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CANADIAN MANUFACTURER AND INDUSTRIAL WORLD
DEVOTED TO THE MANUFACTURING INTEREST OF THE DOMINION

VOL 45. TORONTO, OCTOBER 17, 1902. No. 8

Labor Gazette

CANADIAN MANUFACTURER AND INDUSTRIAL WORLD
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ESTABLISHED IN 1880.

PUBLISHED ON THE FIRST AND THIRD FRIDAYS OF EACH MONTH

The Canadian Manufacturer Publishing Co., Limited.

McKinnon Building, Cor. Melinda and Jordan Sts., Toronto.

Cable address: "CANAMAN." Western Union Telegraphic Code used.

J. J. CASSIDEY, - - Editor and Manager

THE CAUSES OF THE COAL STRIKE.

The present anthracite coal strike, which in its effects is more generally felt than any other similar labor dispute, can be traced back to the hard coal strike of 1900, when the advances demanded by the miners were conceded by the operators. In 1880 the average price at tide-water for all sizes of anthracite was $3.73 per ton. Since that time the price of hard coal has steadily declined, the average in September, 1900, being $2.80 per ton. In 1899, just before the strike of 1900, the average earnings of the miners of the Wyoming field was $2.85 per day, and since that time they have been considerably advanced. The failure of an attempt on the part of the United Mine Workers of America to secure a joint conference with the operators, which effort dates back to February 15, 1901, is one of the leading causes of the present strike, and from that time up to the outbreak of the strike, a strained condition prevailed throughout the region. The specific demands of the United Mine Workers of America for the employees of the anthracite fields and for which the organization is now contending are as follows: (1) An increase of pay of 20 per cent. to the miners who are paid by the ton. (2) A reduction of 20 per cent. in the time of per diem employees. (3) That 2,240 pounds shall constitute the ton on which payment is based for all coal mined where miners are paid by weight.

The first demand of the United Mine Workers embraces about 40 per cent. of all inside employees in the anthracite fields. Under normal conditions the mines are operated about 200 days per year, ten hours constituting a day. The second demand if conceded by the operators would result in reducing the working day to eight hours, so that it would be necessary to operate the mines 240 days per year to obtain the same results as under the present arrangements. When these demands were rejected by the operators some months ago the miners agreed to accept one-half the concessions demanded, and later agreed to submit the differences to arbitration.

Despite the steady increase in the wages of employees throughout the anthracite fields there has been, as already shown, a steady decrease in the price of coal. This has in part been made up by the introduction of improved mining and coal handling machinery and by advanced mine engineering methods, but at the same time freight charges have been advanced and in many instances the reports of the coal operators show that the profits of the industry have not been 5 per cent. upon the amount of capital invested. In 1899 the total cost per ton for the coal mined was $1.71 and the net profit 13 cents per ton. In 1902 the cost per ton for mining had advanced to $2.25, while the net profit per ton was 25 cents.

The features of the coal strike up to date may be summed up as follows: Strike began May 12, 1902, duration 157 days; miners and others thrown out of work, 183,500; capital invested in coal mines, $511,500,000; operators' daily loss in price of coal, $443,500; total loss caused by strike, $183,290,000.

THE YUKON—DR. WICKETT'S REPORT.

The report of Dr. S. M. Wickett, of Toronto, the special representative of the Canadian Manufacturers' Association appointed to investigate the business and other prospects of the Yukon, appears at length in the current issue of Industrial Canada.

In view of the attention which the Yukon is attracting, as well as for the valuable information which it affords, the report cannot but be of the greatest interest not only to our manufacturers, but to the general public also.

As stated by Industrial Canada, so far as the importance of the Yukon is concerned, the fact must be considered that a mining camp covering only about thirty square miles, with a population of less than 30,000, yields this year a golden harvest valued at $12,000,000. As to the market which the Yukon presents, two very important facts are evident from Dr. Wickett's report—first, that the field is worthy of the attention of Canadian manufacturers, and, second, that our manufacturers can supply the demand.

We cannot but express much admiration for the style in which Dr. Wickett's report is presented. It is not only interesting to the casual reader but valuable to those who contemplate travel, trade or settlement in that far-away corner of Canada; and the value of it is much enchanced by the many excellent photo-engravings of places and situations with which it is illustrated.

Dr. Wickett is to be congratulated upon his most excellent report, and also upon the style with which it is presented.

THE PURELY CANADIAN INDUSTRY.

The establishment at Hamilton, Ont., of a branch factory of an American concern, known as the Deering Harvester Co., is an indication that the United States manufacturers, fearing an elevation in the Canadian tariff, are preparing to cut their coats accordingly. In commenting last week on this incipient American industry at Hamilton The World complained of the lack of Canadian enterprise, which left room for such an

outside concern. We showed that, while such a factory as that of the Deerings spends some money in salaries and wages in this country, it sends all its profits back to the head office in Chicago or New York, and we pointed out that if the enterprise were purely Canadian, backed by American capital, all the money earned by it would be kept in circulation in this country, and go to the establishment of other Canadian industries.

But it is not, after all, so much lack of Canadian enterprise as the inefficiency of the Canadian tariff that has prevented Canadian manufacturers from securing more of the trade in agricultural implements. The low tariff of 20 per cent. persisted in for many years, has allowed the American manufacturers room to come in, and get a hold on the trade. They are now building a factory here to secure that, but had the tariff been kept up then the American manufacturer would not have got a foothold in this country, and every Canadian factory would have been extended, and the entire business would have been run by Canadian capital and enterprise.

And the more The World looks at the question the clearer it becomes that purely Canadian industries are preferable to these branch American factories. The latter may employ, as they do in the United States, foreign labor, Poles and Slavs, to the great disadvantage of the Canadian workman. In any case they spend in the country for material and labor only; beyond these outlays everything goes back to the United States. A purely Canadian factory, using Canadian capital, spends and expends all and everything for the enriching of the country. A Canadian factory that not only enjoys a home trade, but a foreign trade, is one of the most valuable assets that the country can have. It utilizes home labor and home materials, and draws from the wide world to increase the national wealth.—The Toronto World.

The absurdity of The World's argument is exceedingly amusing, showing as its does its ignorance of the ethics of protection. In one sentence it speaks of the lack of Canadian enterprise which leaves room for the starting up in this country of a branch of a large American concern, and complains that all it is likely to spend in Canada will be some money in salaries and wages, while the profits go into the pockets of capitalists who may reside elsewhere. The World blames the tariff for the large investment of Canadian capital in Canada as seen in the establishment in Hamilton of a branch factory of the Deering Harvester Co. The low tariff it says, allowed the American manufacturers of agricultural implements to sell their goods in Canada, and at the same time it compels them to start up immense works in Canada so as to avoid the oppression of that same tariff. At one time The World complains that not enough capital is being invested in manufacturing industries in Canada, and in the same breath complains that American capital is being thus invested. It would no doubt amaze The World to be informed that but a very, very small portion of the capital invested in such industries in Canada was originally made by Canadians; that a very, very much smaller portion was made by British capitalists, and that the balance—hundreds of millions of dollars—are the investments of Americans. We cannot conceive, however, that capital invested in Canadian industries, come from where it may, can be viewed as anything more or less than Canadian capital. Suppose the investors in the Deering works in Hamilton do place their dividends in American banks, the Canadian works in which they have invested their capital cannot be thus withdrawn, for those works are a fixture which cannot be removed. The materials used in the construction are the products of Canada, or if imported Canadian duty has been paid on them; and the remuneration paid to the labor employed in the works is paid to Canadians; and it is to be hoped that The World will have generosity enough to allow the American investors to enjoy their gains as seems best to them.

It is possible that, learning what a delightful country Canada is, they may be induced to do as many other Americans do, spend a few of their summer months each year in fishing in our northern waters, a few other months in hunting in our wildernesses, and still other months in the enjoyment of the urban privileges of our delightful winters.

DISPENSING WITH THE REVENUE.

The Globe has received several letters from manufacturers pointing out that it is unfair to say that they have 30 or 35 per cent. protection under the present tariff. They say that the articles they use are taxed to such an extent that their real protection is not more than 15 or 17 per cent. For instance, one correspondent says it so happens that carriage manufacturers have to import a considerable amount of stock, which constitutes their raw material. These imports are from England, the United States and Germany, and are not manufactured in Canada.

Why do not these people move to have the duties taken off their material? If the stock is not manufactured in Canada, the question of protection does not arise. It is merely a question of dispensing with a certain portion of revenue in order to encourage an industry. We are most strongly in favor of encouraging industry in that way. Why do not manufacturers generally take that position? It would strengthen them immensely if they came before the people as advocates of better conditions of manufacture.—The Globe.

The reason why the carriage manufacturers who import a portion of their stock which constitutes their raw material do not move to have the duties upon it removed is simply because the amount of such imports is inconsequentially small, and also because it is not, nor could it be to their interest to break down and abandon the policy of tariff protection even to that extent. If it is a fact that any material entering into the manufacture of carriages is not made in Canada, which is doubtful, with the increased demand arising from the growing prosperity of the trade, under protection, the manufacture of such goods will soon become established here. The manufacture of carriages is already an established industry in Canada, and the manufacturers value the anxiety of The Globe in their behalf at its true worth.

Of course The Globe is most strongly in favor of encouraging any Canadian industry by dispensing with a certain portion of the revenue by putting everything it can in the free list, as it says it is, but the encouragement would not occur to Canadian manufacturers but to those in other countries.

The "better conditions of manufacture" advocated by The Globe is a delusion. What is wanted is more protection, not less.

OUR TRADE WITH JAMAICA.

The present agitation in Jamaica for either the federation of the commercial union of that colony with the Dominion of Canada is worthy of and receiving serious consideration in this country. The Jamaica planters desire to find a free market in Canada for their sugar, lemons, oranges, bananas, coffee, ginger, spices, logwood, etc., in return for which they would purchase from us oats, split peas, soda and fancy biscuits, tin and enamelled ware, boots and shoes, organs, furniture, agricultural implements, ropes and cordage, paints, lumber and other building materials, metallic roofing, canned goods, live stock, butter, cheese, tallow, bacon, hams, flour and other food stuffs and manufactures. According to the report of the committee of the Royal Jamaica Society of Agriculture and Commerce and Merchants' Exchange: "The natural conditions of the respective colonies are all in favor of mutual trade. Each country is the natural complement of the other in natural products, and it is high time that

the feeling which has so long existed in favor of improved trade relations should bear good results." The principal drawback to the interchange of commodities is the lack of a rapid, up-to-date, frequent and direct steamship service. The direct trade between the two countries has largely increased since the advent of the Canada-Jamaica line from St. John, N.B. but this new service, although a decided improvement, is but a monthly one, carried on in far from up-to-date steamers, occupying from eight to ten days between St. John and Kingston, Jamaica.

In this connection we are in receipt of a communication from Mr. F. W. Hodson, Dominion Live Stock Commissioner, in which, in speaking of the extension of trade between Canada and the British West India Islands in live stock and live stock products, gives us the substance of a report made to him by Mr. W. Simpson MacCormack, of Kingston, Jamaica, dealing with the requirements of those markets in these lines, in which he says: "I note your remarks regarding the high quality of Canadian bacon, butter and cheese and the desire of your department to establish a market in these islands for these products. You also expressed the hope of hearing from me, telling what the outlook is for the building up of the trade between Canada and Jamaica.

"I would state that considerable attention is now being directed by importers here, to the superiority of Canadian products, but I regret to say that Canadian producers appear disinclined to bring themselves into line with our market requirements as to size of packages and promptitude in filling orders, etc.

"Butter.—What is required is (1) choice creamery put up in one half, one and five pound tins, also in kegs of about 34 pounds, costing about 19 to 23 cents per pound, also good dairy butter put up in small 10 pound tubs, and 24 pound kegs costing from 15 to 18 cents per pound f.o.b. Halifax.

"Cheese.—Large sizes are not saleable but a lively demand exists for the best qualities, in strong boxes of four, weighing about 10 pounds each, also singles put up separately in strong boxes weighing about 18 to 25 pounds each.

"Bacon.—Slips from 8 to 14 pounds, also sides from 40 to 48 pounds, and middles (cut from sides) of from 18 to 24 pounds of superior mild cured extra lean selections (pea-fed) will always find ready sale, and there is also a fair demand for mild cured, rolled spiced breakfast bacon and slips from 2½ to 8 pounds boneless.

"Hams.—Mild cured extra lean (pea-fed), also smoked and pale dried, from 8 to 12 pounds. A market would also be found for picnics (shoulder hams) from 5 to 10 pounds; and what are known as bath chops 3 to 4 pounds also have a demand.

"Referring to the last two mentioned articles there should not be the least difficulty in building up a direct trade, for I know as a fact that quantities of the articles arrive here from Bristol and other English ports rebagged and represented as of English manufacture, but which I have good reason for knowing, owe their origin to Canadian farmers.

"Probably the principal and most important shippers of these goods give their attention to the British market, being of course vastly more important, but if you could induce some of the smaller men to direct their attention to the details o the requirements of this market for the articles as referred to above, I am satisfied that the demand would be a revelation.

"I would mention that the Pickford and Black steamer which sails from Halifax on the 15th of each month is provided with refrigerated cold chamber, enabling printed butter and rolls to be shipped. I cannot too strongly impress upon your dairymen the importance of this market, and I am prepared to give every assistance to place their products, provided as previously mentioned they are prepared to meet the local requirements of these markets."

THE EMPLOYERS' ASSOCIATION.

The Employers' Association of Toronto, Canada, was formally organized at a meeting of manufacturers and other employers of labor held October 14. The Association, which is the first of its kind in Canada, will have a constitution and by-laws similar to those of employers' associations in various cities of the United States.

The organization selected the following officers.—President, J. P. Murray, Toronto Carpet Mfg. Co.; first vice-president, W. H. Carrick, Gurney Foundry Co.; second vice-president, A. F. Rutter, Warwick Bros. & Rutter; treasurer, Frank Polson, Polson Iron Works; secretary, H. G. Hunt. The Provisional Executive Committee, consists as follows:—Robert Davies, Don Valley Brick Co.; R. E. Menzies, Menzies Mfg. Co.; W. J. Smith, J. B. Smith & Sons; J. J. O'Hearn, representing the master painters; F. D. Brown, of Brown & Love; William Wilkie, Hendrie & Co.; George W. Watts, Canadian General Electric Co.; A. Angstrom, Bertram Engine Works; Joseph Wright, Bennett & Wright; A. A. McMichael, James Robertson & Co.; A. E. Kemp, M.P., Kemp Mfg. Co.; W. K. George, Standard Silver Co.; John Firstbrook, Firstbrook Box Co.; P. W. Ellis, P. W. Ellis & Co.; J. C. Scott, representing master carpenters; John Dixon, representing carriage builders; Atwell Fleming, Hunter, Rose Co.; T. G. Mason, Mason & Risch Co.; J. P. Northey, Northey Co.; W. B. Rogers, Charles Rogers & Sons Co.; John F. Ellis, Barber & Ellis Co.; J. O. Thorn, Metallic Roofing Co.; M. Dusseau, Gendron Mfg. Co.; B. Fletcher, of Fletcher Mfg. Co.

The objects of the Association are set forth as follows:

(1) To protect its members in their rights to manage their respective business in such lawful manner as they may deem proper.

(2) The adoption of a uniform legitimate system, whereby members may ascertain who is, and who is not, worthy of their employment.

(3) The investigation and adjustment, by the proper officers or committees of the association, of any question arising between members and the employees, when such question shall be submitted to the association for adjustment.

(4) To endeavor to make it possible for any person to obtain employment without being obliged to join a labor organization, and to encourage all such persons in their efforts to resist the compulsory methods of organized labor.

(5) To protect its members in such manner as may be deemed expedient against legislative, municipal and other political encroachments.

The constitution provides for firms or individual members of firms joining, and the annual meeting is to be held on the first Thursday in April.

The by-laws contain the conditions under which the association will render assistance to its members. It is provided that whenever a member is involved in a labor dispute the strike committee of the association shall, on request of such member, investigate the matter, report to a special meeting of the association called for the purpose, and this meeting may vote extra pay from the funds to such workmen as remain faithful to the employer, and may also partially compensate the employer for his financial loss by a grant of not more than $1 per day for each employee on strike or locked out, whose place such employer is unable to fill. Should a member take action which preticipates a strike or lockout he shall not be

entitled to any assistance, and should he settle a strike or lockout without the consent of the strike committee, he must repay any money spent by the association on his behalf. The association may, on request, prosecute leaders of mobs, those who threaten injury to members or their property, and those who organize a boycott on the goods of any member.

When any demand is made on a member by a labor or other organization, and the member refers the demand to the association, such member shall not settle with the labor organization without the consent of the strike committee. The strike committee must, however, endeavor to settle the difficulty with the labor men.

All firms paying yearly dues of $25 are to have one vote and an additional vote for every $100 paid above $25 in yearly dues. It will require a majority of three-fourths of the members to dissolve the association, and a majority of four-fifths is required to alter this clause.

Cards of recommendation will be given all employees who are honorably discharged by any firm. The association is empowered to pay for police or other protection necessary to guard the person or property of its members.

It is believed that the action of municipalities in fixing wages to be paid by contractors and otherwise interfering in regulating wages may be successfully assailed in court or otherwise, and the constitution of the association has made provision for such a course.

CANADA'S FOREIGN TRADE.

The growth of Canada's foreign trade continues at a most remarkable rate. For the three months of the present fiscal year, ending September 30, the aggregate trade on the basis of imports for consumption and exports of all kinds amounted to $112,481,550, an increase of $7,750,000 over the same corresponding period of last year. The imports for consumption totalled $50,911,940, being an increase of $3,837,227. Dutiable goods show a gain of $3,963,147, while imports of free goods slightly declined. Exports of domestic produce reached a total of $57,493,585, being an increase of $7,359,388 over the corresponding period of 1901. The exports of animals and their produce were $5,363,145 better than for the first quarter of the previous fiscal year, but mineral products decreased by $2,304,000. Exports of other classes increased as follows:—Products of the fisheries, $95,330; of the forest, $2,148,936; agricultural products, $1,383,191; manufactures, $644,426. The details of imports and exports for the past quarter as compared with 1901 are as follows:

IMPORTS.

	1901.	1902.
Dutiable goods	$29,207,381	$33,170,528
Free goods	17,817,332	17,741,412
Total	$47,024,713	$50,911,940
Coin and bullion	1,758,119	621,328
Total	$48,782,832	$51,533,268
Duty collected	7,823,893	8,934,198

EXPORTS—Domestic Products Only.

	1901.	1902.
The mine	$12,127,061	$9,822,576
The fisheries	2,407,610	2,502,940
The forest	11,957,131	14,106,067
Animals and their produce	15,700,396	21,063,541
Agriculture	4,248,261	5,631,452
Manufactures	3,687,724	4,332,148
Miscellaneous	6,012	34,861
Total merchandise	$50,134,195	$57,493,585

The imports for consumption for September only gained by $2,808,413, compared with the same month of last year, while the increase in domestic exports was $3,446,809.

THE HISTORY OF STRIKES.

A timely contribution from Hon. Carroll D. Wright, United States Commissioner of Labor, on "Strikes in the United States," appears in the North American Review. The period covered is the twenty years from 1881 to 1900 inclusive. The statistical history of strikes in the United States begins with 1881. Labor movements of this character were resorted to before that year, but the data concerning the earlier controversies were not collected in a methodical way. Commissioner Wright notes that the first strike in Pennsylvania, or "turn-out," as it was called in that day, was that of the journeymen shoemakers of Philadelphia, in 1796, for an increase of wages. This initial strike was successful. He mentions only four strikes as occurring in the United States before the nineteenth century.

Until 1877 there were "no very notable strikes" as to the number of persons concerned, "although some of them were severe in the conditions accompanying them." One of the strikes of 1877 was against the Baltimore and Ohio Railroads, at Martinsburg, West Virginia, to resist a reduction of wages. In the same year occurred the great strike against the Pennsylvania Railroad at Pittsburg. The sequel to this strike was the decision of the courts making the county liable for the losses, over $3,500,000, "sustained through the riots accompanying the strike."

Commissioner Wright notes that the movement possessing "the most interesting, thrilling, and dramatic incidents" was the Homestead affair of July 4, 1892. Its incidents are briefly sketched down to July 12, when order was restored by the coming of the troops. The year marking the culmination of labor controversies in the past century was 1894, when the Pullman strike at Chicago, the Lehigh Valley strike, the strike on the Great Northern Railway, and other strikes of minor importance took place. The "steel strike" of 1901 is referred to as highly interesting in that "the real nut of the difficulty was not a question of wages, hours of labor, or rules or conditions of work, but a contest for the recognition of the right of the Amalgamated Association to demand the unionizing of the mills. It was the first great struggle in the United States that was conducted solely on this issue. The result was that the association did not secure the terms demanded, and it lost further, because some of the mills were taken out and made non-union."

Mr. Wright conservatively estimates the loss in wages by the steel strike at $4,000,000. The steel company claimed that it suffered slight loss. He concludes his informing and suggestive contribution as follows: "The approximate statements are sufficient to convince any right-minded person that every effort that can be made to adjust differences and deal with grievances in such a way as to prevent an open outbreak should be encouraged. . . . It is recognized now that labor conflicts grow out of increasing intelligence. The avoidance or adjustment of such conflicts must be the result of increased intelligence. Fools do not strike? It is only men who have intelligence enough to recognize their condition who make use of this last resort. With increased intelligence they will look back upon the strike period as one of development; and when they shall have accommodated themselves to the new conditions, and when employers shall have recognized the intelligence of their employes, these

matters will be handled in such a way as to prevent in the future a repetition of incidents like those which are chronicled in the statistical history of the strikes of the last twenty years.

HOW TO USE SOFT COAL.

The probability that, owing to the coal strike, large numbers of persons who have been accustomed to use anthracite in their houses will be obliged to find other fuel this winter, moves The Scientific American to print editorially some directions regarding the domestic use of soft coal. In spite of the possibilities of gas, wood, and electricity, the writer is of opinion that, it is to bituminous coal that the public will have to turn during the winter as the cheapest and most satisfactory substitute of anthracite, and upon investigation he is satisfied that this may be had in sufficient quantities at prices not exceeding $5 or $6 a ton. There is no quality in soft coal, he goes on to say, that unfits it for domestic use.

Indeed, as a matter of fact, practically no other fuel is used, or has been used, for domestic purposes in Great Britain, and while the cooking-ranges differ somewhat in design from those used in this country for anthracite coal, it will be quite possible for the householder, by using a little judgment, to burn soft coal to advantage in the ordinary American cooking-stove. The most important fact to remember is that the great quantities of gas thrown off when soft coal is first ignited render it necessary to supply considerably more air above the bed of fuel than is the case with anthracite coal. Thus, in replenishing the kitchen stove, it will not do to fill the grate entirely full of fresh fuel, since this would result in the rapid lowering of the oven temperature, which would not be restored until the mass had become ignited and the gases somewhat burned off. It will be found that the best method is to feed small quantities of fuel to the fire at frequent intervals, keeping the lower drafts closed more than they would be in burning anthracite coal, and keeping the upper draft constantly open. For use in the heating-furnace, soft coal will be found to give good results when once the proper manipulation of the furnace has been learned. It should be understood at the outset that more constant attention will be necessary, for the reason that soft coal burns more quickly and will not remain incandescent for so long a time as anthracite coal. During the daytime the attendant will have no difficulty in keeping a steady fire if he is careful to feed the furnace frequently; to keep the bottom drafts but slightly open; and to give a liberal feed of air through the air inlet in the furnace-door. Owing to the rapidity of combustion of bituminous coal, it will not be possible to bank up the furnace for the night and leave it with a certainty that there will be a live fire remaining in the morning; but this difficulty can be overcome if a ton of anthracite is laid in with the winter's supply of soft coal, and the anthracite used for banking up the fire over-night. A ton of anthracite used only for this purpose should suffice to tide the household over the period of high prices.

There is one feature connected with the use of soft coal, however, which, unless it be carefully safeguarded, may introduce an element of danger. We refer to the heavy deposit of soot in the flues which will occur when soft coal is used. This soot, unless it is swept out at stated intervals, will accumulate, and being inflammable would be liable to ignite and produce a fierce fire in the chimney, with a consequent risk to the dwelling. It sometimes happens that the ends of rafters or beams are, by careless or ignorant construction, allowed to project into the chimney flues. These might become ignited and carry fire to the interior of the house. There is further danger that the shower of sparks from a burning chimney would ignite a shingle roof.

WASTES AND BY-PRODUCTS.

The following extracts are taken from a report by Henry T. Kittredge to the Director of the United States Census upon the utilization of wastes and by-products in manufactures:

For nearly a century the world's main supply of soap depended on soda, which was obtained as a product of the sulphuric acid industry. The soda industry being brought to a standstill in France during the French Revolution, the National Convention of that country appealed to the chemists to discover some method for making soda from common salt, which had been shown by Du Hamel in 1736 to contain the same base as soda. About forty years thereafter Scheele found that caustic soda could be obtained from salt by the action of lead oxide, but the production of soda from chemical processes was unimportant from an industrial standpoint until Le Blanc secured results that gave to the world one of its principal industries. His discovery was based upon the treatment of chloride of sodium with sulphuric acid, forming hydrochloric acid and sulphate of soda. The hydrochloric acid was regarded as a by-product of so little value that it was allowed to pass off into the air, to the great detriment of vegetation in the neighborhood. To remedy this evil the English Government took action against the soda works to compel them to condense the acid and keep it out of the way, and this led indirectly to the discovery that hydrochloric acid could be used as a valuable agent in the bleaching industry, which, however, was at that time far from having attained its present height of development. For use in this way it was found necessary to employ some agent to decompose hydrochloric acid, so that chlorine could be obtained from it, and the best agent was found to be the binoxide of manganese, which the acid dissolves, setting free a part of the original chlorine of the acid or of the salt and forming manganous chloride. Previous to about forty years ago this latter product was allowed to go to waste, and it was not until the demand for manganese oxide was so great and the price so high that a reclamation of the spent manganese was looked upon as desirable that this was accomplished, adding greatly to the resources of the chlorine industry for bleaching.

The choicest perfumes on the market are obtained from oils and ethers extracted from flowers; but many others are artificially made, many out of bad-smelling elements. The fusel oil obtained in the distillation of spirits has an odor that is peculiarly disagreeable, yet it is used, after treatment with proper acids and oxidizing agents, in making the oil of apples and the oil of pears; and the oil of grapes and the oil of cognac are little more than fusel oil diluted. Oil of pineapple is best made by the action of putrid cheese on sugar, or by distilling rancid butter with alcohol and sulphuric acid. One of the most popular perfumes may be obtained from one of the products of gas tar, out of which is also obtained the oil of bitter almonds, so largely consumed in the manufacture of perfumed soap and confectionery.

The refuse of cities throughout the civilized world is now generally collected and disposed of for sanitary reasons, though in many instances it is utilized to good advantage for industrial purposes. The collection of this refuse has been made only within a comparatively few years, but is now carried on systematically, being more or less self-supporting and advantageous from an industrial point of view. Formerly this refuse was simply accumulated and disposed of by burning or casting into streams or onto waste land. Now bones, glass, rags, iron, paper and other articles are separately collected and sold. Old tin cans are used (1) for the recovery of solder, (2) for the recovery of the tin and (3) for remelting in the manufacture of steel or iron. The waste heat from furnaces, into which the inflammable refuse is thrown, may be utilized for steam purposes in operating engines for electric lighting and power. The city of Glasgow, Scotland, obtains waste heat from such furnaces equivalent to nearly 9,000 h.p. per day of ten hours for power for manufacturing purposes.

The food wastes of New York city are disposed of by what is known as the Arnold utilization process, which is, briefly, steam digestion and a separation of the cooked product into greases and fertilizer fillers. The greases are all, or nearly all, shipped abroad, and it is believed refined and separated into several grades, such as glycerine, red oil, lard oil and inferior grades. It is not known that refineries in this country are as yet able to handle what is known as garbage grease, as the secret of the trade seems to be held abroad. The solids after being dried and screened are sold to the various manufacturers of complete fertilizers, and by them made up into grades which seem to be particularly adapted for use in the cotton belt.

The economic uses of furnace slag have been greatly developed within the last few years. Formerly this slag was carted away from the furnace and disposed of in the most available place as so much refuse material, hardly worth the cost of carting. It was considered an encumbrance of the smelting works, of no account except to fill up gullies and ravines, or to be thrown into the sea, if such a disposition could be made of it. Within very recent years it was estimated that the cost of removing this waste slag from the furnaces of England was nc less than $2,500,000 annually. The amount of slag made by the iron furnaces of Great Britain is certainly immense. A considerable portion of this waste is now put to some profitable use as a substitute for artificial porphyry in the construction of buildings and for street pavements. Paving stones are made from it for the streets of Metz, Brussels and Paris of a quality sufficiently durable to stand heavy traffic.

A very important innovation in the metallurgical industry in Germany is the utilizing of the waste gases of blast furnaces for working gas engines. That the waste gases can now be made serviceable in their entire heating capacity by a rational burning in gas engines is one of the most important steps that have been recently made in science in its adaptations to practical technics. What this improvement means economically is seen by a theoretic calculation, according to which this use yields a profit of $1.25 per ton of pig iron production, which means for Germany alone, where the utilization of these waste gases is made, a gain of over $10,000,000 on her entire wrought-iron production.

Gas machines for utilizing these gases were introduced into Germany about 1898. Good results were reported from all quarters, which lead to the belief that this is a material advance in the development of an important gas machine industry.

Nearly all of the formerly waste products of lumber and timber are now turned to some utility, and some of the new products thus formed are of considerable value Of this latter class may be mentioned sawdust, which was formerly considered an absolute waste material and was allowed to float down the stream or was thrown into a heap where it could be most conveniently disposed of.

The production of acetic acid, wood naphtha and tar from sawdust is one of the latest enterprises in Norway. A factory has been started at Frederikstad capable of distilling 10,000 tons of sawdust in a year. It also manufactures charcoal briquettes, which are exported to the Netherlands. The acids are chiefly placed on the German market, while the tar is mostly consumed at home. The factory is said to be the first of its kind erected in that country. According to an English patent of 1897. sawdust may be so prepared as to be noninflammable and then applied to jacketing of boilers and other purposes.

EDITORIAL NOTES.

Mr. G. H. Adams, senior member of Messrs. G. H. Adams & Co., manufacturers' agents and general merchants, Melbourne, Australia, informs us that he will visit Canada in the early part of the coming year with a view to calling upon such of our manufacturers and exporters who may desire to establish business relations in Australia. Our friends will no doubt accord him a pleasant and hearty reception.

The British Government has come to the support of the Cunard Line, in so far as it has increased the subsidy paid for services performed from $450,000 to $750,000. The Government has also undertaken to advance the money to build two express steamers which are to be faster than anything now afloat. The loan will be secured by a mortgage upon the company's fleet and will bear interest at the rate of 2¾ per cent. It is to be repaid within twenty years from the date of the completion of the second vessel. The company pledges itself to remain a purely British undertaking. It will hold its whole fleet at the disposal of the Government, which is at liberty to purchase it at agreed rates. The company agrees not to raise freights unduly or to give preferential rates to foreigners. It is understood that the new steamers are to make between 24 and 25 knots an hour.

Manufacturers are still experiencing the same difficulties in securing coke that they have for some months past. While there is no decrease in the production of this important furnace and foundry fuel, the anthracite strike has diverted the coke output into channels where it is not in demand under ordinary conditions. Coke is a very good substitute for anthracite coal for steaming purposes as well as for domestic use, possessing much the same chemical composition as anthracite, the only difference being that coke is quite porous while anthracite is compact. In the great coking fields of the United States located in Western Pennsylvania and West Virginia, great crushers with a daily capacity of 1,500 tons each are now busy crushing coke into fine sizes for domestic use, and millions of tons of this fuel are now being shipped east to supply the markets formerly supplied by anthracite coal, hence the scarcity of coke in Canada and elsewhere.

There is a beautiful simplicity about the way Governor Stone, of Pennsylvania, deals with the strike. He tells the mine owners that they must produce coal in usual quantities forthwith, or settle with the strikers, or the State will take the mines out of their hands. He does not quote statutes, nor go to law, nor appoint commissions. He simply says the people govern, they need coal, they are not to be deprived of it, and if it is not produced for them they will go and take it. Is this course constitutional? The proposition is to do it and find out. A country whose constitution is continually being violated to the injury of the public can afford now and then to give the precious constitution a few bumps for the benefit of the masses.—Toronto Star.

There is this difference between Mr. Tarte's theory of tariff protection to our manufacturing industries and Mr. Sifton's theory of a tariff for revenue only. According to Mr. Tarte it is better to dispose of our surplus production in foreign markets at a reduced price than to stop production when the limit of home consumption has been reached, but according to Mr. Sifton and The Globe there is but one answer, and it is this: We care nothing about home production, home labor, home wages. What we are looking for, what we have always contended for, is lower prices. To that end we have always assailed protection. We care nothing about wages, about the interests of labor, about our superior standard of living. What we want and always have wanted is cheaper prices. Therefore, we say, repeal every feature of protection in our tariff law and let foreign competitors come in. That is the free-traders answer of yesterday, to-day and forever. It is also the answer of certain "progressives" who think prices are too high and would revise the tariff downward in order to lower prices. Mr. Tarte's proposition is: Give us protection, give us prosperity and the question of prices will solve itself.

The Washington Government, in raising the duty on Canadian wood pulp, is only at its old game of trying to crowd Canada to the wall. The American paper makers at present obtain much of their wood pulp from this country, and Uncle Sam is dissatisfied with this state of affairs. He does not like to see Canadians do anything but hew wood and draw water for American industries. He objects to the pulpwood being manufactured into wood pulp in Canada before it is sent to the American paper mills. He believes that he should get the pulpwood from Canada in its raw state, and chafes if even a portion of the process of manufacture is accomplished to the north of the forty-ninth parallel. In other words, his purpose is to compel Canada to send over her own raw materials to build up American industries. Now it would seem that the pulp and paper industry is one in which the advantage is particularly on the side of Canada. The paper mills of Ohio, Pennsylvania and other States depend, it is contended, on Canada for their raw materials. In this case, if they do not take our wood pulp they must have our pulpwood or close down.—Toronto World.

CAPTAINS OF INDUSTRY.

The following items of information, which are classified under the title "Captains of Industry," relate to matters that are of special interest to every advertiser in these pages, and to every concern in Canada interested in any manufacturing industry whatever, this interest extending to supply houses also.

If a new manufacturing enterprise of any kind is being started, or an electric lighting plant instituted, or an electric railroad, or a telephone, or a telegraph line is being constructed; or a saw mill, a woolen, cotton, or knitting mill; or if any industrial establishment has been destroyed by fire with a probability of its being rebuilt, our friends should understand that possibly there may be something in the event for them. Do you catch on to the idea?

The starting of any such concern means a demand for some sort of machines, machinery, or supplies, such as steam engines and boilers, shafting, pulleys, belting, lubricants, machinery supplies, wood or iron working machinery, ventilating and drying apparatus; pumps, valves, packing, dynamos, motors, wire, arc and incandescent lamps, and an infinite variety of electrical supplies, chemicals, acids, alkalies, etc. It is well worth the while of every reader of the Canadian Manufacturer to closely inspect all items under the head of Captains of Industry.

J. C. Wilson & Co., Glenora, Ont., report having sold, during the last month, through their London, England, agency, six Little Giant turbines for customers in the various countries of Europe. Their foreign office in London, England, is working up a steadily increasing trade in this particular line.

Pratt & Letchworth, Brantford, Ont., will make a number of additions to their plant in order to handle the great amount of business being received.

The North End Woodworking Co., St. John's, N.B., has applied for a New Brunswick charter. The company is capitalized at $20,000 and will acquire the woodworking business formerly conducted by A. O. Maybee, of St. John's. Among those interested in the new company are Rupert G. Haley, J. T. Gregory, and Harley W. Gross, of St. John's.

The Empire Coal & Tramway Co., Moncton, N.B., has been formed by F. M. Givan and W. J. Weldon, of Moncton, and others, and has applied for a New Brunswick charter. The company is capitalized at $190,000, and will engage in mining coal, manganese, copper, iron and other minerals. The company will acquire the property of the Micmac Mining Co., and other important mineral lands.

The machine shop of the Collins Bay Wrecking Co., at Collins Bay, near Kingston, Ont., was destroyed by fire October 12.

Stanley, Mills & Co., Hamilton, Ont., are having plans prepared for a large addition to their department store. Charles Mills, the well-known architect of Hamilton is in charge of the work.

The Canadian Yukon Western Railway has applied for a charter to construct a road in the Canadian Yukon district. The Yukon Consolidated Water & Power Co. has also been formed with a capital of $2,500,000.

A. J. Collier, a coal expert, has recently returned from a trip of 1,300 miles, made slowly during the past summer down the Yukon River, investigating the coal resources of that country. He found that coal exists along most of the Yukon. Four mines were found in operation. One is at Five Finger Rapids and another at Cliff Creek, both in Canadian territory. These mines are all producing a good quality of steaming coal, and several Yukon steamers are using it in place of wood, which is becoming more expensive each year.

The Stewart River Development Co., of Canada, with a capital of $500,000 has been formed to develop electrical power from the Stewart River.

Messrs. Perkins, Frazer & Burbidge, Ottawa, have applied for a charter for a new company which will engage in the manufacture of biscuits and confectionery for the Canadian trade. The company will have a capital of $100,000, and will employ 150 workmen.

The Skelton Mfg. Co., manufacturers of plows, is considering the matter of locating at Peterborough, Ont., the town having offered the company flattering inducements to do so.

The T. & H. Electric Co., Hamilton, Ont., has added a new line of direct current dynamos and motors, and induction motors for two and three phase connections. The company has a large amount of new business on hand for various electrical supplies and equipments.

Among the large contracts for power generating machinery recently received by the Goldie, McCulloch Company, Galt, Ont., was one for two cross compound engines of 1,500 h p each, for the Cataract Power Co., to be used for auxiliary power purposes at the Hamilton plant. This is another evidence of Canadian industry, and we are pleased to know that the Goldie & McCulloch Co. are capable of fulfilling so large a contract.

J. C. Wilson & Co., Glenora, Ont., have now under construction for Jno. Fisher & Son, paper makers, Dundas, Ont., a pair of bevel mortise gears, to transmit 250 h.p. The teeth in these gears are to be machine dressed on both sides, thus assuring their mathematical accuracy and easy running.

The Brantford Plating Co., Brantford, Ont., which succeeded the Brantford Silver Co. some time ago, has enlarged its facilities for all kinds of plating on gold, silver, nickel, copper and brass. The company is now doing work for numerous firms and individuals in all parts of Ontario, and has received a number of orders from Winnipeg and other western points. This company makes a specialty of refinishing all sorts of metal goods, and is adding a line of novelties and metal specialties to its work. Messrs. Geo. W. Markle, and Charles Farr, of Brantford, who have had a wide experience in this line of work, are at the head of the company, and the plant is thoroughly equipped for all kinds of work in its line.

Messrs. R. Rogers & Co., Toronto, have just completed a solid concrete tank, with a capacity of 7,000 gallons of oil, for the Pakenham Pork Packing Co., of Stouffville, Ont.

The Hamilton Bridge Co., Hamilton, Ont., has awarded the contract for a new steel frame building, which will form a part of the extensive improvements to be made by the company.

American capital is at the head of a project to establish an immense pulp and paper mill at Bella Coola, B.C.

Among the industrial concerns recently incorporated at Victoria, B.C., were the following: The Canadian Oil & Mines Co., capital $2,500,000; the Vancouver Petroleum Syndicate, capital $25,000; The Athabasca-Venus Co., capital $500,000; The Revelstoke & McCullough Creek Hydraulic Co., capital $125,000; The East Kootenay Placer Mining Co., capital $50,000; and The Phoenix Electric Lighting Co., capital $50,000.

Messrs. Clark & Demill, manufacturers of wood-working machinery, etc., Galt, Ont., inform us that they are making considerable additions to their present works, extending their machine shop, which will enable them to connect with the track of the Canadian Pacific Railway. This addition gives them a machine shop 90x33 feet, and a moulding shop 48x40 feet floor space. These improvements, and the addition of new machine-lathes, planers, etc., affords them increased facilities for giving their customers prompt attention.

The Thunder Bay Harbor Improvement Co., Algoma, Ont., has received an important contract for harbor work at that place for the Canadian Northern Railway Co.

The Boyd, Caldwell & Co., Lanark, Ont., woolen goods manufacturers, has been incorporated, capital $200,000. The provisional directors are, T. B. Caldwell, Jeannette Caldwell, B. O. C. Caldwell, of Lanark.

J. C. Wilson & Co., Glenora, Ont., makers of the Little Giant turbine water wheel, in a communication received from them, report many enquiries being made for water wheels, and state having booked orders for ten wheels during the past four weeks. Among their customers are W. & J. G. Greey & Co., Toronto; Bishop & Monroe, St. John's, Nfld.; E. Edmonds, Simcoe, Ont.; Jno. McCaskill, Gould, Que., and others.

The Temiscaming Railway commissioners have awarded the contract for building the railway to A. R. MacDonell, the lowest tenderer. The price will not be made known until the contract is signed. Mr. MacDonell has had many years' experience; has built railways under Mackenzie and Mann and has been identified with Mr. Hogan, of Ottawa. Ont., in contracts on the Canadian Pacific and in a contract for a dock and pier at Port Colborne for the Dominion Government. The present contract covers 110 miles. The commission will furnish rails, fastenings and superstructure for the Montreal River bridge. The first sixty miles are to be constructed by December 31, 1903.

Kilgour Bros., Toronto, are looking for a site for new paper mills and may locate at Ottawa.

The Canadian Machine Telephone Co. is arranging to establish its headquarters in Ottawa. The company, which consists of residents in Toronto and Ottawa, has secured the Canadian manufactory rights of the new automatic telephone system, and is arranging to open its factory. Some forty skilled hands will, it is said, be employed at the outset. The output is patented in 35 different countries. It obviates the necessity of having a telephone central exchange.

The Pelton Water Wheel Co., San Francisco, Cal., reports having just closed a contract with the Vancouver Power Co., Vancouver, B.C., covering three Pelton wheel units, with a combined capacity of 10,000 h.p. The wheels are for direct connection to electric generators; the power to be used for electric railway and manufacturing purposes near Vancouver. The Pelton Co. now has under construction Pelton water wheels aggregating 30,000 h.p.—all of which are to be used in connection with the electric transmission of power.

The Reardon Broom Co., Ottawa, Ont., has been incorporated with a capital of $20,000, by R. E. Reardon, C. H. Stapledon and others, and will manufacture and deal in brooms, brushes, etc.

The O. H. Warwick Co., St. Johns, N.B., has been incorporated with a capital of $60,000, and will engage in the pottery industry. Those interested are Geo. L. Warwick, O. H. Warwick, and William Warwick, of St. John's.

The Springbank Mineral Spring Co., St. Catharines, Ont., has been formed with a capital of $800,000 by American and Canadian capitalists. The Canadian end of the enterprise is being engineered by W. J. Keyes, C. J. Baby, J. T. Groves and R. N. Campbell, of St. Catharines. The stocks and bonds of the company are being taken up entirely by New York and Philadelphia capitalists.

The Vancouver Power Co., Vancouver, B.C., has awarded an important contract to the Westinghouse Electrical Co. for electrical apparatus necessary to generate 9,000 h.p. The company is constructing works on the north side of Burrard Inlet, and the electricity generated will be used to run the car services in Vancouver and New Westminster.

The Renfrew Roller Mills Co., Renfrew, Ont., a new concern, are erecting a fine large brick flour mill, with a $50,000 bushel grain elevator attached. The mill will be of 200 barrel per day capacity, and will be equipped with full gyrator system. The entire machinery in this will be of the most modern and up-to-date description, furnished by the Goldie & McCulloch Co., of Galt, Ont.

The Dominion Motor & Machine Co., Toronto, have just shipped an 8 h.p. portable gasoline motor to Mr. F. S. Filmore, of Westmoreland Point, N.B., also a 3 h.p. gasoline motor to the Woodbridge grain elevator at Woodbridge, Ont. The company has just furnished 12 Bundy traps to the Dominion Radiator Co., Toronto. The company is very busy at present and is constantly booking new orders.

The new plant of Shurley & Deitrich at Galt, Ont., is rapidly nearing completion and will be ready for operation in a short time. The new addition is to take the place of the building destroyed by fire some time ago, and will be modern in every respect and thoroughly equipped with the most improved machinery for the manufacture of saws and iron and steel specialties.

The well known firm of Smart & Eby, Hamilton, Ont., has been reorganized under the name of Smart-Turner Machine Co., and will continue in the business of engineers and machinists at their former place of business in Hamilton. The company are about to make a number of improvements in their shops.

The Price Porritt Pulp & Paper Co., has been formed with a total capital stock of $250,000, headquarters at the City of Quebec, to manufacture wood pulp and sulphite pulp, paper, paper board, and to carry on a general electric light and power business. The charter members are William Price, Henry Edward Price and Arthur John Price, all of Quebec.

The Goldie & McCulloch Co., Galt, Ont., inform us that they are exceedingly busy in all departments of their works, and are filling some very large orders for flour milling machinery.

The Canadian Woolen Mfg. Co. has been formed at St. Hyacinthe, Que., and will take over the business of the Canadian Woolen Mills Company of that place.

A fine factory building 180x52 feet is about being erected in Lombard street, Toronto, which will be occupied by the Toronto Brass Mfg. Co., and the National Cash Register Co., of Dayton, Ohio., which latter concern will manufacture their specialty for the Canadian trade in Toronto.

The B. F. Sturtevant Co., Boston, Mass., manufacturers of air moving machinery, heating and ventilating appliances, etc., state that their new plant at Readville, Mass., is fast approaching completion. It will provide employment for some 5,000 hands.

J. C. Wilson & Co., Glenora, Ont, makers of the Little Giant turbine wheel, report continued activity in the demand for machine dressed gearing, one of their specialties. Among recent customers are John McLachlan, Cannington, Ont.; Bishop & Monroe, St. John's, Nfld.; S. Vessott & Co., Joliette, Que., through their Toronto agency; the Canadian Colored Cotton Mills Co., a repeat order for their Hamilton mill; the Rathburn Co., Deseronto, Ont., a repeat order also; W. & J. G. Greey & Co., Toronto; W. H. Crowe, Demorestville, Ont.

The Roman Stone Co., Toronto, capital $60,000, has been granted an Ontario charter. The provisional directors are, Edgar B. Jarvis, Hugh D. Eby, James P. Murray, Wm. G. Van Egmond, and Reginald G. Smellie.

The Dominion Compressed Air Dustless House Cleaning Co., Toronto, with a capital stock of $99,500, has been formed to manufacture and deal in machinery for and to carry on the business of cleaning, renovating, deodorizing and disinfecting, and to acquire the Thurnman patents. John B. Kay, John I. Davidson, Thomas C Irving, John S. King and others, of Toronto, are interested.

The Taylor, Forbes Co., Guelph, Ont., with a capital stock of $300,000, has been formed to manufacture hardware, radiators, boilers, furnaces and all classes of heating apparatus, and machinery of all kinds. The charter members are John M. Taylor, Guelph, George D. Forbes, of Hespeler, and Adam Taylor, Guelph.

The Sterling Chemical Co., Montreal, with a capital stock of $20,000, has been chartered to carry on the business of chemists, druggists, dysalters, oil and color men, etc., in pharmaceutical, medicinal, chemical, industrial and other preparations. The charter members include Louis E. Masson, Edouard F. Surveyer, and Leon D. Masson, of Montreal.

The Williams Co., Galt, Ont., leather goods, capital $40,000, has been chartered, The provisional directors are, Joseph W. Williams and Francis J. Leach.

The Lake Erie Coal Co., Walkerville, capital $100,000, has been formed. The provisional directors are L. C. Walker, William Woollatt, Alex. Leslie, F. H. Walker and J. H. Walker.

The Standard Bag Co., of Montreal, has been incorporated by Joshua Collins, F. S. Mackay and others of that city.

The International Portland Cement Co., Toronto, capital $1,000,000, has obtained an Ontario charter. The provisional directors are William F. Cowham, P. W. Stanhope, J. S. Irwin, A. F. MacLaren, and David Jamieson.

The Union Oil Co., Petrolea, Ont., capital $600,000, has been formed. The provisional directors are William S. Calvert, P. C. Pettingill, A. Cameron, W. Gleeson, and Wm. Lyon McKenzie.

The Ontario Compressed Dustless Housecleaning Co., Toronto, capital $50,000, has been incorporated. The directors are W. T. Bradshaw, D. K. Ridout, and J. D. Montgomery.

CALIFORNIA EXCURSIONS.

The Chicago. Union Pacific and North-Western Lines are selling round trip excursion tickets at low rates to principal California points, the route of the famous "Overland Limited" the finest trans-continental train. Less than three days to California. Write for "Overland" booklet and "California Illustrated" to B. H. Bennett. general agent, 2 East King street, Toronto, Ont.

THE CENTRAL ONTARIO POWER CO.

Frank Turner, Esq., C.E., the well-known engineering expert of Toronto, has accepted the presidency of the Central

Ontario Power Co. of Peterborough, Ont. Mr. Turner is a gentleman of wealth and great engineering experience, well known as having been a member of the Trent River Canal Commission of 1886. Some other directors of the company are R. S. Hudson, Esq., assistant general manager the Canada Permanent & Western Canada Mortgage Corporation, Toronto; Edward J. Adams, M.D., Toronto, and Eugene Coste, Esq., M.E., Toronto. The offices of the company are at Peterborough and Toronto, J. Alex. Culverwell, managing director.

BUFFALO DOWN-DRAFT FORGES.

The Buffalo Forge Co., Buffalo, N.Y., have sent us a new brochure just issued by them having reference to their Buffalo down-draft stationary and heating forges for industrial works, in which the several different styles of these forges are illustrated and described.

The typical features of these forges are alluded to in the booklet in part as follows:

Smoke and gases are immediately and completely withdrawn. Removal effected by down-draft suction through underground tile pipes. No escape from the largest and heaviest fires. Hoods are adjustable to different positions at fire, according to conditions. No overhead piping systems and inefficient telescopic hoods obstructing valuable space and light. Indestructible. First cost moderate. No further expense. Overhead galvanized-iron piping is subject to frequent renewals. Buffalo down-draft forges taken from burned buildings have been reinstalled without repairs.

The fumes from hard coal and coke furnace fires, a menace to the health of operatives, are readily eliminated. Forge shop atmosphere pure as the best ventilated machine shop, with a temperature materially reduced in summer. Adequate blast. Thorough exhaust.

Down-draft forges were patented by the Buffalo Forge Co., in November, 1894, and under that patent the down-draft principle used in their forges is, we are informed, exclusively owned by this company.

In shops where a small number of Buffalo down-draft forges are installed, the blast and exhaust currents of air may be supplied from a Buffalo "B" Volume Exhauster, the method employed to obtain this result being made clear by reference to a plan shown in the book. This a typical Buffalo down-draft layout, the system being thoroughly practical, and is, we are told, used in hundreds of small smith shops with entire satisfaction. The smoke from the fire, together with a plentiful supply of fresh air, is drawn through the hood, exhaust connection and underground exhaust piping back to the exhauster, from which it is discharged under pressure into the blast piping. This blast piping system is also placed below the floor level, and is arranged with branches to the different tuyeres and to the chimney. These underground piping systems are usually constructed of tile, and are practically indestructible, obviating the frequent repairs to which overhead piping systems are subject, and providing against inefficient telescopic hoods obstructing valuable space and light.

A balance damper automatically acts to discharge a varying amount of smoke and air into the chimney according to the number of forges in operation, insuring a perfect working of the system under all conditions. It can be easily attached to any forge system.

This balanced damper also affords perfect protection against back gas explosions, and should be generally used for this purpose, as the prevention of a single explosion may save many times its cost. The usual place to locate this damper is shown by the diagram; other places however serve equally well. This system is known as the Single-Fan Buffalo Down-Draft Forge System.

A special illustration shows the Buffalo Down-Draft System of Forge Construction, as installed in a large railroad repair shop. The blast for the 36 Buffalo Down-Draft Forges and the two Buffalo Down-Draft Heating Forges is furnished by a Buffalo Steel Pressure Blower, placed upon an elevated platform, and discharging into an iron pipe which leads to the tile piping blast system under the floor. The exhaust is furnished by a Buffalo Steel-

Plate Exhaust Fan. This fan is placed on the same platform with the Steel Pressure Blower and connects to the exhaust system of tile pipe by means of an iron pipe. The discharge of the Steel-Plate Exhaust Fan leads to the stack.

THE MINERAL RESOURCES OF VANCOUVER ISLAND.—The mineral resources of Vancouver Island comprise gold-bearing quartz, copper-gold sulphide ores, bornite ore, iron ore, coal and auriferous black sand.

The industry of lode mining is at present only in its infancy. In fact systematic prospecting was only really commenced about 1897. Since then the coast lines have been fairly well exploited, but the interior of the Island, except around Mount Sicker and Alberni, has not been explored. The reasons for this are that while prospectors can travel along the shore lines of the numerous inlets, bays and lakes by boat or canoe, it is only with the greatest difficulty that they can travel in the interior, where the growth of timber and underbrush is so dense, mountains precipitous and the streams too rapid to permit of navigation even with canoes.

With these difficulties to overcome, and the further fact that until the present time all ore mined on the Island had to be exported to the United States for treatment, it is hardly to be wondered at that metaliferous mining has made no greater progress in the past, but in the future this rule should not apply, because smelting plants have been installed on the east coast of the Island, the Government has been extending the trails and improving the roads, and the population of the Island is more thoroughly educated in the work of the prospector and the business of developing mines.

The actual productive districts of the Island to-day so far as metalliferous ores are concerned, are the Mount Sicker, Kennedy Lake, Alberni, Sidney Inlet and Quatsino. Of these, Mount Sicker takes the lead, the Lenora mine alone having shipped about 40,000 tons of copper-gold ore, while in the Tyee mine there are about 60,000 tons of the same character of ore blocked out. This grade of ore yields per ton an average value of about $5 in gold (5 per cent. (dry) in copper and variable silver values sufficient to appreciably increase the commercial value of the ore. Besides this grade of ore there are some 40,000 tons of second grade on the dumps at the Lenora which carries sufficient value to pay a profit to the mine owners as well as for treatment at the smelter plant of the North-Western Smelting & Refining Co., at Crofton.

It was in consequence of the large amount of ore in sight and the promising

prospects in the Mount Sicker District that the smelting plants at Crofton and at Ladysmith were erected during the ast summer. The former of these, with a capacity of about 700 tons per day, erected by the North-Western Smelting & Refining Co., has contracted for the entire output of the Lenora mine, production from which constitutes for the works a base of supply. This smelter will, in addition, to secure this tonnage, purchase copper-gold ores from all points on the Pacific Coast, with the expectation of treating mine products from as far north as Alaska, and those also from South America. The smelter at Ladysmith, with a capacity of 100 tons per day, has been erected by the Tyee Mining Co., for the purpose of treating the ore from that mine.

The productive mines in the Alberni District have been the Three Jays, the Monitor, the Three W.'s, and to a limited extent, the Alberni Consolidated. The two last named produce gold-bearing quartz, some of which carried very high values, the other copper-gold ores, the grade ranging from five to ten per cent. copper (dry) and about $3.00 in gold and silver per ton. In addition to these properties there are in the Alberni District a very large number of promising prospects partially developed which really merit thorough exploitation and systematic work. Besides the copper-gold and gold-bearing quartz ores in the Alberni District, there are quite extensive deposits of magnetic iron ore. During the past two years serious attempts have been made to determine the extent and permanency of these deposits, control of which has been acquired by a syndicate from the United States with the avowed purpose of establishing iron and steel plants on that side of the line. The ore carries from about 55 to 65 per cent. metallic iron, very low contents in phosphorous and silica, and no titanium.

In the vicinity of Kennedy Lake comparatively narrow fissures filled with high grade gold-bearing quartz were discovered in 1899 and worked to some extent. On the Rose Marie claim a concentrating plant was erected and the concentrates shipped to the Tacoma smelter, but the owners becoming involved in financial difficulties the plant was closed down. However, during the past season several other mineral locations were made in the same vicinity and samples of the ore shipped to the Crofton smelter for treatment with satisfactory results to the mine owners.

In the vicinity of Clayoquot Sound and Sidney Inlet a large number of mineral locations have been staked and the assessment work kept up on them. The ore is usually a fairly high grade chalcopyrite associated with magnitite, but on some locations in the Sidney Inlet camp considerable quantities of bornite, carrying high copper values occur at and near the surface but is usually replaced by chalcopyrite before any great depth has been attained in the workings.

The Quatsino Sound District has during the past year attracted much attention, due largely to the fact that a Tacoma company acquired by purchase a considerable tract of mineral land on which very extensive surface showings of good grade copper ore occurred, and immediately commenced systematic development on a large scale. An aerial tramway and bunkers were erected to facilitate shipment of the ore quarried from the outcroppings. The grade of the ore had been established previous to the commencement of the construction of these improvements through shipments made to both Tacoma and Crofton smelters. The permanency and extent of the ore bodies at depth are being determined by actual work.

The section in which these ore bodies occur embraces quite a large territory near the northwest end of the island, and during the past season has received more attention from prospectors than any other portion.

The coal mining industry of Vancouver Island is so firmly established, and the areas of coal-bearing land so well known that any description in this article is unnecessary, nearly all being embraced by the land grant of the Esquimalt and Nanaimo Railroad except about thirty thousand acres which was purchased by the New Vancouver Coal Co. from the Hudson's Bay Company previous to confederation and a limited area on Quatsino Sound owned by a San Francisco syndicate.

Owing to the discovery and use of fuel oil in California, which has in the past been the most important market for Vancouver Island coal, the collieries have not produced as large a quantitiy during the present year as previously. Roughly speaking, the output has, in the past, averaged nearly one million and a half tons a year, about two-thirds of which has been exported. The establishment of smelters on the island will prove beneficial to the coal mining industry, because of the increased demand for coke as well as coal.—W. M. Brewer in the Mining Record.

NICKEL STEEL FOR ENGINE FORGINGS.—The principal advantages of nickel steel over ordinary carbon steel for forgings lies in the relation which the elastic limit bears to the tensile strength and elongation, the elastic limit being in a sense the true strength of the metal. The elastic limit of nickel steel is very much higher than the elastic limit of carbon steel of the same tensile strength and elongation, very often 30 per cent. higher, and in some cases as much as 50 per cent. higher. The principal drawback to the commercial use of nickel steel is the first cost of producing it, which in

many cases is higher than the cost of ordinary finished forgings.

The United States Bureau of Steam Engineering is using nickel steel very largely in the principal engine forgings, the specifications being for H. G. M. F. tensile, 95,000; elastic, 65,000; elongation, 21 per cent. in 2 inches. These specifications are met and in many cases exceeded at the works of the Fore River Ship & Engine Co., some tests going as high as 74,400 elastic, 110,000 tensile, 21 per cent. elongation.

One virtue of nickel steel is the facility with which a low carbon steel will harden, it being the practice after a forging is forged and rough machined, to heat it and dip in oil, which hardens it very much; afterward the forging is submitted to an annealing process which removes any strains set up in the metal by the sudden cooling which it receives. Nickel steel, after the first cost of production, is not much more expensive to forge than any carbon steel that runs over 0.40 per cent. carbon, and about the same care is necessary in heating and forging as is required by a high carbon steel.

The market for nickel steel is gradually spreading to the commercial trade. Some of the largest engine builders are using it in work where special strength is required; notwithstanding the increased cost over common steel, it is money saved when we consider the cost of breakdowns and delays.

In cases where strength and lightness are required, the high elastic limit of nickel steel permits of using forgings of much less sectional area for the same strength. When the virtues of nickel steel become more largely known it will most surely be used largely in our merchant marine. One of the greatest benefits derived from its use is the fact that a fracture started is not nearly so apt to increase in size as in common steel or wrought iron. This is due to the great tenacity and strength of the metal.

Nickel steel if properly forged, oil tempered and annealed has a very fine grain, and the fracture, in testing, is close and homogenous and free from crystalline spots. Nickel steel permits of a very fine finish on polished surfaces, and is free from checks and seams, and compares very favorably with any other composition of either steel or wrought iron.

In forging the ingots the United States Government requires a discard of 20 per cent. from the top and 5 per cent. from the bottom from all bottom poured ingots and a discard of 25 per cent. from the top of all others. The wisdom of this policy is borne out in general practise, as the testing machine shows very quickly when the stock is taken too near the top or bottom of an ingot. Anybody trying to be economical in working up the discard always regrets the attempt, as it soon shows in the quality of material, and inspectors should be extremely careful that the full amount of discard is taken off and not embodied in the forgings.

A NEW GRAND TRUNK LINE.—The Grand Trunk Railway is preparing to construct a direct line to Sault Ste. Marie from Gravenhurst, a distance of 440 miles, and will incorporate the Sault Ste. Marie Railway Co. Mr. John Bell, K.C., general solicitor for the Grand Trunk, is solicitor for the new railway.

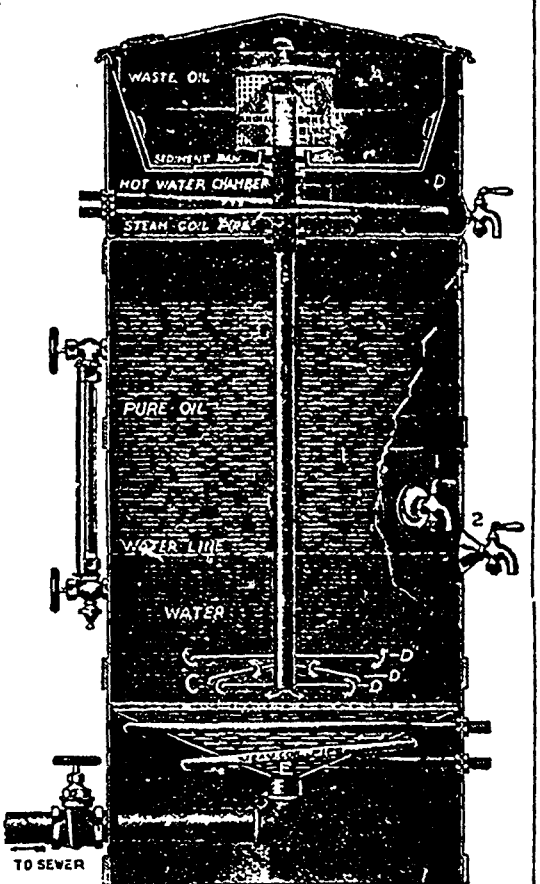
THE AMERICAN OIL FILTER.

A new oil filter which has just been placed upon the market by the Burt Mfg. Co., of Akron, Ohio, is shown in the accompanying illustration, and a brief description of the principles involved in its operation should be of interest to all readers who are familiar with the great possibilities for economy which are afforded by the collection of waste lubricating oil, and filtering it over and over until it has been entirely used up. The saving in this way amounts to from 50 to 90 per cent., depending upon how carefully the oil is collected after having been used. This is an economy which is not generally overlooked in large plants, but the American Oil Filter is made in small sizes which are a profitable investment in connection with engines where even as little as two barrels of oil are used in a whole year.

This new filter has been especially devised by the Burt Co., for the filtering of very heavy grades of oil which cannot be successfully cleaned in an ordinary filter because of the liability to clog up easily. The claim is made that such oils are readily purified by this filter, and obviously, therefore, it must give perfect results in the filtering of common engine oil. The fact that the oil is heated, and, thereby, thinned immediately upon being poured into the filter, accounts for its high speed of operation and superior capacity.

By referring to the illustration it will be seen that the pan for receiving the waste oil is surrounded by a hot water chamber through which passes a steam coil pipe. When this chamber has been filled with warm water, and the lower part of the filter has also been filled with warm water until it flows from faucet 2, the filter is ready for operation, the proper steam connections, of course, having been previously made. The cleansing of the oil is then accomplished as follows:

Through the filtering material in the cylinder the oil makes its way into tube B and down onto the filter plate D, where the pressure of the oil above overcomes the resistance offered by the weight of the water, and the oil spreads out in a very thin film, becoming thinner and thinner as it travels from the center to the circumference of the plate. Every particle of the oil is thus exposed to the action of the water. This process is repeated as



the oil flows upon plates D 1 and D 2. The separation of every foreign ingredient from the oil is thus made complete. The remaining impurities then settle by force of gravity to the bottom of chamber E, and are drained off by simply opening the valve. The pure oil is drawn from faucet 1.

Attention is called to the minimum of attention required by this filter. Any kind of filtering material may be used, or none at all, and the filtering material may be removed without interrupting the oil service. The method of cleaning the filter is very simple, requiring only that the cylinder at the top be unscrewed, the filtering substance removed and the sediment pan lifted out and emptied of the large quantity of dirt and grit which has collected in it through force of gravity. In nearly all other oil filters the bulk of the dirt is collected at the bottom—in The American Oil Filter it is collected at the top, greatly increasing the ease with which the latter may be cleaned.

The business of the Burt Mfg. Co. has grown to large proportions, over 12,000 of their oil filters having been sold during the past twelve years throughout the world. They are used in twenty-eight different countries, and have been adopted by ten different governments. These facts, in themselves, would seem to be an ample guarantee of satisfaction, but rather than allow any opportunity for dissatisfaction upon the part of the buyer, the Burt Co. are glad to allow a 30 days' trial of the filter to prove their claim that it will reduce lubricating oil bills at least 50 per cent., and satisfy in every way. Otherwise it may be returned at their expense.

Descriptive booklet can be obtained by writing to the Burt Mfg. Co., Akron, Ohio.

HOW SMOKE EXPLODES.—How smoke explodes in a burning building was graphically shown the Fire Insurance Society by Underwriters' Inspector Wm. McDevitt. Mr. McDevitt set a two-storey building, about three feet high on the table. Then he partly filled it with smoke from pieces of burnt wood. Thrusting in a gas jet, a smart explosion followed, and a tongue of flame and smoke ten feet long shot out of the windows. The inspector also endeavored to make, on a small scale what firemen call a back draught, which is really a downward explosion of smoke through elevator shafts or stairways where there are iron shutters, but the roof of the little house was blown off, and the smoke went up instead of downward.

The inspector used only plain wood to produce the smoke for this explosion. Varnished or oiled wood would, he said, have been more effective, as producing more and thicker smoke. Before giving

his practical illustrations of the explosive force of hot smoke he briefly explained the causes of such explosions. In a fire, he said, free carbon rises and mixes with the hydrogen; methyl, alcohol, creosote and other gases are also present in smoke. Of itself smoke would explode, he said, at a temperature of 600 to 800 degrees, but frequently it is ignited by sparks or by coming in contact with a flame.

When the smoke has become ignited, the inspector went on, the interior of the building is instantly converted into a mass of flame. The Hunt-Wilkinson fire strikingly exemplified that. When I first saw the fire great volumes of dense black smoke poured out of the windows. Suddenly there was an explosion, and the smoke was transformed into such flame as I never saw before.

Very thick smoke, when ignited, the speaker said, becomes a pillar of flame and rolls through a room with such a force as to shake the walls and make the windows rattle. If sprinkled with water there would be no explosion. Where formerly the firemen tried to keep smoke in, under the impression that it smothered the fire, they now immediately break in windows or skylights to let it out.

Several ways of preventing such explosions were described by Mr. McDevitt. In large stores, he said, if an air shaft of sufficient size were in the centre there would be no internal spread of fire.—Philadelphia Ledger.

COAL NEAR OWEN SOUND.—Coal has been found three miles west of Williamsford, and about fourteen miles from Owen Sound, Ont. The specimens taken up are a high grade of Massilon coal, and the value of the discovery depends altogether on the extent of the deposit, which will be tested at once. It may prove of inestimable importance to Owen Sound and that section of the province.

ABOUT TRUCKS.—The truck is only one of the minor things in a mill, and yet it is one of those which become absolutely essential in a well equipped mill, and as an essential it is necessary that the truck should be of the best possible construction. It is easy to build a truck, for it ordinarily consists of four wheels and a platform, but a truck built for a special design and for a good purpose must be far more than a mere platform with four wheels and a handle. If the truck is not well adjusted in all of its parts, each part being in harmony with all the other parts and all a part of a general design, the truck is no more suited to the purpose intended than a badly constructed and badly designed locomotive would be for drawing a limited express. There are trucks and trucks and the manufacturer who is buying trucks should not overlook the merits of well constructed trucks. The H. C. Slingsby truck, has been called the king of trucks, at least those made by Mr. Slingsby have been so designated, for he controls patents on trucks which are of great value. The manufacturer who is at all interested in trucks, whether for the dye room, for the finishing room,

or for any other room of the mill, or for the warehouse, might obtain information of value regarding trucks by addressing the head office of Mr. Slingsby, at Temple Building, Montreal, for whatever is pertinent to the subject of trucks is known to him. All of the Slingsby trucks offered to the Canadian trade are manufactured in Montreal.

PEAT DEVELOPMENT IN ONTARIO.—Concerning the development of the peat bogs of Ontario, A. G. Seyfert, of Stratford, Ont., writes to the United States Government as follows:

Several years ago I wrote a report on the peat development in Ontario that, if judged by the requests for more information received by me from all over the world, must have been of widespread interest. Hundreds of thousands of dollars have been expended during the past few years in experiments by the different companies in the Province for the perfection of machinery to turn out a fuel that will compete with coal. The peat plant known as Victoria Road, near Lindsay, Ont., has alone spent $60,000 the past year in completing its machinery, but the result is not yet satisfactory.

The Ellice Peat Co., successors to the Stratford Peat Co., near this city, have added a new machine known as an artificial drier. Under the old process, the bog was cut and sun dried. With the new machine the crude peat is run through the apparatus as fast as dug from the bog. Part of the moisture is evaporated by the heat of the process and the balance removed by the immense pressure the material undergoes, until it drops from the machine in cubes, ready for the market. This process of converting the raw material into marketable fuel is a great improvement over the old method, but further improvements are expected.

The whole question of making the inexhaustible beds of bog commercially valuable lies in the drying process. The genius who will invent a machine to satisfactorily extract the moisture from crude peat will not only make a fortune, but will be a public benefactor. Thus fa , the nearest solution to the problem lies probably in the machine invented by Mr. Dobson, now in use at his peat works at Beaverton, near Lake Simcoe, in northern Ontario. This machine consists of a press, drier and spreader, and is a most ingenious contrivance, for it cuts, pulverizes, and spreads the material at the same time. This reduces the moisture 50 per cent., and the balance is taken out by the drying process. The machinery in operation at this plant has a capacity of 20 tons a day. The bogs are 3 miles from a railroad, and yet the demand for the fuel is such that it brings $3.25 a ton at the plant and is retailed at Toronto at $4.25. The plant near Stratford now has a daily capacity of 25 tons and a ready sale for all the fuel it can produce. It is run night and day, with a view to supplying the demand caused by the scarcity of hard coal. Canada annually consumes nearly 3,000,000 tons of anthracite coal, all of which comes from Pennsylvania. Most of this is delivered during the summer months. The prolonged strike has changed the situation to such an extent that this summer no coal was delivered, and a serious fuel famine confronts the people of this latitude. This condition of affairs has given a tremendous impetus to the manufacturing of peat for fuel all over the Province, and will probably lead to the perfection of inventions, so that this crude bog will, in course of time, be the leading fuel and to a large extent take the place of hard coal.

COAL VS. ELECTRICITY. — Mr. C. J. Miller, Chairman of the Manufacturers Committee of the Board of Trade, of Orillia, Ont., makes an interesting calculation, by which he demonstrates the substantial nature of the inducement which that town is holding out to manufacturers in offering them electric energy at $16 a horse power. Basing his sum on the accepted maxim that under the very best conditions, with expansion engines, and the most modern machinery, it takes 4 pounds of soft coal to make a horse power for an hour, he figures it out as follows, making a 100 h.p. power plant his standard.

It will require 4,800 pounds to produce 100 h.p. for 12 hours. Taking soft coal as worth $4 a ton it would cost $9.60 to supply fuel for the boilers for a day, or $2,880 for a year of 300 days. Add $500 for a man to run the plant, and we have $3,380 for such a plant for a year. In addition to this there is the cost of water, oil, the trouble and expense of handling the fuel, the interest on money invested in it, and many other small items connected with a steam plant. But taking the figure as it stands, Orillia offers a similar amount of power superior in convenience and steadiness for $1,600 a year—and nothing extra for overtime. This in case of a factory using 100 h.p., and having to produce it in other places by coal, is worth more than a bonus of $1,700—for the figures given above are based on favorable conditions and are lower than could be attained in actual practice.

PLATINUM IN BRITISH COLUMBIA.—Platinum in ores have been discovered in the Similkameen district, of British Columbia, according to the report given by J. H. MacIntosh, a mining man from that district. Platinum is one of the rarest of metals, and is more valuable than gold, the price averaging $21 an ounce. Th Similkameen has been long known for her rich coal lands, but another matter which is bringing the Similkameen to the fore is the discovery of platinum in ores in that district. Platinum has been found for years in the placers of Granite creek, which has been one of the greatest producers of that metal in Canada. Platinum in ores is rarely met with, however, and the discovery of that rich metal is giving an impetus to mining in the district. Representatives of some of the largest platinum refineries of the East have visited the district and made tests of the properties. Mr. Moore, of the Canadian Pacific Railway smelter at Trail, has been sent in by that company, and has been busy sampling the ores.

MINERALS IN THE NICOLA VALLEY.—Mr. H. F. Evans of Lower Nicola, B.C., who is prominently indentified with the mineral development of the Nicola Valley has sent to this office a number of samples of the minerals of that section. The Nicola Valley is rich in all kinds of minerals including coal, and progressive miners are now at work developing the region The fire clay industry is certain to become an important one there owing to the abundance of the product. Fullers earth, iron ore, etc., are also abundant.

OPPORTUNITIES.

The following enquiries have been received at the offices of the High Commissioner for Canada in London, and at the Canadian Section of the Imperial Institute, London, England.

NOTE.-Those who may wish to correspond with any of these enquirers can obtain the names and addresses by applying to the CANADIAN MANUFACTURER, Toronto. No charge for giving information. When writing refer to the numerals opposite the enquiries, and enclose two-cent postage stamp for reply.

853. THE CANADIAN MANUFACTURER is in receipt of an enquiry from a reliable concern in Melbourne, Australia, for names of Canadian makers of news paper, both flat and in rolls, who would probably become large purchasers of the article.

854. A London firm having branches at Beira, Port Elizabeth, and Cape Town, desires to get into communication with Canadian firms wishing to establish agencies in South Africa for Canadian produce and manufactured goods.

855. A firm in Portsmouth desires to open up business relations with firms in Canada who are exporters of fruits, such as apples, etc. They will undertake sales at a fixed commission.

856. A Liverpool house asks to be placed in correspondence with Canadian manufacturers of birch squares, turned legs and other chair stock, also of drawer bottoms.

857. A British house in Japan exporting druggists' lines wishes to arrange with Canadian firm of good standing to handle their goods.

INDUSTRIAL PUBLICATIONS.

The Bourne-Fuller Co., Cleveland, Ohio, is sending out a neat set of blotters calling attention to their various products.

"The American Cotton Industry" is the title of a volume by F. M. Young, just issued by Methuen & Co., of London, Eng., in which the modern processes of the cotton textile manufacturing industry are fully described.

The August volume of the Canadian Patent Office Report just issued has been received at this office.

The Superior Portland Cement Co., Toronto, has issued a neat prospectus which contains much information and many illustrations relative to the use of Portland Cement, and incidently calling attention to the plans of the company.

"Dye Stuffs" is the name of a monthly publication issued by the Cassella Color Co., New York City. It contains much information for textile workers and calls attention to the products of the company.

The "coal issue" of the "Indian Mercury," of Amsterdam, issued some time ago, contains much valuable data concerning the coal fields of the world which makes interesting reading at this time in view of the coal famine in the New World.

The Toronto & Hamilton Electric Co., Hamilton, Ont., has just issued a neat catalogue calling attention to the line of direct current dynamos and motors and induction motors which the company has lately added to its line of work. The catalogue fully describes and illustrates these lines and calls attention to the various other products of the company, and should be in the hands of all persons interested in this line of power machinery and appliances.

Bulletin No. 43 of the United States Department of Labor, just issued, from Washington, contains a report to the President on the anthracite coal strike, prepared by Carroll D. Wright, Commissioner of Labor.

Butterfield & Co., Derby Line, Ver., and Rock Island, Que., have just issued a very attractive catalogue and price list of their line of stocks and dies, die plates, taps, engineers and steam fitters tools, etc. The catalogue contains 64 pages and in it are illustrated, catalogued and listed more than sixty of the products or the company.

The Berliner Telephone Co., London, England, has sent us a catalogue on telephones and supplies manufactured by the company, attached to which is a complete price list.

MARKETS.

This Department of THE CANADIAN MANUFACTURER is devoted to the interests of the Hardware Trade.

THE CANADIAN MANUFACTURER is distributed to the Wholesale and Retail dealers in Hardware, to manufacturers of Agricultural Implements, of Iron and Wood-working Machinery, of Electrical Appliances, of Steam Engines and Boilers, to Engineers and Foundrymen, and to Dealers in Machinery and Steam Fitters' Supplies throughout Canada. There are more than 10,000 manufacturing concerns in Canada which use Steam as a Motive Power. We reach them all. Every recipient of this paper is a buyer of Hardware of one kind or another; and Advertisers will do well to bear this in mind.

Following are reports and observations relating to the markets of Canada and elsewhere, having reference to Hardware, Metals, Paints, Oils and such specialties as are usually handled by jobbers and dealers in such goods. Following these items will be found current market quotations on such goods, and the trade are requested to suggest to the publishers any improvements by which it is believed the quotations may be rendered as correct and valuable as possible.

TORONTO, October 17, 1902.

There have been few changes in the general market conditions during the past week, prices continuing much the same as last reported, with the usual fluctuations in the various lines. The prospects for an early settlement of the coal strike will likely have a very encouraging effect upon nearly all industrial markets. The scarcity of fuel for foundry and furnace purposes still continues, and a number of establishments are shut down in consequence.

The following metal and hardware prices are quoted:

THE TORONTO MARKET.—The feature of the market this week has been a good active demand for seasonable goods. The outlook for trade in the West, as well as in other parts of the Dominion, is very promising. Values are generally firm. Cut nails are 2½c per keg higher. Makers of hay rakes have issued a new list, which quotes the less expensive lines $1.20 base and 40 per cent. discount. Sash weights are 25c per cwt. higher. Rope halters are 5 per cent. higher. American manufacturers have advanced the prices of builders' hardware. Glass is firm owing to an unsettled feeling in the foreign labor markets. Harvest tools are very firm and the present tendency of the market is upward. Portland cement is 40c per barrel higher.

In metals there has been a fair movement, especially for some lines of sheet. Copper is firmer.

Barbed Wire—$2.77½ to $3 per 100 lbs.

Binder Twine—650 ft., 15c; 600 ft., 14c; sisal, 500 ft., 11½c.

Building Paper—Dry sheathing, 35c; tar sheathing, 45c.

Bolts and Nuts—Carriage bolts, common, $1 list, 50 per cent.; carriage bolts, full square, $2.40 list, 55 and 10 per cent.; carriage bolts, Norway iron, $3 list, 55 and 10 per cent.; machine bolts, all sizes, 50 and 10 per cent.; coach screws, 60⅔ and 10 per cent.

Cement—Canadian Portland, $2.80 to $3.20; Canadian hydraulic cements, $1.35 and upwards.

Cut Nails—$2.43 to $2.45.

Galvanized Wire—Nos. 6, 7 and 8, $3.50 to $3.85; No. 9, $2.85 to $3.15; No. 10, $3.60 to $3.95; No. 11, $3.70 to $4.10; No. 12, $3 to $3.30; No. 13, $3.10 to $3.40; No. 14, $4.10 to $4.50; No. 15, $4.60 to $5.50; No. 16, $4.85 to $5.35.

Glass—Terms, 4 months, or 3 per cent. off cash 30 days. Discount from pane price list, 33⅓ per cent.

Green Wire Cloth—$1.37½ per 100 square feet.

Harvest Tools—60 per cent. to 60 and 10 per cent.

Horse Nails—"C" brand, oval, 40, 10 and 7½ per cent.; "M" brand, 50, 10 and 5 per cent. off; countersunk, 60 per cent.

Horseshoes—No. 2 iron shoes, light, medium and heavy, $3.45 f.o.b.; snowshoes, $3.70.

Iron Pipe—Black, 1 inch, $5.20; galvanized, 1 inch, $7.20.

Poultry Netting—Two-inch mesh, 19 w.g., 60 per cent. off the list; 2-inch mesh, 18 w.g. and heavier, 50 and 10 per cent.

Rope—Pure Manila, 15c; sisal, 12½c; British Manila, 13c; lath yarn, 11½c to 12c.

Rivets and Burrs—Iron rivets, 60 and 10 per cent.; iron burrs, 55 per cent.; copper burrs, 30 and 10 per cent.; copper rivets and burrs, 45.

Smooth Steel Wire—Base price, $2.60 per 100 lbs.; fine steel wire, 25 per cent.

Spades and Shovels—40 and 5 per cent.

Wire Nails—Base price, $2.50 to $2.55.

Screws—Flat head, bright, 87½ and 10 per cent. off the list; round head, bright, 82½ and 10; flat head, brass, 80 and 10 per cent.; round head, brass, 75 and 10 per cent.; flat head, bronze, 70 per cent.; round head, bronze, 65 per cent.

Old Material—Agricultural scrap, 60c; machinery cast, $13 to $14; stove plate,

$10; No. 1 wrought, $11.50 per ton; No. 2, $5.50; new light scrap copper, 8c to 8½c; coil wire, scrap, 10c; light brass, 5 to 5½c; heavy yellow brass, 8c to 8½c; heavy red brass, 9½c; scrap lead, 2½c to 2½c; zinc, 3c; scrap rubber, 5c to 5½c; good country mixed rags, 50c to 60c.

Antimony—9½c per lb.

Bar Iron—Common, $1.95 to $2.05 per 100 lbs.

Black Sheets—28-guage, $3.15; dead flat, 26-guage, $2.50.

Brass—Sheet and rod, discount 15 per cent.

Canada Plates—All dull, $2.90 to $3 per box; half-polished, $3 to $3.10, and all bright, $3.75 to $3.85.

Copper—Ingot at 13½c per lb., and 22c to 23c for sheet.

Galvanized Sheets—$4.30 to $4.50.

Lead Pipe—Discount 35 per cent.

Pig Iron—No. 1, $23; No. 2, $22.50.

Pig Tin—32c to 33c.

Pig Lead—3½c to 3¾c.

Solder—Half and half, 20c; refined, 19c; wiping, 18½c.

Tool Steel—B. C. and black diamond, 10c to 11c.

Spelter—5c to 6c per lb.

Tin Plates—I. C., $4.75 to $5; cokes, $4.25.

Terne Plates—$8.50.

Tinned Sheets—7½c to 8c.

Zinc Sheets—6c to 6½c.

Paints and Oils—Trade is a trifle quiet in staple lines, as it is usually on the approach of cold weather when outdoor work is restricted. Turpentine is dearer. Linseed oils are lower.

White Lead—Ex-Toronto, pure white lead, $5 to $5.25; No. 1, $4.62½ to $4.87½; No. 2, $4.25 to $4.50; No. 3, $3.87½ to $4.12½; No. 4, $3.50 to $3.75; dry white lead, in casks, $5.02½.

Red Lead—Genuine, in casks of 560 lbs., $5 to $5.12½; in kegs of 100 lbs., $5.50; No. 1, in casks of 560 lbs., $4; kegs of 100 lbs., $4.50.

Paris White—Is quoted at 90c to $1.

Whiting—65c per 100 lbs.; gilders' whiting, 80c.

Paris Green—Barrels, 18¾c; kegs, 19c; drums, 25 lbs., 20c; tins, 1 lb., 21½c; packages, 1 lb., 20½c.

Benzine—In barrel lots, 18¾c per gal.; gasoline, 21½c to 22½c.

Plaster Paris—New Brunswick, $2 per barrel.

Gum Shellac—In cases, 35c; in less quantities, 40c.

Putty—Bladders, in barrels, $2.25; bladders, in 100-lb. kegs, $2.40; bulk, in barrels, $1.90; in less quantities, $2.05.

Pumice Stone—Powdered, $2.50 per cwt. for barrels, and 4 to 5 cents per lb. in less quantities and 8c in barrels.

Liquid Paint—Pure, $1.20 to $1.40 per gallon.

Castor Oil—English, in cases, 9½c to 10c per lb., and 10c to 10½c in single tins.

Linseed Oil—Raw, 1 to 2 barrels, 70c; boiled, 73c, delivered.

Turpentine—Single barrels, 76c; 2 to 4 barrels, 75c.

Refined Oil—American water white, 17c to 17½c in bulk; Sarnia water white, 16c to 16½c in barrels; Sarnia prime, 15c to 15½c in barrels.

MONTREAL HARDWARE PRICES.—Wholesale hardware men say they look for a gradual strengthening of the entire market, unless the coal strike is speedily settled. Already manufacturers are paying from two to three times as much for fuel as formerly, and the inevitable result is that the price of their product will be advanced.

So far, however, the market has been affected very little, if any. Staple lines show no change, save that cut nails in car lots have been advanced from $2.37½ to $2.40.

Wholesalers report a continuance in the demand for all lines of goods, more especially for seasonable ones. Travellers are sending in large orders, and remittances are prompt and unusually satisfactory, while the outlook for future trade continues most encouraging.

Following are the Montreal quotations on the principal lines:

Bar Iron—Merchants' bar, $1.95 per 100 lbs., in small quantities.

Black Sheets—$2.40 for 8 and 16 guage per 100 lbs.

Galvanized Iron—No. 28, Queen's Head, $4.40; Appollo, 10¾ ounces, $4.40, and Comet, $4.25, with 25c extra in less than case lots.

Ingot Tin—31c per lb.

Lead—$3.25 per 100 lbs.

Terne Plates—$7.50 per box.

Lead Pipe—7c for ordinary, and 8c for composition waste, with 37½ per cent. off.

Iron Pipe—Black pipe, ¼, $2.40 per 100 feet; ⅜, $2.65; ½, $3; ¾, $3.70; 1 inch, $5.25; 1¼, $7.40; 1½, $8.90; 2 inches,

$12.40; galvanized, ½, $4; ¾, $5.05; 1 inch, $7.25; 1¼, $10.10; 1½, $12.15; 2 inches, $16.70.

Coil Chain—No. 6, 12½c.; No. 5, 10½c.; No. 4, 10c.; No. 3, 9½c.; ¼-in., 7½c. per lb.; 5-16, $5.05; 3-5, $4.40; 7-16, $4.20; ½, $4; 9-16, $3.95; ⅝, $3.70; ¾, $3.65; ⅞, $3.65; 1, $3.65. In carload lots an allowance of 10c. is made.

Sheet Zinc—In cask lots $5.50; in less, $5.75.

Antimony—10c per lb.

Tinplates—$4.25 for coke; $4.75 to $5.25 for charcoal.

Canada Plates—52's, $2.70 to $2.80; 60's, $2.85 to $2.90; 75's, $2.80 to $2.85; full polished, $3.75; and galvanized, $4.25 to $4.35.

Tool Steel—Black Diamond, 8c; Jessops, 13c per pound.

Steel—Sleighshoe, $2.20; tire, $2.30; spring, $3; reeled machinery, $2.85, and toe calk, $2.90.

Barbed Wire—$3 f.o.b. Montreal in less than car lots.

Horseshoes—Iron shoes, light and medium patterns, No. 2 and larger, $3.35; No. 1 and smaller, $3.60; snow shoes, No. 2 and larger, $3.60; No. 1 and smaller, $3.85; X.L. steel shoes, all sizes, 1 to 5, No. 2 and larger, $3.45; No. 1 and smaller, $3.70; featherweight, all sizes, $5; toe weight steel shoes, all sizes, $6.25 f.o.b.

Horse Nails—Discount of 60 per cent. on oval heads, and 65 and 5 per cent. on countersunk heads; C brand, discount of 40, 10, 7½ per cent.

Wire Nails—$2.55 in small lots, and $2.50 for car lots, f.o.b. Montreal.

Cut Nails—$2.45 for small lots, and $2.40 for car lots.

Building Paper—Tarred felt, $1.70 per 100 lbs.; 2-ply ready roofing, 85c per roll; 3-ply, $1.10 per roll; carpet felt, $2.25 per 100 lbs.; dry sheathing, 35c per roll; tar sheathing, 45c per roll; dry fibre, 50c per roll; tarred fibre, 60c per roll; O.K. and I.X.L., 65c per roll; heavy straw sheathing, $30 per ton; slaters' felt, 60c per roll.

Cordage—Manilla, 15c per lb. for 7-16 and large; sisal, 12½c per lb., and lathyarn, 11½c per lb.

Scythes—Cast steel, $5; Clipper, $6; Climax, $6.50; concave, $7; grain, $10; bush, $6.

Galvanized Wire—Nos. 6, 7 and 8 gauge, $3.45; No. 9, $2.80; No. 10, $3.55; No. 11, $3.65; No. 12, $2.95; No. 13, $3.05; No. 14, $4.05; No. 15, $4.55; No. 16, $4.80; No. 17, $5.20; No. 18, $5.45.

Smooth Steel Wire—Bright iron and annealed on a base of $2.60 per 100 lbs., f.o.b., Montreal, Toronto, Halifax, London, Hamilton and St. John. Net extras per 100 lbs. are as follows: Coppered wire, 60c.; tinned wire, $2; oiling, 10c.; spring wire, $1.25; best steel wire, 75c.; bright, soft drawn, 15c.; special hay-baling wire, 30c.

Fine Wire—The discount is 25 per cent.

Brass and Copper Wire—Discount 62½ per cent.

Fence Staples—Bright staples sell for $2.90 per 100 lbs. keg, and galvanized at $3.25, with an extra of 25c. for 25 and 50 lb. packages.

Harvest Tools—Discount of 60 per cent. and 10 per cent. off list prices for balance of 1902 and for season of 1903.

Oils and Putty—Turpentine, 74c per gal.; linseed oil, raw, 72c; boiled, 75c; Newfoundland pure prime cod, 32c; castor oil, 8 to 10c; putty, in bulk, bbls., $1.90; in bladders, per 100 lbs., in bbls., $2.25; bladders, in boxes, $2.40; tins, $2.25 to $2.65.

Glass—First break, per 50 feet, $2.10; second break, per 50 feet, $2.20; per 100 feet, third break, $4.70; fourth break, $4.95; fifth break, $5.20; sixth break, $5.70; seventh break, $6.20.

Leads and Paints—White lead, Government standard, $5 to $5.25; exterior, $4.75; No. 1 grade, $4.65; No. 2 grade, $4.50; red lead, pure, in casks, $4.50; in kegs, $4.75; No. 1, in casks, $4.25; in kegs, $4.50; pure mixed paints, $1.20 gallon.

BRITISH PIG IRON MARKETS.—Messrs. William Jacks & Co., 49 Leadenhall street, London, E.C., England, under date of October 3, 1902, quotes as follows:

Since writing you last the market position here has remained unchanged, and prices are as under:

No. 1 Gartsherrie, 66/6 per ton, f.o.b. Glasgow. No. 3 Gartsherrie, 59/9 per ton, f.o.b. Glasgow. Nos. 1, 2, 3 Cumberland Hematite 69/- per ton, f.o.b. Liverpool. Special analysis, 73/- per ton f.o.b. Liverpool. Refined D.T.N. Hematite in small pigs, 87/- per ton, f.o.b. Liverpool.

BUFFALO PIG IRON MARKET.—Office of Rogers, Brown & Co., Buffalo, N.Y., October 14, 1902.

The most pronounced feature of the market is its inactivity. Demand for deliveries on old contracts continues without abatement, but new orders are not being considered at present.

The very unnatural and unhealthy atmosphere which has surrounded the industrial situation recently has taken the enthusiasm out of most people. Without doubt the settlement of the coal strike will be both an actual and a sentimental relief to the whole business world.

We quote below cash f.o.b. cars Buffalo:

No. 1. Strong foundry coke iron, Lake Superior ore $25.75

No. 2. Strong foundry coke iron, Lake Superior ore $25.25

HOW WILL THE ISTHMIN CANAL AFFECT TRADE?—Those who have

watched the failure of the different organizations which have discussed or attempted the project of cutting a waterway through the narrow neck of land which connects North and South America, may feel disposed to regard the undertaking as more or less visionary, says the Montreal Star. In fact, the proposal has frequently been referred to as "The Navigator's Dream." It is a dream, however, which sooner or later is sure to be realized. Interests demand it which are too powerful to be denied; the only wonder is that it has been delayed so long.

Ever since the United States battleship Oregon was compelled to make a hurried voyage around the Horn from California to Cuba during the recent Spanish war, it became a settled thing that the canal had to be built, and although international interests may delay matters for some time, the completion of the project is almost sure to be accomplished within a few years. The United States Government now has the matter in hand, and it was lately announced that they were prepared to pay $40,000,000 to the Panama Canal Co., of America for its rights and privileges, the cost of the canal, completed, having been estimated at about $185,000,000.

Just to what extent the completion of the canal will affect Canadian trade, few would be venturesome enough to predict, but the subject furnishes food for some interesting speculation.

The length of the canal is 46 miles, and it is estimated that an ordinary ship will pass through it in 48 hours. The distance from New York to San Francisco around the Horn is estimated at about 13,174 miles, while that via the proposed Nicaragua canal, which approximates the Panama, is only 4,907, or 8,267 miles shorter. Averaging the speed of steamships at 15 miles an hour, a saving of 555 hours, or 23 days will be found to be effected over the old route.

Manifestly one of the first and most powerful interests with which the canal would come into conflict is that of the transcontinental railways both of the United States and Canada. It is an axiom with transportation men that water carriage is vastly cheaper than rail and it will readily be seen how inimical to railway interests would be the building of a canal which would reduce the duration of a sea voyage by 23 days. They could only hope not to be affected, on the supposition that, even with the saving of 23 days, the voyage would still require so much time that steamship men would not be able to offer freight rates which would be sufficient inducement to shippers to change from rail to water transportation.

That this condition does not exist in the case of the Panama canal is shown by the fact that a monthly service of both sailing ships and steamships is already in operation between Liverpool and other English ports and Pacific coast ports. In fact, it is claimed by some of the British Columbia merchants that it costs more to ship goods from Liverpool to Winnipeg than it does from Liverpool to Vancouver, the latter city having the advantage of the all-water route, while Winnipeg can only be reached by water and rail.

This being so, it does not require much argument to convince the average business man that a large proportion of the freight now passing through Canada, will, upon the completion of the canal, go by that route instead.

And in proportion as the carriage from England by the all-water route is cheapened as compared with water and rail, will the merchant of Eastern Canada lose the vast trade in goods imported from the other side of the Atlantic which he has been counting upon doing with the great Canadian West. Of course, there will always be an immense trade in goods in which time is the most valuable consideration, and upon these the canal will have little or no effect. Also railway freights will doubtless be lowered greatly to suit the new conditions, but it must be that the all-water route will claim a much greater proportion of the freight business than it now does immediately it is shortened by the building of the canal.

That this is no dream and that eastern business men would do well to arrange to meet the new conditions as they arise, the following from the Vancouver News Advertiser will be additional testimony:

A large proportion of the goods consumed and required by the populace of the Kootenay not only does not originate at the Coast, but is neither produced nor manufactured in Canada. This fact militates against the Eastern merchant, and in favor of the wholesalers of the Pacific

coast cities. Such articles as teas, coffee, rice, sago, tapioca, salt, many classes of cloth and dry goods, tobaccos, fresh and canned fruits, and all classes of English goods, lumber, sugar, fish and innumerable other articles can be and are supplied to the cities and towns of the Kootenay, and even to Calgary, Alberta and beyond, from Vancouver and the Coast cities at rates that enable the retailer to profitably dispose of them notwithstanding the competition of the Eastern article. Vancouver, Victoria and New Westminster, being coast cities and sea ports are able to obtain a very large percentage of their goods by cheap water routes, whereas the merchants of the Eastern cities have to pay the Atlantic rates and the railway freight rates in addition.

PRODUCTION OF ELECTRICITY DIRECT FROM COAL.—Exactly a century ago Volta discovered the electric current, and only two years later, by means of it the dissolution of water into its component parts was effected. In 1821 Sir Humphry Davy for the first time demonstrated the electric arc between two carbon points. Then and long afterwards the current was entirely produced by electric batteries, giving but feeble results, at great cost, owing to the expensive nature of the chemicals used. Still, the results were in so far satisfactory, as the used up zinc, or rather the heat developed during the process in Daniel's battery, was completely converted, giving 100 per cent. of electricity.

However, it was not until coal supplanted the expensive zinc in the production of electricity that the latter became of importance outside the laboratory, and began to interest the engineer. This was due to Siemens' great discovery of the dynamo, which during the last 30 years has been improved to such an extent that we now can produce any desired strength of current at a relatively small cost. That the cost is still high is due to the roundabout way in which the current is obtained from the coal.

In discussing the subject before the Chemical Society at Berlin, Dr. Weber recently gave some figures showing what an enormous saving might be effected if the steam engine or other motive power could be dispensed with, and the electricity obtained direct from the coal.

If we examine the present process in detail, we find that the most effective boiler can only make use of about 81 per cent. of the heat stored in the coal, while in the latest type of steam engine only 16 per cent. of the energy of the steam comes into play; the rest is lost. Better results are achieved with the dynamo which converts 90 per cent. of the received mechanical power into electricity, and similarly the electric motor is able to produce power equivalent to 90 per cent. of the electricity passing through it. Further improvements are not likely to greatly better these results as long as the process remains the same, for just the worst link in the chain of production, viz., the steam engine, has already been brought to a state of perfection not easily surpassed.

The above figures show that only about 12 per cent. of the energy stored in the

coal can be utilized, and hence one can understand the importance of discovering some means of simplifying the process. If by some way electricity could be obtained direct from the coal so as to give even 50 per cent. only of the stored energy, all steam engines would disappear from use immediately, as it would be so much cheaper then to obtain whatever power is needed by means of electric motors, not to say anything of the greater convenience of the latter. Such a discovery would do even more, as it would postpone by three or four times its length the dreaded period of exhaustion of the available supply of coal, so its importance to a country like England may well be realized.

As long ago as 1842, Robert Mayer, to whom we owe the theory of the conservation of energy and the mechanical equivalent of heat, pointed out the great advantage of utilizing the energy of coal in the direct production of electricity. But it was not until the success of the dynamo had practically demonstrated the value of the coal, that the loss in the process was fully realized and attempts were made to mitigate it.

The great difficulty is the resistance to chemical reaction on the part of the coal at ordinary temperature. To overcome this, coal was heated in an iron pan with saltpetre or soda, when an electric current was obtained from the coal to the iron, but it was found that the heating took away all the advantage. So further experiments were tried by mixing coal with strong sulphuric acid without applying heat, but this process also proved too expensive, and the only gain of these attempts was the determination of the electrotechnic equivalent of coal. The want of success, has, however, not discouraged chemists, many of whom are still experimenting in this direction, and Dr. Weber thinks that their efforts, if sympathetically carried out, must lead to the solution of the problem before many more years have passed.—Kuhlow's.

PROPERTIES OF NICKEL STEEL.—Analyzing the results of various and many investigations, experiments and tests that have been made in order to obtain scientific deductions on which to base consistent methods of manufacturing different grades of nickel steel suitable for the requirements of varied service, it is found that the remarkable properties of this alloy are imparted to it through the peculiar effect that the nickel has on the carbon contained in the steel. We understand that in the cooling of carbon steel from the fluid state the iron crystallizes out of the mother liquor, and from the latter a carbide of iron cement is formed which surrounds the iron crystals and binds them together, and so the amount of carbon in the composition of the steel has much to do with the physical properties of the metal, this element causing a peculiar hardening effect, especially under the influence of water or oil-tempering. Now with iron, practically pure, or containing only a very small amount of carbon, nickel forms a homogeneous alloy much tougher and stronger than either nickel or iron alone, each one per cent. of nickel up to five per cent. causing an increase of about 5,000 pounds in elastic limit and 4,000 pounds in tensile strength.

The effect of nickel upon the resultant metal as the percentage of carbon increases, varies within limits in accordance with the amount of the latter in the alloy. A range of from three to six per cent. is found to be best adapted for general service.

Nickel-steels show an increase in elongation and contraction of area when compared with simple steels of the same tensile strength. A steel having 0.25 per cent. carbon and three per cent. nickel is equivalent to a 0.40 per cent. carbon steel in tensile strength, while the elastic limit and elongation are higher. In steels of less than 0.50 per cent. carbon the elastic limit is about 50 per cent. of the ultimate strength, and usually less than this when properly annealed. Nickel raises the proportion about five per cent. for each one per cent. of nickel added.

Nickel-steel for commercial uses (three to six per cent.) is not hard when properly annealed, but is exceedingly tough, the nickel seeming to impart some of its own properties to the alloy. In color it is lighter than simple steel of the same carbon, and when polished has the

appearance of being nickel-plated. The corrodability of nickel-steel lessons as the amount of nickel in its composition increases. Low percentages of nickel affect this property slightly; high percentages, however, about 18 per cent., tend to produce an alloy which is practically non-corrosive.—H. F. J. Porter, in Cassier's Magazine.

JAPANESE MARKETS.—A few years ago Mr. George Anderson of Toronto was commissioned by the Department of Trade and Commerce to proceed to Japan for the purpose of investigating the chances of opening up a trade in Canadian goods with that country. On his return he reported that there were favorable openings for many lines of Canadian goods, and strongly recommended our manufacturers to look after their interests in the ever-increasing markets of the East. Some of the articles especially mentioned by Mr. Anderson were: flour, canned goods, condensed milk, biscuits, food-stuffs generally, leather, rubber and gutta percha goods, books and stationery, asbestos, cottons, lumber, pulpwood, papers, electrical apparatus, etc. The Department of Agriculture has now in preparation an exhibit for the great exposition to be held at Osaka, Japan, next March. The Japanese Government has set aside a separate building for Canada's exclusive use, while exhibits from other foreign countries will be shown in what is called the foreign sample building. Canadian manufacturers interested in the sale of their goods in Japan, China, etc., will do well to communicate with the Commissioner of Exhibitions, care of the Department of Agriculture, Ottawa, from whom all information concerning this Exhibition can be had.

THE TRANSVAAL TARIFF AMENDMENTS.—According to a despatch from Pretoria an extra issue of the Official Gazette says:

The amended tariffs are only provisional, the Government desiring ultimately to enter the customs union on a basis which will not sacrifice vital interests of the Transvaal. The negotiations thus far have been unavailing because the Transvaal does not feel justified in increasing the duties on certain foodstuffs to the extent which the coast colonies consider necessary for the protection of their products. In the meanwhile the conditions in the Transvaal preclude further delay in adjusting the unjustifiably high duties and the duties ordinarily reasonable but excessive in a country which practically has to be refitted. The duties therefore are abolished on machinery, building materials, metals and agricultural implements. The large sacrifice of revenue involved is considered preferable to increasing by taxation the cost of renewing industrial capital of the colony.

As it is imperative, however, to replace a portion of the loss, the duties on wines and spirits are increased. The existing duty on dynamite is left unaltered owing to questions bearing on the conditions of its manufacture and importation into the Transvaal being under discussion, but the duty will be separately dealt with as soon as possible. The duty of six cents each on poles, two cents a pound on sulphuric acid, six cents a pound on lead and twelve cents a pound on copper wire are cancelled. All iron will be admitted free, and the cost of building will be greatly reduced by the removal of the duties on cement and timber.

The alteration of the duty on cigars and cigarettes from $3.75 per hundred cigars, without distinction of size, to $1.50 a pound, and on cigarettes from $3 75 per thousand cigarettes to $1 a pound, is considered equitable.

The special duties on jams and confectionery of $10 per 100 pounds will be reduced to three cents per pound; the special duty of $2.50 on oats, $1 25 on oat hay, and the special duty on coal will be abolished.

Anomalous duties will be amended. Many of the changes to be made have been agitated for years, especially with regard to matches, which were specially taxed $1 per gross for the benefit of the company owning the concession. This tax will be now reduced to fifty cents per gross.

No mention is made of the special duties which were suspended in 1897 owing to the agitation here, but which the Government reserved the right to re-impose. They remain suspended, but it is expected that they would be repealed.

INTERNATIONAL STORES.—What are called "line stores," and in many cases are so designated by large signboards, are a well known institution along the boundary between Canada and Maine, writes a Bangor correspondent of the Philadelphia Record. The governments of both Canada and the United States look with suspicious eyes upon these stores, and there has been more or less talk of joint action to prevent the erection of any buildings upon the boundary line.

The line stores on the Quebec border are usually built exactly on the boundary line, and are double stores. The boundary line is marked by iron posts, and sometimes a store is built over one of these posts, which protrudes from the middle of the floor.

There is a door on each side of the line, with which line the shelves and counter run parallel, and thus there is a Canadian store and an American store, each with its own entrance. On the Canadian side are Canadian goods, such as woolens, blankets, dress goods, ready-made clothing, fur coats and robes, carpeting, buttons, sugar, and some lines of hardware. On the American side are cotton goods, prints, Yankee notions, tobacco, jewelry, kerosene oil, etc., and on this side farm produce is taken in exchange. The Canadian and American goods are kept each on their own side, and no attempt is made to conceal the fact that both are there. The Canadian customer can go in at the Canadian door, purchase Canadian goods on the Canadian side, and go out again without having crossed the boundary line at all, and the American customer can do the same on his side, but while the storekeepers keep the two classes of goods separated they do not ask the customers any questions, and they can buy at either counter and make their exit by either door.

Stores of this kind are chiefly found on the line between the Province of Quebec and the States of Vermont and New Hampshire and the northwestern part of Maine, but they are not unknown on the line that divides northeastern Maine from New Brunswick. They are always a mile, generally several miles, from a custom-house station. It is related that one man who built a line store took up a boundary post and did not replace it. He afterwards sold out and moved away, and the post was set down at random by his successor. Sometimes a store is on one side of the line, with a warehouse exactly on the line. There are a few manufacturing industries located on the line, including, it is said, one that makes patent medicines and requires considerable alcohol.

In some places there are two stores, separated by but a few feet and connected by a board walk, by which goods can easily be transported from one building to the other. It is a very convenient arrangement for people who don't mind dodging the customs laws. A provincial man can step across the floor to the Maine side and buy some tobacco, and a Maine man can move across to the New Brunswick side and get some liquor, all under the same roof. Farm produce can be changed from Canadian to United States produce in short order. A manufacturer can get raw material from both sides. Canadian produce can be exchanged for Yankee jewelry or notions, Canadian woolens into American cottons, and so on. Of course it is not admitted for a minute that the line houses were built for smuggling purposes; but they are there, right on the line, and it would be a great relief to the two governments if they were not there.

FAILED TO GET ORDERS.—The efforts of the Canadian Manufacturers' Association to secure 2,000 tons of Scotch domestic coal for Toronto manufacturers at $7 per ton, laid down at Montreal, failed. The offer was good until noon Monday, and enough subscriptions could not be secured. The secretary asked quotations on 700 tons, as that amount was wanted. Many citizens applied, under the impression that the offer held good for the entire city, but were told that only manufacturers could subscribe for this shipment, as the association would only handle it to Montreal, and from there the individual manufacturers would have to take care of their subscriptions.

CANADA SOUTH-AFRICA TRADE.—The Allan Line steamship Ontarian, which sails from Montreal for Cape Town and other ports on Saturday will inaugurate the new service between Canada and South Africa. The Manufacturers' Association has been notified that the space has been very generously bespoken, and when the vessel sails she will have a large and valuable cargo under her hatches. In the Ontarian's refrigerator will be butter, while hay, flour, beans, peas, deals, dressed poultry and canned goods will form a large part of this, the first direct cargo, which will amount to about 6,000 tons measurement, the ship being filled throughout. The journey between Montreal and Cape Town is about twenty-eight days. The Ontarian will be followed on November 18 by the Elder-Dempster steamer Melville, and on December 18 the Furness Line steamer Oriana will be the third vessel to make the journey, sailing from Halifax and St. John. It is expected that the steamships on their return trips to Canada will bring back some cargo, consisting chiefly of wool. Considerable South African wool has at different times come to Canada by way of England.

REVIVAL OF THE SAILING SHIP.—In a recent editorial the San Francisco Chronicle pointed out that a recrudescence of the building of ships to be propelled by sail had set in, not only in this country, but in other maritime countries also. The multimasted schooner of big tonnage has become a favorite type of sailing vessel in the United States. These fore-and-aft-rigged craft have gradually increased the number of their spars from two to seven, the latter being the latest production of an eastern shipyard. There is a big fleet of six masted schooners in eastern waters, and the seven-masted steel vessel, with a cargo-carrying capacity of 11,000 tons, which was recently launched in Maine, is to be followed by others of the same rig and tonnage. These vessels possess great speed, in addition to their extraordinary cargo capacity, and they are endowed with the additional advantage of being immensely cheaper to operate than either steam vessels or square-rigged ships of one-half their tonnage. The seven-masted schooners which are being turned out of the eastern shipyards are primarily intended for the coal-carrying trade on the Atlantic seaboard, but their builders intend ultimately to employ them in the trade between the Pacific coast and the Orient. Pacific coast shipyards are turning out four and five-masted schooners for the lumber trade, in which they are able to compete successfully with the steam craft. Some of these vessels have also entered the Pacific trade as oil carriers. One four-masted schooner is now carrying fuel oil in bulk from the California coast to the Hawaiian Islands in competition with the oil-burning steam oil carriers employed in the trade. France is also encouraging a return to sailing ships by offering liberal bounties to their owners. The pioneer of a big fleet sailing under the tricolor is at present reported in Philadelphia, where she is loading refined oil for Japan. This new French fleet of sailing ships is intended for the Oriental trade, which is now almost wholly monopolized by steam craft. —Bradstreet's.

BRITISH AND AMERICAN METHODS. — The American experts who will report to the United States Government on British industries are preparing their statement. These experts find that the country is handicapped as against the United States by the fact that Americans get as much as they possibly can, consistently with profit, out of the machinery and human labor employed, and Englishmen do not. They blame the British worker and the British employer alike for this state of things. Even if British methods are changed they believe that the United States will inevitably become the dominant industrial power of the world, with a fight between England and Germany for second place.

BUSINESS FAILURES IN CANADA FOR NINE MONTHS OF 1902 AND 1901.

CANADA.	No. of Failures.		Assets.		Liabilities.	
	1902.	1901.	1902.	1901.	1902.	1901.
Ontario	319	365	815,110	1,346,035	2,176,730	3,061,349
Quebec	306	371	930,900	1,166,730	2,296,302	3,156,747
New Brunswick	31	60	110,175	701,060	192,525	1,486,775
Nova Scotia	63	85	122,291	178,055	240,232	312,706
Prince Edward Island	6	7	18,800	31,000	39,425	43 600
Manitoba	30	38	47,453	119,520	103,740	302,495
North-west Territories	16	20	61,285	83,850	101,168	152,473
British Columbia	77	75	647,975	531,400	1,130,791	857,350
Yukon Territory	3	....	6,000	.....	16,500	....
Totals.	851	1,041	2,759,989	4,160,670	6,300,413	9,376,495

Canadian failures for the nine-months' period numbered 851, a decrease of 18 per cent. from last year, while liabilities aggregated only $6,300,413, a decrease of 35 per cent. from last year.—Bradstreet's.

CLASSIFIED INDEX.

CLASSIFIED INDEX.

(CONTINUED).

Exhaust Heads
Burt Mfg. Co., Akron, Ohio.

Financial
Bradstreet's, New York City.
Neff & Postlethwaite, Toronto.
Ratcliffe's Adv. Agency, London, Eng.
South American Trade Journal, London, Eng.

Filters—Oil
Burt Mfg. Co., Akron, Ohio.

Fire Brick
Buckner, R. E. H., Toronto.
Dougall, James, & Sons, Bonnybridge, Scot.
Hamilton Facing Mill Co., Hamilton, Ont.
Hyde, F., & Co., Montreal.
Scioto Fire Brick Co., Sciotoville, Ohio.
Stanyon Engineering Co., Toronto.
Stowe-Fuller Co., Cleveland, Ohio.

Founders
Buffalo Forge Co., Buffalo, N.Y.
Canada Foundry Co., Toronto.
Cowan & Co., Galt, Ont.
Gartshore-Thomson Pipe & Foundry Co., Hamilton, Ont.
Karch, H. W., Hespeler, Ont.
Kingston Foundry, Kingston, Ont.
McDougall, The R. Co., Galt, Ont.
Northey Co., Toronto.
Rehdor Plating & Mfg. Co., Thorold, Ont.
Selby & Youlden, Kingston, Ont.
Tallman, J. N., & Sons, Hamilton, Ont.

Foundry Facing
Hamilton Facing Mill Co., Hamilton, Ont.

Galvanizing
Brantford Plating Co., Brantford, Ont.
Ontario Wind Engine & Pump Co., Toronto.

Gas and Gasoline Engines
Dominion Motor & Machine Co., Toronto.
Goldie & McCullough Co., Galt, Ont.
Northey Co., Toronto.

Generators
Canadian General Electric Co., Toronto.
Forman, John, Montreal.
Geo Electrical Engineering Co., Toronto.
Jones & Moore Electric Co., Toronto.
Kay Electric Dynamo & Motor Co., Toronto.
Phillips, Eugene F., Electrical Works, Montreal.
Toronto & Hamilton Electric Co., Hamilton, Ont.

Government Notices
Commissioner of Crown Lands of Ontario.
Factory Inspectors.
Mineral Lands of Ontario.
Minister of Agriculture.

Hardware
Butterfield & Co., Rock Island, Que.
Gartshore, John J., Toronto.
Morrow, John, Machine Screw Co., Ingersoll, Ont.
Rice Lewis & Son, Toronto.
Samuel, M. & L. Benjamin & Co., Toronto.

Heating and Ventilating
Buffalo Forge Co., Buffalo, N.Y.
Dominion Radiator Co., Toronto.
McEachren Heating & Ventilating Co., Galt, Ont.
Sturtevant, B. F., Co., Boston, Mass.

Hoisting Machinery
Kingston Foundry Co., Kingston, Ont.
Selby & Youlden, Kingston, Ont.

Hydraulic Machinery
Jenckes Machine Co., Sherbrooke, Que.
Northey Co., Toronto.
Wilson, J. C., & Co., Glenora, Ont.

Importers
Smith, Clark & Co., Port Elizabeth, Cape Colony.

Iron and Steel Specialties
Armstrong Mfg. Co., Bridgeport, Conn.
Bourne-Fuller Co., Cleveland, Ohio.
Brown & Co., Paris, Ont.
Dodge Mfg. Co., Toronto.
Karch, H. W., Hespeler, Ont.
Laurie Engine Co., Montreal.
McDougall, The R. Co., Galt, Ont.
Nova Scotia Steel & Coal Co., New Glasgow, N.S.
Rice Lewis & Son, Toronto.
Samuel, M. & L. Benjamin & Co., Toronto.

Lamps—Electric
Forman, John, Montreal.
Packard Electric Co., St. Catharines, Ont.

Lathes
Bertram, John, & Sons Co., Dundas, Ont.
London Machine Tool Co., London, Ont.
McDougall, R., Co., Galt, Ont.
Petrie, H. W., Toronto.
Williams, A. R., & Co., Toronto.

CLASSIFIED INDEX.

(CONTINUED).

CLASSIFIED INDEX.

(CONTINUED).

Pipe Threading Machines

Armstrong Mfg. Co., Bridgeport, Conn.
Rice Lewis & Son, Toronto.

Pipes and Tubes

Bourne-Fuller Co., Cleveland, Ohio
Canada Foundry Co., Toronto.
Gartshore-Thomson Pipe & Foundry Co., Hamilton, Ont.
Montreal Pipe Foundry Co., Montreal.
Rice Lewis & Son, Toronto.
Samuel, M. & L. Benjamin & Co., Toronto.

Plaster

Albert Mfg. Co., Hillsborough, N B.

Plates

Bourne-Fuller Co., Cleveland, Ohio.
Nova Scotia Steel & Coal Co., New Glasgow, N.S.
Rice Lewis & Son, Toronto.
Samuel, M. & L. Benjamin & Co., To onto.

Plating

Brantford Plating Co., Brantford, Ont.
Rehder Plating & Mfg. Co., Thorold, Ont

Pneumatic Tools

Cooper, James, Mfg. Co., Montreal.
Jenckes Machine Co., Sherbrooke, Que.

Portland Cement

Canadian Portland Cement Co., Deseronto, Ont.
Hyde, F., & Co., Montreal.
Owen Sound Portland Cement Co., Owen Sound, Ont.
Rathbun Co., Toronto
St. Lawrence Portland Cement Co., Montreal.

Power—Electric and Water

Central Canada Power Co., Peterboro, Ont.
Great Northern Ry. of Canada, Quebec.

Power Plants—Equipments

American Steam Gauge & Valve Mfg. Co., Boston, Mass.
Buffalo Forge Co., Buffalo, N.Y.
Canada General Electric Co., Toronto.
Cooper, James, Mfg. Co., Montreal.
Electrical Construction Co., London, Ont.
Gee Electrical Engineering Co., Toronto.
Goldie & McCullough, Galt, Ont.
Jenckes Machine Co., Sherbrooke, Que.
Jones & Moore Electric Co., Toronto.
Kay Electric Dynamo & Motor Co., Toronto.
Northey Co., Toronto.
Phillips, Eugene F. Electrical Works, Montreal.
Robb Engineering Co., Amherst, N.S.
Stanyon Engineering Co., Toronto.
Sturtevant, B. F., Co., Boston, Mass.
Toronto & Hamilton Electric Co., Hamilton, Ont.
Unit d Electric Co., Toronto.
Wilson, J. C., & Co., Glenora, Ont.

Precious Stones

Wickramanayaka, J., & Co., Kalutara, Ceylon, India.

Pulleys

Dodge Mfg. Co., Toronto.
Goldie & McCullough Co., Galt, Ont.
Wilson, J. C., & Co., Glenora, Ont.

Pulp and Saw Mill Sites

Great Northern Railway of Canada, Quebec.

Purifiers

Cowan & Co., Galt, Ont.
Goldie & McCullough Co., Galt, Ont.,

Railroads

Big Four Route.
Chicago & North-Western Ry., Toronto & St. Paul, Minn.
Great Northern Railway of Canada, Quebec.

Railway Supplies

Algoma Steel Co., Sault Ste. Marie, Ont.
Canada Switch & Spring Co., Montreal.
Gartshore, John J., Toronto.
Nova Scotia Steel & Coal Co., New Glasgow, N.S.
Phillips, Eugene F., Electrical Works, Montreal.

Rivets

Bourne-Fuller Co., Cleveland, Ohio.

Roofing

Eastern Granite Roofing Co., New York City.
Metallic Roofing Co., Toronto.

CLASSIFIED INDEX.
(CONTINUED).

CLASSIFIED INDEX.

(CONTINUED).

Valves

American Steam Gauge & Valve Mfg. Co., Boston, Mass.
American Steam Pump Co., Battle Creek, Mich.
Canada Foundry Co., Toronto.
Hamilton Brass Mfg. Co., Hamilton, Ont.
Kerr Engine Co., Walkerville, Ont.
Williams, A. R., Machinery Co., Toronto.

Ventilators

Buffalo Forge Co., Buffalo, N.Y.
McEachren Heating & Ventilating Co., Galt, Ont.
Sturtevant, B. F. Co., Boston, Mass.

Wagons and Carriages

Horo, F. W., & Son, Hamilton, Ont.

Weaving Machinery

Carruthers, Robt., Lowell, Mass.
Karch, H. W., Hespeler, Ont.
Mason Machine Works, Taunton, Mass.
Riley, C. E., & Co., Boston, Mass.

Wire and Wire Rope

Groening, B. Wire Co., Hamilton, Ont.
Samuel, M. & L. Benjamin & Co., Toronto.
Wire & Cable Co., Montreal.

Wood-Working Machinery

Carrier, Laine & Co., Levis, Que.
Clark & Demill, Galt, Ont.
Cowan & Co., Galt, Ont.
Karch, H. W., Hespeler, Ont.
London Machine Tool Co., London, Ont.
McEachren Heating & Ventilating Co., Galt, Ont.
Petrie, F. W., Toronto.

Zinc

Samuel, M. & L. Benjamin & Co., Toronto.

INDEX TO ADVERTISEMENTS.

Where the folio is not given the Advertisement appears at intervals.

ofc ..... outside front cover. | obc.....outside back cover.

Pages Missing