Nearly every one of ordinary intelligence and experience knows that this does not often happen, and indeed very seldom. How often in the experience of Canada, during the last fourteen years, it has happened that the keen competition between Canadian manufacturers has reduced the prices of their products not only below the cost of production, but below the values at which similar goods could have been imported, even if admitted free of duty. When this has occurred, the ultra free trader, finding himself driven from his favorite argument of extra prices, has taken the very opposite ground that protection is vicious because it has attracted to manufacturing industries so much capital and skill, that the manufacturers have been compelled to sell their goods too cheaply. It is not, however, on such exceptional cases that the argument as to the excessive burden on consumers must be met, but on general experience, and this is amply sufficient to confute such a theory. Our own Trade and Navigation Returns furnish all the evidence required. The United States is the most ultra-protective country in the world, so that, according to the contention of free trade dogmatists, manufactured goods must be dearer there than in any free trade or less highly protected country. Is this the case?

Our Trade and Navigation Returns show that during the year ending June 30th, 1892, Canada imported manufactured goods from Great Britain, value \$36,421,631, and imported manufactured goods from the United States valued at \$22,526,402. Leaving out the finer classes of cotton, woollen and linen goods, and silks and fancy dry goods, in which Great Britain excels, and part of which, although imported from that country, are really the products of France, Germany, etc., Canada imports in all other kinds of manufactures a greater value from the United States than it does from Great Britain. In manufactures from iron, steel, and other metals, and in general

hardware; in leather, rubber and gutta percha goods; in books and stationery; in drugs, dyes and chemicals, and in miscellaneous and fancy goods, other than dry goods, the United States supplies Canada with the greater value. The general terms of credit are more liberal in England than in the United States, and the difference in the cost of transportation from the two countries is not very material. Is it not then perfectly clear, that so far as more than one-half of the manufactured goods required by Canada is concerned, they are produced and sold in the highly protected United States as cheaply as they are in free trade England? Nor can it be maintained in objection to this statement, that the goods which are imported from the United States were of those classes which do not require or obtain any protection there. A careful analysis of these imports show that fully one-half of the whole \$22,500,000 consists of manufactured goods on which the United States tariff imposes custom duties ranging from forty per cent upwards. It may be asked, such being the case, where is the necessity for protection? Answering frankly, none. So soon as any manufacturing industry attains to that degree of skill and prosperity that it can succeed without protection, the protection should be withdrawn, so that the manufacturers shall not have it in their power to use the tariff for the purpose of charging exorbitant profits. This is the line of action demanded by the results of the late elections in the United States. It is the same course which has been adopted in protective Germany. That country has for a long term of years fostered and encouraged the beet sugar industries, until this has become its largest and most important foreign trade. Gradually the bounties on exports have been reduced from time to time, as the necessity was being reduced, and at present the bounty granted is a mere nominal sum, and it has been decreed that from and after 1897 no more bounties shall be paid.

All that any established industries have a right to ask or expect is, that having a due regard to the difference between the cost of material and labor in their own country, as compared with competing countries, they should be allowed protection for such industries as can be judiciously undertaken, to the extent necessary to enable them to meet foreign competition on equal terms.

With reference to the present agitation in favor of the granting of a moderate bounty by the Government and Legislature of Ontario, for the purpose of developing the manufacture of iron and steel from Ontario ore, the objection generally urged is, that the present protection afforded by the Dominion tariff on manufactured iron, together with the bounty offered on pig iron, offer as liberal advantages for this purpose as the country can afford to grant. Notwithstanding this, the iron industry makes little or no progress, therefore it may be inferred that there is no scope for its development. What is the cause of this failure? Granted, that the advantages offered by the Dominion Government are sufficient for the purpose, where is there any ground for reliance upon their continuance? It is not so much the insufficiency of the inducements as the uncertainty of their duration that deters capital from embarking in this enterprise. What with the agitation for unrestricted reciprocity for tariff reform; for free trade with England; for free trade with the world; or for preferential trade with England, and the vigorous attempts to array the agricultural class against the manufacturing class, the commercial policy of the country is involved in such a cloud of doubt and uncertainty



that capitalists who might see their way clearly to the successful prosecution of the iron industry under the present Dominion policy, dare not venture upon the undertaking in face of the possibility, that even before their works could be brought into operation, there might be a complete reversal of that policy, by which their entire capital would be sunk in useless buildings and machinery which could not be profitably employed under the three conditions. The granting of the small bonus or other assistance now asked for from the Ontario Government would not only prove an additional pecuniary inducement to investors in the iron industry, but the provincial recognition of the beneficial influence of this enterprise would prove a wonderful power in creating confidence in the future favorable treatment which might reasonably be expected from both political parties, during the early years of the development of this great national and provincial industry.

### SEWER PIPE.

NEARLY two months ago the London Advertiser published an editorial in which it was stated that the duty upon 12-inch sewer pipe that cost 16.6 cents per foot was 23.56 cents. This was so palpably wrong and absurd that letters were written to that journal pointing out the error, and requesting in fairness to all concerned that the real facts be given; but up to the time of this writing no such correction has been made. But the Advertiser has attempted to justify itself to its readers by the publication of another article which makes other false statements. It says:

We have taken the trouble to make some inquiry into the sewer pipe question, and have discovered that in regard to this commodity, as well as many others, the customs department at Ottawa have a means of discriminating against importers, and arbitrarily adding to the tax by declining to assess the duty at invoice prices. We have before us, for example, the latest price list of a leading manufacturer of sewer pipes in the United States. It shows that if the duty on 12-inch United States sewer pipe were only 35 per cent. on cost, as our correspondents contend, it would be 4 37-100 cents per foot. But in order to increase the tax, and thus discourage the trade, and compel Canadians to pay the price demanded by the two manufacturers of the product in Canada, the customs department at Ottawa decree an arbitrary valuation on the import, making the actual duty, at the present date, something like 10 41-100 cents per foot. In other words, the trade allows 85 per cent. off list prices and a cash discount of 2 per cent., whilst the rule of the customs authorities is only to allow 65 per cent.

The facts are simply these: The manufacturers of sewer pipe in the United States have a uniform price list for their goods, from which American buyers are allowed a discount of 65 per cent. The American price list for 12-inch sewer pipe is 85 cents per foot, and a deduction of 65 per cent. from this would make the net cost in that country 29.75 cents. This, then, establishes the cost at factory of American pipe. But the rule of the combine there by which pipe cannot be sold at less price than 65 per cent. off list does not apply to foreign shipments, and for the sake of working off and disposing of surplus stock, Canadian buyers are allowed a discount of 85 per cent., which reduces the cost of 12-inch pipe to 12.75 cents per foot. In other words Yankee sewer pipe manufacturers will sell their goods to Canadian buyers for much less than they will sell them for to American buyers. Here, then, was a wide open

door for defrauding the Canadian Customs. The ad valorem duty of 35 per cent. imposed by the tariff upon foreign sewer pipe, is based upon the value in open market in the country of production of the article in question, and not upon any fraudulent or fictitious value. It was discovered that sewer pipe, the market value of which in the American market was 29.75 cents per foot for 12-inch, was valued at only 12.75 cents per foot for export to Canada; and the Customs ruling was made that the value for duty should be, not the slaughter price for export, but the same as charged in the trade to the American buyer. The 35 per cent. duty upon 12 inch pipe, valued at 65 per cent. off list would be 10.41 cents, and this is what the Customs should exact; but the fraud upon the Customs consisted in entering the goods valued at 85 per cent. off list, or 12.75 cents per foot, paying only 4.46 cents duty.

The Advertiser tells us that it has taken the trouble to make inquiry into this question. It did this after it had been remonstrated with for asserting that, on 12-inch pipe that cost 16.6 cents per foot the duty collected was 23.56 cents—nearly 150 per cent. Its enquiry showed that it had made a wild and exceedingly foolish assertion, but it did not have the honesty to correct its error. We also have made inquiry into the matter, and in our issue of April 7 gave a tabulated statement, the facts contained in which cannot be successfully contradicted. We showed that, taking the American list as the standard, which shows the price of 12-inch pipe to be 85 cents per foot, the price at 65 per cent off would be 29.75 cents; at 85 off, 12.75 cents; 35 per cent. duty on 65 off list to be 10.41 cents; freight, United States to Toronto, 7.20 cents; 85 per cent. discount plus duty, plus freight, 30.36 cents; and 65 per cent. discount plus duty, plus freight, 36.95 per foot. This shows that even where the Canadian buyer obtained pipe at 85 off, it costs 30.36 cents to lay it down in Toronto; and we also showed that last year the tender of Canadian manufacturers of similar goods laid down alongside of ditch where desired, in London, was 21 cents for 12-inch pipe. This price, we desire the Advertiser to observe, was 8.75 cents less per foot than similar American pipe could be supplied for in any American city.

The Advertiser is instant in season and out of season demanding that the Government abandon the levying of specific duties. It wants ad valorem duties in all instances. A great objection to ad valorem duties is that it would open the door to fraudulent valuation; and this sewer pipe matter is a case in point. A specific duty of 10.41 cents per foot on 12-inch pipe would be the equivalent of 35 per cent. ad valorem. In the collection of duty, if specific, the 10.41 cents would have to be paid; but the Advertiser's method of ad valorem would make it possible for only 4.46 cents to be collected.

Another very weak spot in the ad valorem system is this: The Advertiser wants the value of sewer pipe for Customs purposes to be placed, not at what the article is really worth to purchasers in country of production, for consumption there, but what it may be invoiced at for export to Canada. We have shown that the American consumer must pay \$35 for what the Canadian purchaser invoices at only \$15. But if this difference may be observed; if the \$15 being a fictitious and fraudulent valuation for Customs purposes, must be accepted at the intrinsic value of the article, why not make the value \$5, or even five cents? In fact how is the value for Customs purposes to be arrived at? The now celebrated watch

case episode in Montreal illustrates this contention. In that case it was shown that the list price of the article to the American trade was very much higher than the price at which the goods were invoiced at for export to Canada, and by a technicality the Customs lost a large revenue that should have been collected.

### CUSTOMS RULINGS.

FOLLOWING is a list of Customs rulings effecting the tariff, promulgated since the beginning of the current year :

O. C., Dec. 19, 1892. Fibre obtained from ramie or China grass, and yarns woven entirely of such fibre, to be admitted free of duty until end of next session of Parliament.

Hatters' bands, bindings, tips, sides and linings, when imported in the piece by manufacturers of hats and caps, free; quantities imported not to be in excess of legitimate needs.

Cards and portfolios, and pasteboard boxes for commercial samples, free. The same rule applies to sample pasteboard boxes having no commercial value, and to which commercial samples are attached.

Woven carpets, so called, of which the warp is composed entirely of cotton, and which are either two ply or three ply ingrain carpets, are dutiable under item 225 of the tariff, at the rate of 5 cents per square yard and 20 per cent. ad valorem. This ruling is made in consequence of misleading descriptions in invoices having been made where these carpets had been admitted to entry at 25 per cent. ad valorem under item 223 as being "Carpets n.o.p.," or under item 229 as being "Jute Carpets."

O. C., Feb. 6, 1893. Platinum and the black oxide of copper to be admitted duty free: the black oxide of copper as long as the article is not manufactured in Canada.

Photograph mounts, bevelled, embossed, printed or plain, are dutiable as under item 303 of the tariff, at six cents per pound and 20 per cent. ad valorem.

Coal oil and tobacco are added to the list of articles as being "ship's stores" which may be entered free of duty ex warehouse.

By resolution of the House of Commons taking effect on March 1, 1893, item 192 of the tariff was repealed, and in lieu thereof the following rates of duty were enacted:—Twine for harvest binders, of hemp, jute, manilla, or sisal, and of manilla and sisal mixed, 12½ per cent. ad valorem. Rove when imported for the manufacture of twine for harvest binders, 10 per cent. ad valorem.

Item 983 of the tariff was repealed by same resolution as above and the following substituted in lieu thereof:—Mining machinery imported prior to May 16, 1896, which is at the time of its importation of a class or kind not manufactured in Canada, free.

O. C. March 13, 1893. Metallic copper, the exclusive product of Canadian ores shipped out of Canada by the producers thereof, for the purpose of being smelted, such product being returned to Canada direct to the producers of the ore from which smelted, may, until July, 1, 1894, be admitted on payment of duty on the cost and charges to the producer, or for the smelting thereof.

Cash registers, by whatever name known, to be dutiable at 35 per cent. ad valorem, as the same should be properly classed

either under item 406 of the tariff, as "portable machines," or under item 488 as "furniture."

Watch glasses and watch crowns are properly dutiable under the terms of item 521 of the tariff at 25 per cent. ad valorem, it being held that the same should be read in conjunction with Section 61 of the Customs Act, the glasses and crowns in question being parts of watches.

Paving blocks of stone, not further advanced than chipped or rough hammered, are dutiable under item 547 of the tariff at 20 per cent. ad valorem.

The medicinal preparations known as phenacetine and sulphonal, which are enumerated in the British Pharmacopœia, cannot be rated for duty as proprietary medicines, under item 134 of the tariff, at 25 per cent. ad valorem, as formerly, but must be accepted for entry under item 547 at 20 per cent ad valorem.

Paper or cardboard boxes, imported for use by jewelers or confectioners, are properly rated as follows:—If manufactured entirely of paper or cardboard they are dutiable under item 320 of the tariff, at 35 per cent. ad valorem; and if manufactured of cardboard, and lined with either plush, silk, satin, or satinette, they are rateable under item 518 at the same rate. This ruling to apply to similar boxes when imported for use in other lines of business than these here mentioned.

Cuttlefish bone is free of duty under item 720 of the tariff.

Complaint having been made to the Customs Department that in some instances playing cards imported in sheets have been entered at Customs under item 303 of the tariff as illustrated cardboard, Customs officers are advised that playing cards so imported in sheets, to be cut in Canada, are dutiable under item 309 at the rate of six cents per pack.

### EDITORIAL NOTES.

WHEN Mr. Foster is remodelling the tariff let him increase the duty on scrap iron to not less than \$10 per ton, and that will give us a puddled iron industry; and let him put a duty of \$10 per ton on steel rails, and give a bonus of \$5 per ton upon the home production of the article, and that will give us a steel rail industry and a pig iron industry also.

DURING the years 1890-91 Canada imported 332,657 tons of steel rails, valued at \$7,140,000, an average of \$2,380,000 per year. This vast amount of money was taken from the pockets of the people to pay for material and labor in a country thousands of miles away from us, and these imports were admitted duty free. They did not pay a dollar into the treasury. If at Confederation, or even at the inauguration of the National Policy, a duty of \$10 per ton had been laid upon steel rails, and at the same time a bonus of \$5 per ton had been offered upon their production in Canada, the \$50,000,000 that has been sent out of the country to pay for rails now in use in our railway system would have been kept at home, and the country would have been that much better off. If this had been done our population would have been quite a million greater than it now is.

ACCORDING to the ethics of protection, the National Policy was intended to apply to manufacturing industries where there was a probability that within a reasonable time those indus-

tries would become developed to an extent where the demands of the home market would be supplied by them, and at reasonably low prices. If experience showed that the prevailing duty was not sufficient to effect this, but that it might be accomplished under a higher duty, then the higher duty should be imposed. But if it is found that the duty is sufficiently high, and that the development from any cause is not probable or possible, then the duty is clearly not for protection, but for revenue only. If this is the case—if it is a fact that a high duty will not develop the industries, and that it is not desirable to obtain revenue in that particular manner, then it is clear that the duty should be modified or removed to meet the emergency. It might be unfortunate for the investors, but better for the whole country.

A FINE model of Windsor Castle, built to scale from architectural drawings, will be exhibited at the World's Fair. It is believed to be the largest in existence and the only one architecturally correct. The model covers an area of 45 x 18 feet, and stands 16 feet high. It is built upon a stand, the inside of which is a work of art in saloon decoration.

PAPER stockings are said to be a new German invention. A Berlin shoe trade journal says that the stockings are made of a specially prepared impregnated paper stock, which, it is claimed, has an extraordinary effect on perspiring feet. The moisture is absorbed by the paper as rapidly as it is formed, and the feet remain dry and warm, while the constant temperature maintained in the shoes is said to be a great preventive of colds.

ELECTRICITY in a street car in Fall River, Mass., a few days ago, caused a drummer to lose about \$300. He had a travelling bag filled with fine watches and jewelry, and when he sat down he laid the bag on the floor. The head of an iron bolt protruded through the floor, and unfortunately for him his bag rested on this bolt. The magnetism from the works beneath the flooring was communicated through the bolt to the watches, and every one of the main and hair springs was ruined.

THE World's Fair was opened on Monday of this week. When President Cleveland touched the gold telegraph key the contact started the immense Allis engine and the big Worthington pumping plant. A loud gong, connected in the same circuit, announced that the hundreds of smaller engines and machines should be put in motion. The fountains spouted, the crowd cheered and applauded, and the din of humming machinery announced that the great Exposition was under way.

We are in receipt of the following notice which explains itself:—Having now removed to our extensive premises in the O'goodly Building, 31 and 33 Melinda Street, we have the pleasure of announcing that Mr. James Murray, late of the firm of James Murray & Co., Front St., will undertake the management, and anything entrusted to our care will have prompt attention. Our facilities for all classes of printing are unsurpassed, our plant being new and of the latest and

best description. Publishers and authors liberally dealt with. Estimates furnished when desired.—Murray Printing Co.

CANADIAN manufacturers desire cheap fuel oil: Shall they have it? Give it to them. During last year the Cleveland Rolling Mill Company, Cleveland, Ohio, paid more than half as much for fuel as for all the labor, of all descriptions, represented on its pay rolls. Its consumption of coal and coke in 1892 was 441,261 tons, and of fuel oil, 10,535,395 gallons, the total cost for fuel being \$1,180,000. The total pay rolls in the same time were \$2,235,992.

THERE are in use in the United States not less than 550,000,000 railroad cross ties. The average life of a cross tie is put at five years on main lines. This would require for annual renewals alone, not counting new extensions, 111,000,000 new ties. The life of cross ties used on side tracks is much greater, but the average cannot exceed six or seven years, and at the lowest estimate 80,000,000 to 90,000,000 new ties will be required annually. This will require about 2,500,000,000 feet board measure, of the best timber.

WHATEVER may be the effect of protection upon the owners of large farms there can be no question but that it brings very tangible benefits to the actual tillers of the soil. This is conclusively proven by a report recently published by the British Commission on Labor, which states that the annual remuneration for farm labor in the United States is \$282, compared with \$150 in Great Britain, \$125 in France, \$107 in Holland, \$90 in Germany, \$60 in Russia, \$50 in Italy, and \$30 in India. No deduction for lower cost of living, etc., can alter the force of these comparisons.

A LETTER from United States Consul Fowler at Ningpo, urges upon the state department the advisability of calling the attention of the manufacturers of steam, oil and electric launches to a trade that is open to them in that part of China. "This vast district," says Mr. Fowler, "is intersected by thousands of miles of canals and rivers, and although it covers a territory of 39,500 square miles and has a population of 25,000,000 people, there is not a single launch or boat of any kind propelled by steam, oil or electricity, excepting a few launches that ply from Shanghai to Hangchow, the capital, 150 miles northeast of this port. The canals are the only roads in this part of China, and travel is of course, by boat. The traffic carried on by boats, which are propelled by "ya lows" (large cars) is very large. I have been discussing the benefits of small launches with the Taotai for the past two years, and now he has requested me to find out all I can for him. If he should adopt a launch for his own use, I am quite confident that it will not be long before many orders will be placed with our manufacturers."

AFTER several years of contention and interference before the Patent Office, two broad fundamental patents have been granted to Charles J. Van Deputee, covering all the essential features of the trolley. The patent is assigned to the Thompson-Houston Electric Company. In detail, the claims allowed cover, first, the underneath contact, made either by a rolling

wheel or a sliding spoon contact piece; secondly, the converse of these two cases; and thirdly, the reversibility of the trolley pole on top of the car, enabling the contact to be made on either side of the trolley, as the case may be. The possession of this patent practically means the entire control of the overhead system throughout the United States. This so far is the only system which has proved successful, no serious rivalry having yet been shown by either the storage battery or the underground conduit. The patent has been and continues to be infringed by several companies. The acknowledgement of the claims under this patent granted to the dead inventor, made by the Patent Office, is an important victory for the General Electric Company, which will most likely be followed by very important results to the entire street railway fraternity.

One of the results of Populist rule in Kansas is the withdrawal from business of the Knight Investment Company, who claim that under the laws recently passed relating to mortgages, the borrowing power of the state has been ruined, and that material injury to the future of the state is sure to follow these financial measures. As is generally known, foreclosure proceedings in that state are often prolonged, so that a period of two years is necessary to complete the foreclosure of a mortgage. The new law gives a further period of 18 months for redemption by the mortgagor, with the privilege to him of living on the foreclosed estate during that time, thus causing to the person holding a Kansas mortgage a possible delay of three and a half years before possession can be obtained, in case the mortgage is not paid at maturity. It is needless to say that under such conditions Kansas mortgages would be discriminated against decidedly by the eastern investor. The legislature, also, has passed a law prohibiting the making of contracts payable in gold. The course pursued by the Populists and the laws passed by the last legislature, if maintained, will completely strangle the borrowing power of Kansas and impair the state's progress materially.

REFERRING to the question of amending the Canadian customs law so as to enable vessels bought outside the dominion to be registered in Canada duty free, which will doubtless be brought to the attention of parliament next session, when the government's tariff reform measure comes down, the CANADIAN MANUFACTURER says: "If any such law is passed it would mean the closing down of Canadian ship yards, and the transference of the Canadian ship building industry to American lake ports. Cleveland, Buffalo, Detroit and Bay City, would at once enlarge their ship building facilities so as to supply the Canadian demand." Unfortunately for the Dominion, she has practically no ship building industry to destroy. Canada's merchant marine has varied barely 100 tons each year in the past ten years. The few steel boats that have of late years replaced lost tonnage have either been built in England, or in the United States, and from this country registered in Newfoundland to avoid the duty. American lake builders would not object to building vessels for Canadian owners, but the question of free ships in Canada will not be of much importance to them unless a change in the tariff policy of the dominion brings about a revival in shipping.—Cleveland, O. Marine Review.

STATISTICS of production of open-hearth steel in the United States and Great Britain for 1892 are thus given in a recent issue of the Bulletin of the American Iron and Steel Association: Open-hearth steel ingots produced in the United States for the period named, 669,889 gross tons, against 579,753 tons in 1891, and 513,232 tons in 1890. The production of 1892 heads the list of any previous year. These statistics include steel made in the open hearth by the basic process. Direct castings are included as ingots. The American production of Bessemer steel ingots in 1892 was 4,168,435 gross tons, or more than six times as great as that of open-hearth steel in the same period. The open-hearth steel made in 1892 was produced by sixty-three works, located in twelve States—New Hampshire, Massachusetts, New York, New Jersey, Pennsylvania, Alabama, Ohio, Indiana, Illinois, Michigan, Missouri and California. The number of complete works at the close of 1892 was eighty, being nine times more than at the close of 1891. British production in 1892 was 1,418,830 gross tons against 1,514,538 tons in 1891, and, 564,200 tons in 1890. The slate of Bessemer steel for 1892 shows a total of 1,500,810 gross tons, against 1,642,000 tons in 1891, and 2,014,843 tons in 1890. The production of Bessemer steel in the same country in 1892 was less than that of open-hearth steel in either of the years 1890 or 1891. The open-hearth steel industry in the United States is making steady advances.

It is reported that a reduction of wages is proposed by some of the large manufacturers of iron and steel in this State, the reduction to be made during the coming summer. This movement will not be undertaken in mere wantonness, but from necessity. While prices of all kinds of articles have been falling steadily, for years past, wages have not declined. The results of price depression upon the iron trade are plainly apparent in the many and serious failures that have occurred; but, so long as the mills could be continued in operation, the laborers have received their wages without diminution. Reduction now will of course involve some hardship, but by no means so much as if prices had risen rather than fallen. The decline of prices, with stationary wages, has indeed been an equivalent to an increase of wages. At any rate, it is clear enough that with some manufacturers, under the existing condition of the market, the choice may lie between continuing with lower wages and suspending operations wholly. Furthermore, wages are likely to go further down, before they begin again to advance. The duties upon iron and steel will surely be reduced or removed in the next Session of Congress, and then even fairly prosperous American manufacturers will be forced to put their labor upon the level provided by the changed rates. It is worthy of remark that the first attempt at wage-reduction is now to be made in the industry which was deprived of a part of its tariff protection by the McKinley act. The workmen in this industry are about to have a very instructive object lesson in the relation of the tariff to their earnings.—Philadelphia Manufacturer.

ADVERTISE

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THE CANADIAN MANUFACTURER

The following figures from a London paper called "Society" will be interesting, as affording some idea of the acreage, rentals and incomes of the great landlords in the United Kingdom:

Peers	Acreage	Rental	Other Sources	Total Income
Westminster.....	19,749	£20,000	£730,000	£750,000
Bedford.....	87,494	183,000	427,000	610,000
Bute.....	110,008	287,000	319,000	606,000
Norfolk.....	49,866	301,000	220,000	521,000
Cleveland.....	101,194	134,000	445,000	579,000
Hamilton.....	179,650	188,000	387,000	575,000
Devonshire.....	108,572	247,000	302,000	549,000
Portland.....	181,199	180,000	319,000	500,000
Doncaster.....	46,103	241,000	72,000	313,000
Dudley.....	25,551	187,000	308,000	495,000
Durham.....	30,171	110,000	352,000	462,000
Fitzwilliam.....	115,743	100,000	294,000	394,000
Derby.....	(53,800)	194,000	240,000	434,000
Yarborough.....	50,823	100,000	240,000	340,000
Sutherland.....	1,358,545	107,000	108,000	215,000

Of course, a great deal of this vast territory is unprofitable moor and wasteland; much of it is yearly decreasing in value; and much more, though possessing good soil and with excellent buildings, would be abandoned by the tenant entirely without the help afforded so constantly by the landlord in the hard times which have struck the British farmer and owner alike.—The "Empire."

This is just too funny for anything. Talk about land yearly decreasing in value, and that it would be evacuated by the tenants unless assistance were rendered them by these landlords. The list shows that fifteen "Peers" own 3,079,545 acres of land, and that their income from it, and from investments of the rentals, amounts to nearly \$40,000,000 per year. Think of the fact that these men who have never earned a dollar in their lives by manual labor, or by useful mental labor, but whose income is derived from the rental of the lands of which

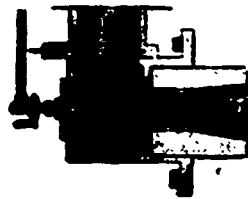
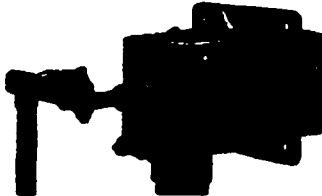
they claim possession, having incomes averaging some \$2,640,000 each. And think of their "generosity" in doling out handfuls of charity to starving tenants, the sweat of whose brows affords these enormous incomes. What a farcical idea to suppose that all men are created free and equal. If God made them thus his Divine will has been fearfully thwarted.

A few days ago a deputation of farmers and fruit growers waited upon the Ontario Government to request that farmers, fruit growers, and husbandmen should be excluded from the list of employers who were liable for damages in cases of accident under the Workman's Compensation Act. It was explained that the request was made in accordance with a resolution passed by the Central Farmers' Institute. Mr. Jones, the president of that institute, said that the farmers had begun to realize that under the operation of the act they were in a very awkward position—that they were afraid that owing to the law becoming better known, cases of so-called accidents were becoming more numerous among farm laborers. Mr. Foran, of the Winona Grape Growers' Association, desired the exemption because he had already been mulcted for \$500 because of a slight accident to a workman; and he enumerated cases where similar costs had been laid growing out of what was either the grossest carelessness or intentionally inflicted injury. Mr. Carpenter, of the Wentworth Fruit Growers' Association wanted the exemption because the labor he was forced to employ was "the scum of creation." Of course these gentlemen and the people they represented, are all honorable and liberal minded men, opposed to class legislation, and would not ask anything for themselves that they would

## Hydro-Carbon Burner

For Burning Crude Petroleum Under Low Pressure

(Meyer's Patent.) Adapted for all kinds of Iron and Steel Forging, Tempering and Welling, Annealing, etc., for Burning Sewer Pipe, Heating Asphalt, Oxidizing Lead, Generating Steam, and an endless variety of special work.

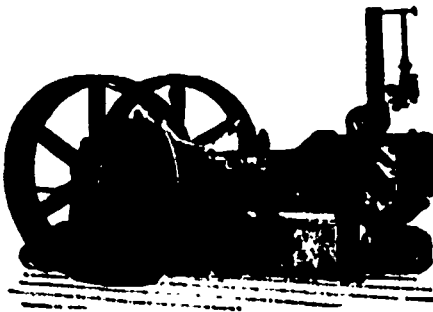


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not quite willingly accord to others. Therefore we think the delegation made a mistake in only asking that farmers and fruit growers be exempt from the operation of the law. If the law is good in its operation in any industry it certainly must be good in all industries including farming and fruit growing. If it is not wise to enforce it in their industries, it should be made inoperative in all industries. These dear good and generous gentlemen, however, are quite willing if one of that class whom Mr. Carpenter calls "the scum of creation," to wit, a laboring man, in a brick yard for instance, which is neither a farm, a vineyard or an orchard, should by some accident receive personal injury, that the owner of that brick yard should be mulcted in heavy damages; but if the injury should be done while in their employ, they must be held blameless. This is very thin indeed, very thin. It is to be noticed that whenever a workman receives an injury in a workshop or factory, and the quantum of damages must be assessed by a jury, where farmers, fruit growers and husbandmen are the jurors, the plaintiff is quite sure of obtaining a verdict in his favor, often regardless of the facts which show that he is not really entitled to it. Whether the law will be amended as prayed for or not, it is to be hoped that it may be so changed as to allow defendants in actions for damages brought under this Act to have their cases decided by a judge, and not allowed to go before a jury.

COLUMBIAN BOILER TUBE SCALE CUTTER.

The accompanying illustration is of the "Columbian" boiler tube scale cutter, a patented invention now being manufactured by Messrs. Dobson & Sutton, Hamilton, Ont. This most useful article is quite different in its character from others used for like purpose, the distinguishing feature of it being a spiral knife edge flexible steel cutter. In other flue cleaners the diameter of it cannot possibly be even the fraction of an inch greater than the least diameter of the flue: for if it was it could not be made to pass through. In such cleaners it is impossible to remove all the scale from the flue, and in this most important respect it fails in accomplishing the desired result. In the "Columbian" cleaner, the cutter being flexible it adjusts itself to any and all irregularities of the flue, and, being forced in with a spiral motion, no portion of the tube is left untouched, and the metal made clean of all scale. This instrument is made in different sizes to suit all usual diameters of flues. It is attached by screwing into the end of a proper rod, or handle, and being quite light, it is easily worked. When not in use it may be unscrewed from the handle. If the spiral knife blade cutter becomes damaged or worn it can be replaced at very small expense. A large number of these cleaners are in use in Toronto, and those who have used them recommend them very highly. For further particulars apply as above.



\*The Dominion Illustrated Monthly for April, just received, is exceedingly interesting and fully up to any of the preceding numbers. Its illustrated articles are: frontispiece, "An Egyptian Lady;" "Altea Rubra," by H. R. Y. Reid; "The First Legislators of

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Upper Canada," by S. A. Curzon; "The Gwydyr Girl," by May Austin; "Cricket in Canada," by G. G. S. Lindsey; "Resuscitation of the Apparently Drowned," by F. H. Killick. The Sabiston Litho. & Pub. Company, Montreal and Toronto, Publishers. Yearly subscription \$1.50.

A NOTABLE feature of *Outing* for May is the first of a series of articles upon the giants of the American equine world, under the title of "Queens of the Trotting Track." From the days of famed Lady Suffolk down to the reign of peerless Nancy Hanks, all record breaking performances and other valuable bits of horse-lore are cleverly woven into a clear and instructive article. Beautiful full page illustrations from specially painted portraits, alone worth double the price of the magazine, embellish the article, which will be followed by complete histories of the "Kings of the Track" and "Famous Pacers," by the same author, in succeeding issues of *Outing*, and combined will form a most interesting history of the development of that purely American production, the ideal light harness horse.

*Godey's Lady's Book* is one of the oldest living magazines in the world—certainly the oldest in the American continent—having been started in 1830. In the olden time the pages of this delightful magazine were brightened and beautified with a great variety of ideal faces and figures and bright-colored plates. This feature has not been abandoned in the present issues, but rather improved and modernized, and we are now presented with truthful likenesses of many of the most prominent and best known women who are now living upon the earth, and the influence of whose character is being felt in the good work they are accomplishing in making the world better because of their having lived in it. The presentation of these portraits of contemporaneous women is a feature of great value in *Godey's*, which all lovers of the good, the true, the pure and the beautiful will appreciate.

Good housekeeping for May has standard papers from such writers of national reputation as Miss Parloa, H. Annette Poole, Architect E. C. Gardner, M. J. Plumstead, Hester M. Poole, Helena Rowe, Mrs. Oliver Bell Bunce, Ruth Hall and others; with verse to match, an abundance of minor articles, choice selections, wholesome diversions for the curious and the little folk. The course of this prosperous publication shows that it is entirely possible to merit and win success by adhering to the good old-fashioned way of giving sound, sensible value for the money, without restoring to

catch-penny devices. Each number has a fine piece of music, new, well worth the subscription price of \$2 a year. Clark W. Bryan Company, Springfield, Mass.

OUTING for May is as pure and refreshing as the shades and breezes of the woods and waters it loves so well. As usual, the number is finely illustrated. The contents are as follows: "How the Major Learned to Fish," by Jno. E. Gunckel; "A Jack Rabbit Chase," by Belle Hunt; "Red-Drum Fishing at Oregon Inlet," by Lieut. F. H. Newcomb; "Queens of the Trotting Track," "The Toltec Idol," by T. Philip Terry; "The Letter of Credit," by Chas. C. Nott, Jr.; "How to Catch the Wily Trout," by H. Prescott Beech; "Round About the Zuyder Zee," by Mrs. G. C. Davis; "Lenz's World Tour Awheel," "Through Erin Awheel," (continued), by Grace E. Denison; "A Chamois Hunt," by A. Ranger; "The Modern Single-handed Cruiser," by C. B. Vaux; "An Ideal Vacation Tour," by Chas. E. Hammett; "Starting and Starters," by Jno. Corbin; "The South Dakota National Guard," by Capt. P. Leary, Jr.; and the usual editorials, poems, records, etc.

THE *May Wide Awake* has an entertaining description of life on a light-house island in the China Sea, by Rousevelleville Wildman. Grace Dean McLeod has a characteristic Nova Scotia story—"Petit Pere Felix," a tale of the invasion of Acadie; Joseph Hatton tells of "The Prince's Dilemma," an exciting incident connected with the coin room of the British Museum; Crawford Capen writes of "Stamps and Stamp Collecting;" Annie Sawyer Downs tells how the "Young Folks at the Eddy" dealt with the servant-girl problem; Penelope Palmer writes of the poor Welsh boy in the Pennsylvania mines who made marvelous "Underground Music;" Hugh S. Hart, of the Xavier Club, of New York, contributes to *Wide Awake Athletics* a paper—"Golf: the Coming Game;" Adeline Fordham furnishes a timely suggestion for girls in her "Constancy Club," and the poetry of the number is from Celia Thaxter, Marion Ames Taggart, Sallie Margaret O'Malley, and Price Collier. Price 20 cents a number, \$2.40 a year. D. Lothrop Company, Publishers, Boston.

THE exhibition number of Scribner's Magazine is the contribution which the conductors of that periodical make to the great exposition at Chicago. They have planned to make it as fine an example of an American magazine as can be produced. It is put forth as a representative number to show the literary, artistic and mechanical

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resources that are employed in such a publication, and is fully representative of the individual writers who have made the existence of a great magazine possible. This issue contains nearly one-third more matter than the regular numbers of Scribner's, and the illustrations are of extraordinary abundance and richness, including twenty-five full pages, two of them in colors, the frontispiece being a reproduction of a pastel by Robert Blum. Fourteen of the full pages have no relation to the text, but are reproductions of pictures made specially by the artists for this number as most representative of their work. These are printed with great care, with no type backing them. The greatest care has been taken in the mechanical reproduction of the number, which has a specially designed cover by Stanford White, who made the original cover of the magazine. It is interesting to note that the original drawings, manuscripts, proofs, etc., of this exhibition number are to be displayed at the Chicago exposition.

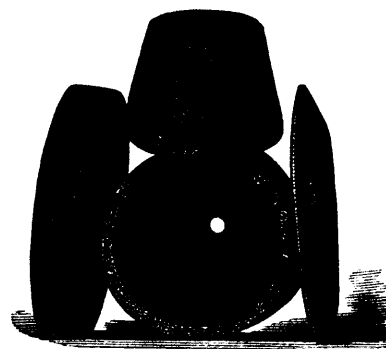
The large number of pictures in the *May Popular Science Monthly* is the first feature to arrest attention. The number opens with a charming account of "Japanese Home Life," by Dr. W. Delano Eastlake, which has many characteristic illustrations. There is also a description of "The Oswego State Normal School," by Prof. William M. Aber, with views of class-rooms and laboratories, and portraits of instructors. Prof. Byron D. Halsted contributes an illustrated article on the practical subject "Decay in the Apple Barrel," and Prof. G. F. Wright defends his recently attacked book in an article under the title "Evidences of Glacial Man in Ohio," also with many illustrations. The able argument by Herbert Spencer on "The Inadequacy of Natural Selection" is continued in this number. Mr. G. W. Littlehales, of the United States Hydrographic Office, describes the "Growth of our Knowledge of the Deep Sea." Prof. Wesley Mills advocates the "Cultivation of Humane Ideas and Feelings." P. E. M. Berthelot recounts "The Discovery of Alcohol and Distillation." "How Science is Helping the Farmer" is told by Prof. C. S. Plumb. Other articles are "Dietary for the Sick," by Sir Dyce Duckworth; a "Tribute to the French Academy to American Geological Exploration;" and a Sketch with Portrait of Prof. Samuel William Johnson. New York: D. Appleton & Company. Fifty cents a number, \$5 a year.

THOMAS CARLYLE's youngest sister is a resident of this Western continent. This interesting fact *The Ladies Home Journal* has discovered, and the home-life and personality of "the last of the Car-

yles" are most interestingly pictured and described in its May issue. Mr. Howell's picture of girl life, "The Coast of Bohemia," grows in interest, and Will N. Harben gives the opening chapters of a short serial story, "Before Two Altars." The World's Columbian celebration is remembered in a stately poem by Edna Dean Proctor, entitled "The New World's Queen." That problem of polite society, "The Married Woman's Signature," is made the subject of an interesting discussion by Julia Ward Howe, Frances Hodgson Burnett, Mrs. Burton Harrison and other famous women in a symposium "Under Which Name?" Edward W. Bok makes a strong plea for men to give their wives more recreation and take them out of their home-life, while Elizabeth Robinson Scovil contributes a paper on "The Art of Letter-Writing." Mathilde Wurm tells how she learned the piano "With Schumann's Wife as my Teacher." An excellent article on the duties of the housekeeper, "If the Cholera Should Come," is contributed by Helen Jay, and an equally practical one by Maria Parloa on "Closing a House for Summer." Miss Scovil contributes an article on "Life in the Invalid's Room," and Mrs. Mallon "Some Commemoration Costumes." Palmer Cox gives a page of his inimitable "Brownies" as they disport in Paris, and Mrs. Lyman Abbott is as usual helpful in "Just Among Ourselves." Altogether this May number is so full of good things that no woman can afford to be without it. Published by The Curtis Publishing Company, Philadelphia, for Ten Cents per number, and One Dollar per year.

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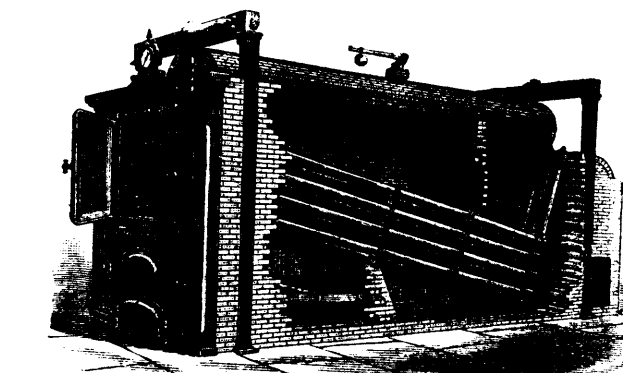


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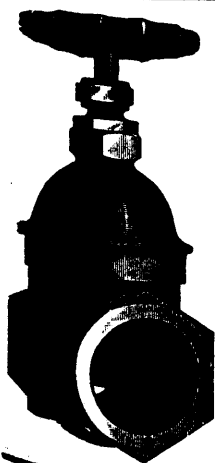
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# Inventions.

## CANADIAN PATENTS.

The following patents have been issued from the Canadian Patent Offices from April 4 to April 11, 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.

- 42,452 Wrench, W. E. Ayres, April 4th.  
 42,453 Flanged rail, J. Crockett, and J. Furnival, April 4th.  
 42,454 Making cigar fillers, B. Baron, April 4th.  
 42,455 Anti-friction bearing, L. K. Jewett, April 4th.  
 42,458 Weighing machine, C. H. Phillips, April 5th.  
 42,459 Food warmer, C. A. Penniston, April 5th.  
 42,460 Window lock and catch, F. G. Woodruff and R. G. Sharp, April 5th.  
 42,461 Connecting nipples for heating radiators, E. S. Manny and C. F. Lalonde, April 5th.  
 42,462 Chromatic pitch pipe, C. H. Congdon, April 5th.  
 42,463 Safety boiler feed, W. B. Culver, April 5th.  
 42,464 Railway surface cattle guard, The Consolidated Railway Equipment Co., April 5th.  
 42,465 Disinfecter, A. Davis, April 5th.  
 42,466 Form, setting, and type casting machine. G. Corsa, April 5th.  
 42,468 Split pulley, D. T. McNeil, April 5th.  
 42,469 Train signal for railroad, W. D. Sheldon, April 5th.  
 42,470 Train signal for railroad, W. D. Sheldon, April 5th.  
 42,471 Railroad gate, W. D. Sheldon, April 5th.  
 42,472 Making shade cloth and coating fabrics, W. P. Cole, April 5th.

- 42,473 Tread for floors, etc., J. Mason, et al, April 5th.  
 42,474 Pulp screening machine, C. J. Foster, April 5th.  
 42,475 Feeding device for threshing machine, J. P. Moanett, April 5th.  
 42,476 Combination tool, E. A. Cochran, April 5th.  
 42,477 Utilizing the water power of falls, C. J. Zeitinger, April 6th.  
 42,478 Weather guard attachment, J. P. Warner and A. F. Navarte, April 6th.  
 42,479 Furnace grate, M. Carl and J. Ruse, April 6th.  
 42,480 Can lacquering machine, R. D. Hume, April 6th.  
 42,481 Mineral wool, C. H. Hubbell, April 6th.  
 42,482 Adjustable shelf support, S. A. Morden, April 6th.  
 42,483 Hammer and nail feeding device, T. Gorman, April 6th.  
 42,484 Mowing machine cutter, A. Docter, April 6th.  
 42,485 Nutlock, E. E. Poole et al, April 6th.  
 42,486 Track flanging and cleaning machine, The Nevens Flanger Co., April 6th.  
 42,487 Boot freeing and crimping, H. Kraus and H. Aleht, April 6th.  
 42,490 Metal wheel, A. H. D. and E. H. N. Neff, April 7th.  
 42,491 Sprinkler system, W. Meracher, April 7th.  
 42,492 Packing box, C. R. Mengel, April 7th.  
 42,493 Railway pumping mechanism, H. D. Lyman, April 7th.  
 42,494 Milk separator and cooler, E. Bartlett, April 7th.  
 42,495 Press, A. Doig, Jr., April 7th.  
 42,496 Cast iron sectional boiler, H. A. Smith, April 7th.  
 42,497 Door closer, G. T. Blackstock et al, April 7th.  
 42,498 Disc harrow, W. P. Millar, April 7th.  
 42,499 Milling machine, J. C. McCollum and W. W. Murphy, April 7th.  
 42,500 Rockdrilling, T. W. Sterling, April 7th.  
 42,501 Striking device, T. W. Sterling, April 7th.  
 42,502 Horse gear, R. A. Lister, April 7th.  
 42,503 Book case, C. E. Foster, et al, April 7th.  
 42,504 Perforating attachment for printing presses, G. H. Shoun et al, April 7th.  
 42,505 Portable and variable shafting, W. Ross, April 7th.  
 42,507 Dental chair, D. Stuck, April 8th.  
 42,508 Plow, J. E. and E. M. Mitchell, April 8th.

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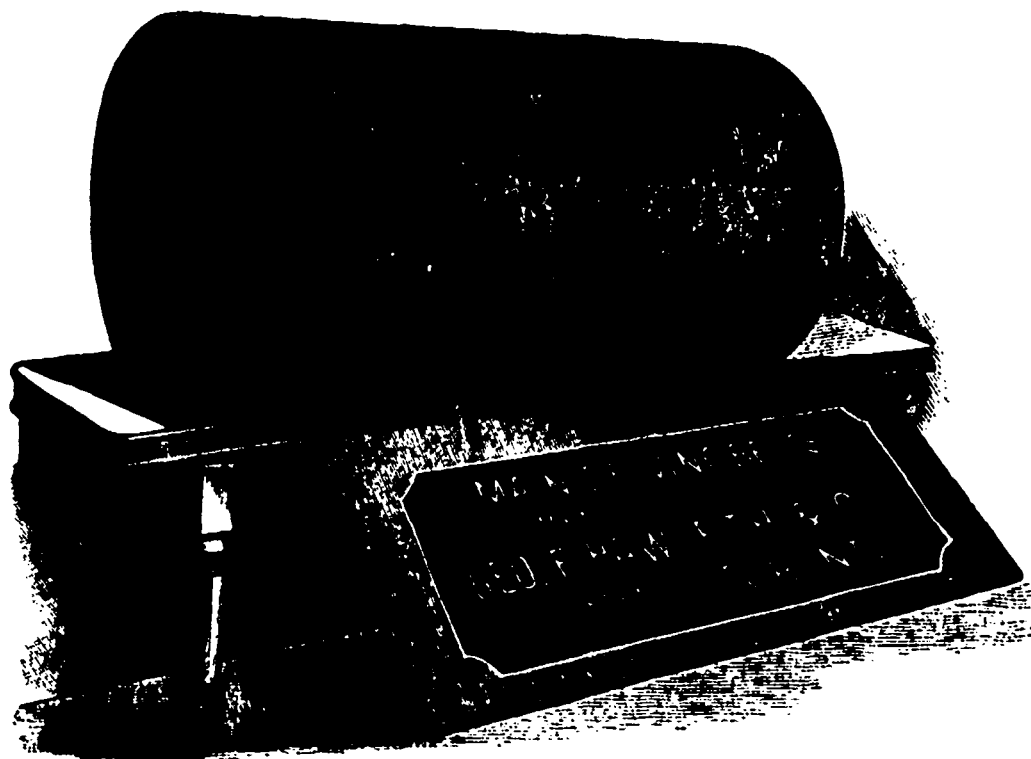
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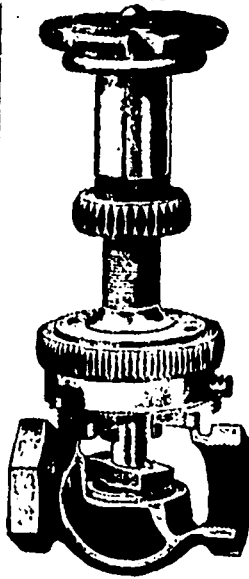
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- 42,511 Corset or stay, J. G. Patterson, April 8th.
- 42,512 Stove pipe damper, H. W. Wilson, April 8th.
- 42,513 Bellows, D. H. Barker, April 8th.
- 42,514 Cream cabinet, P. H. McIntosh, April 8th.
- 42,515 Creamer, P. H. McIntosh, April 8th.
- 42,516 Egg carrier, W. A. Oswald, April 8th.
- 42,518 Buckle, J. Ziegler, April 8th.
- 42,519 Sleigh, O. A. Nonnann, April 8th.
- 42,520 Self winding and synchronizing clock, A. G. Wiseman, April 8th.
- 42,521 Umbrella, R. Ralston, April 8th.
- 42,522 Plow, W. A. Keahey, April 8th.
- 42,523 Steam passenger boat, A. McDougall, April 8th.
- 42,524 Eye glass, F. G. Schmidt, April 8th.
- 42,525 Sole sewing machine, G. R. Peare, April 8th.
- 42,526 Rotary, stock cutter, Isaiah Hardee, April 10th.
- 42,527 Hot air furnace drum, J. H. Crossmon.
- 42,528 Spring rins apparatus and wheels, J. Boyd & Co.
- 42,529 Handles, N. H. Proutry.
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- 42,534 Sash fasteners, A. Raymond.
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- 42,536 Friction clamp, N. W. Harrisburgh.
- 42,537 Churns, G. P. DeLaval.
- 42,538 Device for attaching horse shoes, R. D. Anvers.
- 42,539 Ozone, C. R. Poulsen.
- 42,540 Stools, R. M. Burrows.
- 42,541 Hydrocarbon burner, W. F. Otis.
- 42,542 Ladies' garnets, Louis Lehm.
- 42,543 Money recording and receipting machines, Jos. F. Schiner.
- 42,544 Hoop band fastener, Chas. Sparks.
- 42,545 Baking oven, F. Hubbard.
- 42,546 Detachable heels for boots, M. Wise et al.
- 42,547 Waggon and other vehicles, J. T. Huber.
- 42,548 Drinking founts, B. Fletcher.
- 42,549 Valves, F. McElroy.
- 42,550 Vapor burning torch, F. Rhino, April 11th.
- 42,551 Ice Velocipedes, Xavier Mclair.
- 42,552 Locks for safes, B. Rees.
- 42,554 Rotary harrow, The J. C. Wyman Co., April 11th.
- 42,555 Grain car, C. E. Castle et al, April 11th.
- 42,556 Double faced woven pilt fabric, J. Coley and W. J. Hogg, April 11th.
- 42,557 Sawing machine, J. H. Gateley, April 11th.
- 42,558 Safety device for elevator, H. H. Day, April 11th.
- 42,559 Reversing gear, D. Pitcaethly, April 11th.



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OFFICE, SCHOOL, CHURCH & LODGE FURNITURE

SEND FOR CATALOGUE.

- 42,560 Mowing machine, The W. N. Whitely & Co., April 11th.
- 42,561 Mowing machine, The W. N. Whitely & Co., April 11th.
- 42,562 Domestic Refrigerator, A. T. Ballantyne, April 11th.
- 42,563 Tobacco smoking device, L. Davis, April 11th.

**ELECTRICAL.**

- 42,456 Electric railway, J. F. Munsie, April 4th.
- 42,467 Circuit controller, W. B. Cleveland, April 5th.
- 42,488 Electrically heating crucible and holder, therefor American Electric Heating Co., April 6th.
- 42,489 Electrically heating crucible and holder, therefor American Electric Heating Co., April 6th.
- 42,506 Electrical propulsion of vehicles on railways and tramways, J. J. Heilmann, April 7th.
- 42,517 Electric curling tong, E. Seybold and J. E. Brown, April 8th.

**SCIENTIFIC PROCESS.**

- 42,457 Extraction of metal from ores, J. J. Shedlock and T. Denney, April 5th.
- 42,553 Amalgamating gold and silver with mercury, Noble Mining and Milling Co., April 11th.

**Wants.**

**ADVERTISING IN THIS COLUMN FREE.**

Any subscriber to or advertiser in THE CANADIAN MANUFACTURER who may desire to purchase any sort of machine or machinery; or any sort of mill, factory, workshop, foundry or other supplies; or any materials for manufacturing purposes, and will notify us of his wants, the same will be published in a prominent department of this paper, and his name and address will be furnished to any subscriber or advertiser who may desire to supply the want, for which services no charge whatever will be made.

Stationery and marine engineers with proper certificates, and engineers competent to take charge of electric plants, and first-class mechanics and expert electrical workmen desiring situations, are invited to make their wants known in this column. No charge will be made for putting applicants in communication with employers who may desire their services. Our friends are cordially invited to avail themselves of this invitation.

In answering refer to number of want. Address all communications to CANADIAN MANUFACTURER, Toronto.

**WANTED**—Situation as boss finisher on any kind of men's goods, in woolen mill. References. Address, No. 5, CANADIAN MANUFACTURER.

**WANTED**—Situation as stationery engineer, with second-class certificate. References. Address, No. 6, CANADIAN MANUFACTURER.

**WANTED**—Punching Machine second-hand, 16-inch throat, to punch hole 3/4-inch diameter, in 3/4-inch steel plate. Must be in good working order. Address, No. 8, CANADIAN MANUFACTURER.

Established in 1846

**STEEL**

**Singer, Nimick & Co., Ltd.**

**PITTSBURGH, P.A.. U.S.A.**

Manufacture all kinds of Tool Steel, Hot and Cold Rolled Sheet Steel, Hammered and Rolled Steel, Saw Plates, "Soft Steel Centre," "Iron Centre," "Iron Back," "Soft Steel Back" (extra thick face), Plow Steels, Crucibles.

Open Hearth and Bessemer Plow Steels, Finished Rolling Plow Collars, Rotary Harrow Discs, Round, Square and Flat Machinery Steel, Springs, Axles and Steel Tire. Agricultural Steel Cut to any desired pattern.

Mention this paper.

Represented by

MR. HUGH RUSSELL, Temple Building, 185 St. James St., MONTREAL

**WANTED** Situation by accomplished Analytical chemist and engineer, familiar with blast furnace work and the manufacture of steel. Address, No. 9, CANADIAN MANUFACTURER.

**WANTED** A Boston manufacturer wants a good machinery house in Canada to represent him in the Dominion. Address: No. 10, CANADIAN MANUFACTURER.

**WANTED**—Situation by stationery engineer with a first class certificate. Best references. Competent to take charge of electric plant if necessary. Address, No. 11, care of CANADIAN MANUFACTURER.

**WANTED** Several first-class machinery moulders. Address, No. 12, CANADIAN MANUFACTURER.

**WANTED** To exchange boiler, 11 feet long, 44 inches diameter, with 45 3-inch tubes, for boiler about twice that capacity, marine type preferred. Cash difference. Address, No. 13, CANADIAN MANUFACTURER.

**WANTED** A new or second-hand 2 h.p. Gas Engine. Must be in good running order. State what make. Address, No. 14, CANADIAN MANUFACTURER.

**WANTED** A first-class open die bolt cutter, to cut bridge bolts, from 1/2-inch up to 1 1/4-inches. Address, No. 15, CANADIAN MANUFACTURER.

**WANTED** Address of manufacturer making machinery for manufacturing dies, etc., for suspender buckles. Address, No. 16, CANADIAN MANUFACTURER.

**WANTED**—Competent man to act as agent or solicitor for sale of device for increasing capacity of steam boilers, and affecting great economy in fuel. Must be acquainted with use of steam. Address, No. 17, CANADIAN MANUFACTURER.

**WANTED** A second-hand Patrick cloth press. State particulars. Address, No. 18, CANADIAN MANUFACTURER.

**WANTED** Second-hand pony planer, to plane 12 to 16 inches wide; also shaping machine must be in good running order. Address, No. 19, CANADIAN MANUFACTURER.

**WANTED**—Good machinists for fine turning and fitting. Address, No. 20, CANADIAN MANUFACTURER.

**WANTED**—Second-hand, in good condition, one Engine Lathe about 6 foot bed and 16 inch swing, with rod and screw feed. One small drill. One small shaping machine. Address, No. 21, CANADIAN MANUFACTURER.

**WANTED**—Superintendent and designer of twenty years experience in England making woollens, worsteds, tweeds and serges, both plain and fancy; at present designing with a large mill in Massachusetts, making fancy tweed and cassimeres, would accept first-class position in good mill. He thoroughly understands handling raw material and the manufacturing of the goods throughout. Address, No. 22, CANADIAN MANUFACTURER.

**Machinists' Fine Tools**

**Drills, Chucks, Reamers, Etc.**

**WILEY & RUSSELL**  
Screw Cutting

**TOOLS**

**RICE LEWIS & SON, Ltd.**

**TORONTO**

On Feb. 1, 1892, the largest power electric generator manufactured was of 275-horse power. Machines of 2,000-horse power each are being manufactured by the General Electric Company. The largest lighting generators in use, Feb. 1, 1892, were capable of supplying only 2000 incandescent lights each. There are now being constructed generators of the direct-coupled type, with a capacity of 12,000 incandescent lights each.

CHEMISTS now turn scrap iron into ink, old bones into lucifer matches, the shavings of the blacksmith's shop into Prussian blue, fusel oil into oil of apples and pears, the drainings of cow-houses into fashionable perfumery, beggars rags into new pilot coats, cess-pool filth into ammonia, and tar waste into aniline dyes and saccharine. In Paris they first utilize rats to clear the flesh from the bones of carcases, then kill the rats, use up the fur for trimmings, their skins for gloves, their thigh-bones for toothpicks and their tendons and bones for gelatine wrappers.

PURE tin is not affected at ordinary temperatures, but as soon as a portion of the tin is removed by injury so as to expose even a tiny speck of iron surface, corrosion at once sets in and proceeds very rapidly. The reason of this is an electrical nature, that is, iron and tin together form what is called a "galvanic couple," which will decompose the water charged with carbonic acid deposited upon them from the air; oxygen and hydrogen gases are liberated, and the iron having the greater affinity for the oxygen, is the metal attacked; in particular, such corrosion is very rapid when the exposed iron surface comes in contact with water highly charged with carbonic acid, as in a mineral water factory.

THE three oldest known pieces of wrought iron in existence are the sickle blades that was found by Belzoni under the base of a sphinx in Karnac, near Thebes; the blade found by Col. Vyse imbedded in the mortar of one of one of the pyramids, and a portion of a cross-cut saw, which Mr. Layard exhumed at Nimrod—all of which are now in the British museum. Another piece of iron, an account of which might not be inappropriate in this connection, is the wrought bar of Damascus steel which King Porus presented to Alexander the Great. This bar, which is of unknown antiquity, is still carefully preserved in the National Turkish Museum at Constantinople.

THE first record of coke making, says the Connellsville Courier, is probably contained in Sir John Evelyn's diary. Under date of

July, 1656, he writes: "Came home by Greenwich Ferry, where I saw Sir John Winter's new project of charring sea-coal, to burn out the sulphur and render it sweet. He did it by burning the coals in such earthen pots as the glass men melt their metal, so firing them without consuming them, using a bar of iron in each crucible or pot, which bar has a hook at one end, that so the coals being melted in a furnace with other crude sea-coals under them, may be drawn out of the pots sticking to the iron, whence they are beaten off in great half-exhausted cinders, which being rekindled make a clear, pleasant chamber fire, deprived of their sulphur and arsenic malignity. What success it may have time will discover.

A novel but very sensible application of electric lighting to railway cars has been brought out in Boston. It is the location of a lamp and reflector just under the sill of a passenger car, close by the steps. As the train approaches a station at night the brakeman turns on the current, and passengers have a clear view of the steps and station platform. The reflectors are placed in a lantern 7x7x7 inches, and are made up of reflecting facets or mirrors so arranged that the light will not be thrown in the eyes of passengers or others approaching the train, but will properly diffuse the light downward and outward where it is needed. The light is a 16-candle power incandescent bulb. The glass of the lantern case is semi-cylindrical in front, so that there will be no shadows thrown by uprights or supports of the lantern body itself. The cost of equipment is about \$90 per car, and the cost per night, on a train making forty-five stops, was only twenty-seven cents per night.

AMONG the more recent industrial applications of Portland cement is its substitution for rubber and asbestos preparations in the packing of steam joints, the fact appearing from extensive practical trials, especially in Germany, that such packing is quite as efficient as those which have hitherto been relied upon, while its cost is very much below the latter. In practice, the cement is made into paste with water and spread in a layer from one-fifth to one-half inch thick over the surface of the metal, and the plate or cover to be fixed is now placed in position, and the screws simultaneously screwed down very slowly. After the layer has been compressed to about one-eighth of an inch in thickness, the screwing is suspended and the cement allowed to harden for four hours; the screws are then turned farther and the edges plastered again with cement. The joint is completed in about eight hours after making the cement.

## MACHINERY.

FOLLOWING list of New and Second-Hand Boilers, Engines and General Machinery for sale by The Canada Machinery and Supply Co., Brantford, Ont., dealers in New and Second-Hand Machinery and Supplies:—

ONE BOILER, TO BRICK IN, 11 in. dia. x 11 ft. 7 in. long, 11 1/2 in. tubes, in first-class order.

THREE 25 H.P. PORTABLE loco. fire box boilers, in good order.

TWO 6 H.P. FIRE BOX BOILERS for cheese factories.

ONE 12 x 16 SLIDE-VALVE ENGINE, Beckett's make.

TWO 9 x 12 HORIZONTAL ENGINES, Waterous make, "Clipper."

ONE 9 x 12 HORIZONTAL ENGINE, Morrison maker, Hamilton.

TWO 3/4 x 9 SLIDE-VALVE ENGINES, Beckett's make.

ONE 14 H.P. ENGINE, Leonard make, nearly new.

ONE 12 H.P. HORIZONTAL PORTABLE ENGINE and boiler on skids; Ames & Co., Makers, Oswego, N.Y.

ONE 12 IN. H.P. TRACTION PORTABLE ENGINE and boiler, Oshawa make.

MACHINERY:

ONE 26-INCH MCGREGOR, GOURLAY & Co. make, heavy surface planer, almost new.

ONE ONE-SIDE MOULDER.

TWO 26-INCH CAST, GOURLAY & CO., make, light surface planers, in good order.

ONE ALMOST NEW VERTICAL SPINDLE boring machine, McGREGOR Gourlay & Co's make.

ONE ALMOST NEW IRON TOP JIG SAW, Cowan & Co., makers.

ONE BLIND SLAT TENONING MACHINE.

SIX GOOD SAW TABLES.

ONE WOOD FRAME TENONER in good shape.

ONE SET TWO HEAD BLOCK SAW MILL irons.

ONE ALMOST NEW GENUINE "BAILEY" GAUGE, or handle lath, with countershaft.

ONE ALMOST NEW SPINNING LATH, for spun metal work, with countershaft.

FOUR DOWELL MACHINES.

ONE ALMOST NEW 40 INCH WHEELS, BRESON BAND SAWING MACHINE, with one two-and-a-half inch blade.

ONE ALMOST NEW DOUBLE EXCELSIOR CUTTING MACHINE with packer.

ONE SELF-ACTING WATEROUS MAKE SHINGLE MACHINE and joiner.

ONE ALMOST NEW, GOLDIE & McCULLOCH make Purifier.

ONE 20-INCH "WATEROUS" CHOPPER, almost new, complete with double elevators.

ONE LOZENGE MAKING MACHINE, of large capacity, American make, complete with brass dies and printing attachment.

ONE DOUBLE EXCELSIOR CUTTING MACHINE, almost new.

ONE GOLDIE & McCULLOCH PURIFIER, almost new.

FULL PARTICULARS CHEERFULLY GIVEN, upon enquiry at the Canada Machinery and Supply Co., Brantford, Ont.

The Boston people have computed that the fire loss in that city from electrical causes is about one per cent. larger than in other municipalities. An analysis of the causes of fires there, discloses the fact that they arise from imperfect wiring, and by employing contractors to do the work that are unreliable. Electricity is energy at high pressure, and therefore dangerous to the extent that careless workmanship connected with it ought not to be tolerated. The chief sources of danger in detail are in imperfectly constructed cut-outs, in the combination of a gas and electric light fixture, and the placing of two wires of opposite polarity on the same cleat. Cut-outs are sometimes made of wood that will warp, which leaves an imperfect contact, and this opens up a liability to sparking. The combination gas and electric light fixture often makes mischief through imperfect insulation, and a leak in the gas pipe. Then in the case of two wires on the same cleat with different polarities, it has been found that as the insulation deteriorates there is greater liability to a dangerous work. The underlying trouble is the ignorance of the general public as to electrical matters, and their unwillingness to pay the price that is necessary to obtain better workmanship.—*New York Hardware.*

The copper plating of sheet zinc for building purposes, has been tried with considerable success, and the process can be recommended where mechanical wear takes place. The zinc combines very well with copper. The electrolytic method of copper plating is advantageously used, but the zinc may be coated with copper by ordinary means. In the first place the sheet zinc is cleaned with soda from any adhering dirt and grease, and is also purified by a weak acid bath from the covering of zinc oxide. There are then dissolved in 24 parts of water 1 part of refined verdigris and 12 parts of cream of tartar, the mixture is heated to boiling point, after which 3 or 4 parts of Spanish white are added. The Spanish white is here decomposed and is precipitated as lime tartrate. The dark blue liquid

is poured off and filtered, and can be used either as a bath for the sheet zinc or for the production of a copper plating paste. The first mode of application is better, as the fluid forces its way into the corners and angles of the zinc articles, and is uniformly distributed all over. If it be desired to coat an immovable zinc object with copper, the article, after being cleaned, is painted with the copper solution and the chalk compound, and, after drying, it is brushed. This very simple operation would also prove of value for architectural purposes, namely, where it is desired to remedy the generally unpleasing effect of zinc ornamentations.

There are comparatively few persons outside the carriage and boat-building interest that know to what an extent the wood-bending business is carried, and the management that is necessary in carrying on a well arranged wood-bending establishment. Few know that the fine carriages they ride in are very largely made of bent wood. The felloes of all their wheels are bent and made in two parts. The framework of coaches and heavy carriages is nearly all made of bent stock. They are not only better made, but more cheaply made. The frames of most of our pleasure boats are bent, and so are many of the frames of our finest sailing yachts. Furniture of many kinds has bent frames. All the celebrated Thonet chairs, which for comfort and beauty are not excelled in the world, are entirely of bent wood. The object of bending is two-fold, saving of time and stock, and stability and strength of the work when put together. We ought to add another beauty of form. Bent carriage shafts are almost, if not entirely, used now, instead of the old-fashioned, clumsy sawed ones. It is a business that needs to be well understood, however to make a success of it. Simply the forms to bend on, and the steam box to soften the wood in, do not make a success in wood-bending. We must know perfectly the stock to be bent, for the stock is so variable that no two pieces bend alike. Simple as the work seems to be, yet it is full of

**FOR SALE**

- 1 Stiles & Parker 400 lbs. Friction Drop Press
- 1 " " No. 2 Power Press, new.
- 1 " " " " " "
- 1 Turbine 14 inch Base Water Wheel.
- 1 Steel Shaft 10 feet long 10 1/2 inches diameter.

Apply to

**The D. F. JONES Mfng. Co., Ltd.**  
**GANANOQUE, ONTARIO**

**W. R. SCOTT, Toronto**

BUYS AND SELLS ALL KINDS OF

**New and Second-Hand Machinery**

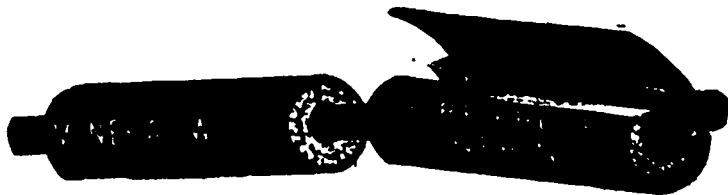
**FOR SALE In Good Order**

- 1 Tempering Furnace (Buffalo Forge Company)
- 1 Fan Blower No. 2, with Countershaft, (Smith)
- 1 Punching Machine, each Foot and Hand Power
- 1 Barnes Drill, No. 1, 20 inch Swing
- 1 Barnes Lathe No. 5, (full set of Screw Cutting Gear) and everything in the shape of Iron and Wood Working Machinery.

**Bargains At all Times**

**Address, 489 Church Street**

**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 83 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.

**Canadian Mineral Wool Co., Ltd., 122 Bay Street TORONTO**



**ELEVATORS**

**FENSOME ELEVATOR WORKS**  
 52-54-56 DUKE ST  
 TORONTO.

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

little details which must be strictly attended to, else the result is a miserable failure. The small number of places where wood is bent as a business makes it an industry in which there is little competition, and, if it is well understood, and the necessary details strictly attended to, it will make good returns for the money invested.

#### PROGRESS OF FUEL OIL.

Industry after industry, plant after plant is introducing oil as fuel, and this is not restricted to localities where coal is expensive and oil is cheap, but the Pittsburg district, where coal is so plentiful and oil has to be piped some distance, is in no wise behind in the adoption of fuel oil. An interview with Mr. William T. Eyer, of New York City, representing the fuel oil branch of the Standard Oil Company's business, shows the increasing popularity of the new fuel. Mr. Eyer said that it must be understood by manufacturers that oil must be used properly in order that it may be used economically. By properly being dealt with the appliances that have been invented for its use after great study, and which ample experience has proven to be successful. Oil can be used in such a way as to occasion an extravagant waste, and then again with the proper appliances may be used in such a way as to get the maximum heat from the minimum supply of fuel. This is the fundamental necessity. Without any fuel saving appliances and devices, and there are a great number of them of more or less efficiency, oil will of course be wasted and its use as fuel be less economical.

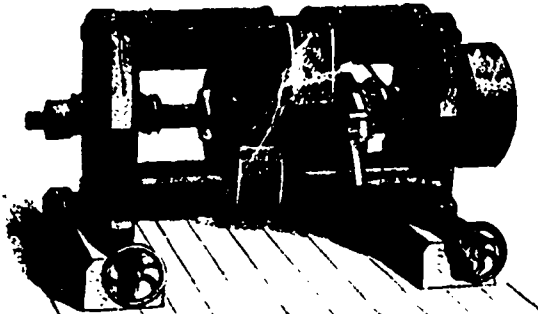
Oil is being used at present, and has been used for several years, in a large number of the largest manufacturing institutions in the United States, embracing almost every branch of industry. The Chambers & McKee Glass Company, at Jeanette, Pa., using a 900-ton furnace, has used oil successfully, and prefer it to any other fuel in flattening. The company claims the heat is better adapted to securing a superior product. The United States Glass Company's factory at Greensburg, and one of the same company's factories at

Pittsburg, are using oil successfully, and it is very probable that it will use oil in its two factories at Findlay, O., the Columbia and the Bellaire Goblet works.

New Jersey factories also are using oil. Whitall, Tatum & Co., at Millville, the largest bottle works in the world, are using oil in many of their departments, and they are making some extensive additions based upon the success of oil as a fuel. Oil costs them about \$1.17 per barrel. The Colmansey Glass Company, of Bridgeport, N. J., the Whitney Glass Company, at Glassboro, and the Woodbury Glass Company, at Woodbury, all use oil exclusively.

The Moore Bros., at Clayton, have put it in their melting furnaces and all through their works. The Riverside Glass Company, at Wellsburg, W. Va., is meeting with the best of results from the use of oil after testing it for two years. The Illinois Steel Company although owning and operating its own coal lands, uses 5,000 barrels per day for 300 fires. In Pittsburg, oil is selling at 70 cents per barrel, and in New Jersey at about \$1.15 per barrel. Oil in Findlay is selling at 50 cents, and is therefore cheaper than at any other place in the world, excepting in the immediate producing district. In the Northwest one of the large factories using oil is the Cream City Glass Company.

The Libby Factory at the World's Fair will use oil as well as the entire power plant in the grounds. The advantages claimed for oil as a fuel are, regularity in the heat, a perfect control of the fire at all times, absence of expense in handling, and economy in all features of fuel consumption. In the iron furnaces, it is claimed that the heat is less harsh and more mellow, which insures a better product. The Chicago Hydraulic Press Brick Works use it in preference to gas. Getting at a ratio between coal and oil is a difficult matter. The quality of coal differs in every section, and of course varies accordingly in the heat-producing power. As near as it can be figured, however, under boilers a ton of coal is equal to 3 barrels of oil, and under furnaces to less than 2 barrels. But with the use of oil, the output of a plant can be very materially increased without any additional outlay for boilers, etc. This largely decreases the ratio. — *American Manufacturer.*



#### THE RELIANCE ELECTRIC MANFG. CO., Ltd.

Manufacturers of The Reliance System of Arc and Incandescent Lighting

and Power Apparatus. The Rie System of Electric Railway.

Head Office and Works - WATERFORD, ONT.

Branch Office:

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Core Compound, Ceylon Plumbago,  
and Foundry Supplies

WRITE FOR CATALOGUE AND PRICES.

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We carry in stock all weights of Mill Boards for making Paper Pulleys, and for packing purposes, also thin boards for covering pulley faces.

Special attention to letter orders.

CANADA PAPER CO., (Ltd.), 15 Front St. West, Toronto

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## M. & L. SAMUEL, BENJAMIN & CO. HARDWARE, METALS

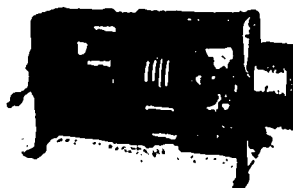
Chemicals and Manufacturers' Supplies

No. 30 Front St. West - Toronto

ENGLISH HOUSE:

Samuel Sons & Benjamin

1 Rumford Place, LIVERPOOL



## THE BALL Electric Light Co.

Established 1882. LIMITED  
70 Pearl Street - TORONTO

## Manufacturers, Engineers and Contractors

For complete Electric Light and Power Installations, Arc and Incandescent Dynamoes, Electric Motors,

ELECTRIC ELEVATORS A SPECIALTY

The Best Apparatus. Prices Reasonable. Guarantee Absolute.  
Write for Printed Matter and Estimates.

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With power to suit

From two to fifty horse power. Apply  
F. W. BARRETT, 68 Esplanade West, TORONTO, ONTARIO

AN IMPORTANT INDUSTRY.

The introduction of steam and hot water radiators for heating dwellings, offices, and public buildings, has entirely revolutionized old methods. A few years ago the Toronto Radiator Manufacturing Company, Toronto, obtained possession of the patent of the Safford radiator, and with sufficient capital in their business to make it an entire success, have been pushing the manufacture of this article with the greatest vim and energy imaginable. The result has been gratifying in the extreme, and the company claim that they are not only making a radiator that is not excelled by any on the market, but that they are doing a lion's share of the trade.



The Safford radiators are put together without the use of wrought iron bolts, packing, or red lead. They also avoid the undesirable tapered iron thimble which has been used by other manufacturers, and which, we are told, has been discarded by American manufacturers. In the construction of this radiator the manufacturers use only their own patent mechanical device known as a right and left screwed nipple, which makes a perfect joint, and one that is guaranteed to stand the highest pressure and not leak. The Toronto Radiator Company inform us that they ship their radiators to all parts of the civilized world where heating apparatus is required, and have now on hand orders to supply radiation for some of the largest and finest buildings in Europe, China and Australia. They have furnished the entire radiator plants for many of the largest buildings in the Dominion, erected during the past five years. They have branch houses at Montreal, St. John, N.B., Quebec, Winnipeg, Man., and Victoria, B.C., each house being under the charge of competent men who are alive to the requirements of the trade.

All the radiators sold by this company are manufactured at Toronto. This branch of the business, as well as all outside work, is under the personal supervision of Mr. John M. Taylor, the secretary and general manager of the company, who is up to date on every point pertaining to the manufacture of heating apparatus, and who is now compiling a work on the subject of heating, which will be published at an early date. Any one contemplating

placing a heating plant, would do well to send to this company for information; they have barrels full of it on tap, and it is freely dispensed to the needy.

Some of the buildings in Toronto, in which are Safford radiators, are the New Parliament Buildings, Board of Trade, Confederation Life, Freehold Loan, and Canada Life Buildings, and the Dominion Bank.

THE

“OPTIMATES”

POWER HAMMER

Patented in the United States, Canada, and England

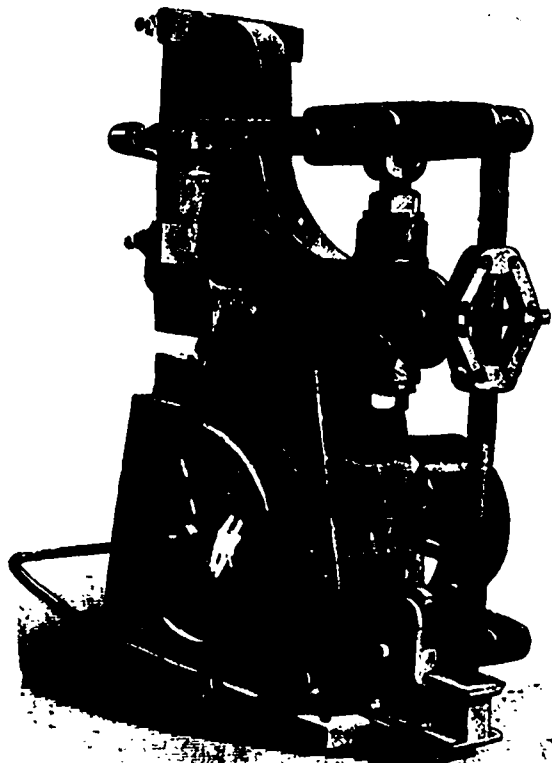
W. H. LAW

Inventor

MANUFACTURED BY

THE CENTRAL BRIDGE AND ENGINEERING CO., (Ltd.)

PETERBOROUGH, ONTARIO, CAN.





**1893**

**OUR LATEST**

**1893**

# Safford Radiator.



—FOR—

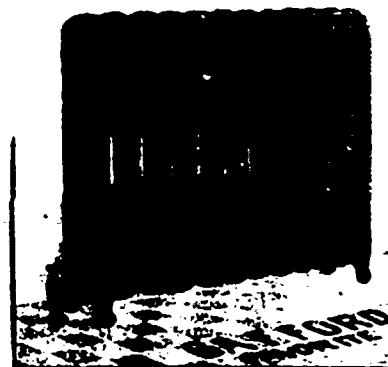
**STEAM AND HOT WATER HEATING**

**—ARE UP TO DATE—**

*MOST EFFICIENT. NEW DESIGNS. BEST CONSTRUCTION.*



TEN STYLES  
and  
UPWARDS OF  
TWO  
HUNDRED  
SIZES.



**Radiators Patented and all Designs Registered**

**REFERENCES :**

**NEW PARLIAMENT BUILDINGS  
BOARD OF TRADE  
CONFEDERATION LIFE**

**UPPER CANADA COLLEGE  
TORONTO UNIVERSITY  
SCHOOL OF SCIENCE**

**AND THOUSANDS OF OTHERS.**

MADE ONLY BY THE

## TORONTO RADIATOR MANUFACTURING CO.

TORONTO, ONT.

**Montreal, Que. St. John, N.B. Winnipeg. Victoria, B.C.**

### The LARGEST MANUFACTURERS in CANADA

## 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, respecting any Canadian manufacturing enterprises. Be concise and explicit. State facts clearly, giving correct names and address of person or firm alluded to, and nature of business.*

THE Taylor Knitting Mill at Merriton, Ont., was destroyed by fire April 26th. Loss about \$20,000.

THE Globe Furniture Company, Walkerville, Ont., are building a three-story addition to their factory.

MESSRS. A. C. MILLER, Picton, Ont., will build a storage warehouse in connection with their canning factory, 80 x 40 ft.

MESSRS. J. M. GREEN & COMPANY, St. Thomas, Ont., have their new planing mill completed and are now placing the machinery.

M. B. PERINE, of Doon, Ont., are building a large fire proof warehouse to take the place of the one destroyed by fire a short time ago.

A wire nail and screw factory is about being built at Port Hope, Ont. It is expected that it will commence operations in a few weeks.

A new factory is being started in St. Catharines, Ont., of which Mr. Wm. Stagg will be manager, to manufacture hairoloth, puddings, etc.

MESSRS. McDONALD & THOMSON, Woodstock, Ont., are rebuilding their Oatmeal Mill which was burnt last fall. It will be completed by next month.

THE Hobbs Hardware Co., London, Ont., as will be seen by their advertisement in this journal, are offering binder twine for

sale. They say that prices are ready, and they request those who may be interested to see their samples.

MR. GEORGE LLOYD, St. Catharines Ont., manufacturer of the Peerless Water Heater, has just placed a new steam engine and boiler in his factory.

THE Doty Engine Co., Toronto, are building three Heine Safety Tubular Boilers, aggregating 500 horse power, to be put into the establishment of the T. Eaton Co., Toronto.

MESSRS. R. H. SMITH & Co., St. Catharines, Ont., are putting in a 50 horse power electric motor, manufactured for them by the Reliance Electric Mufg. Co., Waterford, Ont.

MESSRS. MILLER & Co., Trenton, Ont., are laying the foundation for another addition to their canning factory, which will be used as a storehouse in connection with their works.

MESSRS. E. LEONARD & SONS, London, Ont., builders of steam engines, etc., have opened an office at 79 York street, Toronto, where Mr. Thomas Nopper will represent them.

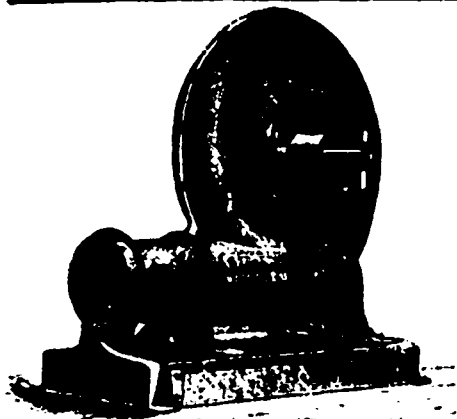
MR. C. REIDER, Paris, Ont., manufacturer of electro-plated stove trimmings, etc., presents a very attractive card in another page to which we ask the attention of our friends.

MESSRS. DARLING BROS, of the Reliance Works, Montreal, manufacturers of the Morse Valve Reseating machine, inform us that they have sold 30 of those machines since the first day of March.

THE Canadian Hairoloth Co., St. Catharines, Ont., are adding a number of new looms to their factory, and will double their present capacity. They have recently placed a steam engine as auxiliary power.

MESSRS. SPRAAT & GRAY, Victoria, B.C., machinery dealers and agents for Dodge Wood Split Pulley Co., Toronto, have recently put in a complete stock of belt pulleys in all sizes, for the convenience of the trade in that province.

MESSRS. MILLER BRO. & SONS, of Montreal, general agents in that city for the Dodge Wood Split Pulley Co., have just completed the largest month's business in Wood Split Pulleys yet enjoyed since the establishment of the agency.



Blower on Adjustable Bed

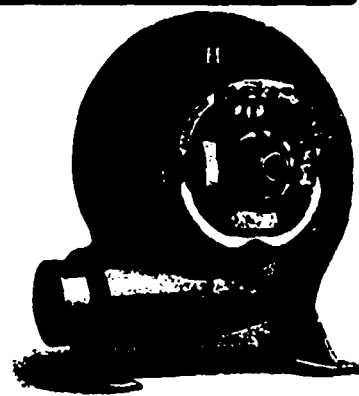
### THE STURTEVANT

### STEEL

# Pressure Blowers

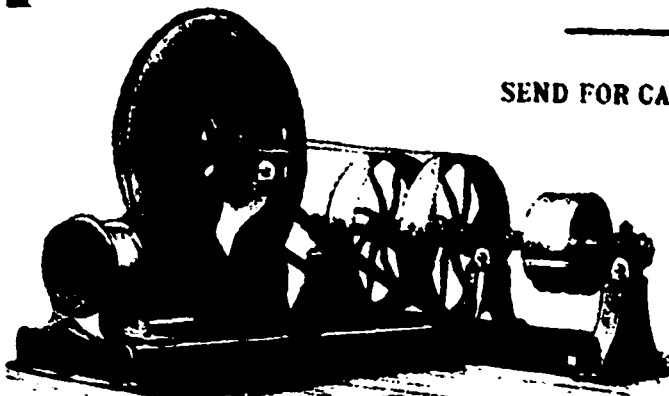
- FOR -

Cupola Furnaces and Forge Fires

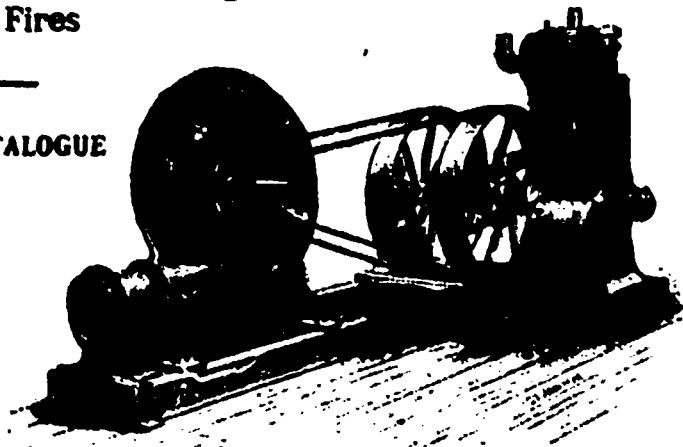


Blower with Electric Motor.

SEND FOR CATALOGUE



Blower on Adjustable Bed with Combined Countershaft



Blower on Adjustable Bed, with Double Enclosed Engine.

**B. F. STURTEVANT CO., BOSTON, MASS. U.S.A.**

THE factory of the Oakville Basket Co., at Oakville, Ont., was destroyed by fire April 29th, together with two warehouses filled with their goods. Loss about \$3000. The company will rebuild immediately and will be in full running order within three weeks.

THE Kerr Engine Co., Walkerville, Ont., are requesting the attention of steam users to the Webber Straitway valve for steam, water, or gas, manufactured by them. They inform us that every valve is thoroughly tested before being sent out from their works. They are sole manufacturers of the article in Canada.

THE Dodge Wood Split Pulley Co., Toronto have fitted up the new Car Works of the Rathbun Company, at Deseronto, Ont., with their Patent Split Pulley throughout. They also transmit 150 horse power to the same, a distance of 300 feet from the cedar mill, by means of the Dodge patent system of rope transmission.

THE Dodge Wood Split Pulley Co., Toronto, are now busy erecting four large rope drives for the estate of the late James McLaren, Buckingham, Que. They have also completed three drives in the new mill of W. C. Edwards, at Ottawa, and a large main drive for Messrs. R. & W. Conroy's mills, at Duchesne Mills, Quebec.

THE Hamilton and Toronto Sewer Pipe Co., Hamilton, Ont., manufacturers of sewer and culvert pipe, etc., are sending to their friends a very handsome ornament for desk use in offices. It consists of a number of pieces of pinked felt of various colors fastened together, upon which is printed information relating to their business.

THE Dodge Wood Split Pulley Co., Toronto, have received the order for fitting up all the drives in the big Gilmour & Hughson mills at Hull, Que., with their patent system of rope transmission, also for all the belt pulleys required. The Dodge Co. have also made some additions in Hurdman's mills at that place, and adjusted all rope drives for the season's work.

THE Dodge Wood Split Pulley Co., Toronto, are calling attention to the fact that despite some statements to the contrary, their belt pulleys are all thoroughly nailed up in the rim after being glued and pressed in the usual way. They say that no customer need

be dissatisfied for a moment with a Dodge pulley, as each and every pulley is sold under an absolute guarantee of entire satisfaction.

MESSRS. THEO. H. EATON & SON, Windsor, Ont., "The Old Dye-wood Warehouse" which was established some 60 years ago, and who are importers and manufacturers of dye woods, dyeing drugs, solid and liquid extract of logwood, fustic, indigo, nematine, and who are sole agents for the "Crown" aniline dyes, etc., inform us that their business is exceedingly prosperous. Mr. B. F. Geiger is well known throughout Canada, and will make a visit to Toronto this summer.

THE American Bit, Brace, and Tool Company, 122-126 Washington Street, Buffalo, N.Y., are reaching out for Canadian trade and are, we are informed, obtaining a very gratifying share of it. In their card which appears in another page, they announce that they manufacture seventy-nine styles and sizes of bit braces, besides many other lines of similar goods. They use only the best materials, and employ only the most skilled workmen, and guarantee all their tools to be mechanically perfect.

REGARDING the great excellence of the pig iron made by the New Glasgow Iron, Coal, and Railway Co., in their furnaces at Ferrona, N. S., in the shops of the Grand Trunk Railway at Montreal in tests recently made, this iron was found to be of such a satisfactory character, that it is now being used as the chief ingredient in the mixture of iron used in the manufacture of locomotive driving wheels. Test bars made of this mixture show a greater breaking strain and higher deflection than the railroad people have ever been able to obtain with the use of Scotch irons.

THE Toronto Carpet Mfg. Co., Toronto are adding to their present plant another art square loom, also a Schaum and Uhlinger steam-driving hydro-extractor, and are showing commendable enterprise in building in their factory four looms for weaving their Axminster carpet which is now meeting with great favour from the trade. This will be the first pile carpet made in Canada, and the company are to be congratulated on being the pioneers in an industry which gives employment to so many people in other lands.

## IN PRESS

### THE SHIPPING MANUFACTURERS' LIST

INDEX TO leading Manufacturers of Canada and articles manufactured by them.

The INFORMATION which this work contains is of value to all classes of BUSINESS men, and may be considered a good COMMERCIAL RATING on any one that appears in this list of Manufacturers. The value of this work will be appreciated when it is known that the INFORMATION it contains has been obtained by a thorough Personal Canvas of Manufacturers THROUGHOUT THE DOMINION. Nearly eighteen months have been consumed in getting the information this work contains of the Manufacturing Industries of CANADA.

The work contains 500 pages handsomely bound in cloth, and represents over forty departments of trade. Section 1 contains over twenty thousand entries of articles. Section 2 contains over twenty thousand addresses of Manufacturers. Section 3 contains over four hundred advertisements of Manufacturers, making this the most thoroughly representative work published on this Continent.

No foreign addresses or advertisements appear in this work.

THE PUBLISHER

*The Shipping Manufacturers' List*

34 Confederation Life Building, Toronto

## FUEL OIL APPLIANCES

### IMPROVED DUPLEX SYSTEM

FOR

Annealing, Forging, Enamelling,  
 Welding, Melting, Brazing  
 and Heating Generally

WITH

## FUEL OIL

FURNACES DESIGNED AND BUILT

FOR EVERY PURPOSE

Estimates MADE AND Works EQUIPPED COMPLETE

## W. K. ROCKWELL

Constructing Engineer

81 Centre Street, NEW YORK

THE Waterous Engine Works Co., Brantford, Ont., inform us that they have recently received a large order from the Sandwich, Windsor and Amherstburg Electric Railway Co., for grip pulleys, shafting, etc., as follows:— 43 ft. of 5½ inch shafting with 9 self-oiling ball and socket boxes and floor stands; one plain pulley 45 x 24 inches built 300 horse power grip couplings; one 300 horse power grip coupling and the following grip pulleys:—one 86 x 12 inches; one 84 x 12 inches; one 72 x 10½ inches; one 56 x 17 inches; one 54 x 16 inches; and one 54 x 22 inches.

THE B. F. Sturtevant Co., Boston, Mass., have recently shipped to Toronto and vicinity eight of their lumber drying apparatus, sold through their special agent, Mr. A. R. Williams, of Toronto. They have also just shipped two very large and complete drying plants to Newfoundland, which we are informed is the first modern apparatus of this sort ever put into operation in that island. The Montreal Street Railway Company have recently been supplied by the Sturtevant Company with a large steam fan of special design for delivering a forced blast beneath the boilers of their power house. The company report a growing demand in Canada for their most excellent machinery.

THE Cant Bros. Co., of Galt, have just manufactured for Messrs. Wm. Gray & Son, the well-known carriage builders of Chatham, a new machine which will prove especially useful for sanding and polishing the joined bodies of buggies, carriages, and light waggons, or for any other work of irregular curved form. In the centre of a strong iron table is a horizontal disc, thirty-six inches in diameter, lightly bevelled off towards the rim, and covered with a cushioned face of sandpaper, revolving at a speed of 600 revolutions per minute. The disc can be raised or lowered at will, and a fence in the middle enables two operators to work on the machine at the same time from opposite sides. The sand-paper is held in the centre of the disc, and on the outside by an iron band, and is easily removed when worn out. The machine results in a saving of both sandpaper and labor.

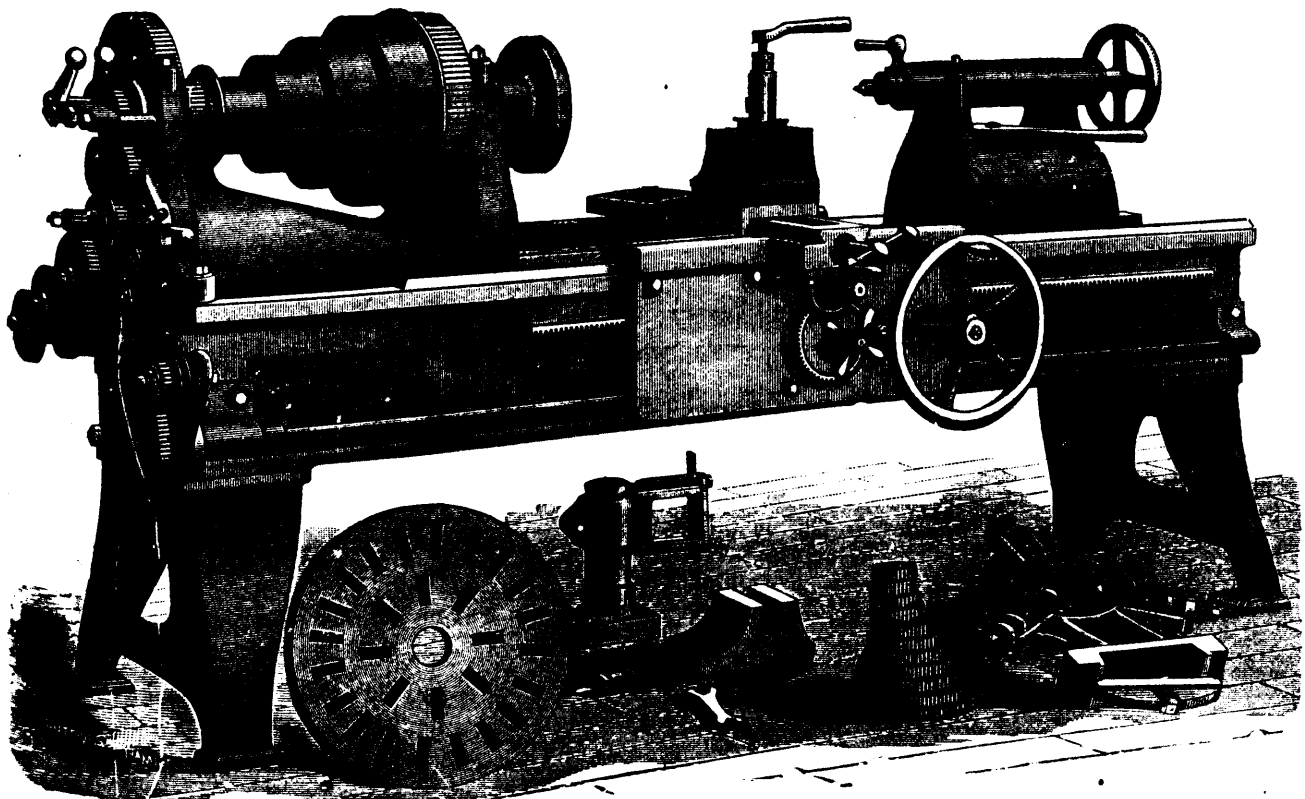
ONE of the finest exhibits at the World's Columbian Exposition in the line of specialties in steam goods, will be that of the Penberthy Injector Co., of Detroit, Mich. They are located in section 25 Machinery Hall, where their exhibit will be housed under a handsome pagoda decorated in handsome shades of blue and terra cotta. A railing made of Penberthy injectors, and safety crank-pin oilers arranged in unique design, will enclose their space, and

within this they will show the visitor their injector in actual operation. They will also have a complete line of sizes on pedestals for inspection, and will exhibit full lines of all their other specialties. Their exhibit will be in charge of their travelling salesman, Mr. W. O. Lee, and their manager Mr. S. Olin Johnson, who will be pleased to meet all steam users and dealers in steam supply goods, and explain to them the merits of the popular "Penberthy" specialties.

THE Michigan Emery Wheel Company, 194 Catherine St., Detroit, Mich., whose business card appears in another page, are manufacturers of solid emery and corundum wheels, to run wet or dry special shapes, "Perfection" saw gummers, etc. The excellence of the emery goods manufactured by this concern, goes unchallenged by any who knows what a really first class article really is; and we are informed that, owing to their good factory facilities, their goods are being sold at prices which are exceedingly reasonable when imported into Canada. That there is a good demand for emery wheels in Canada is shown in the fact that our importations last year aggregated nearly \$7,000, all of which, except less than \$300 worth, were from the United States. Great Britain does not appear to be in the swim in this trade at all, as less than \$200 worth of emery wheels was the extent of our imports from that country.

It was recently announced in this journal that Messrs. James Murray & Co., one of the oldest, largest, and best known firms of printers and publishers in Ontario, had determined to wind up their business and dispose of their estate. Mr. James Murray of that concern, together with his son Mr. John S. Murray, constituting the Murray Printing Co., have taken commodious space in the new Osgoodby Building on Melinda street where they are prepared to do anything in the way of printing, book-binding and engraving. Their facilities for doing all classes of work are first class, their plant being new and of the best description. Their machinery will be driven by an electric motor supplied to them by the Ball Electric Light Co., Toronto, the energy being taken from the wires of the Toronto Incandescent Electric Light Co. This issue of the CANADIAN MANUFACTURER is a specimen of the work done by the Murray Printing Co. Mr. James Murray has been long in the business, is well known not only in Toronto, but throughout Ontario, and has achieved a most enviable reputation in his business.

**Canada Tool Works, John Bertram & Sons, Dundas, Ont.**



PRICE LIST ON APPLICATION.

24-in LATHE



# Canada Iron Furnace Co., Ltd.

MONTREAL, RADNOR AND THREE RIVERS

Manufacturers of the well-known

## "C.I.F." THREE RIVERS CHARCOAL PIG IRON

suitable for Car Wheels, Cylinders and Fine Castings where the utmost strength is required.

This Brand of Iron has been found Equal to the Famous "SALSBURY" Iron

Offices: New York Life Insurance Building, Montreal

THOMAS J. DRUMMOND, President.

JAMES T. McCALL, Sec.

# DRUMMOND, McCALL

PIPE FOUNDRY COMPANY, Ltd.

MANUFACTURERS OF



"SPECIALS," HYDRANTS, VALVES, Etc.

Offices, - New York Life Building, Montreal  
Works, Lachine, Que.

# New Glasgow Iron, Coal, and Railway Co.

LIMITED

MANUFACTURERS OF

# PIG IRON

"Ferrona" Brand

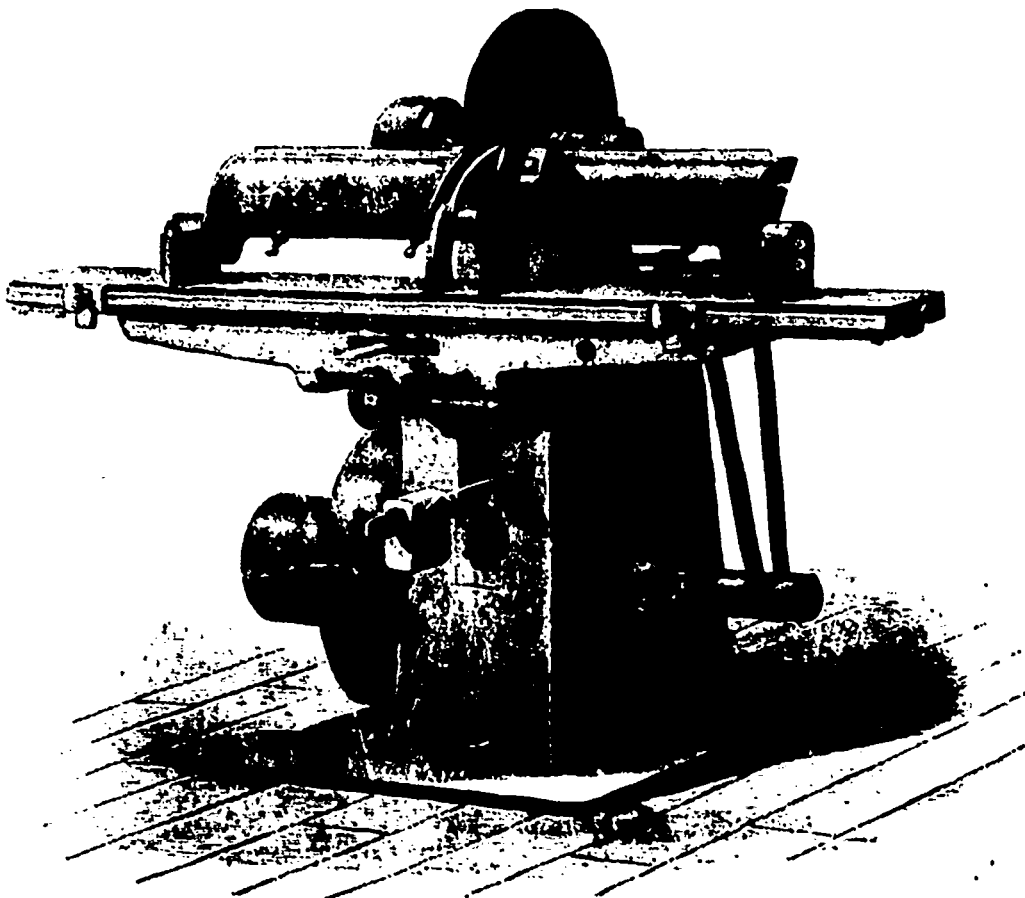
Office and Works: - FERRONA, Nova Scotia

# Cast Iron Water and Gas

# PIPES

Special Castings

# CANADA PIPE and FOUNDRY CO., MONTREAL



Improved Automatic

KNIFE

# Grinding

MACHINE

# COWAN & CO.

CALT, ONTARIO

## THE WATERSPOUT

PATENT

### *Pulsating Steam Pump*

The most Durable, Handy, Economical Pump in the World

PRICES AND TESTIMONIALS FROM

*The Waterspout Engineering Co.*

MANCHESTER, ENGL.

U.S. and Canadian PATENTS on sale



## JAS. A. CANTLIE & CO.

GENERAL MERCHANTS

AND

MANUFACTURERS' AGENTS

ESTABLISHED 22 YEARS.

**COTTONS.** Grey Sheetings, Checked Shirtings, Denbams, Cottonades, Tickings, Bags, Yarn, Twine, etc.  
**TWEEDS.** Fine, Medium and Low Priced Tweeds, Serges, Cassimeres, Doekins, Etottes, Kerseys, etc.  
**FLANNELS.** Plain and Fancy Flannels, Overcoat Linings, Plain and Fancy Dress Goods, etc.  
**KNITTED GOODS.** Shirts, Drawers, Hosiery, etc.  
**BLANKETS.** White, Grey and Colored Blankets.

Wholesale Trade only Supplied.

13 & 15 St. Helen St., MONTREAL

20 Wellington St. W., TORONTO

Advances made on Consignments. Correspondence Solicited.

## HAMILTON COTTON CO.

HAMILTON, - ONTARIO

## DYERS, BLEACHERS

AND MANUFACTURERS OF

Warp Yarn, in Beam, Chain or Skein, White or Colored,  
 Single and Double Yarns, Cop Yarn,  
 Single and Double Hosiery Yarn in all  
 Colors including genuine "Fast Black."

Paul Frind & CO., Toronto, SELLING AGENTS  
For Beam Warps.



New Glasgow **I. MATHESON & CO.** Nova Scotia

Engineers and Boiler Makers

MANUFACTURERS OF

## Corliss Steam Engines

Especially adapted for Mills and Factories.

Agents for

D. H. and C. Haggie's Patent Wire Rope for Mining Purposes

DRAPER'S IMPROVED

GLOBE  
VALVE

Patented

Constructed to prevent Scales or Grains of Dirt being Caught between faces at point of closing.

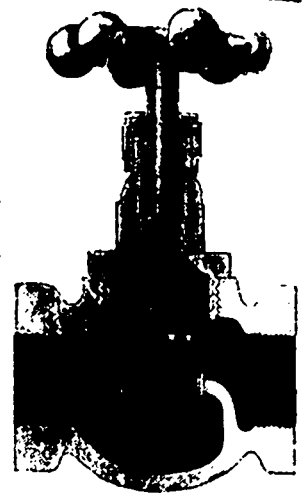
When the projection on valve enters the seat orifice, of which it is an easy fit, only clean fluid rushes past. Scales, etc., are pushed back and the faces meet with nothing between to injure them. Send for prices and particulars to

**T. DRAPER**

Manufacturer

BALL VALVES for various purposes—  
Oil and Salt Well Supplies,  
Etc., Etc.

PETROLEA, ONT.



## S. LENNARD & SONS

Dundas, - Ont.

Patentees of the "Elysian" Seamless Hosiery

MANUFACTURERS OF

## Plain and Fancy Hosiery

CAPS, TUQUES, SASHES, ETC.

To the Wholesale Trade only

Represented in Eastern Ontario, Quebec, Nova Scotia, and New Brunswick by **DUNCAN BELL**, Montreal.

In British Columbia by **E. G. ANDERSON**, Victoria, B.C.

In Western Ontario by **S. LENNARD**, Senior Member of the Firm.

"PERFECTION"

## STOVES, RANGES and FURNACES

Enjoy the unique distinction of being made entirely from original designs and original wood patterns. We confidently place them in competition with the best American productions duplicated by Canadian makers.

Write us for particulars

The Jas. Smart Manufacturing Co., Ltd.

BROCKVILLE, ONT.





= Industrial and Trade Directory. =

**Acids and Aniline Dyes**

**THEO. H. EATON & SON**, Windsor, Ont.; Detroit, U.S.A.—Importers of every Description **Pure Aniline Dyes** for Cotton and Woolen Manufacturers. Dyed Samples furnished on application. Address all correspondence to Head Office, Detroit, Mich.

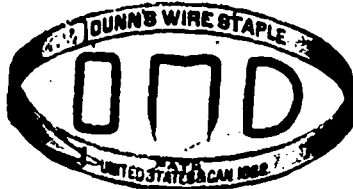
**Steel Stamps**

STENCILS BRANDS

**I. C. FELL & CO.**

13 Victoria Street - TORONTO

**DOMINION DYEWOOD & CHEMICAL CO.**, sole agents in Canada for Farbwerke, vormals Meister, Lueger & Co., Elberfeld, Germany and Read, Huddell & Sons, Huddersfield, England. All shades for woolen, cotton, leather and paper manufacturers. Latest information on dyes as well as dyed samples on application.



**P. DUNN,**  
Mnfr.  
COTE  
ST. PAUL  
NEAR  
Montreal

All kinds of Wire Staples and Suspender Rings

**McARTHUR, CORNELLE & CO.**, Montreal.—Supply of best quality at lowest prices, every description of coloring materials required by manufacturers of woolens, cottons, silks, paper, leather, etc. Are sole agents in Canada for the celebrated aniline dyes of A. Parrier, Paris.

**C. REHDER,**

PARIS, ONT.

Manufacturer of **ELECTRO PLATED STOVE TRIMMINGS** OF ALL KINDS.

**MIDDLETON & MEREDITH**, Montreal.—Aniline Dyes, Benzidine Colors, Dyewoods, Extracts, Chemicals.

**BELLHOUSE, DILLON & CO.**, Montreal.—Drugs, Acids, Aniline Colors and all Dye Stuffs.

**BROWN & CO.**

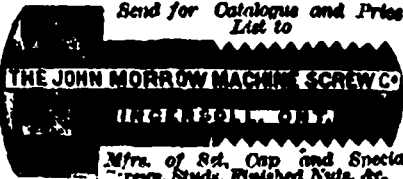
Manufacturers of  
**SQUARE AND HEXAGON**



**HOT PRESSED NUTS**

PARIS, ONTARIO

Send for Catalogue and Prices List to



Mfrs. of Std. Cnp and Special sizes, Studs, Finished Nuts, etc.

**Agricultural Implements and Parts**

**WELLAND VALE MANUFACTURING CO.**—Lock No. 2, St. Catharines, Ont., Canada.—Manufacturers of axes, scythes, forks, hoes, rakes and edge tools.



**PENBERTHY**

**AUTOMATIC INJECTOR**

50,000 IN USE

Absolutely Automatic and Restarting at all Pressures

Send this advertisement and write for prices.

**PEMBERTHY INJECTOR CO.**

DETROIT, - Mich.

**THE WHITMAN & BARNES MANUFACTURING CO.**, St. Catharines, Ont.—Manufacturers of mowing and reaping machine knives, sections, guard-plates, cutting apparatus complete, spring keys and cutters, etc.

Trade Mark Manhattan. Registered Sept. 21, 1889, No. 17,054.

**MANHATTAN**

**Self-Lubricating**  
**Plumbago Packing**  
Is the best to be had for Engines, Pumps, with oil, hot or cold water, Steam Hammers, etc. It is made round and square. Send for circulars, or sample for trial to  
**GREENE, TWEED & CO.**  
Mfrs., 83 Chambers Street, N. Y.

**Bridge Builders**

**DOMINION BRIDGE CO. (Limited)**, Shops at Lacolle, Quebec.—Builders of Steel and Iron Railway and Highway Bridges.

**Carriage Makers' Supplies**

**JOHN HEARD & CO.**, St. Thomas, Ont., Manufacturer of spokes and all kind of Bent Goods for Carriages, Buggies, Wagons, Sleighs, Cutters, etc.



BEST LEATHER

**BELTING**

ALWAYS ON HAND

Telephone 2590.

**F. W. HORE'S SONS**, Hamilton, Ont.—Manufacturers of wheels, wheel material, shafts, etc.

**Chemicals and Dye Stuffs**

**McARTHUR, CORNELLE & Co.**, Montreal.—Offer at lowest figures chemicals required by Soap-boilers, oil refiners, paper-makers and manufacturers of woolens, cottons, leather, etc. Sole agents for British Alizarine Co., London.

**METAL ENGRAVERS**

**& DIE SINKERS.**  
**STEEL STAMPS**  
**STENCILS & BRANDS.**  
**Patterson & Howard**  
STAMPS  
40 WELINGTON ST. W. TORONTO.

**THEO. H. EATON & SON**, Windsor, Ont.; Detroit, U.S.A.—Carry full line of Pure Dyeing Drugs, Dyewoods and Extracts adapted for the requirements of Woolen and Cotton Manufacturers.

**DOMINION DYEWOOD & CHEMICAL CO.**, sole agents in Canada for Mucklow & Co.'s celebrated English Dyewoods and Dyewood Extracts, Inigo Extract, Cudbear, and all chemicals used in dyeing. Stocks kept in Montreal and Toronto.

**ONTARIO**

**Bureau of Chemical Information**

Laboratories, 57 and 59 Colborne St., Toronto

REPORTS GIVEN ON MINING PROPERTIES, COMMERCIAL PRODUCTS ANALYSED, ORES ASSAYED, RESEARCHERS UNDERTAKEN

Manufacturers Supplied with Processes and unsatisfactory Processes perfected.

**MIDDLETON & MEREDITH**, Montreal. Agents for the New York and Boston Dyewood Co. Dyewoods and Extracts; representing the Acton Gesellschaft für Anilin-Fabrikation, Berlin. Pure Aniline Dyes. Agents for Carl Neuhaus, manufacturer of Red and Orange Alizarine and Acetate of Chrome, also dealers in Blue Vitrol, Ferrumates of Potash and Soda. Prices and samples on application.



**BELLHOUSE, DILLON & CO.**, Montreal.—All manner of Chemical and Dye Stuffs for manufacturing purposes. Drugs, Acids, Extracts.

**Edge Tools, Saws and Hardware**

**WELLAND VALE MANUFACTURING CO.**—Lock No. 2, St. Catharines, Ontario, Canada.—Manufacturers of axes, scythes, forks, hoes, rakes and edge tools.

**J. L. O. VIDAL & SON**  
City of Quebec

Are agents to sell and handle on commission all sorts of New and Second-Hand Machinery.

**Glove Manufacturers**

**W. H. STOREY & SON**, Acton, Ont., Manufacturers of fine gloves and mitts, in every variety and style. Moccasins.

# = Industrial and Trade Directory. =

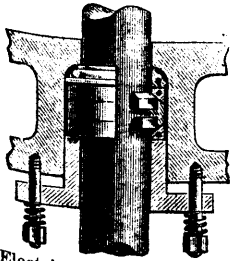
## Hoists and Elevators

LEITCH & TURNBULL, Canada Elevator Works—Cor. Queen and Peter Streets, Hamilton, Ont.—Patent safety Hydraulic, Hand and Power Elevators. Telephone connection.

## Horn and Rubber Combs

C. G. ELRICK & CO., Sheppard St., Toronto, and 61 St. Francois Xavier St., Montreal.—Manufacturers of Horn and Rubber Combs, etc.

## FORREST SILVER BRONZE PACKING



Applied to any stuffing box without disconnecting. Steam, air and water-tight without the aid of soft packing, under highest steam pressure and piston velocity. Automatic, admits of excessive vibrations, lashing, and crowding of rod, does not bind, economical, guaranteed to out last all other packing. Used by the largest Iron Works, Steamships and for years all over the world.

Electric Light Companies

FORREST SILVER BRONZE PACKING CO.  
115 Liberty Street, NEW YORK

Agents Wanted Everywhere

## Knit Goods

S. LENNARD & SONS, Dundas.—Manufacturers of plain and fancy hosiery.

## Machine Tools

JOHN BERTRAM & SONS, Dundas.—Machine Tools and wood-working machinery, Toronto Agents—The Polson Iron Works Co., Montreal, The Machinery Supply Association, Agents for Quebec.



## RIPANS TABLETS

REGULATE THE STOMACH, LIVER AND BOWELS AND PURIFY THE BLOOD.

RIPANS TABLETS are the best Medicine known for Indigestion, Biliousness, Headache, Constipation, Dyspepsia, Chronic Liver Troubles, Dizziness, Bad Complexion, Dysentery, Offensive Breath, and all disorders of the Stomach, Liver and Bowels.

Ripans Tablets contain nothing injurious to the most delicate constitution. Are pleasant to take, safe, effectual, and give immediate relief.

Price—Box (6 vials), 75 cents; Package (4 boxes), \$2. May be ordered through nearest druggist, or by mail. Sample free by mail. Address THE RIPANS CHEMICAL CO., 10 SPRUCE STREET, NEW YORK CITY.

## Malleable Iron

THE ONTARIO MALLEABLE IRON CO., Ltd., Oshawa, Ont.—Manufacturers of Malleable Iron Castings, to order, for all kinds of Agricultural Implements and miscellaneous purposes.

SMITH'S FALLS MALLEABLE IRON WORKS, Smith's Falls, Ont.—Manufacturers to order of REFINED malleable iron castings. Agricultural and other castings a specialty. Carriage castings in stock.

ALL KINDS OF

Boxes, Crates and Packing Cases

MADE TO ORDER AND BY CONTRACT

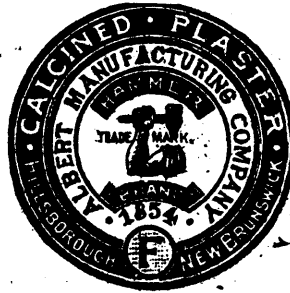
RE-SAWING, PLANING and MATCHING

R. B. ELGIE

19. Alice St., TORONTO

Telephone 2563.

# Calcined Plaster



MANUFACTURED BY

MANUFACTURED BY

ALBERT MANUFACTURING CO.  
HILLSBOROUGH, NEW BRUNSWICK

## Oils

MCARTHUR, CORNEILLE & CO., Montreal.—Afford best value in pure olive and lard oils, also in all other leading lines of vegetable, animal, and mineral oils for factory use.

## Paper Manufacturers

WM. BARBER & BROS., Georgetown.—Manufacturers of book and fine papers.

THE TORONTO PAPER MANUFACTURING CO., Cornwall, Ont.—Manufacturers of engine sized superfine papers, white and tinted book papers, blue and cream laid and wove foolscaps, account book, envelope and lithographic papers, etc., etc.

## Wire Works

THE B. GREENING WIRE CO., Ltd., Hamilton, Ont.—Perforators of zinc, iron and steel; manufacturers of wire cloth, all grades, wire ropes, bank and office railings, etc.

TIMOTHY GREENING & SONS, Dundas, Ont.—Wire Manufacturers and metal perforators, wire cloth, all grades, perforated sheet metals of every description, all kinds of special perforating an indenting done to order.

## R. SPENCE & CO.

Beech File Works.

HAMILTON, - ONT.

MANUFACTURERS OF

## FILES and RASPS

Recutting in all Branches

## Woodworking Machinery

COWAN & CO., Galt.—Manufacturers of every description of wood-working machinery.

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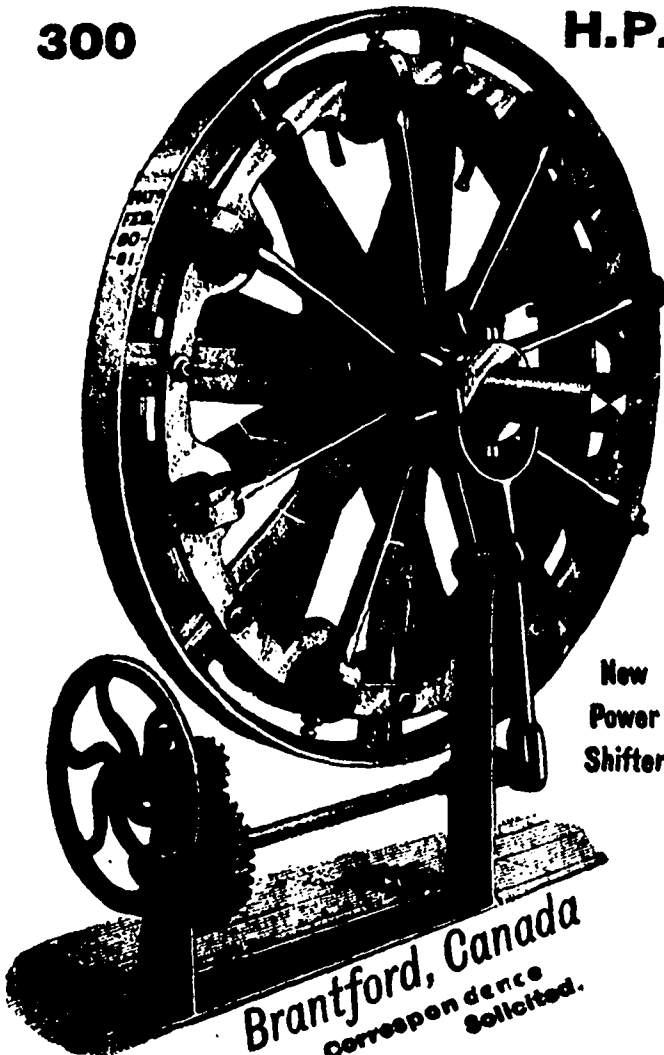
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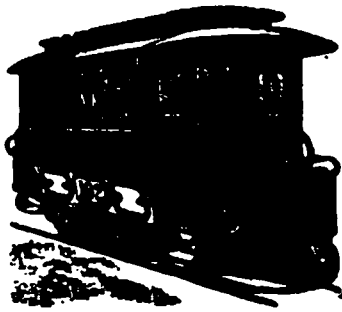
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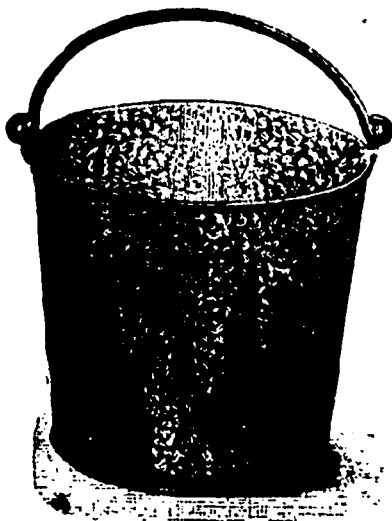
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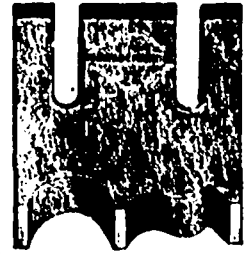
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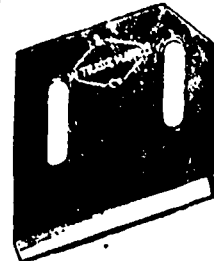
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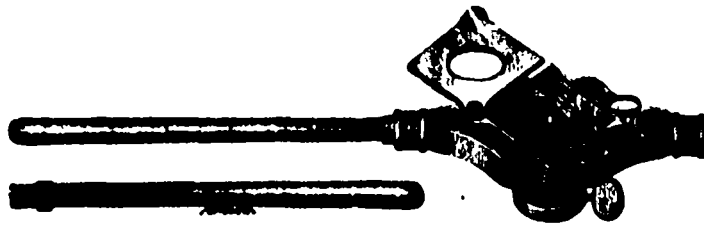
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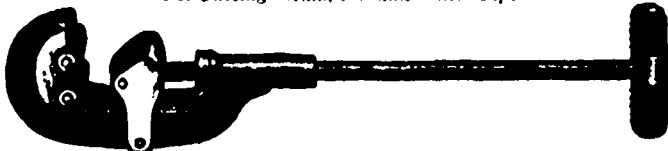
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The report was adopted and the retiring Directors unanimously re-elected. The Board of Directors are now constituted as follows: James Goldie, Guelph, pres.; W. H. Howland, Toronto, vice-pres.; H. N. Baird, Toronto; Wm. Bell, Guelph; Hugh McCulloch,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

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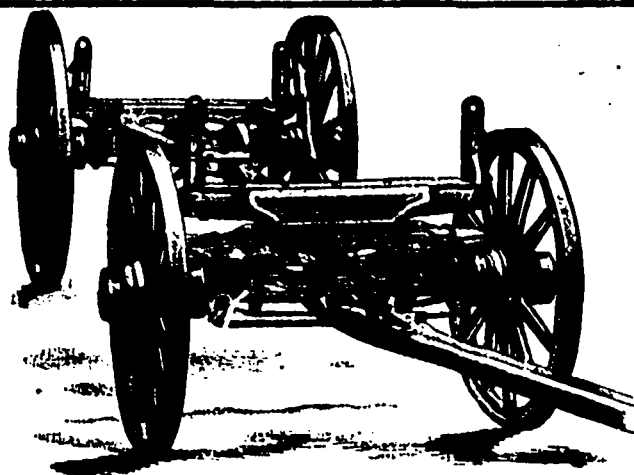
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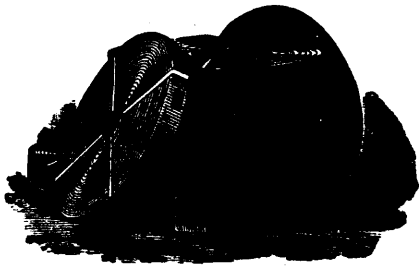
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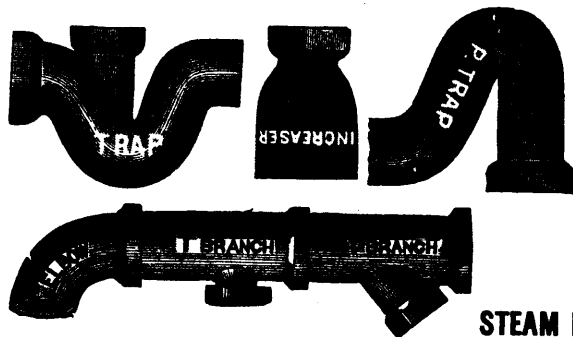
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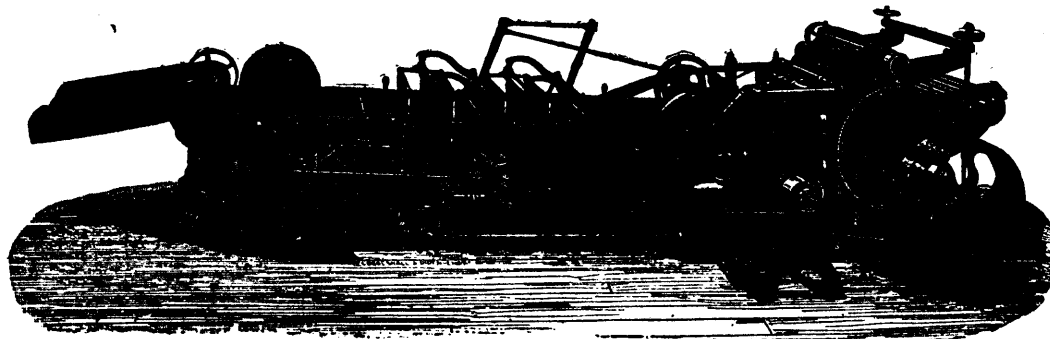
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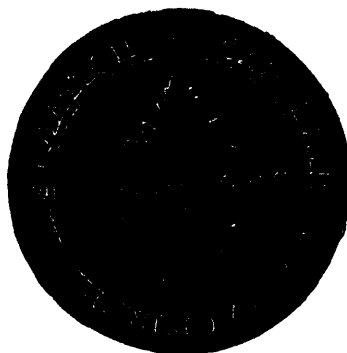
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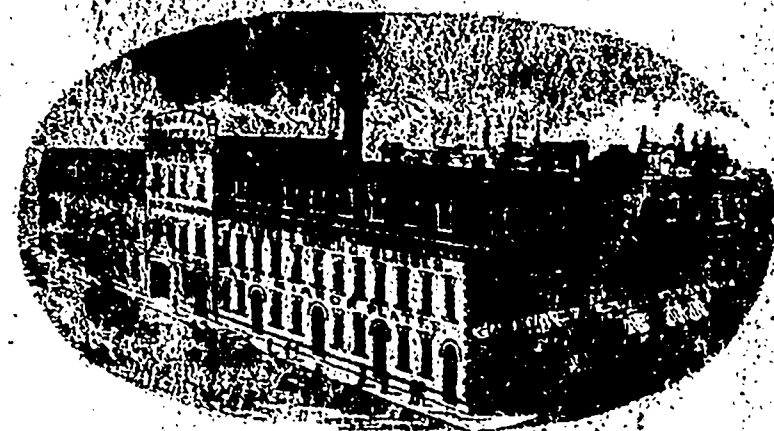
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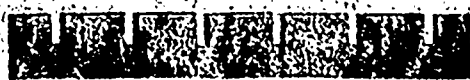
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