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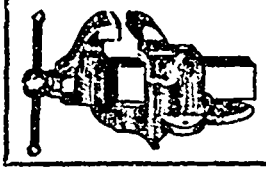

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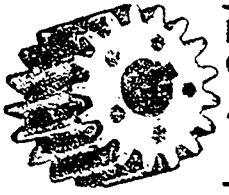

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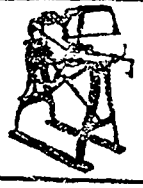

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A Combined Electric Light Plant and Pumping Station.

A DESCRIPTION OF THE PLANT INSTALLED BY THE MUNICIPALITY OF SASKATOON, SASK.

During the last year or two THE CANADIAN MANUFACTURER has described in detail many different types of power and electric light plants None have been more unique than the plant recently installed at Saskatoon, "The Hub of the West." This plant, in addition to furnishing the electric light for the municipality, is pumping station for the supply of water for domestic and fire purposes

In Fig. 1, an exterior view of the plant shows it to be a particularly substantial and attractive building. It is made of cement blocks of standard size 32x12x8 inches, the interior being nicely plastered. Structural steel trusses form a strong framework for a light metal roof.

The building comprises three divisions, the boiler room at the south end, the pump house in the middle and the electric light plant in the north end.

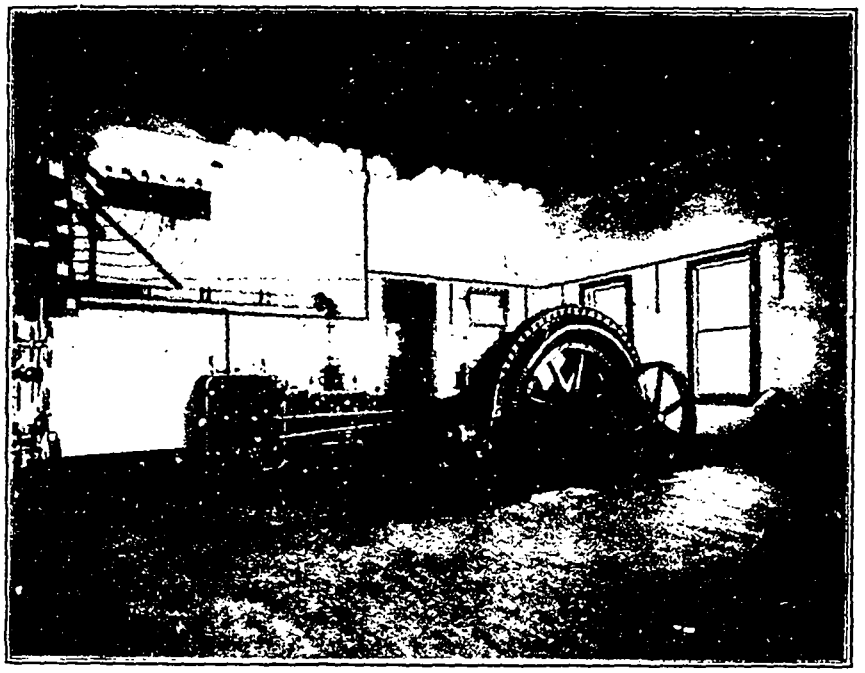


FIG. 2—INTERIOR VIEW OF SASKATOON ELECTRIC LIGHT PLANT AND PUMPING STATION.

THE PUMPING STATION.

Water is brought by gravitation a distance of 400 feet from a point in bed of river by intake pipes to two deep wells at south side of the pump house. From these wells the water is raised by two reciprocating deep well pumps, and after passing through a 600 square foot surface condenser, supplied by the Robb Engineering Co., it is carried to sedimentation basins which remove the mud and sand in suspension amounting to over one ton per million gallons. From these basins it is carried back to a large steel tank forming a third well, from which it is forced into the mains by a 12x18x12x18 inch horizontal compound Duplex C O P. plunger pump, of Canada Foundry make, under pressure of 80 pounds for domestic and 150 pounds for fire purposes.

The economy made possible by combining pumping station and electric light plant is evidenced in the dual service of condensing and feed water apparatus. In addition to raising the temperature of water passing from deep well to basin, and thus preventing the freezing of water in basin during the winter, it supplies water, as a result of condensation of steam from generator engine and duplex pumps, for the hot well, a circulating pump being used for this duty From the hot well it passes through the feed water heater to the boiler feed pumps. This heater which is a 350 h.p. Hoppes standard exhaust heater of the open type, is one that is becoming very popular in the West, as it is easily cleaned and takes care of all hard substances in the water before the latter reaches the boiler. After being heated to a temperature of 200 F. by the exhaust steam from air pumps, it is forced into the boilers.

THE BOILER ROOM.

In the boiler room there is a battery of three 150 h.p Standard Return Tubular boilers 72 inches in diameter by 18 feet long, built by the Canada Foundry Co. These are hand-fired, plain grates being used. Soft coal from Blairmore or Bankhead, Alta., a distance of about 200 miles, is used, the price being about $7 a ton laid down at works.

THE ELECTRIC LIGHTING PLANT.

An excellent view of the electric light plant is shown in Fig. 2. The engine is a Robb-Armstrong 34x17x24 inch side crank tandem compound Corliss engine, built by the Robb Engineering Co., of Amherst, N S., and is directly connected to a 225 k.w. generator.

This engine is worthy of special attention, it being fitted with Robb-Armstrong Corliss valve motion running at 150 r.p.m. In addition to this, the engine is fitted with a forced lubrication system, a new departure for Canadian engine builders.

The generator is of 225 k.w. capacity, 60 cycle, 2 phase and 2,200 volt, alternating current In the foreground of Fig 2 is shown a 12½ k.w. direct current generator as an exciter.

These generators as well as switch board,

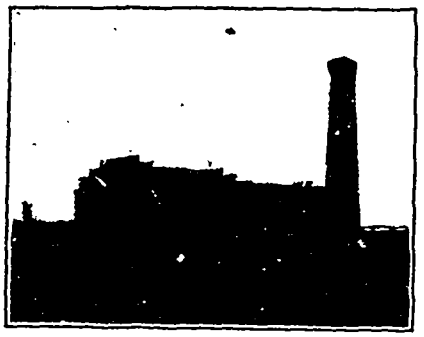


FIG. 1—EXTERIOR VIEW OF SASKATOON ELECTRIC LIGHT PLANT AND PUMPING STATION

which is of blue Vermont marble panels and necessary instruments, transformers, arc lamps and pole line for distribution of light and power, were made by Allis-Chalmers-Bullock, Limited Montreal, who took the contract for the entire electrical equipment.

The plant was designed throughout by Mr Willis Chipman, C.E., of Toronto, who has made a specialty of this type of plant, having installed combined water works and lighting plants of somewhat similar type at Edmonton, Prince Albert and Moose Jaw. Mr. George H Brown was resident engineer in charge of construction. Several of the pumps and other equipment were specially made to suit this kind of installation.

OPENING FOR MACHINERY IN MEXICO.

U. S. Consul Clarence A. Miller, of Matamoras, Mexico, reports that Mr. Q. Trevino, of that city, has just imported an engine, a boiler, and a large pump for the purpose of irrigating his land. The indications are that in the near future a great deal of irrigation machinery will be imported at Matamoras. The great success of irrigation on the Texas side of the river is having its influence on the Mexican side, and it is but a question of a short time until a great many other farmers will follow the example of Mr. Trevino. Manufacturers of machinery may be able to hasten the development of trade in this line by persistent efforts and the aid of wide-awake agents.

The revenue of the Dominion for eleven months to end of February amounted to $87,601,299, an increase of $8,123,794 over the same period a year ago. Expenditure chargeable to ordinary accounts was $60,-120,353, an increase of $10,735,384. Capital expenditure of $25,768,188 represents an increase of over $12,000,000.

Engineering for Industrial Buildings.

Some Suggestions for the Design of a Factory or a Mill.

By D. C. Newman Collins, in Textile World Record.

Mill owners have, sooner or later, to face the problem of plant extensions or the construction of a new plant. He does not want the cheapest building possible, but he does want the most suitable one for the least money. The first consideration is economy in production; any means for saving labor or increasing production will be of permanent value; any obstacle to these ends will cause a steady loss.

The writer was recently called upon to look over an old plant and found an entire absence of railroad connections and a corresponding annual cost of $5,000 for trucking alone. Throughout the entire plant there was a waste of labor in carrying heavy material back and forth during the various stages of manufacture. The trucking expense of $5,000 would pay 4 per cent. on $125,000, which was practically the cost of buildings in a new plant, while every advantage in labor saving devices and economy in operation in a new plant was clear gain.

It requires $20,000 invested at 4 per cent. to maintain one man in service at $800 per annum. If his capacity can be doubled it means an equivalent to the increase of that amount in working capital. The cost and control of labor is a complex and important matter in all industrial improvements. The growing difficulty is not only to get good labor, but to hold it. To study the mental and physical condition of men is really more important than the careful adjustment and lubrication of machines.

Mill buildings are not a matter of pleasing effects nor of fastidious decoration. They do not come under the classification of architecture as it is generally understood This class of work is the offspring of a cold commercial computation of dollars and cents. How much will they earn and how much will they cost. An industry should be made co-operative in every detail, the mechanical and human equipment and the buildings making one homogeneous unit. The manager who is responsible for the expenditure of large sums of money has a responsibility upon his shoulders sufficient to warrant the expenditure of a small portion of it in skilled and experienced engineering ability.

The Strong Position for Decision.

The birth of an enterprise should be attended by a comprehensive and clear preliminary study of all points, made with an intimate knowledge of values and costs so as to present the proposition in clear shape for criticism, for discussion and for proving the amount of appropriation necessary to launch it successfully. Too often is an owner influenced to begin an important improvement with insufficient funds to complete it. With the preliminary report accompanied by reliable estimates and information to provide a convincing check upon extravagance and error an owner knows where he stands and is in the strongest possible position to decide intelligently when to begin spending money.

After general plans are perfected the administration aims to secure their accomplishment for the least money. This means close planning to do the work with the least material, to decide upon material cheapest and best for the purpose, to establish just how much material will have to be purchased and to buy it right. The foundation of all good buying is broad competition on definite quantities and qualities of material. Every contractor and material dealer has his own idea of successful business policy and it is seldom one that permits a loss to himself. Very few of them will quote bottom prices until they see positive evidences of an immediate sale unless it is in the preliminary stages of the work when they may make their quotation attractive, knowing that the records do not bind them to any definite requirements.

The Necessity of Competition.

A request to bid in competition is, virtually, a challenge to beat the other fellow and in getting his price where the owner wants it he is simply complying with the essence of the enquiry. This does not reflect upon the honesty or integrity of the contractor or material dealer. Every firm is measured and respected by its success in securing business at profitable rates. This merely points out the importance of establishing exactly what is to be done and how it is to be done before getting prices; uncertainties that add to the probable cost of the work should be eliminated and definite quantities fixed so that each bidder will start on an even footing and the work can only be controlled by price. It is even more necessary in order that the owner can control the delivery of the material and that he can feel sure that he is receiving full value for his money and that he may know that the accepted prices are right.

Plans and specifications are the sole technical and legal basis of adjustment in an exchange of money for building material delivered. If they are indefinite or incomplete so will the results be. They are useful in analyzing market conditions and indispensable in compelling the proper delivery of material.

A few thoughts on the ethics of con'racting, as of recent practice, may illustrate the wisdom of a proficient handling of purchases. Many owners seem to think that competitive prices on a flat building of certain dimensions, without plans and specifications, as satisfying all demands of competition without regard to the uncertainty of how much material each bidder includes in his estimate and without appreciation of the helpless position he would be placed in should he need to compel its proper completion. It is easy to place a contract but much more difficult to feel sure that you get the value of payments on the work. Not knowing in detail what he is buying or what it should cost, he merely accepts the lowest bid and assumes that the price is right.

It has been the custom in many quarters to ask steel companies to estimate upon a building of fixed size, that contains steel, each quoting a price according to their own design. In such a case each is bidding upon a different thing and there is no real competition at all; they give very little data upon which to make a comparison. About all that is known is that "so and so agrees to put up a building for so much money and he is the lowest bidder." The owner pays thousands of dollars for a thing and does not know what it is.

What is Included.

The first question would be, "Does it include everything?" A conscientious man who figures on giving everything required will not likely be the lowest bidder, while the one who figures on "skinning" the weight, or can arrange to run in some of it as a "extra" can well afford to bid low. An important question will develop here as to whether a steel contractor, probably located at a distance, can drive piles, lay brick, excavate or do other work as cheaply as local people can who have a local acquaintance and organization.

One thousand tons of steel at $100 and 2,000 tons at $50 amount to the same thing Suppose, for illustration, that a building could be designed closely so that this 1,000 tons would answer all purposes and our records show the exact amounts in detail; we can invite the same bidders to bid on this fixed amount and secure the $50 bid thus cutting the price in two.

A Case Where Two Profits are Paid

General contractors who bid on the entire work for a lump sum do not always do every trade with their own men and consequently will get sub-contractors to estimate on their special trade for them. They add these various amounts to their estimates on their own work, add their profit to the total and send in this bid. In this way the profits are doubled up; each contractor has a cost and a profit and the general builder adds his profit to the total, and the only work that is done at cost is the particular branch that he is equipped to do with his own men.

Some owners favor the percentage form of contract in order to overcome the possibility of excessive profits and to permit of convenient changes being made during erection. In this method the work is done at cost and the builder charges a fixed percentage of the total cost as his profit. This form of contract has many indefinite results. Many disputes have arisen over the settlement of percentage contracts, perhaps due in many cases to the owner's unfamiliarity with the details of the building business and sometimes due to the abuse of the confidential nature of the agreement. Under this agreement there is no incentive to keep the cost down nor to prosecute the work with diligence; in fact, the contractor's interests are rather in favor of slow and expensive construction.

Many Kinds of Contracts

These disadvantages have stimulated the presentation of many other methods. Some contractors will propose doing the work for

a fixed profit, the owner paying all costs; others will offer to guarantee the limit of cost and charge a fixed profit; there are methods by which a proposal will be received to do the work for a fixed profit and at a limited cost, penalizing this profit for any overrun of the cost and sharing any saving made under the limit of cost. There may be contractors who will prefer doing only the labor and have all material furnished free by the owner. Sub-contractors will frequently bid on their special trade only, not wanting to assume work with which they are unfamiliar or poorly equipped to handle economically.

One Essential Fact.

These methods all have advantages and disadvantages and are worthy of consideration. There is one fact, however, that remains unchanged by any proposition, that in a well planned building there is just so much material to be bought; there is just so much labor to be done in installing this material; there are specified details to be observed in its proper delivery and under fixed conditions it should cost just so much money.

Industrial buildings are usually constructed of wood, brick, reinforced concrete, steel or other material according to the demands of service and the natural resources of the locality. Where the operations consist of transporting heavy loads during manufacture, the introduction of labor saving devices, such as cranes, trolleys, tramways, conveyors, elevators, etc., is necessary. These special requirements will largely control the type of construction; a study of these stresses will show whether the functions come within the limits of timber construction or will overrun into the more expensive reinforced concrete or into structural steel. In localities where lumber is easily obtained it is often cheaper, even if material must be sacrificed, to avoid heavy transportation charges on other material. The same advantage in cost would hold in a wood territory by using steel instead of transporting timber or stone, cement and sand. In some cases the building site produces a desired quality of sand and stone for concrete making reinforced concrete cheaper than timber.

Keeping Control in the Right Place.

This detailed arrangement of buildings in commercial quantities of material does not imply a mass of details to be supervised by the owner nor does it tend to do away with the general contractor if his price is right. What it does do is to put a technical problem on a simple commercial basis, removing all doubt as to the best way of executing it economically. For instance, concrete is measured in cubic yards and analyzed into terms of so much sand, stone, cement, forms, labor cost of mixing, labor cost of placing it and finishing. Brickwork may be similarly assessed by classification of so much mortar, sand, cement, lime, labor cost of laying, scaffolds, cleaning down, etc., all subdivisions being subject to close valuation according to local conditions. The control of the work is entirely in the hands of the man who is spending the money, as it should be.

A Case in Point.

A specific instance was developed in making purchases for a large mill building where the following conditions developed: Quick completion was desired; the separate local trades were hungry, but their rating was hardly in proportion to the magnitude of the work. General contract bids were excessively high when compared with the local prices on separate trades and material was very hard to get quickly. The purchases were, therefore, directed in this way. All lumber schedules were made in detail in the engineer's office before the plans were complete and prices secured from these definite lists in open competition; material was delivered at the building. This order was placed and the time of delivery fixed. The steel and iron work was separated from other work and developed to the smallest detail on separate drawings as a flat basis of competition. Windows, doors, carpenters' irons, door sills, window sills, skylights, stairs, and all sub-trades were similarly separated from the plans and completed on special drawings or lists so as to read, so many like this and so many like that. Competitive prices were obtained and the orders placed. While the principal material was being prepared or in transit and other purchases being arranged, the foundation plans were completed and contracts for labor given to the lowest bidder. This permitted the completion of this part of the work by the time the plans were done and material being received.

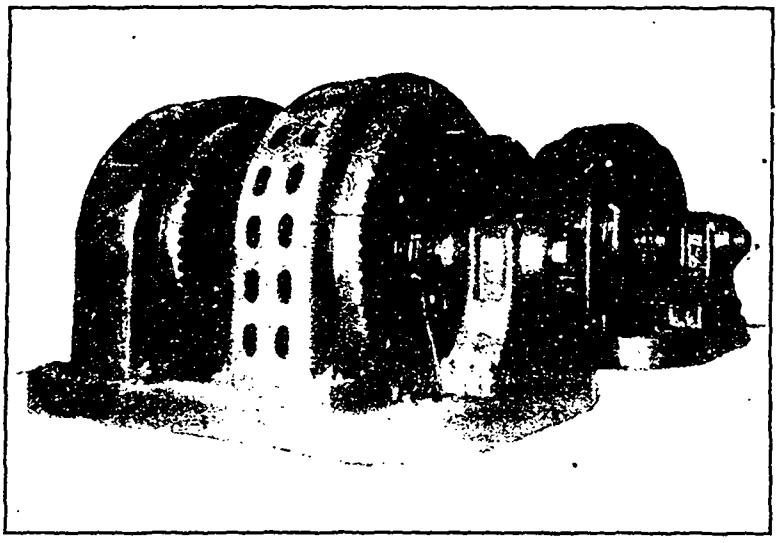
All local contracts were for labor only at unit prices; so much per thousand or per square foot; thus relieving the local men from great financial responsibility. The specifications were written as the work developed and were binding as to where one trade stopped and the other began. Many sub-contracts were placed for the work erected complete. A competent superintendent was retained by the owner to work under the instructions of the engineer and the work was completed quickly, harmoniously and in a manner satisfactory to the owner and for a very low total cost.

Other work can often be done under a single contract to good advantage. It is simply a matter of knowing exactly what is to be bought and saying so at the start.

When buildings are developed to incorporate every detail of efficiency in manufacture; every saving in maintenance cost; every practical precaution against loss by fire; when they are produced on paper and again in commercial quantities of material, there are absolute records established that prevent any tendency toward litigation. Legal disputes are generally the result of misunderstanding, uncertainty or unfair methods and the elimination of these elements breed co-operation among the varied interests and a harmonious, quick and satisfactory execution of the work involved.

Crocker-Wheeler Equipment for Shawinigan Water and Power Co.

Montreal occupies the leading place among the large cities on this continent and, in fact, in the world, from the point of view of the amount of electrically transmitted water power in use for driving factories and street cars, and for lighting its streets and buildings. This power is transmitted from the Lachine Rapids, from Chambly on the Richelieu River, and from Shawinigan Falls on the St. Maurice River. The amount of power required is steadily increasing, and one of the means recently taken to supply this increased demand is the installation in the Montreal Terminal Station of the Shawinigan Water & Power Co. at Maisonneuve, of two large motor generator sets for the conversion of the power received from Shawinigan Falls, over the ninety mile transmission line, into power suitable for the most economical distribution throughout the city.



Two 2,000 h.p. Crocker-Wheeler Motor Generator Sets in the Montreal Terminal Station of the Shawinigan Water and Power Co.

Each of these motor generator sets consists of a 2,000 h.p. 30 cycle, synchronous motor driving a 2,000 h.p. 60 cycle, 3 phase, 2,300 volt, alternating current generator. Some conception of the size of these generators may be obtained from the fact that each of them can furnish enough electric power to light up thirty thousand sixteen candle power incandescent lamps.

These machines are built by the Crocker-Wheeler Co., of Ampere, N.J., for the sale and manufacture of whose apparatus in Canada, the Canadian Crocker-Wheeler Co., Limited, Montreal has been recently formed.

The Industrial Development of Newfoundland.

EXTRACTS FROM THE BUDGET SPEECH OF HON. E. M. JACKMAN, MINISTER OF FINANCE, NEWFOUNDLAND GOVERNMENT.

In rising to present my eighth Budget I feel sure that the honorable members of both sides of the House will be pleased to hear that the financial position of the Colony is on a sound and satisfactory basis. I propose, sir, to review the Colony's trade and finances for the year ending 30th June, 1907, and to institute a comparison between the figures of 1906-7 and the year 1898-9, with a view of showing the progress that has been made during the last eight years.

I submit, sir, that the buoyancy of the revenue in all departments, the increase in our exports and imports and the development of our internal trade as shown by the postal and telegraph and other returns are barometers that never fail to faithfully record the prosperity and well being of our people. We had during the past eight years a series of good years and although there has been a slight curtailment of trade during the past year as a result of the financial disturbance in the world's money markets, yet it did not in any way seriously affect the trade of this Colony.

I propose to review in brief outline, the exports on which our foreign trade is based, and for purposes of easy comparison, I am submitting percentages of increases and decreases to enable the house to more fully appreciate the development that has taken place in our trade during the past eight years. I also think it is desirable to quote the present values of our staple products and their value in the year 1898-9. Before quoting these in detail I desire to bring under the notice of the honorable members the striking fact that the value of our fisheries, which after all is the basis of our trade, has increased over four million dollars, or sixty-six per cent. since 1899, and as the following figures will show, there has been a greater increase in the products of the forest and mine.

	1899	1907.	Increase.	Per cent. of increase
Products of the Fisheries	$6,025,693	$10,058,052	$4,032,359	66
Products of the Forest	115,229	494,910	379,681	329
Products of the Mine	622,002	1,382,793	760,791	122

Having reviewed our Exports and their increased values, I now wish to direct the attention of the house to a comparative statement showing the countries that purchase our products.

Comparative Statement of Exports for years 1899 and 1907:—

Countries to which Exported.	1899	1907	Increase.	Decrease	Per cent.
United Kingdom	$1,443,226	$1,437,154	.....	$6,072	4
Dominion of Canada	541,727	1,532,608	$990,881	.....	182
Other British possessions	1,013,853	452,604	.....	561,254	124
United States	620,056	1,342,380	722,324	.....	116
Portugal	799,649	1,841,968	1,042,319	.....	130
Italy	140,379	1,331,518	1,191,139	.....	804
Brazil	1,912,868	2,063,439	150,571	.....	7
Spain	88,317	994,308	905,991	.....	1026
Other countries	516 574	1,105,182	588,608	.....	113
	$6,936,315	$12,101,161			

Gibraltar showed in 1899 $593,236; in the Statistics of 1907 Gibraltar does not appear, the exports being distributed amongst the countries to which the exports were ordered from Gibraltar.

I also submit a Comparative Statement of Imports for the years 1899 and 1907.—

Countries from which Imports were made	1899.	1907.	Increase.	Decrease.	Per cent.
United Kingdom	$1,935,024	$2,669,934	$734,910	.....	37
Canada	2,088,093	3,669,098	1,581,008	.....	77
Other British Possessions	220,259	341,103	120,844	.....	55
United States	1,928,834	3,417,359	1,488,525	.....	77
Portugal	41,114	46,104	4,990	.....	12
Brazil	23	327	304	.....	1,32
Spain	66,172	75,322	9,150	.....	13
Other countries	31,725	206,793	175,068	.....	55
	$6,311,244	$10,426,040			

The purchasing power of the people has increased by reason of good fisheries and the high prices of fishery products, the development of our mines and also by the introduction of foreign capital in connection with our pulp, timber and mineral resources.

I submit, sir, that the greatest test of the progress of a people like ours, who are not either manufacturers or agriculturists, is to find out first what is their purchasing power from foreign countries, and second, is their purchasing power within their earning power. I propose, sir, to quote the figures bearing on this test for the purpose of proving that our increased revenue is the result of the prosperity of the people and not increased taxation.

In the years 1898-9 and 1906-7 the Imports were:—

	Imports.	Estim. Population.	Purch. power per Head.
1898-1899	$6,311,244	220,000	$28.68
1906-1907	10,426,000	230,000	45.33

The average annual balance of trade in favor of the Colony in these years is $1,10[illegible] 088.

child imports on an average $16.65 more than they imported eight years ago.

Now sir, let us examine the figures relating to our exports which represent the earning power of the people as based on our foreign trade.

In the year 1898-9 and 1906-7 the exports were:—

	Exports.	Estim. Population	Earn p. per head
1898-1899	$6,936,315	220,000	$31.53
1906-1907	12,101,161	230,000	52.61

From these figures it will be noted that the earning power of the people has increased $21.08 per head; the average number of persons in each family in the country is five and a quarter, consequently the earning power in every family in Newfoundland in 1907 is greater by $110.67 than it was eight years ago.

The excess of exports over imports for the years 1898-9 to 1906-7 inclusive is as follows:

Fiscal Years.	Excess of Exports over Imports.
1898-1899	$625,07[illegible]
1899-1900	1,139,[illegible]
1900-1901	833,[illegible]
1901-1902	1,715,[illegible]
1902-1903	1,496,[illegible]
1903-1904	933,[illegible]
1904-1905	390,[illegible]
1905-1906	1,672,[illegible]
1906-1907	1,675,[illegible]
	$10,521,[illegible]

AMENDMENTS TO REVENUE BILL.

To raise the revenue to provide for the public service, I propose, sir, the re-enactment of last year's Revenue Bill with some slight amendments. The amendments refer principally to three features of government policy.

SCHOOL DESKS ON FREE LIST.

First, we propose to add school desks to the free list; at present they pay 40 per cent. duty. The Government recognize the fact throughout the country school boards are making special efforts to provide more

By this table it will be seen that under present conditions every man, woman and child

school equipment. It has been represented that the tax of 40 per cent. on school desks makes it almost impossible for the boards to purchase the class of desks that would prove most satisfactory to teachers and pupils. By placing these articles on the free list we feel that we are aiding and encouraging the school boards in their efforts on behalf of education.

MOTOR ENGINES ON FREE LIST.

We also propose to add motor engines to the free list when used for agricultural purposes, or to be used in vessels owned in this colony and employed in its fisheries, or employed solely on missionary work within the colony. We believe that the placing of motor engines on the free list will be in time a great boon to the fishermen and farmers of the colony. Our fishermen are making great strides in the way of improved equipment for their vessels and gear. The competition of foreign fishermen, in our territorial waters, who are equipped with auxiliary power, points to the need of freeing our people from the handicap that a twenty per cent rate of duty on motor engines imposed upon them.

TIMBER FOR SHIPBUILDING, FREE.

We also propose to place hardwood plank over eighteen feet in length, and also mast pieces of pitch pine, Oregon pine or similar hardwood timber on the free list, when imported for the purpose of shipbuilding; we hope that with the increased bounty given to shipbuilding in the Act recently passed, and the placing of hardwood timber on the free list that it will be a help to our ship building industry.

WIRE FENCES AND GATES FREE.

As a further aid to agriculture we propose to add wire fences and gates and fasteners to the free list We are also placing material imported for the covering of patent flakes on the five per cent schedule; provided that certificates are furnished the Minister of Finance and Customs that it is to be used solely for such purpose.

INCREASED BOUNTY ON CANNED CODFISH.

Under section 10 of the Revenue Act, 1905, provision was made for the drawback of twenty cents per 96 pounds on herring and other edible fish (excepting lobsters and trout) packed in cans and exported with a view of encouraging the export of canned codfish which we understand is finding a market in the United States and Canada. We propose amending the Act to enable us to pay a bounty of twenty cents per case of forty-eight pounds.

The other changes will be explained in Committee, they are merely technical and are proposed for departmental convenience.

I have, Mr. Speaker, aimed at giving the House a statement of the progress of the Colony made during our term of office. I am of opinion that there is no country in His Majesty's Dominions with such a small population as ours that can show a record such as the figures that I have submitted to-day portray

The lesson to be learned from the record of this development and the history of the past is, that we should look forward to the future with hope and confidence. During the past decade there has been a complete change in methods of business especially the system of transportation and marketing which accounts in some measure for the high prices of our fishery products.

The internal trade of the Colony and the profits arising from it are to-day better distributed than in the past, the direct imports from abroad of the outport business houses have increased over one hundred per cent. in eight years. This distribution of trade, and the fact that a large number of our young fishermen are fast becoming owners of their fishing vessels and independent, will, in its social, economic and educational aspects have in time powerful influence on the future of our country.

The greatest asset in the Colony's possession to-day (viewed from the standpoint of its present resources) is the educated, independent, up-to-date fisherman who invests his money and uses his brains in developing the fisheries of Newfoundland and Labrador.

It is true sir, that up to a few years ago we "carried all our eggs in one basket," and a failure of the fisheries, or a depreciation in the value of the catch meant poverty for our wage earners; but to-day more settled conditions prevail in connection with our fishery operations. We are not now solely dependent on one industry. Our forest and mineral resources are being rapidly developed. In a short time the rivers of the interior will be harnessed, and, as a result of cheap power and extensive forest areas, this Colony will become a large producer of paper and pulp. It is estimated that inside of a few years there will be 10,000 persons connected with the manufacture of pulp and its kindred industries in this country.

A Defence of Canadian Banks and Chinese Labor

AN INTERVIEW WITH SIR WILLIAM VAN HORNE IN CANADIAN GAZETTE, LONDON, ENG.

"You may take it from me," said Sir William Van Horne, chairman of the Executive Board of the Canadian Pacific, "that you will see no flies on Canada in 1908." The conversation had ranged over many of the Canadian topics which were suggested by the presence in London of one of the acknowledged makers of modern Canada, and through it all there ran the most determined Canadian optimism—optimism of the reasoned, resolute kind that has in past years helped to carry Canada's greatest industrial enterprise over many rough places.

BANKS HAVE NOT HELD UP MONEY.

"Your English journals," said Sir William, "have, I am told, had a good deal to say about the effect upon Canadian development of the general financial stringency. The suggestion has been made that enterprise has been held up by the reluctance of the banks to put out money. No legitimate Canadian business that I know of has been held up by any such action on the part of the banks. Quite the contrary. We have every reason to thank Providence, or something else, that we have such banks and such a banking system, and I can assure you from my own knowledge that this Canadian reason for thankfulness is fully recognized in the United States. In New York and elsewhere you now find the Canadian banking system regarded as a model; indeed, the effect of the differences between the Canadian and the United States systems has never been more marked than during the recent troubles."

INDUSTRY AND THE UNEMPLOYED.

"And what about the unemployment in Canadian cities of which English journals have had a good deal to say?"

"There again, the difficulties have been much magnified. Of course, the winter season always brings a certain amount of lessened employment owing to the cessation of some of the seasonal industrial operations, and in the winter now closing this cause of unemployment has been accentuated by exceptional immigration and so on. But there is little that is abnormal in the difficulty, and nothing that is more than temporary. For the most part the winter unemployed earn high enough wages during the season to be well able to take care of themselves, and as for the rest, there are many societies—the St. George's Society and others—who see to it that whatever temporary difficulty there may be is properly and fully met. This is, I repeat, entirely abnormal and exceptional. What is normal is the great difficulty we in Canada have had for years past arising from the scarcity of labor, and I see absolutely no ground for expecting that there will not be far more than enough work for all in the coming year. Indeed, so pressing and permanent is the Canadian need of labor that I, for my part, would open wide the door to all virile men—their children will be all right under Canadian conditions even if the parents do not fulfil every expectation. There is plenty of room for all."

THE ASIATIC PROBLEM.

"But not for Asiatics?"

"Ah! that is quite another question, isn't it? I have nothing to do with politics, of course, and politics come in there. But I do not hesitate to say that in my judgment British Columbia does need Asiatic labor for her rapid development, and I believe that apart from what is called the hoodlum element the people of British Columbia generally are not against the Asiatics."

"The hoodlum element?"

"Yes, the hoodlum element. If you want to find the germ of this anti-Asiatic movement you will not find it among the men and women of the Pacific coast, who find the Asiatic of the greatest use in household service, in the laundry business, in the small restauraunt business, the salmon canneries, and so on. No, it is not there you must search for the beginnings of the anti-Asiatic movement and the continued stimulus by which the movement is kept alive. But if you go south to the bar saloons of California and Seattle, you will realize how much the animosity of the Asiatic is due to the fact that he is a poor hand at liquor and the worst of customers in that line. The animosity thus set going has spread. It began in California in municipal life; it spread to the

State, and then no one could go to Congress without a pledge against the Chinese. We in Canada may have some such experience as that before us."

A "White Man's Country."

"But, of course, Sir William, Canada is a white man's country, and if the Asiatic comes in his thousands and settles there ---"

"That 'if' is all-important. As a matter of fact the Asiatic does not intend to settle there and does not do so. It is impossible to think of his settling there. The kernel of the whole situation lies in the fact that he is there to make money and go away when he has made it, leaving behind him the increased national wealth he has created by his labor and the earnings he has spent in the country, for, mind you, one Chinaman will spend more money in a month than an Italian spends in two months."

The interviewer ventured to recall a certain elaborate scheme for the settlement of large sections of prairie Canada by Chinamen which was put before Sir William Van Horne twenty years ago when he was president of the Canadian Pacific Railway Co., a scheme which was forthwith rejected.

"Yes," said Sir William, "of course that would never do. We do not want Asiatic settlement, and we should not get it on any substantial scale if we did, but British Columbia does greatly need the rapid development which Asiatic labor would bring her. And, mind you, every two Asiatics employed means employment for at least one white man. The experience of California shows that. It is the need of just the labor which the Asiatic would give that prevents a great number of works from being carried out and providing openings for the more highly skilled white labor as foreman and so on. There, I repeat, lie the permanent interests of British Columbia as distinct from the politics of the moment, and hence, as I say, I believe the people of British Columbia generally are not against the Asiatic."

Justice and the All-Red Project.

"You have been reported in Canada, Sir William, as holding strong views on the 'All Red' project."

"Someone has, I see, asked what more do you want than the all red schemes we have already—the 'all-ready' schemes of the Canadian Pacific and other undertakings. The Canadian Pacific took up the all-red idea when no one else believed in it—carried through a transcontinental line, placed first-class service on the Pacific, and with a service on the Atlantic created a compact and efficient All-Red route for the Empire between the East and the West. It showed the way, proved that the business was there, followed up the business closely, kept it close up to the actual needs of Canada and the Empire, and to-day shows that it is prepared to continue the same practical, business-like policy of expansion as the need arises. For a Government concern to step in at this stage, with heavy State subsidies, to take away these services from those who created them, is, I think, not necessary and not fair—indeed, it is not decent. Of course I speak only for myself in saying this Sir Thomas Shaughnessy speaks for the Canadian Pacific."

Canadian Investment Abroad.

"One other word, Sir William, about these Canadian investments in Central and Southern America. You have, perhaps, heard the suggestion that this money might be used at home in Canada with great advantage to the Dominion, at a moment when every part of Canada offers so many openings for capital?"

"Canadians have been very successful in a number of profitable enterprises in Mexico, South America, the West Indies, and elsewhere, but these commitments have now been largely liquidated. It is a fact that Canadians have done more in the directions you name than the capitalists of the United States, but it is Canadian brains rather than money that have gone to make these successes. If you could trace the bonds of the Sao Paulo, the Mexican and other undertakings you would find them held most largely in Europe. Besides, quite as much money has come into Canada by reason of these enterprises as has gone out."

Charles M. Hays on Canadian Situation.

An Interview with the President of the Grand Trunk Pacific in "Canada."

Canada is all right. There may not be quite the same "boom" in all directions as existed a year ago—especially in prairie lands—but it is better for the country that this is so. Business generally is good, and the large amount of development work, especially in connection with the 1,900 miles of construction work on the Grand Trunk Pacific, which is in active progress, will serve to keep it so.

While last year the crops were not as good as formerly, every year sees additional hundreds of thousands of acres of land put under cultivation and adds its quota to the amount of grain produced. For instance, in 1905, the total acreage of grain area in the North-West was, in round numbers, 6,000,000 acres, in 1906 it had increased to 7,800,000 acres, or 16 per cent., and I see no reason why this increase should not continue for many years to come, as the area of productive land in the North-West is, as you know, not less than 200,000,000 acres. The reaction that has taken place in the price of farm lands is, in my opinion, a good thing for Canada, as high prices for farming land would remove the great incentive to immigration. It is for the good of the country that these lands should be taken up by the settler instead of the speculator. The check to mere speculation and the lower prices resulting therefrom will bring in the agriculturist, which is what the country wants most. Secondly, better results are being obtained from hired labor of all kinds. In the past three or four years, it has been difficult to obtain sufficient labor of any kind for railway construction or other character of work. It has been yet more difficult to secure the best results from such labor as was obtained, because a man will seldom do his best work when he knows that in the event of his discharge he can at once get another job. I think this coming season, while there will be no scarcity of work, the man who has a good steady position will be more concerned to retain it.

As far as the Grand Trunk Pacific is concerned there will be no difficulty in obtaining employment for men used to hard manual labor, but it is useless for a man who had no experience, especially in that character of work required on railway construction, to expect to be employed. This is an important fact, which should be remembered by emigration agencies which deal with the unemployed, and sometimes send out unemployables, men who are entirely useless in Canada.

The railway itself will be a great colonizing factor through its own necessary employees. In the West the railway systems do not employ so many men to the mile as the English railways, but in the former case the employee may have a greater diversity of work. Many twenty men to the mile is the English average; in Western Canada you may take the number as five to the mile, so that when the Grand Trunk Pacific is completed it will employ several thousand men, all of whom will be located along its line as permanent residents, raising their families and spending their wages in the country, thus assisting in its growth and development.

Of the 793 miles, all except 60 miles and that an easy section are already graded and 350 miles of track are laid. I think it will be generally admitted that the character of the new road is in advance of that of any other transcontinental railway in America. Its chief characteristic is extremely light grades, which will not exceed 21 feet to the mile, whereas the most favorable transcontinental line in existence to-day has a maximum gradient of over 100 feet to the mile. I can illustrate this better by saying that the same class of engine that will take a train of, say, thirty cars from Winnipeg to Edmonton will take that same train directly through to our terminus on the Pacific Ocean, Prince Rupert. There will be no severe gradients through the Rockies requiring the service of helping engines. I may also state that while fine scenery and heavy gradients generally go together, our route will be an exception to this rule, and will not be entirely devoid of magnificent scenery through the mountains, as we pass within close proximity of the highest peak in the Rocky Mountains.

Prince Rupert is clearly destined to become a great ocean port. When I first saw the location it was covered with heavy forest and brush, just what Vancouver was about twenty years ago. That length of time will see a city of even greater population at Prince Rupert. It will not be long, thanks to the Grand Trunk Pacific, before the tourist will be able to see not only the length but also the breadth of Canada, going in one direction to the Coast via the Grand Trunk Pacific through Edmonton, and by steamer from Prince Rupert to Vancouver in what is practically an inland sea, and returning via the Canadian Pacific, he will have obtained a comprehensive idea of Canada. The traveller from Japan and the Orient via our route will be at Edmonton, having crossed the Pacific and British Columbia, before another, who started at the same time via the more southerly routes, has made his landing. The journey across the Continent via the Grand Trunk Pacific will save thirty-six hours at least. It follows that the Grand Trunk Pacific must be the keystone of the arch of the "All-Red Route."

. . . THE . . .

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and Industrial World

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CANADA IS ALL RIGHT.

In this issue we publish interviews given in London, England, by Sir William Van Horne of the Canadian Pacific Railway and Charles M. Hays, of the Grand Trunk Pacific.

These articles are well worthy of attention. The views of Sir William Van Horne are of particular interest because of his defense of Canadian banking institutions and of Chinese labor. They are views with which many readers of this paper will readily agree.

We would especially commend attention to the optimism which pervades the interview of Mr. Hays. This interview is given out in face of continued decrease of earnings. The optimism, however, is that of a shrewd judge of Canadian affairs who sees beyond the depression of the moment to the inevitable expansion and the consequent renewal of activities from one end of Canada to the other. Canada is all right.

INDUSTRIAL CONSTRUCTION NUMBER.

For some weeks we have been making preparations to make this issue a "Special Industrial number." At the suggestion of several advertisers we have changed our plans slightly.

On April 17, 1908, we will issue an "Industrial Construction Number," in which we will endeavor to give our readers particularly valuable information regarding the construction and equipment of factories and mills.

An interesting article describing a new power plant will be of value to manufacturers thinking of installing a new plant or increasing their present equipment; an illustrated description of a foundry will give our readers information about the most approved equipment for such a plant; an illustrated article dealing with the problem of heating and ventilating will be of primal importance to many factory managers or superintendents. In addition to these many other subjects of interest to our readers and relating particularly to construction and equipment will be published.

This number will have an extra circulation of particular value to advertisers who desire to sell structural material or factory equipment. First in importance is our regular circulation, covering the factories and mills of Canada; then sample copies will be sent to leading concerns not on our list.

In addition to this the number will be distributed to all the leading architects, contractors and builders of Montreal. This paper has secured a booth at the Montreal Builders' Show, April 20 to 25 and several hundred copies of this issue will be kept there for distribution to the most prominent visitors to the exhibition.

WHEN THE BIG MEN SHOULDER THE LOAD.

One of the pleasant features of an industrial depression such as Canada has undergone during the last few months is the lessening of criticism directed against manufacturers and other large employers.

When the business sky is clear and when business is booming and prosperity is general the manufacturer, to the uninitiated, seems to be "reaping where he did not straw" and to be participating unduly in the general increase of wealth. His business, they think, is growing for the simple reason that the country is growing and the demand in all lines is expanding.

The inevitable happens. Critics arise on every side. One fumes because he is reaching out for too big a share of business; another scolds because he is paying his unskilled labor such small wages, even though he pay more than the standard for such; a third seeks the dictionary for new names to call him because he has sense enough to meet his competitors and to try to eliminate wasteful competition.

Depression has wrought a change. The critic has been compelled to realize that it is not always fair sailing for the manufacturers. As a captain takes personal command of his ship when danger threatens, so must the manufacturer shoulder the big load when industrial contraction or financial depression comes.

For six months practically every manufacturer in Canada has been ground between the two mill-stones—the bills unpaid by customers and the weekly wage bills of his workmen. He has had to pay, pay, pay while his customers were asking for "more time" and again "more time." It is at such times as the present that men must recognize the need in a community of big, strong, capable men who are willing, as well as able, to face the stress and storm of depression as well as to enjoy the pleasant sailing time of general prosperity.

POLICE! POLICE!! POLICE!!!

It is amusing to note the anxiety of many daily newspapers lest manufacturers may discover some way to eliminate the waste caused by unreserved competition in business.

In another column is published an article from the Hamilton Spectator to the effect that "it is hinted" there is likely to be some sort of a combine among the brick manufacturers of Hamilton. The police department have been notified. One is reminded of childhood days when the disobedient or noisy child was threatened with a visit of "the boo man."

Suppose the brick manufacturers of Hamilton do sell their product to one company; suppose that company decides not to sell below last year's price; what then?

These foolish threats of the police when no law is broken, when the manufacturer is not doing an injustice to his customers nor to his workmen, is as petty as it is absurd.

Conveying Freight from Dock to Warehouse.

New applications of conveying machinery are constantly being made to suit special needs. An interesting installation is reported from Seattle, Wash. All steamboat cargoes discharged or awaiting shipment at Virginia Street Dock, have to be conveyed to a warehouse located on the opposite side of railway avenue, a distance of 250 feet from the dock.

Carrier at Dock End.

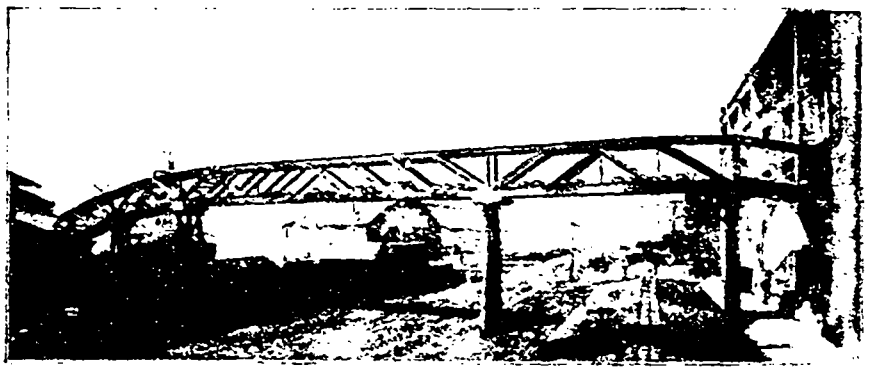
To transfer the large volume of miscellaneous freight handed daily between the dock and warehouse, economically and at the necessary speed without obstructing traffic in the street, the company has recently installed an overhead carrier which performs the work at a cost which is hardly appreciable and which is capable of handling the freight more rapidly than it is possible to load or dispose of it at the terminal points.

As the equipment is very simple and can be modified to suit practically any industrial condition which involves the movement of packages, or miscellaneous articles, in large numbers between fixed points, a brief description will be of general interest.

As shown by the accompanying illustrations, the dock and warehouse are connected by a light elevated structure which supports a continuously moving carrier of the endless chain type, with terminals on the dock level at one end and on the second floor of the warehouse at the other.

The carrier consists of a series of wooden flights nine inches wide by four inches thick and thirty inches long, made of Puget Sound fir. These are secured every twelve inches to two strands of a No 180 Jeffrey steel thimble roller chain, forming a practically continuous apron on which the freight is carried. Wedge shaped blocks attached to every third flight serve to push or retard such freight as might otherwise roll down the incline at the dock end.

The machinery is driven at the upper, or warehouse, end by a 10 h.p. electric motor and being reversible it carries the freight to equal advantage in either direction. It is designed to handle packages not exceeding three feet wide and four feet high, which normally consist of salmon in cases, sacks of salt and sugar, barrels of cement, and miscellaneous articles weighing as much as 1,000 pounds each.



Dock Railway Avenue. Warehouse.

It travels at a speed of 70 feet per minute and consumes about six h.p. when delivering 1,000 packages weighing 100 pounds each per hour. This rate of delivery is based on the speed at which the packages can be loaded and cared for at the terminal points, and is much below the actual capacity of the machine.

The plant was designed and installed by the Pacific Engineering Co., the conveying machinery being furnished by the Jeffrey Manufacturing Co., of Columbus, Ohio.

A conveyor of this type will often pay for itself in a few months and if properly built and operated it will last for many years practically without repairs or renewals.

The Jeffrey Manufacturing Co. has installed several machines of this general character for delivering freight to, and receiving from, ships direct, the outer end being made adjustable to the rise and fall of tide and freeboard of vessels.

Tests of Graphite on Ball Bearings

From Power.

There have from time to time appeared articles in the various trade papers condemning the use of graphite as a lubricant for ball bearings. Professor Goss has made some extensive tests with graphite as a lubricant for ball bearings combined with kerosene oil, lard oil and vaseline, and found that friction losses were very much reduced and the bearings made to carry a heavier load when the graphite was used.

The test ball bearing has the form of a grooved ball thrust and was made by the Standard Roller Bearing Co., of Philadelphia. It consists of two hardened steel rings, each having a groove or race to receive the balls. The bearing fits a 1¾-inch shaft and contains twenty-three 7-16-inch balls. The lower race is caused to revolve through the action of the machine, while the upper one is fixed in position.

It has been shown by previous experimentation that graphite can be efficiently applied as a lubricant when mixed in small quantities with oil or grease. Following this practice six series of tests were run; the lubricant employed upon the test ball bearing being, respectively, kerosene, a mixture by weight of 96 per cent. kerosene and 4 per cent graphite; lard oil, a mixture by weight of 96 per cent. lard oil and 4 per cent graphite; vaseline, a mixture by weight of 96 per cent vaseline and 4 per cent. graphite; the graphite in all cases was Dixon's Ticonderoga flake graphite. As the result of these tests Professor Goss says in part that the following general conclusions may be drawn.

"A combination of graphite and lard oil makes up a lubricating mixture which when applied to ball bearings, will accomplish everything which lard oil alone will do

and which at the same time will give a lower frictional resistance of the bearing and permit a large increase in the load which it may be made to carry.

"An oil as light as kerosene, when intermixed with graphite, will be converted into an effective lubricant for ball bearings when operated under light or medium heavy pressure.

"Even so viscous a lubricant as vaseline will better perform a given service in the lubrication of ball bearings when supplemented by small amounts of graphite. The bearing to which the mixture is applied will work with less frictional resistance and will carry a heavier load than when vaseline alone is used.

"The admixture of graphite with either a liquid or a viscous lubricant serves both to reduce the friction and to increase the possible load which a bearing thus lubricated can be made to carry."

Use of Ball Bearings on Electric Motors

CONDENSED IN ENGINEERING DIGEST FROM "THE ELECTRICAL REVIEW," LONDON.

Although there are now many reliable ball bearings on the market, they do not seem to be made use of on electric motors to the extent that one would expect when one considers the many advantages to be gained by their use. The principal advantages are as follows.

1. Decreased Length of Machine.—Ball bearings are usually less than one diameter (of shaft) long, while ordinary bearing brasses are either two and a half, or in most cases, three diameters long, and for this reason the overall length of the machine can be decreased and consequently a somewhat lighter machine per h.p. can be manufactured.

2. No wear on Bearings.—Owing to the accuracy to which the balls can now be made, and the races can be machined and to the hardness of the balls and races, there is practically no wear in these bearings.

For this reason, these bearings seem to be the ideal bearing for hand-wound closed-slot induction motors, where the air-gap is often cut down as fine as 0.025 in.

3. No oil in Bearings.—Ball bearings should be filled with grease, and they will then run for months without any attention, whereas, with an ordinary bearing using oil lubrication, the bearings have to be inspected at frequent intervals to see that the oil is up to the proper level for the oil rings to pick up the oil. Moreover, there is always present the trouble of oil creeping along the shaft into the armature.

4. Less Starting Resistance.—Owing to the very small frictional losses the resistance to starting up of a machine fitted with ball bearings is much less than in a machine fitted with ordinary bearings, and consequently the current required to start up is less. The coefficient of friction, unlike that of ordinary bearings, is not higher at starting than when running at the working speed.

5 Increased Efficiency.—Owing to the friction in ball bearings being very small, a machine fitted with them will give a better efficiency than one fitted with the ordinary bearings, and as an increase of efficiency of only 1 per cent. means a good deal when a machine is in constant use, this is rather an important advantage.

The coefficient of friction for a continuously lubricated bearing is about 0.05, while for a ball bearing it is 0.0012 to 0.0018, and this is not affected to any extent by the size of the balls or the number of revolutions per minute.

Ball bearings have been applied with great success to dynamos, grinding and wood-working machinery, all of which run at high speed. Machines fitted with them have been running satisfactorily for years at 10,000 to 12,000 r.p.m., and the same may be said of line shafting 4 ins. to 6 ins. diameter, and running at 500 to 1,200 r.p.m. Furthermore, these bearings have been fitted to ventilating fans of up to 15 tons weight, and a periphery speed of 330 feet per second.

Too great stress cannot be laid upon the importance of having the balls absolutely correct to standard both in diameter and sphericity (within one ten-thousandth of an inch), as with hard steel balls running between hard steel races it is of vital importance that the load should be equally distributed.

The races should be grooved and the curvature of the groove should represent the arc of a circle somewhat larger than that of the balls.

Too much importance is often attached to the crushing load, which is apt to be misleading, because although a ball will not absolutely crush to pieces until this load is reached, it will, if the pressure is released, at about half the ultimate crushing load, be found that the ball is in two pieces. However, with regard to the crushing strength of balls, it may be said, that all things being equal, it increases proportionately as the square of the diameter.

With regard to the safe load on balls, from tests made at the "Central Institute for Technical Investigation" at New Babelsbery, the safe load for balls running on rounded surface = 44 d^2 when d = diameter of ball in eighths of an inch, for plain or conical surfaces the load must be smaller, and should not exceed about one-fifth the formula value.

It should be borne in mind that the permissible load is related to the speed at which the bearings run, and as the number of revolutions per minute is increased so must the load be reduced.

The following table gives dimensions and safe loads at various speeds for same.

Sh'ft diam in ins	Ball No diam of ball		— Safe Load in Lbs — 500 r p m	1,000 r.p.m.	2,000 r.p.m.	4,000 r.p m.
1	½	8	900	720	575	460
1½	⅝	8	1,700	1,360	1,090	850
2	¾	9	2,500	2,000	1,600	1,250
2½	¾	9	3,500	2,800	2,240	1,750
3	1	9	5,000	4,000	3,200	2,500

Increase of Shop Production

ADDRESS BY M. GESUNDHEIT, C.E., M.E.,

Before the Metal Manufacturers' Association of Philadelphia, Pa.

The manufacturer nowadays usually appreciates the benefits to be derived from some form of piecework, but unfortunately he is inclined to plunge into it without proper preparation; without a study of his conditions, his equipment, the personal equation of his working forces. Is it then surprising, I ask, to find him frequently failing, more or less, in this attempt and obtaining but a part of the benefits possible under a more skilful application? I happen to know a concern, perhaps the largest of its kind, in the very limits of this city, which has a most profound contempt for piecework, indeed almost a dread, and yet I know that its labor costs are excessive and could be considerably reduced by this very means. What is then the reason for their antagonism to piecework? Simply this: they have tried it once in an unscientific manner, and, as was to be expected, have fallen down on it badly. Their chief executive, a man of determination and great energy, not realizing, however, the scientific nature and far-reaching scope of piecework, enthused suddenly on this phase of the labor question, and insisted that the entire plant, employing several thousand hands, be put on a piecework basis without delay, giving only a short time to prepare for the change; the prices set were arbitrary guesses, no provisions were made for inspection, the result being that the product turned out was so unsatisfactory as almost to ruin their otherwise enviable reputation and desirable trade.

Other manufacturers fail to realize that no matter how good a piecework system may be, its success depends largely on its tactful and careful introduction. I know of several cases, where a thoroughly good piecework scheme failed, because it was unduly pushed on the workmen who were not properly prepared for it and could not therefore comprehend that it would redound to their own benefit But beyond any question, the most grave mistake that the manufacturer is apt to make in regard to piecework is the breaking of faith with his help. Unfortunately few employers can look on complacently when their workmen increase their earnings above, say 25 per cent., and when this point is reached a cut down in the price is the established rule. But what are the consequences? The very object sought for—reduced labor costs—is entirely defeated; since the workmen, readily realizing that their efforts to earn more are used as a weapon against themselves, to compel them to work harder in order to earn what they are accustomed to, soon band themselves together and see to it that they produce no more than enough to earn the permissable amount. The loser in that transaction is evidently not so much the workman as the manufacturer himself; he has no way of learning what the real capabilities of his men or tools may be; and therefore has never at hand the means for ultimately reducing his labor cost; at the same time his production is curtailed and his overhead expenses are maintained high, since they are spread over a reduced volume of output. On the other hand, had he kept faith with his workmen and permitted them to make as much as they could, his labor costs would have been no higher, his volume of product would have been increased, his general expenses would have been lowered, and what is more, he would have learned what a fair price for each piece of work may be, and thus he would have been enabled, at the opportune time to reduce it to the proper level. For it will be readily admitted, that, give a man a long enough time in which to reap the benefit from his extra efforts, and the consideration that the price may be cut afterwards, will not deter him from making hay while the sun shines.

The Clay Working Industry in Ontario.

WRITTEN FOR THE CANADIAN MANUFACTURER BY J. J. BELL.

Next to agriculture, the clay working industry is probably the most ancient in the world. Even in antediluvian times the science of brick making seems to have been understood, and at a very early period in the world's history the use of clay, not only as a building material, but for the making of pottery, and tablets on which the records of the race were preserved, was understood. But up till recently scientific methods of manufacture have been almost ignored. Now the industry is receiving more attention, and in Germany, the United States, and some other countries, departments have been established in some of the technical schools and universities, devoted to the study of clay and its products. With the advance in the price of lumber which has taken place in Canada in recent years, the demand for brick as a building material must increase, while it is preferable to stone because it is cheaper and on account of its fire-resisting properties.

A knowledge of clays and the best methods of working them has been encouraged by the Canadian Clay Products Manufacturers, an association organized some four or five years ago, which holds annual meetings at some central point, for the reading of papers and discussions on topics connected with the industry. No mineral industry can be claimed to benefit a country more than that whose raw material is clay.

Chemically considered clay is a hydrated silicate of aluminum. Popularly defined it is an earthy material, which, when moistened, becomes plastic and may be moulded into any desired shape, which is preserved when dry. When heated to redness, or slightly above it, it fuses, and on cooling assumes a rock like consistency.

As clay is the result of the decomposition of rock, it follows that it must vary with the character of the rock from which it was formed. If the parent rock be largely feldspar, the clay will be white, if it contains free silica or quartz the resultant clay will be sandy, or lean, pure clay being called fat, if it contains a considerable percentage of iron the clay will vary from yellow to red. Some clays contain lime, generally in the form of grains or nodules, and this is a very objectionable feature, as after burning, the lime is almost sure to slake and burst the brick or tile.

The clays of Ontario may be divided into three classes, the pre-glacial, glacial, and post glacial. These are based upon the method and time of accumulation. In Western Ontario the pre-glacial rest upon underlying rocks, which include Hudson River, Medina and Devonian shales. The pre-glacial clay is known as residual clay, but there is very little of it to be found, as any clay which had been formed from the decomposition of rocks previous to the glacial age would be scoured off and carried away by the action of the ice. The shales, which are simply clay pressed into a solid mass by natural agencies, are found only in Western Ontario.

The glacial clay consists of boulder, Erie, upper Erie and Saugeen clays. Boulder clay is an accumulation of clay, sand, gravel and boulders and is practically useless for the manufacture of clay products. Erie clay is boulder clay, not absolutely but comparatively free from stones, which can be removed and is well adapted for the manufacture of brick and tile. It is found in nearly all parts of Ontario, and there is not a county west of a line drawn from Prescott to Ottawa in which it does not exist in beds from one to one hundred and thirty feet deep, if not deeper. It is sometimes known as blue clay and burns to a white or buff color. The upper Erie is a weathered zone on top of the Erie clay. It is from one to three feet thick, and as the weathering process has eliminated most of the lime, while the percentage of iron remains about the same as before weathering, it burns red. Saugeen clay consists of a series of interstratified bands of rich, reddish brown clay alternating with bands of grey or greenish sand, or shell marl. These bands are seldom over three quarters of an inch in thickness, yet banks of Saugeen clay are found 20 feet deep. This clay is doubtless the result of the ebb and flow of water. It is found in greatest abundance in the northern part of the province. Where this clay is marly it is unsuitable for brickmaking. Where sandy, it is eminently suitable, and makes excellent stock brick, though it sometimes is too strong to be used alone and requires a considerable admixture of sand. The great clay belt of northern Ontario is composed principally of Saugeen clay. A line drawn from Prescott through Casselman, Ottawa, Pembroke, Bracebridge and Paisley to Lake Huron, will mark roughly the southern boundary of the Saugeen clay area.

The post glacial clay is a lacustrine clay collected locally into hollows or lakes. It is free from stone and distinctly stratified. Not many workable deposits are found in Ontario. The only ones worked are at Hamilton, London, Conestoga and some about Toronto Both white and red brick are made from this lacustrine clay.

In Eastern Ontario, in which is included that part of the province east of the line drawn from Prescott to Ottawa, the underlying rocks consist of limestone, sandstone and igneous rocks, but no shales, and therefore no pressed brick are manufactured there. For the same reason as already stated in speaking of Western Ontario, there is little residual clay. The glacial clays consist of boulder, Leda, upper Leda and Saugeen. The boulder clay differs from that in the west in that it contains more igneous boulders and is quite distinct from the overlying Leda clay, whereas in the west the boulder clay appears to pass imperceptibly into the Erie. The Leda clay corresponds to the Erie but is much lower in lime, so that it burns red. The organisms it contains show that it was deposited in salt water. Geologists tell us that the fresh water of the upper lakes at one time found its outlet through the Hudson River, and that the part of Ontario east of the line above referred to was covered with salt water, in which the Leda clay was deposited. The Leda clay may be divided into two sections, the lower strong and stiff, the upper sandy and lean and sometimes called Saxicava sand. By mixing in proper proportions an excellent clay for red brick and tile is obtained. Saugeen clay overlies the Leda clay just as it does the Erie clay further west. It is worked in some of the largest yards and yields an excellent red brick.

The post glacial clay in the east as in the west is a lacustrine clay, but any deposit are purely local, and there are none which are used in the manufacture of clay goods.

Having thus dealt with the various characters of clays, the raw material from which clay products—brick, tile, terra cotta, sewer pipe and pottery are produced—I will take up the methods of manufacture in another article.

System in the Clay Business.

From the Clay Worker.

The marketing of clayware of the ordinary class, particularly drain tile, is burdened with some queer and antiquated customs; customs which present day conditions do not call for and which are simply nothing more nor less than a cut in the price, not made by the seller but permitted by him, even in defiance of printed conditions on invoice. In a good many sections it is the general custom to allow deductions from invoices for brick and tile, under claims for shortage, breakage and 2 per cent. for cash in ten days.

The first claim, or that of shortage, is the only one which the manufacturer should allow and the only one on which the purchaser should have recourse against the shipper. Such concessions, even, should be rigorously guarded through a good loading system. When a good loading system is in force, real claims against the honest shipper should be practically eliminated. No particularly extensive system is required, in order to have an accurate check on loading count. Tile and brick are usually loaded on barrows and any variation of count from the regular number is quickly detected. A certain number of barrows are placed in each tier of the car, and here again any variation quickly shows, even to a few tile or brick. A count of the tiers quickly gives the contents of the car. The shipper should advise the consignee of the manner of loading, so he could check the carload, and after checking one tier the consignee can quickly convince himself that the count is correct or otherwise. The shipper is further assured of his count in the checking out of kiln totals. On the other hand, the claimant often unloads a car, in part at least, direct into wagons, employing an uncertain method of counting. Oftentimes the purchaser loads and counts. Some are stocked and the checkup comes from various counts made by as many different persons. Of course, no satisfactory means of overcoming shortage claims can be arrived at unless there is a first positive check by the shipper which the consignee fully understands. When such is in force it

follows that greater care is shown by the consignee in the selling count.

BREAKAGE CLAIMS.

Breakage claims are without doubt chargeable to the carrier. Such losses come, invariably, from careless switching, poor roadbeds, and other conditions beyond the control of the shipper. In this connection it is advisable that the shipper quote prices f.o.b. factory, or if it seems advisable to quote a cost at destination price, make the quotation f.o.b. factory, with freight added to the ordinary factory price and allow deduction of freight. Such a quotation would indicate the intention of the shipper not to guarantee delivery. In such a case breakage claims would have to be made of the carrier.

In these two counts, or points of annoyance and loss to shippers there is a means of doing away with suspicion of dishonesty, which is harmful to business. Many shippers tell tales of claims for shortage and breakage which they claim to have proven dishonest, yet they have allowed them because others do and they are afraid of their competition

The arbitrary manner in which claims are usually made indicates the feeling of security on part of the dealer that it is not necessary to take the longer and more uncertain manner of getting through breakage claims by the carrier route, since a remark that others allow them, immediately convinces the shipper that his competition offers no resistance to such claims.

Shortage is, in fact, inexcusable. It is carelessness and bad for all concerned. It would no doubt be interesting to learn the extent to which some large shippers in other lines are called on to make good claims of shortage. It is not through the power of control of the market that they keep down such claims, but rather through a sure counting system. Their quotations are made in no uncertain manner, and every point in connection with shipping is done with painstaking and honesty. It follows that claims are few, not to be thought of by the honest claimant and avoided as useless by the dishonest.

DISCOUNTS.

Cash discounts are an absurdity, that is all there is to it. This statement maintains in all trades. The call for cash discounts no longer has a foundation. It is not the custom during prosperous periods to make long-time billing. Originally such concessions were made where both the manufacturer and the retailer had to carry a large stock on hand, owing to uncertain and slow transportation facilities, and time billing, which to the manufacturer is virtually carrying stock on hand, was a practical necessity. It is to be admitted that cash discounts prevail, to a greater or less extent, in all trades, but it has been because of the influence of the trader with "ready money" and the fear of competition, not to any sensible business reason. A business custom is nearly always slow in changing.

Why should a clayworker allow a 2 per cent discount on tile sales and no discount on brick? Custom only. Why should he allow any discount? He certainly should not. He has to pay cash, generally net, for all he buys. He pays his men every week, or every two weeks. If he is a borrower of money, he pays 8 per cent. per annum, or less. It would seem difficult to find any reason why tile should be billed 60 days and brick 30 days, particularly since the tile are usually not ordered by the dealer until the former is ready to haul them away, and brick, when retailed, are usually held a much longer time. Now, as to the rate of interest a manufacturer of tile is paying for the use of his own money when he allows a discount of two per cent. The billing is, or should be, 30 days. Ten of this the dealer takes in which to pay, less two per cent.; result, the paying of two per cent. for your money for 20 days, or something like 36 per cent. per annum.

The remedy: Rubber stamps; the impression to be put on all invoices—"This invoice is 30 days net. No discounts allowed. Claims for shortage must be made within five days. No claims for breakage allowed."

Mysterious Moves Made by Brick Manufacturers

ATTENTION OF THE POLICE IS SAID TO HAVE BEEN CALLED BY HINTS OF BRICK COMBINE, SAYS THE HAMILTON SPECTATOR.

From the stories that are being circulated in brickmaking circles, it looks as if there was a new brick combination being formed, and it is also said that the police department has been put wise to what is going on, and that Crown Attorney Washington may do a new stunt in combine-prosecuting some of these days. Mr. Washington denies any knowledge of any new brick deal, but it is said on good authority that one of the detectives has been brooding over the affair for some days.

A meeting was held yesterday of the brick manufacturers of Hamilton, excepting George F. Webb, G. E. Mills, and possibly E. New. Sackville Hill was appointed the manager, or selling agent of the new company, which is said to be in process of formation, and which will control practically all the output of the Hamilton brick yards. The Simpson Brick Co., which owns the Aberdeen Brick Co.—both Toronto concerns—has not sold out to the new company.

It is the output to date of the Simpson brick yards that has been sold to the new company, or the alleged combine. This amounts to nearly two million brick, and the Toronto companies will manufacture six or seven million brick this season yet.

There was a prospect that the prices of brick would tumble when the matter was looked up a couple of weeks ago. The price was then $6.50, but the brick men got together, and made it $7.50, which is the price now. The price said to have been agreed on by the new combination is $8.50, or the same price as last season, when the enormous amount of building nearly created a brick famine.

Brick gossips say that it will be impossible to buy brick less than $8.50 this year, unless it is from the one or two outsiders. George E. Mills is no longer selling agent of the combination because of the entrance of the Toronto companies into the deal. The manager of the Simpson brickyards says that he has been instructed that all output to date has been sold, and will be taken over by the new owners on inventory.

Whether or not there is material in the case for police interference on the ground of a combine in the restraint of trade—a combine for the fixing of the price of brick—is yet hard to say. There have been many prosecutions on such grounds, but Crown Attorney Washington says that the brick combine story fizzled out some years ago. This new one may merit his attention.

The name of the new company is being kept secret, and Sackville Hill says he is not at liberty to give out anything regarding the deal. It looks, however, as if the consumer will pay just as much this year for his brick as he did last year.

FATE CLAY WORKING MACHINERY

It is sometimes claimed that one can tell the class of goods a firm produces by the catalogues they send out If this be true the J. D. Fate Co., Plymouth, O., must turn out some particularly fine machinery, for their catalogue is one of the best we have ever seen. Not only is it printed on fine "coated" paper, but it is illustrated by superb drawings of their many lines of brick making machinery, elevators, conveyors, dump cars, drums, trucks, etc. The cover is of leather, the binding being of a higher class than even the "editions de luxe" of popular novels.

As the J. D. Fate Co. make an exceptionally varied line of brick making machinery this catalogue should be in the hands of every clay-worker who desires to keep in touch with up-to-date methods of manufacturing

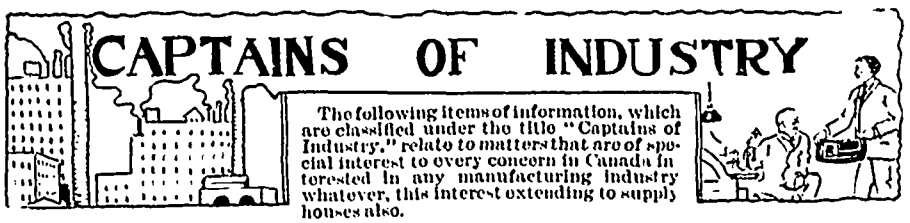
BUYING UP BRITISH COLUMBIA TIMBER LIMITS.

U.S. Consul Abraham E. Smith, of Victoria, reports that an American syndicate, composed of forty-two capitalists, has purchased perhaps the largest single land transaction made in the Province of British Columbia, concerning which he adds:

There was unusual interest in Victoria in this matter. A number of railroad men and wealthy investors, residents of the mid-Western States, chartered a large steamer and examined timber and coal properties on the Queen Charlotte Islands in which they held options. The syndicate, which is to be known as the Moresby Island Lumber Company, closed their options on 40 square miles of timber limits in the center of Graham Island, and also of 40 square miles on Moresby Island. They also purchased outright 800 acres of the choicest crown grant lands on Graham Island. The investment reaches several millions of dollars, the initial payment being $250,000. As a result of the deal a sawmill, to cost $400,000, will be at once erected by the company and located on Cumshewa Inlet on Graham Island

Various members of the party also held options on 10 miles of semi-anthracite coal lands on Graham Island, but it is reported that coal experts advised against the purchase, declaring that the coal is limited in quantity and unworkable, owing to the broken formation and lack of thickness in the veins.

The northern part of Graham Island is already in possession of another American syndicate known as the B. I. Graham Lumber Co., and embraces both timber and coal lands.



The Capital Lock Nut Co., Columbus, Ohio, purpose taking over the plant of the Robertson Machinery Co., Welland, Ont., and will spend about $100,000 in enlarging it.

The Trinidad De Cuba Light & Power Co Belleville, Ont., have been incorporated with a capital of $100,000, to carry on the business of an electric power company, etc. The provisional directors include E. G. Sills, O. A. Marshall and J. Little, Belleville, Ont.

The Deseronto Iron Works, Deseronto, Ont., will shortly close down, owing to inability to secure charcoal.

The British-Canadian Smelters, Limited, Toronto, have decided to locate their plant at Chippewa, Ont. The site is on the Niagara river and vessels having a 25-foot draught will be able to load. The company will erect a plant for the treatment of metalliferous wastes, ore and bullion.

The Westrumite Co. of Canada, Toronto, have been incorporated with a capital of $100,000, to manufacture Westrumite, road machinery and implements, etc. The provisional directors include J. A. McDonald, R. R. Grant and W. A. Hare, Toronto.

A new post office and customs office will be erected at Renfrew, Ont.

The Belleville Rolling Mills, Belleville, Ont., which have been closed down since December, expect to resume operations in the near future.

The Bell Thread Co., Montreal, have decided to remove their plant to Hamilton, Ont.

The Toronto Testing Laboratory, Windsor, Ont., have been incorporated with a capital of $4,000 to carry on a general chemical and mechanical analysis, etc. The provisional directors include W. P. Putnam, C. Lamont and H. Blumhart, Detroit, Mich.

The London Concrete Machinery Co., London, Ont., purpose erecting a large addition to their factory this spring. The new building will be 110x38 feet, two stories high, and built entirely of cement.

An addition will be erected to St. Joseph's Hospital, London, Ont., at a cost of about $10,000.

Goodenough & Rhinn, Detroit, Mich., are looking for a site in London, Ont, for a large steel works.

The Toronto Indestructible Brick Co., Toronto, have been incorporated with a capital of $100,000, to manufacture brick, etc. The provisional directors include A. Cohen, A. G. Parish and G. Keogh, Toronto.

A new company, to be known as the Brantford Iron & Metal Co., Brantford, Ont., have been organized to succeed the Brantford Millstock & Metal Co.

The John Inglis Co., Toronto, have been awarded the contract for the new 15,000,000 gallon pumping engine at a cost of $147,530, and also the contract for a 6,000,000 gallon engine at a cost of $52,700 to be installed at the Toronto waterworks plant.

The Ontario Powder Co., Kingston, Ont., are to build their permanent works at Stoney Point, a quarter of a mile further away from Tweed, and will so buttress or barricade the plant as will not only insure every means of safety in the works, but prevent a recurrence of loss or damage in the village.

The Bowman-Gray Lumber Co., Dundas, Ont., have been incorporated with a capital of $40,000, to manufacture lumber, timber, furniture, doors, sashes, lathes, shingles, etc. The provisional directors include J. H. Bowman and H. M. Gray, Dundas, Ont.

The congregation of the Presbyterian Church, Fort William, Ont., will erect a new edifice this spring.

An addition will be erected to the Harbord Street Collegiate, Toronto, at a cost of about $60,000.

The architects and engineers of Toronto, are considering the erection of a club house and office building at a cost of about $500,000.

The Dominion Storage & Forwarding Co., Toronto, have been incorporated with a capital of $10,000, to carry on a general storage and transporting business. The provisional directors include F. B. Duffett, J. N. McKendry and J. Donnelly, Toronto.

An addition will be erected to the Armouries, Guelph, Ont., at a cost of about $50,000.

The Canadian Organ Co., Woodstock, Ont., will establish a plant in London, Ont., if the city will give them a free site, free building and a $5,000 loan.

The P. L. Robertson Co., Hamilton, Ont., who were recently incorporated to carry on the manufacture of nails, screws and accessories, will erect a factory in the manufacturing district this spring. The company have ordered a lot of machinery and have purchased about thirty acres of land. It is the intention to erect a building costing about $10,000 at first and to so construct it that additions can be made from time to time without interrupting the working of the plant.

The congregation of the Herkimer Baptist Church, Hamilton, Ont., have decided to erect a new edifice at a cost of about $20,000.

The premises of Meakins & Son, brush manufacturers, the American Hat Frame Mfg. Co., and McBride Bros., Church Street, Toronto, were damaged by fire March 7. Loss about $15,000.

The premises of the James Smart Mfg. Co., Brockville, Ont., were damaged by fire March 5.

An addition will be erected to the west wing of Osgoode Hall, Toronto.

The Toronto & Northern Ontario Railway expect to add six powerful ten-wheelers to their locomotive stock next month. The engines are being made by the Kingston Locomotive Works, Kingston, Ont.

A new pump will be installed in connection with the waterworks, Gananoque, Ont.

The ratepayers of Toronto will vote on a by-law for the construction of a bridge across the Don River at Wilton Avenue, at a cost of about $185,000.

Geo. Henry & Son, Toronto, have been awarded the contract for the alterations and additions to the Customs Department of the post office, Toronto. The building will be 90x56 feet, two stories high.

The Elkhart Proprietary Silver Mines, Haileybury, Ont., have been incorporated with a capital of $100,000, to carry on a mining, milling and reduction business. The provisional directors include A. Miner, T. H. Jessop and R. W. Woods, Haileybury, Ont.

Geo. E. Boulter Co., Toronto, have been incorporated with a capital of $60,000, to manufacture goods, wares and merchandise. The provisional directors include J. Rogers, E. A. Scott and N. Higbee, Toronto.

Smallman & Ingram, London, Ont., have been incorporated with a capital of $500,000, to manufacture goods, wares and merchandise. The provisional directors include J. B. Smallman, T. H. Smallman and G. J. Ingram, London, Ont.

The Toronto, Hamilton & Buffalo Railway Co. will build a new bridge at Cainsville, Ont.

A new public school will be erected at Haileybury, Ont.

The council, Dundas, Ont., have recommended the acceptance of the Carnegie grant of $10,000 for the erection of a public library.

The Ridgeway Milling Co., Ridgeway, Ont., have been incorporated with a capital of $20,000, to carry on a general milling business. The provisional directors include F. E. Beam, I. L. Pound and R. T. Hardison, Ridgeway, Ont.

The new building for the Kakebeka Falls Brewing Co., Fort William, has been completed. The plant and building cost about $90,000.

The building being erected for the Landed Banking & Loan Co., Hamilton, Ont., is nearing completion.

Ketchum & Co., Ottawa, have been incorporated with a capital of $100,000, to manufacture automobiles, motor boats, bicycles, trucks, carriages, etc. The provisional directors include H. G. Ketchum, G. W. Easdale and J. G. Henzell, Ottawa.

The Owen Sound Iron Works, Owen Sound, Ont., have about completed two large tube mills for wet grinding at the plant of the Imperial Cement Co.

The Canadian Puncture Proof Tire Co., Toronto, have been incorporated with a capital of $100,000, to manufacture protectors for tires, etc. The provisional directors include R. M. Leggett, R. J. Gourley and W. C. Dayton, Toronto.

A new technical school will be erected in Toronto.

An addition is shortly to be made to the Legislative Buildings, Toronto. It will be a fire-proof building devoted to library and archives purposes.

The capital of the Weston Shoe Co., Weston, Ont., has been increased from $40,000 to $100,000.

MACHINERY AND EQUIPMENT FOR SALE

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BOILERS.—For special quotations on boilers and sheet iron work, write Park Bros., Chatham, Ont.

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WANTED—Aggressive salesmen calling on manufacturers in Maritime Provinces, to carry side line. Good commission. Address CANADIAN MANUFACTURER, McKinnon Bldg., Toronto.

ARTICLES WANTED,

SECOND-HAND SAFE WANTED—IN good condition. J. B. Huether, Walkerton.

WANTED—SECOND-HAND HAND PUMP fire engine, if not in good order and quality need not offer. Write John A. McDonald, Town Clerk, Kearney.

WANTED TO BUY—A SMALL STEAM BOAT second-hand; also half dozen row boats; state price wanted. Address Geo. Woolway, Lakeside, Ont.

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Manufacturers of **Shafts, Poles, Rims, Hubs, Spokes, Sleigh Runners, Etc.**

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ELLIOTT BUSINESS COLLEGE, corner of Yonge and Alexander Streets, Toronto, ranks higher than the average college; students admitted at any time; advantages unsurpassed; graduates highly successful; catalogue free.

MACHINERY FOR SALE.

Brown Engine, 75 h.p., good condition; Large Gap Bertram Lathe; Drill, 21" centre, Pollock & MacNab, Manchester; Milling Machine; Slotting Machine; Surface Wood Planer; Post Drill; also a lot of Pulleys and Belting.—JEFFREY BROS., Petite Cote, Montreal.

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SHOP LICENSES to manufacture W. M. Mackay Patent Feather Edge Sectional Steam and Hot Water Boilers under Canadian Patent No. 97582. This is a positive preventative against breakage from rust, is the latest improvement in boiler construction, and is more largely used in the United States than any other construction. For licenses or outright sale at reasonable figures, address, Alexander Mackay, 70 Victoria Square, Montreal, Canada.

SHOP LICENSES to manufacture a new style of Files that can be easily sharpened when dulled. Canadian Patent No. 107315. Address, Henry Getaz, P.O. Box 292, Schenectady, N.Y., U.S.A.

DYNAMO WANTED.

WANTED—To rent or buy, a 30 to 45 K. W. alternator, belted type; 2 or 3-phase, 60 cycle, 2200 volts preferred. Send price and full particulars to Box 67, Canadian Manufacturer, Toronto.

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BOOKKEEPERS, SALESMEN AND others having capital to invest in well established dividend-paying mercantile and manufacturing businesses situated in Toronto and throughout Ontario, can secure through us a choice of permanent positions, with good salaries attached, your investment guaranteed; strictest investigation solicited. A. L. Massey & Co., Toronto.

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WIRE STRAIGHTENING MACHINES

automatically straighten and cut off accurately any lengths up to 6 feet, sizes of wire No. 14 to 7 gauge

These machines are in good order and do perfect work. We have three to spare and will sell one or more as desired. Price, complete with counter shaft, $75 each.

Also, have some good nail machines which we will tell you about if interested.

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TO MANUFACTURERS

THE WINNIPEG ELECTRIC RAILWAY CO. has for sale

A Large Surplus of Hydraulic Electric Power Ready for Use by Manufacturers.

And would be willing to supply power in any quantity to manufacturers who may decide to locate at Winnipeg or St. Boniface.

Prices and terms on application, stating nature of proposed manufactory and quantity of power required, to

WILFORD PHILLIPS, Manager

WINNIPEG ELECTRIC RAILWAY CO., WINNIPEG

The Port Elgin Lumber Co., Port Elgin, Ont., have been incorporated with a capital of $50,000, to manufacture lumber, timber, etc. The provisional directors include W. McVicar, P. McVicar and W. Rutson, Port Elgin, Ont.

The head office of the Ontario Development Co. is to be changed from Toronto to Windsor, Ont.

The Gorman-Eckert Co., London, Ont., are considering the erection of an addition to their factory.

The premises of the Miller Mfg Co., Mutual St., Toronto, were damaged by fire March 10. Loss about $3,800.

St. Joe Island & Sault Line, Limited, Sault Ste. Marie, Ont., have been incorporated with a capital of $40,000, to manufacture vessels, boats, steamships, etc. The provisional directors include G. A Boyd, C. Carney and G. G. Farwell, Sault Ste. Marie, Ont.

Woodstock, Ont., intend purchasing new pumps and extending the power lines at a cost of about $27,000.

F. C. Whatmough, Stratford, Ont., has been awarded the contract for a complete electrical equipment at St Jerome's College, Berlin, Ont.

The Grand Trunk Railway Co. are considering the erection of a new station at Guelph, Ont.

Fire escapes are being put up at the Collegiate Institute, Chatham, Ont.

The Collingwood Shipbuilding Co., Collingwood, Ont., have been awarded the contract to build a large passenger and freight steamer for the Northern Navigation Co. The vessel will be 365 feet long, 50 feet beam and 27 feet moulded depth, and will cost about $500,000.

A portion of the new factory of the Modern Bedstead Co., Cornwall, Ont., collapsed March 16, causing damage to the extent of about $10,000.

The Farmers' Bank have opened a branch at Arkona, Ont.

The Canadian Bank of Commerce have opened a branch at Crediton, Ont.

The James Smart Mfg. Co., Limited, Brockville, Ont., have suffered losses by fire. insured.

The Jenckes Machine Co., Sherbrooke, Que., are suing the corporation of Gravenhurst, Ont., for $861.

The Dominion Heating & Ventilating Co., Limited, Hespeler, Ont., are supplying a dry kiln outfit, consisting of fan and heater to the St. Mary's Wood Specialty Co., St. Mary's, Ont.

The Smart-Turner Machine Co., Limited, Hamilton, are building a horizontal single cylinder jet condenser, for the new Toronto city dredge.

The Kaufman Rubber Co., Berlin, Ont., have placed the order for 200 in. steel plate fan and heater, with about 10,000 feet piping for their new factory, with the Dominion Heating & Ventilating Co., Hespeler, Ont.

Mr. Luxton Hill, Blythe, Ont., is installing a Dominion Heating & Ventilating Co. shaving exhaust system in his planing mill.

Among the concerns who have bought pumps from the Smart-Turner Machine Co., Limited, Hamilton, Ont., are the Polson Iron Works, Toronto; H. W. Petrie, Toronto; the Valley City Seating Co., Dundas, Ont.; Dufresne & Lock, Montreal; the Robb Engineering Co., Amherst, N.S.; the Pure Milk Corporation, Hamilton; James Playfair & Co., Midland, Ont.; Beehtels, Limited, Waterloo, Ont.; the Georgian Bay Engineering Works, Midland, Ont.; the E. Long Mfg. Co., Orillia, Ont.

An order to wind up the Galt Electric Gas Fixtures, Limited, Galt, Ont., has been granted, and the London and Western Trusts Co. have been appointed interim liquidators.

Mr. James Cleland, president of the Meaford Wheelbarrow Co., Limited, Meaford, Ont., is dead.

J. & R. Weir, Montreal, have been incorporated with a capital of $100,000, to manufacture motors, engines, boilers, yachts, boats, etc. The charter members include J. C. Weir, R. S. Weir and G. Weir, Montreal.

B. Plow & Co., Montreal, have been incorporated with a capital of $20,000, to carry on a general printing and publishing business. The provisional directors include B. K. Plow, Montreal, G. S. Plow and A. Plow, Westmount, Que.

Wilson Carbon Paper Co. Montreal, have been incorporated with a capital of $20,000 to manufacture typewriters, ribbons, carbon paper, office supplies, etc. The charter members include E. M. Wilson, J. Ellan and D. Church, Montreal.

The General Construction Co., Montreal, have been incorporated with a capital of $90,000, to carry on a general contracting and construction business. The charter members include E. A. D. Morgan, G. A Morrison and G. C. Tunstall, Montreal

The International Portland Cement Co., Hull, Que., have been awarded the contract to the Phœnix Bridge Co., Phœnixville, Pa., for the steel work of the new buildings which they purpose erecting.

Tenders will shortly be called for a new public building for Magog, Que.

Plans for the new public building at Cookshire, near Lennoxville, Que., have been received. The proposed building will be two stories, 37½x30 feet. The post office will be on the ground floor and the customs on the first floor.

An independent lighting and power plant will probably be installed at McGill University, Montreal.

The ratepayers of Notre Dame de Grace, Que., voted favorably on a by-law to raise $275,000, for municipal improvements, sewers etc.

The Standard Drain Pipe Co., St. John's, Que., have decided to rebuild their factory which was destroyed by fire a short time ago.

The ratepayers of Sherbrooke, Que., voted favorably on the by-law for the taking over of the plant of the Sherbrooke Power, Light & Heat Co. by the city.

The Convent of the Sisters of Charity, Cape St. Ignace, Que., was destroyed by fire March 9. Loss about $20,000.

The Toronto Type Foundry, Limited, will add a three story addition to their linotype department, 158 St. Antoine St., Montreal. This addition will double their floor space. Messrs. Hutchison & Wood, Montreal, are the architects.

The power plant in the new white lead and varnish works of Brandram-Henderson, Limited, at Mile End, Montreal, including one 325 h.p. Robb-Armstrong Corliss engine, and two 125 h.p. return tubular boilers, is being installed by the Robb Engineering Co

The Robb Engineering Co. are installing three Robb water tube boilers, of 216 h.p each, for the Montreal City waterworks.

C. Lapierre, formerly with Jas. Bennet, Montreal, has opened an office suite 419 Lindsay Building, St. Catharine St. West Montreal, to handle all kinds of electrical construction and repairs.

Partnership under the style of James W. Pyke & Co., iron and steel merchants, Montreal, has been formed by James W. Pyke, general partner and Thomas Prosser, special partner for $35,000.

H. G. Vogel & Co. are installing sprinkler system in the new warehouse of Swift, Copland & Co., Limited, Montreal.

Canadian Stewart Co., Montreal, have been incorporated with a capital of $100,000 to manufacture engines, boilers, tools, machiney, metals, implements, etc. The charter members include D. B. Smith, F. H Shaw and A. Vissett, Montreal.

The structural Steel Co., Montreal, have been awarded the contract for erecting the Canadian Pacific Railway elevator D, at Fort William, Ont.

The Dominion Bridge Co., Montreal, have secured the contract for the steel superstructure of the Redwood bridge across the Red River at Winnipeg, Man It is expected the work will be completed by next fall.

A deal for the purchase of a site for Montreal's new technical school is about closed The Quebec Government is covering the $200,000 issue of bonds required for construction and maintenance, and the civic authorities of the city will pay $15,000 per year towards maintenance.

The premises of the Sydney Hotel, Sydney, N.S., were damaged by fire March 8. Loss about $25,000.

The premises of the Dominion Coal Co at Morien Junction, near Glace Bay, N.S., were destroyed by fire March 8. Loss about $100,000.

A post office and customs house will be erected at Sherbourne, N.S., at a cost of about $25,000.

During the month of February, the Nova Scotia Steel & Coal Co. had taken out 50,700 tons of coal, as compared with 42,500 tons for the same month last year.

The Nova Scotia Steel & Coal Co., New Glasgow, N.S., have reported a new vein of iron ore at Whycocomagh Bay which is said to assay about forty-nine per cent The company intend to build a tramway to enable them to ship the ore to their plant at Sydney Mines, N.S.

An addition will be erected to the Y.M.C.A at North Sydney, C.B.

The post office, Halifax, N.S., will be extended at a cost of about $75,000.

The Department of Public Works, Fredericton, N.B., invite tenders up to March 23 for building the concrete substructure and approaches of Apohaque Bridge in Kings County, N.B., and of St. Jacques Bridge, Madawaska County, N.B.

Department of Public Works, Fredericton, N.B., invite tenders up to March 23, for the construction of the Mill Creek Mouth bridge, Albert County, N.B.

The saw mill of the Wm. Scott Lumber Co., near Fredericton, N.B., was destroyed by fire March 13.

The sawmill of F. D. Sadlier, Rowena Victoria County, N.B., was destroyed by fire recently. Loss about $5,000.

The Canadian Fairbanks Co., have opened an office and sample room at 58 Water St., St. John, N.B.

A large skating rink will be erected at Georgetown, P.E.I.

The new $16,000 school is being erected at Stonewall, Man.

The Grand Trunk Pacific telegraph line from Portage la Prairie, to Winnipeg, Man., has been completed.

A branch of the American Bank Note Co will be opened at Winnipeg, Man.

Lever Brothers, manufacturers of Sunlight soap, have acquired the Royal Crown Soap Works, Winnipeg, Man.

The Central Electric Co., Portage la Prairie, Man., have applied for increase of capital to $150,000, and change of name to Central Electric & Gas Co., Limited.

The Cavan Construction Co. have been awarded the contract for the construction of the Canadian Northern Railway at Rapid City, Man. Work will be commenced about May 1.

The Dominion Government will erect a bridge at St. Boniface, Man., at a cost of about $80,000.

The congregation of the Anglican church, Winnipeg, Man., will erect a church and Sunday School room this year at a cost of about $125,000.

Winnipeg, Man., invite tenders up to March 24 for the supply of turbine pumps of 2,500,000 imperial gallons capacity, with electric motor, for the waterworks.

The Canadian Pacific Railway Co. will put in a pipe line from Pipestone Creek to Reston, Man., at a cost of about $10,000.

The Canadian Northern Railway Co. will relay their line between Winnipeg, Man., and Port Arthur, Ont., with 80-pound rails this season. The work will be commenced early in the spring. This section of the line will also be reballasted and put in first class shape for fast and heavy traffic.

The Dominion Government will erect an examining warehouse at Winnipeg, Man.

A new hotel 126x100 feet, will be erected at Winnipeg Beach, Man.

The St. Joseph's Orphanage, Winnipeg, Man., which was erected last year, will be enlarged this spring.

A new public school will be erected in Winnipeg, Man., at a cost of about $25,000

The Manitoba Linseed Oil Mills, Winnipeg, Man., will erect a large building at St Boniface, Man., at a cost of about $75,000

The Bank of Nova Scotia will erect a new bank building at Winnipeg, Man.

As soon as the weather permits, building will be begun at Portage la Prairie, Man., of the following structures: The Waterloo Mfg. Co., makers of threshers; a flour and oatmeal mill; the International Gas Co., which has bought a site and purposes supplying the town with gas for both light and fuel; an addition to the London Fence Co's factory, and the Government Reformatory and Industrial School.

A new hospital, fire hall and public school will be erected in Daysland, Alta., this coming season.

Five hundred and ninety-nine miles of telephone lines were put into operation in Alberta during the year 1907, and eighteen exchanges placed in commission.

Work has been commenced on the new steel bridge over the Battle River at Hardisty, Alta.

The ratepayers of Wetaskiwin, Alta., voted favorably on a by-law March 10, to raise $18,000 to carry on boring operations for gas.

The Churchill Development Co., Prince Albert, Sask., have been incorporated with a capital of $20,000, to carry on a mining, milling and reduction business. The provisional directors include J. Patterson, H. G. Wright, Hamilton, Ont., and R. Freeman, Toronto.

The Banwell-Hoxie Wire Fence Co., Hamilton, Ont., have been awarded the contract for about 150 miles of fencing for the Canadian Pacific Railway in the vicinity of Calgary, Alta.

Phelan & Shirley, an American firm, have received a contract for grading a forty mile section of the Grand Trunk Pacific at Clover Bar, near Edmonton, Alta. This firm expect to have 400 teams on the work in the near future.

A new public school will be erected at Lethbridge, Alta., at a cost of about $85,000.

The mills of the Regina Flour Mills Co., Regina, Sask., which were destroyed by fire a short time ago, will be rebuilt shortly.

Tenders will be received by School District of Summerberry, Sask., No. 33, until April 1, for the purchase of $10,000 twenty year six per cent. school debentures.

Nine money by-laws have been carried in Edmonton, Alta., which are as follows:—To provide $12,500 to pay part of cost of traffic deck on Canadian Pacific Railway bridge; to provide $10,000 to pay city's share of cost of certain cement and plank sidewalks; to provide $49,000 to cover deficit on last debentures sales, to provide $30,000 additional cost of street railway material, to provide $10,000 for improvement and extension of telephone system, to provide $60,000 for improvement and extension of electric lighting and power system, to provide $5,000 extra cost of erection and equipment of Isolation Hospital; to provide $20,000 for fire equipment and additional cost of new fire halls; to provide $130,000 for city's share of street paving and street railway track laying.

The concrete work on the piers of the Grand Trunk Pacific bridge at Clover Bar, Alta., is nearing completion, and it is expected will be ready for the steel shortly

A provincial jail building will be erected about two miles from Moosomin, Sask.

A new hotel 65x56 feet, will be erected at Alameda, Sask.

A Collegiate Institute will be erected at Regina, Sask., at a cost of about $100,000.

The Massey-Harris Co., and the International Harvester Co. are erecting distributing warehouses at Lethbridge, Alta., and spur tracks will be laid to them from the railway

The new city hall, Regina, Sask., erected at a cost of about $157,000, was opened a few days ago. In addition to various civic offices, the building contains a spacious police court, council chamber and auditorium.

The new automobile hose carriages and chemical engines, for the fire department, Vancouver, B.C., were placed in commission a few days ago.

The new mill being erected for the Patrick Lumber Co., Nelson, B.C., is nearing completion. It will have a capacity of 125,000 feet of lumber per day.

The Nicola Valley Lumber Co., Canford, B.C., have placed an order with the Waterous Engine Works Co., for a complete planing mill outfit including planers, matchers, moulders and all running gear.

The Grand Trunk Pacific Co. have awarded the contract for the construction of the Prince Rupert terminal section in British Columbia to Ely Bros, Larsen & Stuart, Winnipeg, Man.

A report from Creston, B.C., states that a project is on foot to develop power at the Goat River Canyon and that company is now in process of organization.

T. F. Sinclair, Vancouver, B.C., has been awarded the contract for the new sewerage system at Revelstoke, B.C. The cost will be about $50,000.

The Grand Trunk Pacific Co. purpose building a stern wheel steamer to ply between Prince Rupert and Hazelton, B.C., on the Skeena river. The vessel will cost about $30,000.

The North American Land & Lumber Co. have sold their mill and limits at Fernie, B.C., to a syndicate of American capitalists, who will operate it under the name of the Eastern British Columbia Lumber Co.

R. Bowman, Vancouver, B.C., will erect a brick warehouse this spring at a cost of about $18,000.

The Moresby Island Lumber Co., Vancouver B.C., will shortly commence work in the construction of a sawmill to cost $350,000.

The British Columbia Electric Railway Co., New Westminster, B.C., are calling for tenders for the erection of a large addition to the car shops which will double the capacity of the works.

A contract for the laying of about 100 miles of track for the Grand Trunk Pacific from Prince Rupert, B.C., through the Rocky Mountains will be let in the near future at an approximate cost of $8,500,000.

The Canada Life Assurance Co., Vancouver, B.C., will erect a new building at a cost of about $250,000.

The B.C. Electric Co., New Westminster B.C. has issued orders that the work on the construction of the Eburne-Westminster line is to be resumed. It is expected by the company that the grading will be completed by April 1, and also that track laying will be commenced within the next month

The Great Northern Railway Co. are now laying track between Keremeos and Hedley City, B.C., a distance of twenty miles

The city of Vancouver, B.C., have under consideration a new hospital building

The city council, Victoria, B.C., have decided to pave several streets with wooden blocks treated with creosote and placed on a concrete foundation.

A combined school and municipal hall will be erected at Oak Bay, B.C.

Parfett Bros., Victoria, B.C., have been awarded the contract for the erection of the new post office at Ladysmith, B.C.

According to the estimates before the Legislature of the province of British Columbia for the coming year, $100,000 will be expended on the continuance of construction of the court house at Vancouver and $47,000 to that at Kamloops. Sixty thousand dollars is set aside for the new insane asylum at New Westminster. Repairs to the capital buildings, Government House, and other public buildings are also under consideration.

OPENING FOR CEMENT IN AUSTRALIA.

Australia is a growing market for Portland cement, according to U.S. Consul O. H. Baker, Sydney, New South Wales, who reports as follows:

The imports of cement into Australia in 1906 amounted to 88,919,936 pounds, imported from the following countries: Germany, 50,441,950 pounds; United Kingdom, 34,648,653 pounds; United States, 257,152 pounds, other countries, 3,572,141 pounds The wholesale price at Sydney varies, but is at present about $2.50 per cask of 375 pounds. The cement works in New South Wales produce about 1,000 tons per week, but they will soon be enlarged.

RAPID RECOVERY.

Messrs. Lockerby & McComb, Montreal, whose factory on Shannon Street was destroyed by fire in January, have completely rebuilt and remodelled the plant. A very attractive suite of offices have been fitted up. The books were all saved, and comparatively little confusion in the conduct of the business was caused by the fire. New machinery has been installed throughout the plant, and the firm are now in better position than ever to turn out the goods. Their lines include the well known Shield Brand Ready Roofing, Dominion Brand Tarred Felt, and Good Luck Tarred and Dry Sheathing.

ANOTHER BUILDERS' EXHIBITION AT MONTREAL.

The second annual Builders' Exhibition will be held next month at the "New Crystle Rink," Guy St., Montreal.

During the show week the convention of the National Builders' Association is to be held, to which many who are interested in the exhibition will be drawn.

The Architects' Association of Canada are giving not only its countenance but its practical aid to the exhibition. The Master Painters' Association will supervise the exhibits connected with its trade, as will the Master Plumbers' Association the display in its department.

Owing to the largely increased space at the disposal of the management some novel features connected with the building and allied trades will be included.

The applications for space which are coming in for the forthcoming Builders' Show, April 20 to 25, are quite sufficient to guarantee its success. Not only is interest being shown in the event by the builders and contractors of the Dommion, but United States firms are desirous of participating in the privileges that are sure to accrue. The applications are already so numerous as to prove not only the utility but the profitableness of the enterprise.

OF INTEREST TO POWER USERS.

Jones & Glassco, Sovereign Bank Building, Montreal, have started a business importing British machinery and factory supplies. They are taking up agencies for British firms making gas engines, oil engines, gas producers, pumps and miscellaneous electrical supplies. They have the Canadian agency for the Campbell Gas Engine Co. of Halifax, England, and are open to contract for power plants, electric lighting plants, gas engines, and electric machinery for all purposes.

Mr. Jones has made a study of producer gas both in America and abroad. He is a graduate of the Polytechnicum, Zurich, and has had practical experience with gas engines and producers in the Pittsburg district, and in the Campbell Gas Engine Co.'s works in England.

Mr. Glassco is an electrical engineer, a graduate of the McGill University, and has had practical experience and employment with the Canadian General Electric Co., Allis-Chalmers-Bullock, Limited, Westinghouse Electric & Mfg. Co., Pittsburg, and the Canadian Westinghouse Co.

They will occupy the store at 334 Notre Dame St. West after May 1st and will carry samples and stock and intend installing an engine there for show purposes

THE DETERIORATION OF COAL.

Coal deteriorates rapidly after being mixed according to experiments recently made by the Chemical Department of the University of Illinois.

In some cases the deterioration reaches as high as ten per cent. Curiously enough, the only way to prevent it appears to be to store the coal under water, sheltered and unsheltered coal piles being equally affected so long as in contact with air.

In referring to these experiments The Engineering Magazine says: The samples subjected to outdoor exposure uniformly showed marked deterioration, but of varying amount. The treatment of the samples was identical the coal remaining in shallow boxes exposed to the various temperature and moisture changes from October to July. The variations in heat loss, therefore, ranging from two to ten per cent., must be ascribed to inherent properties of the coals themselves. All showed a tendency to disintegrate, but they varied distinctly with regard to the ease with which they crumbled under pressure.

The results of the tests on the coals subjected to a dry atmosphere and a slightly elevated temperature were rather unexpected in that, with one exception in which the deterioration was practically the same, they showed a greater deterioration than in the case of outdoor exposure. This would seem to contradict the popular idea that a roof over coal in storage is supposed to be preferable to open exposure. The samples subjected to high temperature with frequent wetting down behaved in general like those exposed to outdoor influences, though in some cases a greater deterioration was observed in the former samples. Here the results are undoubtedly variable in accordance with the variation of structure and composition of the coals themselves. In general, a greater persistence of value might be expected in the dense and less friable coals and in those with less of iron pyrites throughout their texture.

In conclusion, the authors summarize the results as follows:

(a) Submerged coal does not lose appreciably in heat value.

(b) Outdoor exposure results in a loss of heating value varying from two to ten per cent.

(c) Dry storage has no advantage over storage in the open except with high-sulfur coals, where the disintegrating effect of sulfur in the process of oxidation facilitates the escape of hydrocarbons or the oxidation of the same.

(d) In most cases the losses in storage appear to be practically complete at the end of five months. From the seventh to the ninth month the loss is inappreciable.

(e) The results obtained in small samples are to be considered as an index of the changes affecting large masses in kind rather than in degree, but, since the losses here shown are not beyond what seems to conform in a general way to the experience of users of coal from large storage heaps, they may be not without value as an indication of weathering effects in actual practise.

Publications Worth Reading.

Any Manufacturer or Dealer in Supplies for this Column is invited to send Books on Business Topics for Review or Booklets, Pamphlets, etc., for Reference.

"ACORN" CATALOGUE NO. 20.—A 48-page catalogue, fully illustrated and printed in two colors, giving full information regarding the products of The Metal Shingle & Siding Co, Preston, Ont., for houses, stores, barns and other buildings.

STEEL PLATE FANS.—Catalogue No. 23 giving information regarding the various types and sizes of steel plate fans manufactured by Sheldons, Limited, Galt, Ont.

CANADIAN MADE TURRET LATHE.—The Stevens Co., of Galt, Ont., have issued a catalogue giving detailed description of the Jones & Lamson-Hartness type of turret lathe which they are making for the Canadian trade. Reference is made to several improvements to the lathe designed by the Canadian makers of this type of machine tool.

JEFFREY RUBBER BELT CONVEYERS.—A 48-page catalogue with illustrated descriptions of the many kinds of rubber belt conveyers for handling ore, crushed rock, refuse, chemicals, sand, clay, coal, pulp wood, chips, bottles, bags, barrels, etc., made by the Jeffrey Manufacturing Co., Columbus, Ohio. This catalogue is abundant proof of the great diversity of purposes to which these conveyers can be installed to advantage.

Practical Hints for the Factory or Mill Superintendent.

There are so many excellent technical publications issued throughout the world that even the most ambitious superintendent could not afford to read them all to get the cream of their articles. We propose in these pages to give some of the most practical hints and suggestions which appear in the technical press in all countries.

Care and Preservation of Wire Rope.

From Report of Transvaal Commission on Hoisting Ropes.

All evidence goes to show that the preservative treatment of a rope during its manufacture is a matter of the highest importance, and has a considerable influence on the life of the rope. The core, of tarred Russian hemp, should be thoroughly soaked in an acid-free lubricant. The wires should also be well lubricated while they are being laid-up, and the whole rope then, if the dressing is sufficiently thick and heavy, is well prepared to resist the corrosive action of a damp atmosphere. For shipment abroad, ropes are usually coated with a black (plumbago) varnish: such a rope should be well treated with a lubricating dressing before being put to work, and this is a wise plan to adopt with all winding ropes

ROPE DRESSINGS.

Regarding the composition of a suitable dressing, there are several recipes put forward. Most manufacturers favor plumbago, or graphite mixed with vaseline, linseed oil, palm or other vegetable oil.

Experience in Australia, in a Queensland colliery, showed cases where corrosion and breakage of a hoisting rope could be traced directly to the nature of the dressing used.

It should be pointed out that if a rope dressing is used which hardens on exposure to the atmosphere, care should be exercised to see that the pit-head sheave is kept cleane out in the groove of the rim, as it has been proved by more than one accident that the winding rope can be thrown off the sheave by reason of accumulation of ha dened lubricant in the thread.

QUALITIES OF A GOOD ROPE DRESSING

A good rope dressing wards off corrosion and reduces frictional wear. It should be applied every fortnight in dry, or nearly dry, vertical shafts, but more frequently in inclined shafts on account of its getting rubbed off by friction sooner. In wet shafts the dressing should be applied weekly, or even oftener, if found to be necessary from the condition of the rope. The dressing should be applied hot to the cleaned rope by slowly passing the latter through a box containing the composition. J. M. Wright exhibited a model of a mechanical rope cleaning and oiling machine, but no opportunity offered to try the device under working conditions. A simple machine should certainly tend to secure the regular and thorough cleaning and dressing of the winding ropes.

J. B. Pitchford states: "In order to make a proper examination of a rope, it is necessary to clean it properly and remove al the tar, etc., from the wires, leaving them as bright as possible. One method of doing this is to pass the rope through a trough of hot oil, which removes all the tar. The trough is made of steel, and can be from 15 to 30 feet long. It is of U shape in section, and has a steam space of 1½ or 1¾ in. around the bottom and sides. It is fitted with a relief valve and a drain, so that the condensation can be taken to the hot well. The trough is filled with oil and heated, and the rope to be cleaned is passed slowly through it under depression pulleys by being wound from one rope drum to another. By providing two sets of rope-handling engines, the ropes can be passed back and forth, through the oil, till they are quite clean enough for examination."

Monopol Oils for the Dye Bath.

From the Dyer and Calico Printer.

Monopol oils are new preparations put upon the ma ket by Dr. A. Schmitz & Co., of Heerdt-am-Rhein, as substitutes, among other things, for Turkey-red oil. Comparative trials with Monopol oils, Turkey red oils, Monopol soap, has shown that the first deserve trial, as they are useful additions to the dye-bath in dyeing with substantive dyes, such as the diamine, benzidine and sulfur dyes, on wool, half-wool, silk, half silk, linen and cotton, whether in the form of hanks, cops, wa p, or in the piece. They can be used alone, or in combination with the usual assistants, such as Glauber's salt, borax, carbonate of soda, or soap, as no reaction takes place between Monopol oils and any of these bodies. Monopol oils are not precipitated by hard water, as, although they form lime salts of the fatty acids they contain, these salts are soluble in water, especially when the dye bath is hot. It is well known that both soap and Turkey-red oil give precipitates of insoluble lime soaps, which not only represent waste of material, but are apt to cause unlevel dyeing, as well as other troubles.

On the average, the Monopol oils are added to the dye-bath in the proportion of from 15 to 25 pounds to every 500 gallons of water. In using Monopol oils with substantive dyes no alteration in the usual dyeing methods is requisite.

It is claimed that dyeings effected with the aid of Monopol oils come out fuller, brighter and more level, and also with less tendency to rub than when other fatty mordants are employed. No other oils or any kind of soap level so well and so economically as the Monopol oils. In chemical constitution they are oxysulfo or oxysulfocarbonic acids.

Yarns dyed or printed with the assistance of Monopol oils come out with an excellent lustre and handle, and the baths exhaust well, a specially important point of baths which are to be used once only. The favorable effects of Monopol oils are specially seen in working with mixed yarns or fabrics containing both animal and vegetable fiber. The bath is slowly and uniformly exhausted, so that the vegetable fiber dyes to a somewhat darker tint than the animal fiber, as it should do.

The great solubility of the Monopol oils enables them to penetrate all classes of goods very rapidly and completely. This, of course, makes very level dyeing and renders the oils very useful in machine-dyeing, and in dealing with hard material and closely twisted yarns. They are also valuable in sizing and finishing and dissolve stains caused by lubricating oils. When they are used for soaking purposes, the troublesome scouring of cotton, wool, and linen, can often be dispensed with, and the roughening and tendering which scouring often entails do not occur. After soaking, the goods are rinsed, and are then ready for the dye-bath. The soaking liquid consists of a one per cent. solution of Monopol oil in hot water, a strength which serves as well for cops and piece goods as for warps and yarns. This penetrating action, which is one of the most striking properties of Monopol oil, makes it a valuable help in mercerization when the mercerizing lye is mixed with about one per cent. of Monopol oil, and also in bleaching with peroxides, for which purpose the bleach bath is mixed with from 0.3 to 0.5 per cent. of its volume of Monopol oil.

The American agents for Monopol Oil are Jacques Wolf & Co., Passaic, N.J.

Iron Crucibles in Melting Aluminum.

From the Brass World.

Considerable interest seems to have recently been displayed in the brass founding trade about the use of iron crucibles in melting aluminum, and as many brass foundrymen, who have been accustomed to use graphite crucibles, have the idea that the iron crucibles possess particular advantages, we believe that a word upon the subject will not be amiss.

Iron crucibles have been used to some extent by the large aluminum founders, not because they possess any particular advantages but on account of their low cost. They have been used for melting large quantities of aluminum, and in instances where a large graphite crucible would not give the best of results. Graphite crucibles larger than No. 300's are rarely used, and it is in cases where much larger melts are to be made than such a crucible would hold, that the iron crucible has been employed.

It has been found, however, that the aluminum attacks the iron and not only becomes deteriorated itself, but injures the crucible. The crucible, too, frequently cracks. As far as we can ascertain, the experience with them has not been such as to warrant their extensive use.

FACTORY LOCATIONS.

The following Canadian municipalities are offering inducements to secure manufacturing establishments. Inquiries should be addressed to the Mayor, Town Clerk or Board of Trade of the respective cities

Barrie, Ont.
Hamilton, Ont.
Peterborough, Ont.
Regina, N.W.T.
Sherbrooke, Que.

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