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# THE Canadian Mining Review

Established 1882.

Vol. VI.—No. 5.

1888.—OTTAWA, MAY—1888.

Vol. VI.—No. 5.

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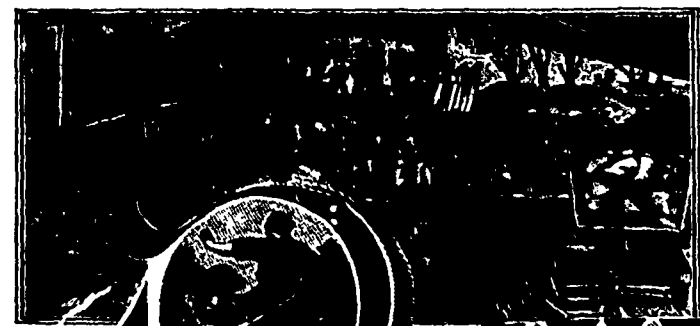
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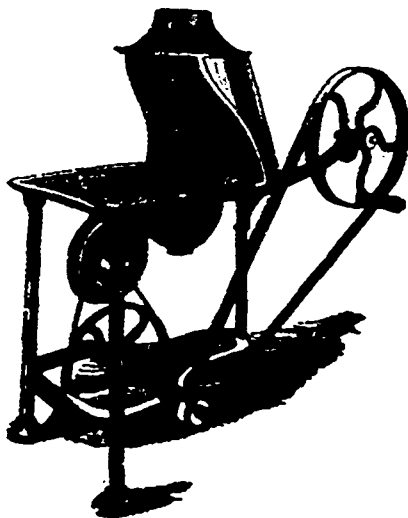
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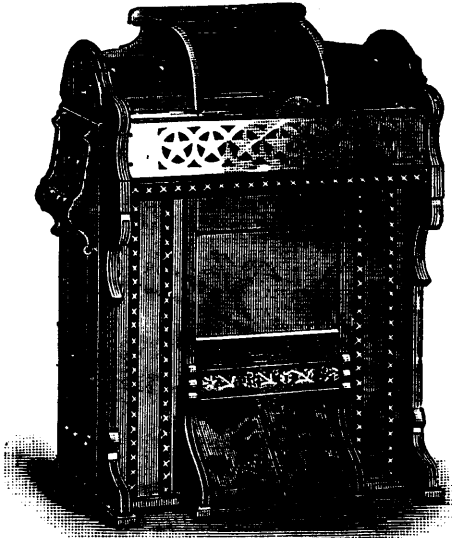
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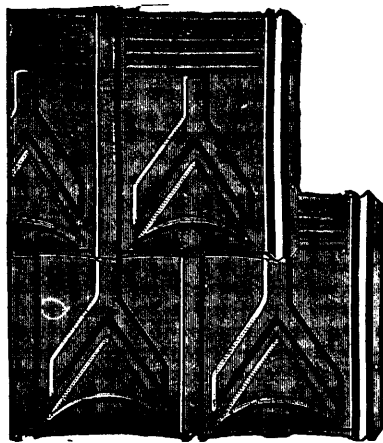
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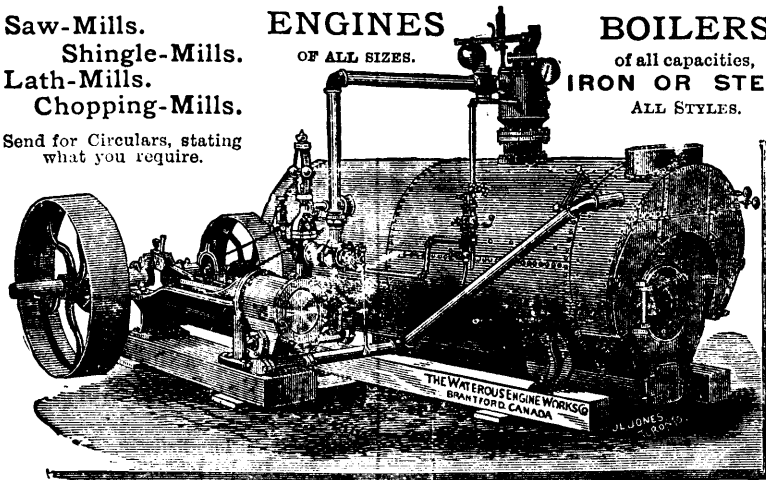
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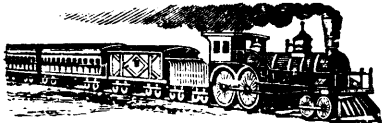
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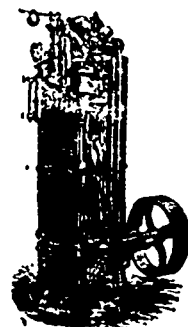
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Vol. VI. MAY, 1888. No. 5.

**Mineral Production, 1887.**

In our article last month it was stated in error that there had been an increased production of iron ore during the year of 6,522 tons of a value of \$128,424. The figures should have read:—

1887—76,330 tons of a value of .....\$146,197  
1886—69,703 " " " ..... 126,982

increase of 6,522 " " " .....\$ 19,215  
The mistake occurred, as many of our readers will have noted, through the transposition of the figures under the head of "Iron" (e).

**Sampling Phosphate.**

Some method of drawing accurate samples is greatly needed in this business. There is some uncertainty in chemists' analysis, though experience is rendering their results more uniform than has been the case. But the selection of a sample is usually a contest between buyer and seller as to which can select the most unfair specimens in either direction. Luck or knowledge frequently enables one party to get the advantage of several per cent. over the other, and dealers in phosphate consider that when sampling time approaches they must prepare for a contest of wits or a gambling game. Ashes, which are imported in much smaller quantities than phosphate, are honoured with a

Government inspector who determines the quality. Some such arrangement must be made to arrive at the value of phosphate before it will be a satisfactory business to either buyer or seller.

### The Development of Our Iron Mines.

The import of iron into the United States from Spain during the fiscal year ending 30th June last was 522,719 tons, or nearly one half of the whole quantity of that ore imported. From Canada, i.e. Ontario and British Columbia, there were imported, from the former 18,340 and from the latter province 10,002 tons, or in all 28,342 tons. The Spanish mines are rapidly giving out, and the material question will be with the American iron workers, whence they shall replace the supply. The question, moreover, does not affect the United States alone, but England will have to cast about for a fresh source for her steel supply, and in that enquiry our Canadian hematite will probably be prominently brought forward. This event might result in some of the English firms removing their works here. The Canadian market is too limited and our population is too scattered for a remunerative manufacture of ore at home for our own markets. Michigan and Wisconsin owe a large amount of their prosperity to the iron mining industry they carried on, the market value of the ore in the former State alone being over twenty million dollars last year, the greater part of which was expended amongst miners, and in teaming and shipping the ore. The duty on the ore from Canada alone prevents the same results in our iron producing districts, for we have a larger mineral tract of country than Michigan, and our ores are equally rich if not superior. What Canada requires is blast furnaces, at convenient points, and a central coke furnace, and with these in operation we should have not only employment for thousands of hands, but thousands of dollars would be distributed amongst our people, now denied to them while the duty remains what it is, or rather in other words, for want of reciprocity.

The stupid cry raised in certain quarters—for it is nothing but stupidity to stand in the way of natural trade—that unrestricted reciprocity means political degradation to Canada, is the barrier against the development of our iron deposits. We do not, in taking up mining questions, take either one side or other in politics—that is not our sphere—but we do look to the best interests of the mining community, and our object is to place their interests before them in the true light. The question may be raised by some, how are blast furnaces to be carried on when the transport of coal is taken into account. This can be answered by the simple reply that charcoal can be abundantly manufactured close to almost all, if not at all the deposits of iron ore; and as regards a market under existing laws, take the case of Nova Scotia where iron and coal are contiguous, but where is the market for a large output? Take

off the duty, and Nova Scotia could not smelt fast enough for the demand. The majority of our iron districts in Ontario are within 200 or 300 miles of Buffalo, and even without smelting works the ore could be easily transported there, whilst from Lakes Superior and Michigan there is a distance of 1,000 miles for conveyance, and yet ore is carried thence to various points in Pennsylvania at a remunerative return. We hoped that a previous article in these columns on this subject would have drawn out new ideas from some of our readers, and opened a correspondence on the matter, and we still hope this effect will be produced. If Canada is to look to her minerals as one of her paying resources, and that they are such if they could only be marketed is a self evident fact, our legislators will have to amend the present state of trade relations between Canada and the United States, as far as minerals are concerned, and the result will astonish not only themselves, but the iron market of the world. Throw open the markets to us, and there is nothing to prevent us turning out as much ore as Michigan and Wisconsin, smelting equally with Americans and circulating through this industry alone money to such an extent that prosperity would prevail in districts where now a stray labourer only makes even a precarious living. When the iron trade flourishes there is general prosperity; when it languishes there is stagnation. We advocate in this commodity at least, reciprocity, and we mean to keep this advocacy before our readers.

### The Ontario Commission.

The want of a complete report on the mineral resources of Ontario has long been felt, and in response to the general wish, on the 14th of March last a resolution was carried in the Legislative Assembly, on motion of the Hon. C. F. Fraser (acting for the Hon. T. B. Pardee, Commissioner of Crown Lands) authorizing the Government to appoint a Royal Commission to investigate and report on this subject. Acting on this resolution, the Council on the 8th instant appointed the following gentlemen a Commission for the above purpose:—

John Charlton, M. P., Chairman; Robert Bell, B.A.Sc., M.D., LL.D., F.G.S., Assistant Director of the Dominion Geological Survey, Ottawa; Wm. Hamilton Merritt, Mining Engineer, Toronto; William Coe, Proprietor of Iron Mines, Medoc; Archibald Blue, Deputy Minister of Agriculture, Secretary of the Commission.

The Commission has been chosen without reference to politics, and it is universally conceded, both by Liberals and Conservatives, that an excellent selection has been made.

Mr. Charlton has long been favourably known as a public man. His business ability is undoubted, and his great experience and extensive knowledge of public affairs will be of much value to the Commission. In addition to these advantages, Mr. Charlton is a man of affable manners,

courteous, quick at perception, and a good writer.

Professor Bell, a native of Ontario, is the oldest member of the Dominion Geological Corps, having been connected with the staff for upwards of thirty years, a considerable portion of which have been spent in Ontario, and our present knowledge of the geology of this Province is largely due to his labours. His extensive acquaintance with the rocks of the continent in general, will be of great service in the present instance. He has made a special study of the economic minerals of the country, and is well versed in the history and statistics of all the mines which have ever been worked in Ontario. Dr. Bell was Professor of the Natural Sciences in Queen's University for five years, and the experience which he must have gained there in instructing students, and clearing up their difficulties on geological questions, will now prove of service to him in preparing a report which may be easily understood and which, we think, should be as free as possible from technical terms. Full of enthusiasm for Canada, we feel confident that Dr. Bell will strive earnestly to meet the wishes of the people of his native Province in connection with the development of her vast mineral wealth.

Mr. Merritt, another Ontario man, is a mining engineer who has taken much interest in the mines and minerals of the Province. He has already done much good service in calling attention in his writings to the mineral deposits of Canada. He has also for the last year or two collected and published numerous statistics of mining in Ontario. At one time he was engaged in mining gypsum on the Grand River. In connection with the present enquiry, Mr. Merritt will be able to give us an account of what has been done in the development of the minerals of the Province from a mining engineer's standpoint.

Mr. Coe will prove a valuable addition to the Commission in consequence of his knowledge of mining and railway building. He has been more particularly engaged in the iron industry, which should claim the serious attention of the Commission, especially with a view to the smelting of our iron ores and the manufacture of iron and steel under the protection now afforded by the tariff. As a business man of large experience, and from his extensive connections with mining men, he is in a position to do much to promote the objects contemplated by the present enquiry.

Mr. Blue, the Secretary of the Commission, is too well known as the painstaking Secretary of the Ontario Bureau of Industries, and as Deputy Minister of Agriculture, to require any praise at our hands. The accuracy and thoroughness with which he has performed his duties in the past are a sufficient guarantee that his present work will be well done.

The Commissioners met the members of the Government by appointment in Toronto on

Saturday, 12th inst., when it is understood a programme was agreed upon, the particulars of which, however, have not been made public.

We regard the appointment of this Commission as very opportune and a highly important step in the right direction. The action of the Government in the matter has met with universal approval throughout the country. We have no doubt that every facility will be afforded the Commissioners, in their investigations, by the owners of mines and mineral lands, and the publication of their report will be looked forward to with the greatest interest. We presume that it will embrace a sketch of the geology of the Province with special reference to economic minerals, and accounts of the principal mining districts. The Commissioners should also consider any suggestions which may be made with a view to improving the facilities for access to new mineral lands. They will no doubt consult the wants of the mining community in general and endeavour to meet them as far as possible.

#### Home Use of Phosphate.

The feeling is growing on every hand that it is absurd to be exporting this richest of all fertilizers while our country is full of worn out lands. Farms are constantly being abandoned in Ontario and Quebec, and families emigrate to a life of hardship in a western wilderness for the sake of newer soils, when knowledge of the means of enriching the old lands would preserve their homes in affluence. It is not a lack of the existence of knowledge either that is at fault, for the knowledge has been gained and many communities are profiting by it, but the fault lies in lack of zeal on the part of those who should be the people's instructors, and also in lack of enterprise by commercial men who might spread the education to their own profit. Now that experimental farms are being undertaken in Canada, it is to be hoped that no niggardly policy will prevent the widest distribution of information as to the results obtained. No subsidy or protective tariff can compare for a moment, as a means of benefitting the country, with a system that would promote the production from its lands. An increase in the fertility of the soil would add to the wealth of the country more than any conceivable number of manufacturing industries could do, and this result would be secured without robbery or injustice to any unprotected interest.

Georgia has been admitted to possess the poorest soil of any of the Southern States, and twenty years ago its worn out lands could be bought for \$3 per acre. But knowledge of fertilizing has been extended and these same lands now command a market value of \$30 per acre, and the State now leads the South in the quantity and quality of its farm products, its cotton equalling that produced on the famous Red River bottoms of Louisiana. The same improvement could occur in the Province of Quebec.

The agricultural editor of the *Boston Post*

says: "To incorporate daily a certain amount of fine ground phosphate of lime into the fresh barnyard manure, by scattering it over the manure pile, or to compost them for some months previous to their designed application is a universally endorsed practice. The good economy of applying these phosphates in a finely divided state to the compost heap has been illustrated again quite recently by Prof. H. C. White, of Georgia." This gentleman put finely ground Carolina phosphate into a compost heap and after about half a year "a careful estimation proved that one-third of the phosphoric acid had been rendered insoluble in soil water. The commercial value of the phosphoric acid had been increased not less than 46.4 per cent."

Many United States farmers now keep finely ground phosphate constantly on hand, and daily spread it in the stables and stalls to absorb the urinary excretions and become mixed with the manure. A most valuable fertilizer is thus secured at small expense. Here is this natural fertilizer placed by nature at our doors, and we are not sufficiently intelligent or enterprising to make use of it. A great opportunity exists in this direction for both the philanthropist and the capitalist to work, and secure the blessing due to him "who makes two blades of grass grow where only one grew before." The Department of Agriculture and the Agricultural Societies should spread information about commercial fertilizers, and some wide-awake men should seize the opportunity to prepare and sell them in Canada.

This is a most important matter for our miners, as well as for our farmers, and we are fully justified in calling attention to it in these columns. Every pound of phosphate that can be mixed in Canada is needed on her own soil, and should be sold here instead of being transported thousands of miles and often sacrificed in competition with inferior foreign products, or through losses by those "tricks of trade" that are so notable a feature of modern commerce.

#### Mineral Development Company.

We have received the prospectus of a newly formed enterprise, under the title of "The Mineral Development Company of Ontario," (limited), with a capital of \$200,000 in 40,000 shares of \$5 each, with its headquarters in Toronto. According to its prospectus, the objects of the company are not to operate in mining, in the proper sense of the word, but to explore and develop to a marketable point mining locations in Canada, and to place them for sale. It is considered, and justly we think, that a company will be in a far better position to do this, than individuals. There are frequent instances of parties owning land in which there is every reason to believe, from analogy, that mineral deposits exist, but who have not the means to explore, nor the knowledge that would direct them where to look, or,

even if they did find indications, who might not be in a position to develop such indications, and to ascertain the value. Such parties have been known to sell their mining rights for a mere bagatelle compared with the real value of the output obtained by the purchaser, and when too late regret their inability to have explored further and developed what indications they knew of. At a juncture like this, such a company as the above steps in, and on very reasonable terms undertakes to ascertain the value of the lands, and to find a purchaser, thus limiting any possible loss, and greatly increasing the prospect of gain. With the names of such men as H. S. Howland, Sandford Fleming, and T. C. Keefer as directors, amongst other well known men of standing, the character of the Mineral Development Company of Ontario may be considered as no "wildcat" scheme. Its Secretary is Mr. Alex. Rankin, 20 Toronto Street, Toronto.

#### Algoma Indian Lands.

Our readers will be interested to learn that the last official act performed by the late lamented Hon. Thomas White was in the interests and for the benefit of the mining community. The new mining regulations for the disposal of Indian lands in Algoma, issued by the Department of Indian Affairs, were thought in some particulars to be prejudicial to the speedy development of the mineral resources of that district and with a view to their adjustment a deputation from Sault Ste. Marie waited upon the Superintendent-General of Indian Affairs.

At his last meeting of the Privy Council—held on the Saturday when he first took ill,—Mr. White brought the matter up, and on his recommendation the laws were amended as follows:—

1. That section 3 be amended by fixing the area of a mining location at 160 acres instead of 40 acres as therein stated.

2. That section 7 be amended by providing that in cases where the survey is not made by the purchaser, the deposit for a survey of a location be \$100 instead of \$50 as therein stated.

3. That sections 81 and 82, reserving a Royalty to the Crown of four per cent. on the sales of the products of mines, and requiring returns by the grantee of all products of his mining location, be annulled.

4. That form "D" of said Regulations be amended by striking out the provision therein respecting the payment of Royalty.

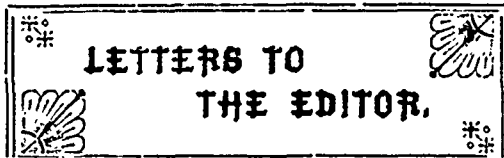
5. That the price of land shall be three dollars per acre.

6. That the 5th clause of the said Regulations be rescinded, but that the right to purchase a location shall be limited to twelve months from the date of obtaining the agent's receipt, as provided in sub-section "C" of section four.

**SITUATION WANTED** as Foreman Engineer at Mines. Sixteen years experience erecting, repairing and running Hoisting, Pumping and Air Compressing Engines and machinery. Would undertake, in connection with above, the duty of Time and Store-keeper or Outside Overman. References if required. Address "Engineer," office of THE CANADIAN MINING REVIEW.

### The Prospector's Soliloquy.

"To dig, or not to dig, that is the question ;  
Whether 'tis wiser in the deed to follow  
The lodes and bearings of auriferous metal ;  
Or to keep watch upon the claims of others,  
And, by attention, jump them ?—To sink,—to blast,—  
No more ;—and, by a shot, bring forth to light  
Gold, pure gold, and the hundred usual signs  
That indicate it,—'tis a consummation  
Devoutly to be wished. To sink,—to blast :—  
To blast ! perchance to burst ; ay, there's the rub ;  
For dynamite speaks truth, and barren quartz,  
When fuse has run its length, stands forth in all  
Its nakedness. There's the delay  
Of new machinery, the cost of it,  
No water power, wood too dear for steam,  
The assayer's test, a partner's contumely,  
Nor signs of proffered help, the road to clear,  
The insolence of office, and the sneers  
Which drive a man to think of seeking death  
At the drill-hole's mouth, and quit the world, hoist  
On his own petard. Who loves backwoods life,  
To grub and rough it with weary thoughts of home,  
But that the chance of something turning up,—  
The unexpected nugget, to grasp which  
All prospectors strive,—captures the fancy ;  
And reconciles us to discomfort now,  
To reap rewards when we are old and grey ?  
Buoyed up by hope, both hearts and nerves are steeled ;  
And thus, that he who seeks shall surely find,  
Brings to our minds both joy and sweet content ;  
And mighty works of great scope and daring,  
This end in view, are carried out in fact,  
Not dreamt of all day long."



We invite Correspondence upon matters consistent with the character of the Review.

Be as brief as possible. The writers name in all cases required as a proof of good faith.

One dozen copies of the issue containing his communication will be mailed free to any correspondent on request.

We do not hold ourselves in any way responsible for the opinions expressed in this section of the Review.

### Asbestos Output—1887.

MONTREAL, April 27, 1888.

The Editor

THE CANADIAN MINING REVIEW :

SIR,—We note per your April issue received to-day, that you give the output of the Anglo-Canadian Asbestos Co.'s mine for 1887, as 340 tons only.

This is an error. The actual output to 29th October, when we closed down for the winter, was about 540 tons, and 100 tons additional were taken out during the 12 months ending that date.

We also note that you make no mention of Mr. Jeffery's mine at Danville, the product of which must have been at least 400 tons.

We are, etc.,

IRWIN, HOPPER & Co.

### Iron Smelting in Ontario.

TORONTO, 17th May, 1883.

The Editor

THE CANADIAN MINING REVIEW :

"There is a tide in the affairs of men, which taken at the flood, leads on to fortune."

SIR,—The above quotation seems peculiarly applicable to the iron industries of Canada at the present time. Our mines are being so developed that we can speak with certainty about the supply of ore ; we can get fuel for coke furnaces from the States at a cheap rate, or from Nova Scotia at a rate which, if not cheap as regards the furnace-man's idea, still allows a moderate profit on the manufacture of iron.

The iron consumers throughout the country are suffering under the imposition of an enormous duty, which has been imposed with the view of forcing the establishment of blast furnaces in Ontario especially, or else of nursing the Nova Scotia industry at our expense, the freight from Nova Scotia to Toronto being at the same time as bad as a special tariff operating against the interests of the Ontario manufacturer. It has come to this—we must seize the opportunity to start furnace work in Ontario and so give our manufacturers cheap iron ; or the tariff must be at once removed. When I say we must seize the opportunity, I do not mean that a furnace could not be run if the existing duties were taken off, but the manufacturers accustomed to the use of Summerlee, Langloan, Salisbury and various other brands of English, Scotch and American irons would not take the trouble to give Canadian iron a fair test if they could get the others just as cheap. Under existing circumstances we can give them Canadian iron \$2.50 to \$3.00 cheaper than foreign iron, and they will gladly try it and do their best to make it answer the purpose ; meanwhile the furnace manager getting a more thorough knowledge of their needs, will work to meet them, so that very soon it will be a matter of indifference to all parties whether the duties are removed or not, because the furnaces in Ontario can afford, once they get in good running shape and understand the mixture of ores needed, to under sell the American furnaces. One difficulty, however, exists, and it rests with the owners of the Canadian iron mines to remove it ; that is, they must show their willingness to dispose of their ore, or of their mines, if they will not mine the ore themselves, at a fair and reasonable rate. Their motto should be "live and let live," but if they want everything and choose to play a stubborn part in this matter it is useless to do anything in the blast furnace line. I knew a man some eight years ago for whom I tried to sell an undeveloped iron mine. I had a purchaser for it, but as soon as the owner saw a chance to sell (what might, for all he could tell, have been a worthless property) he at once asked \$20,000 cash for it. That ended the transaction. If this sort of spirit still actuates Canadian mine owners, Ontario will never make a pound of iron "until" (as an old friend of mine remarked in connection with the above transaction) "there have been a few first-class funerals in the country."

Yours obligedly,

SAMUEL D. MILLS.

### The Profits of Asbestos Mining.

THETFORD, QUE., May 15, 1888.

The Editor

THE CANADIAN MINING REVIEW :

SIR,—I note in your valuable issue for April a quotation from an exchange stating that the exorbitant prices asked for mining locations, and the uncertain nature of the veins of the mineral, are two inherent evils which prevent the industry from being so profitable as it would at first sight appear. As a statement of this kind may be misleading, will you kindly allow me space in your columns to give a few facts in connection with this most important and rapidly increasing branch of our mining industry.

Proprietors of asbestos lands are offering their locations at reasonable prices and conditions. Lands in this district can be purchased at from twenty to fifty thousand dollars, which will yield on an average from 250 to 300 tons of ore per annum (according to the size of the location), for at least twenty-five years. The

cost of mining and preparing the mineral for the market may be fairly stated at \$25 per ton, and as at present the demand is very much greater than the supply, especially for the first quality, which commands from \$80 to \$100, the simplest calculation will show what a capital investment there is for the miner. Other owners are working them at royalties of from \$6.00 to \$8.00 per ton, and here the miner, who only pays for what he takes out, runs little or no risk.

It is the promoters, brokers and middlemen who ask for exorbitant prices and act detrimental to the best interests of the industry. They do not invest a dollar. They get properties bonded to them at reasonable figures, and ask twice, often four times as much as they have the property bonded for. The immense profit these parties make, no doubt causes the "outlay of capital which seriously cripples the resources of a company," but such profits cannot be charged to legitimate mining.

I have been grieved to see many desirable investors victimized by these middlemen, who have not only sold them mining locations at absurdly high prices, but have spent thousands of dollars of their money in ill-adapted and impracticable workings, and on useless and expensive machinery, for which they in their capacity as agents receive large commissions from the manufacturer.

These men are the curse of any mining community, and investors would do well to give them a wide berth and deal with principals only. Extravagant and inexperienced management, large salaries, grand houses, and surface workings which produce no ore, would ruin the best mining property in the world.

On the other hand, companies which have gone carefully and economically to work have for years past, and are now, making over 100 per cent. clear profit on their investment, and these mines are improving and look better every day. There is little room to fear of the exhaustion of the surface deposits by quarrying for many years to come. The asbestos bearing hills rise for many hundred feet above the level of the present workings, and extend, as far as yet known, for a distance of ten miles over a district from the Thetford mines, south to beyond the Coleraine or Black Lake mines, affording ample ground for development for many years to come. (See Reports Geological Survey, 1885-6; also Crown Lands Department, Province Quebec, with accompanying maps of the Serpentine formation.)

I can say very little yet about underground mining. Any expert can easily see, by walking along the open cuts, that the richest ground is below his feet, and if he makes enquiry he will be told that in this neighbourhood the various companies contemplate bringing deeper cuts from lower levels to the place of the present workings, for they are certain it will pay to do so. The Boston Asbestos Company have, during the past winter, sunk a shaft on one of their open cuts, which has proved very profitable, yielding ore in quality and quantity superior to any yet found in the quarries. This was done with a view to test the ground in depth, and give employment to the miners during the winter, as work can not easily be carried on during the inclement season. The result of this experiment has proved so satisfactory that all the others declare that they will sink shafts next winter, so that asbestos mining will soon be carried on all the year round.

So regular are the profits of the Thetford mines, and so bright are their prospects that to-day I am certain they could not be bought for

less than a million dollars.

I am, etc.,  
"ASBESTOS."

[In estimating the value of asbestos lands the quality of the output from the various mines must be considered. For instance, if we compare Thetford with Black Lake, we find that in the former a very large percentage of ore ranks as first-class, with a small percentage of second-class only, while at Black Lake, on the other hand, the bulk of the ore is seconds and thirds with a comparatively small percentage of firsts. The market value of these may be fairly stated as: 1st, from \$80 to \$100; 2nd, from \$40 to \$50; 3rd, from \$10 to \$15 or \$20. It is gratifying to observe that the percentage improves as the quarries increase in depth and the rock becomes more solid.—EDIT.]

### The Canadian Phosphate Co. (Ld.)

The statutory meeting of the Canadian Phosphate Company, Limited, was held at the Cannon Street Hotel, London, on 12th ult., Mr. Edward Packard (the chairman) presiding.

The Chairman said: This meeting is convened in accordance with our articles of association, and is what is called the statutory meeting; I believe the object of it is to give the shareholders an opportunity of meeting their directors. I am glad to inform you, gentlemen, if you are not acquainted with it, that the company has been successfully and fairly floated; that the whole of the share capital is subscribed for, and I believe we are in thorough going order. The property has been taken over by the company, the titles have been duly investigated and found to be in proper order, and the property has been transferred to the company. When the directors first took over the management of this business, we felt it incumbent upon us to make ourselves thoroughly acquainted with it in every respect, and with its possible requirements. In accordance with that idea, one of our directors, Mr. Millar, kindly undertook in a somewhat inclement season to make a journey to Canada, with a view to visiting the mines. With some 10 ft. of snow at the mines this might have been thought a useless journey; but it will require very few words from me to show that it was by no means so, because by his taking it we shall be able to adopt measures which will develop the property much earlier than we could otherwise have done. The expense incurred was not a heavy one, and I feel sure the shareholders will join with me in thanking Mr. Millar for his exertions on that occasion. (Hear, hear.) The thermometer at the time registered 25 degrees below zero, so you will appreciate the physical disabilities under which he laboured. Of course, it was necessary that the output of the mine should be, as far as possible, increased, and with that view we have taken steps which will, we believe, ensure a considerable increase in the output from the mines over and above what would have been possible had we not taken those steps at that juncture. Had we waited till the snow cleared away it would have been almost impossible to have placed the large quantity of machinery in position till the snow came again next year. Mr. Millar will be able to answer any questions so far as relates to what he saw at the mines. The reports received from the mines are as satisfactory as could be expected under the circumstances. The whole prospect of the company is extremely favourable, and there is no reason, in any shape or form, to think but what the success of the company will in the end be considerable. (Applause.) I believe the principal object of the meeting to-day

from a business point of view is to appoint an auditor. I am not aware of any other important business there is to bring before you, but we are here to answer any questions that the shareholders may desire to put to us. (Applause.)

Mr. C. C. Hoyer Millar: I shall be very happy to make a short report on the result of my journey. In accordance with the wishes of your board of directors, I left England on January 7, reaching New York on the 16th, where I called upon Mr. Williams, the president of the Union Phosphate Company, from whom your property was acquired, and who is a director of the present company. I conferred with him at great length as to the future conduct of the mines and the business of the company. From New York I proceeded to Montreal, and during my stay there made arrangements with the Canadian Pacific Railway for the more economic handling of the output from the mines. From Montreal I travelled by rail to Buckingham, driving the remainder of the distance in a sleigh up the River du Lièvre to your property. As almost the entire output of phosphate up to date has been obtained from the Star Hill Mine, I will first describe to you what has been done there. The principal work consists of two large pits, called the Big Pit and the Bridge Pit. These two are situated within 150 ft. of each other, and are working on the same lead of phosphate. The Big Pit is about 90 ft. deep, 50 ft. wide and 70 ft. long, and is crossed by a very good deposit of phosphate, and though from time to time, as the work proceeds, the amount of phosphate actually in sight at one time varies very much, I may say that the pit is looking far better than it did when I visited the mines during the summer of 1885. Hitherto the excavating has been pure quarrying, but drifting is now being done on both sides of this pit, and I hope that all the work here will very soon be under shelter, which will not only mean an economy in working expenses, owing to the fact that less dead rock will have to be moved, but will also make a most material difference in the work done during the winter months, at which time the frost and snow prove a great hindrance. The Bridge Pit is, at the moment, not being worked, but on the disappearance of the snow mining will be resumed here, and in several smaller pits, which are let alone during the winter owing to the expense and difficulty of keeping them free from snow. The Dugway and Ruby Mines are practically untouched, though the prospecting pits show good deposits of phosphate. In the spring attention will be turned to this portion of your property. On the Williams Mine work was only begun last spring; but the two pits (Parquets and Lapoints) are both doing well and producing phosphate steadily. This mine is pronounced by the experts to be the most valuable part of the property, and your company is now turning its particular attention in this direction. Since possession was taken a new barn and stables, sleeping-house for 100 men, boarding and cook houses have been built, and at the present moment a very large cobbing-house for dressing the ore (which will be the largest and most complete on any phosphate mine in Canada) is in course of construction, and will shortly be finished. We have also made arrangements for building a tram-road for the transport of the ore to the river, as the inequalities of the ground render summer haulage impossible. From the steep slope of the hill where the sinking is going on, the ore can be economically handled and the native rock got rid of, and in the spring the scope of operations at this point will be greatly increased. . . It may here be mentioned

that the phosphate runs in a series of pockets connected by small strings or leads of ore, and the cost of production varies in accordance with the size of these pockets. By working in several places at one time the cost of production per ton in the various pits is about equalised. Cost of transport from pit's mouth to ship's deck in Montreal is 11s. per ton. Turning now from the phosphate to the management of the mines, I have much pleasure in saying that your company has secured the services of Captain J. E. Smith, who has been associated with the management since the mine was actually commenced. Captain Smith is above everything the most practical and economic manager that could be wished for, having previously worked for many years in the great mining centres of the United States. He is a large shareholder in the company, and has its interests well to heart, so that you may feel thorough confidence in him. In conclusion I would state that in the opinion of those best qualified to judge, you are the possessors of a most valuable property, of which but a very small portion has yet been touched, and it is beyond the possibility of doubt that as the huge cornfields of Western Canada and the United States get their richness exhausted they will require replenishing with chemical manures, which in turn will cause a great increase in the demand for Canadian phosphate, which is a trade admittedly in its infancy, and one whose expansion is certain. (Applause.)

Mr. Wingfield asked what were the shipments in 1887 that yielded, as stated in the prospectus, 84 per cent. on analysis.

The Chairman said he had personally examined the analysis, and could answer that it was correct. It might be interesting to a competing company to know the shipments, but he could hardly give the information.

In reply to another shareholder, the Chairman said that the output for the week ending March 17 was 60 tons, and for the following week 64 tons; and they were continuing to make satisfactory progress.

A Shareholder: What steps have been taken to secure a Stock Exchange quotation?

The Chairman: We have not actually taken the steps necessary at present, but they will be taken forthwith. (Hear, Hear.)

Mr. Barriston then moved that Messrs. Hibbard, Bull & Co., of 17 King's Arms-yard, Chartered Accountants, be appointed auditors of the company at a remuneration of 20 guineas for the first year.

A Shareholder seconded the resolution.

Mr. Wingfield proposed Mr. Griffiths, of the firm of Deloitte, Dever, Griffiths & Co., but the amendment was not seconded, and the original resolution was put and carried.

The Chairman said that that concluded the business. They had done their best so far, and would continue to do their best for the interests of the shareholders, and he had no doubt that they would be able at their first annual meeting to declare at any rate some dividend to the shareholders.

A vote of thanks to the Chairman closed the meeting.

**A Large Lump of Coal.**—One of the largest lumps of coal ever mined in the Monongahela Valley was taken from J. S. Neel's Cincinnati mines, near Monongahela City, lately. The block measured 7 feet 8 inches long, 3 feet 5 inches high, and 3 feet 7 inches wide. A temporary track was laid to the river, and the big piece of coal loaded in a boat for Cincinnati.



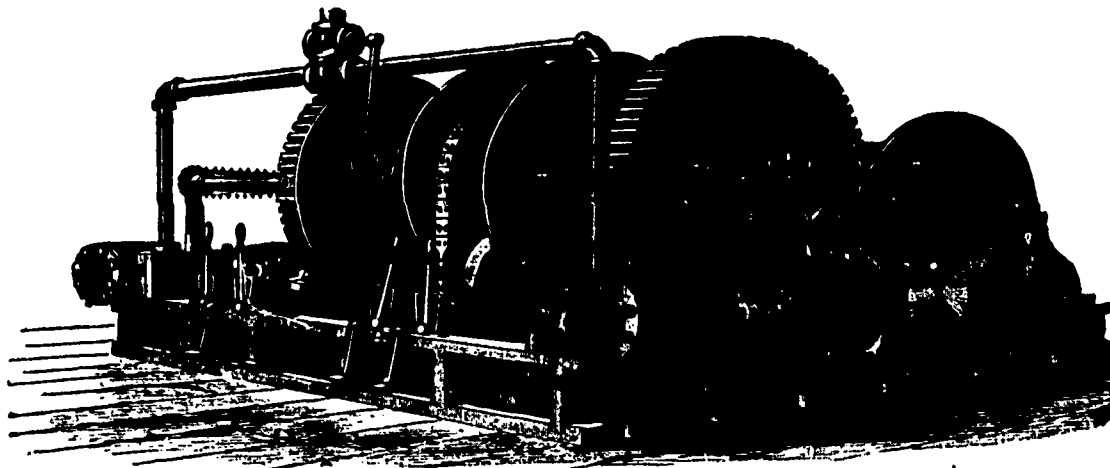


FIG. 40a.—Double Four-drum Hauling Engine.

### Wire Rope Haulage and its Application to Mining.

By Frank C. Roberts, C.E., Philadelphia, Pa.

*Continued from April Issue.*

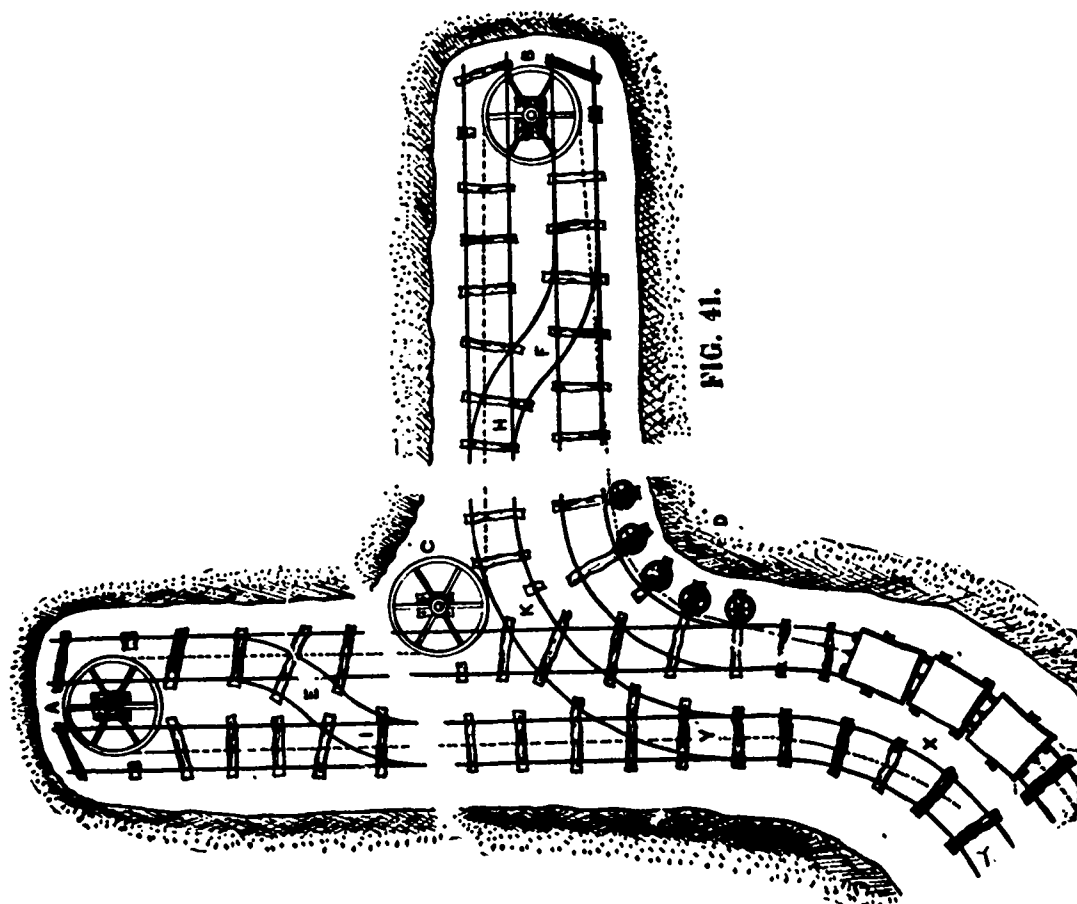
In this system it is of course necessary that the rope be kept taut, and for this purpose artificial tension is introduced. This is usually obtained by passing the rope round a wheel and supporting the latter upon a carriage to which is attached a weight, hanging over a pulley by a chain or rope. Fig. 42 illustrates this arrangement. The rope varies somewhat in length on account of changes of temperature and elongation due to working under tension, and this device permits such variations without detriment to the tractive force or to the rope. An addi-

tional tension device is usually applied to the engine-drums, as will be shown hereafter.

Much time and ingenuity have been employed in devising convenient grips for attaching cars to the moving rope, but those which have been found the most serviceable in mining operations are of the simplest character and among the first employed. Fig. 43 illustrates a grip which may be employed when it is desirable to start and stop the cars without interrupting the motion of the rope. Two levers, B and C, acting on a pivot, K, with jaws, D, for gripping the rope, are actuated by the link A. In order that the grip may pass over the supporting rollers, it is necessary that the rope, when gripped, be elevated above the rollers. To this end, the U-strap, F G, is attached to the bumper of the car, and the grip-levers, B and C, are provided with

lugs H. A chain E forms the link between the grip and the car, by means of which motion is transmitted to the car. In the illustration I have supposed the grip in its lowest position, about to seize the rope. The operator, standing on the bumper at the front of the car, now presses the lever A and closes the jaws D. The rope, moving in the direction of the arrow, carries the grip with it until the chain E is taut. By this horizontal motion of the grip the lugs H, resting and moving on F, are raised to the level of G, and the grip and rope are likewise elevated. In this manner the supporting pulleys may be passed without difficulty.

Where starting is performed at stated points the following device may be employed. A grip similar to the foregoing is fixed by a bolt at K to the bumper of the car. The jaws are about



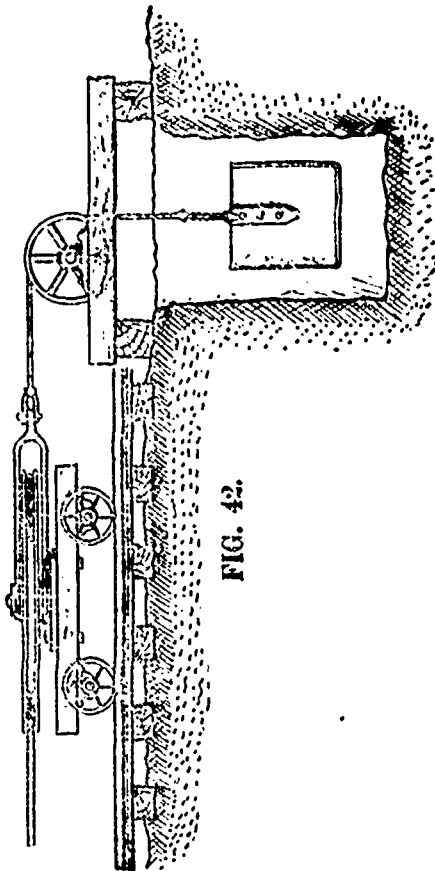


FIG. 42.

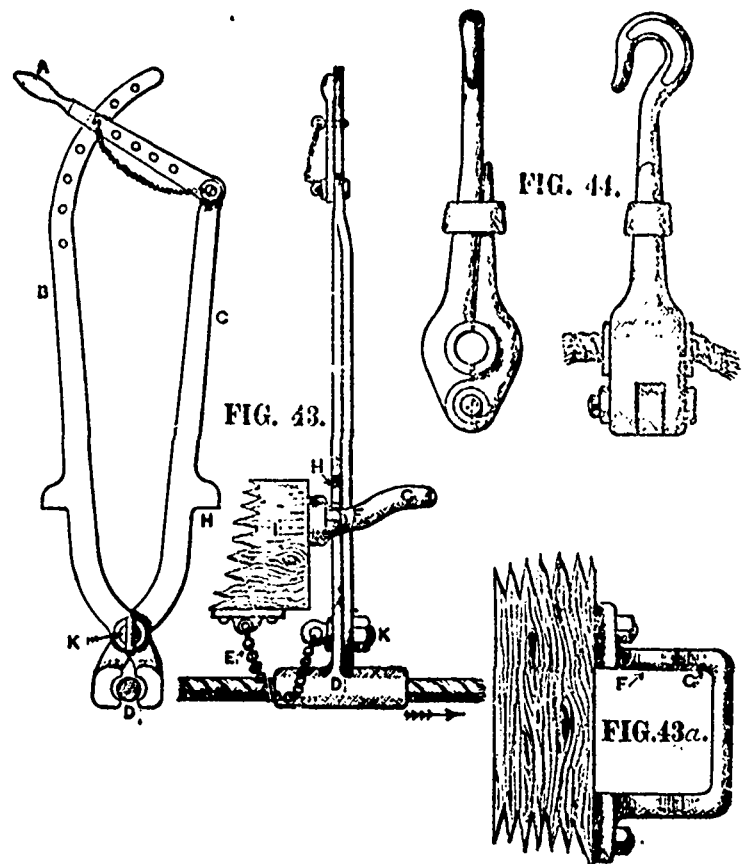


FIG. 43.

FIG. 44.

FIG. 43a.

1½ inches above the level of the rope when resting on the supporting rollers. In order to enable the grip to clasp the rope when starting a train, counterweighted supporting rollers are placed at convenient points. These pulleys raise the rope at the desired points to the level of the grip, and their vertical motion permits the passage of the grip without difficulty. Referring to Fig. 41 it will be seen necessary to introduce these pulleys at points H and Y. In many mines it has been found more convenient to adopt such arrangements that the rope is stopped for attaching and detaching. For this

purpose I would recommend the device illustrated in Fig. 44.

When there are no side-entries to be operated it will be found convenient to employ a grip-car or "dilly." The most approved form of this device is that used at the Imperial Mine in the Monongahela region. This consists of two vertical double-grooved drums, mounted on a truck running on the mine-tracks. The hauling-rope is brought under the dilly and passed over the forward drum and half-way round the rear one. This is repeated and the rope then continues to the terminus. The motion of the drums is

governed by friction-bands. When the dilly is stationary the drums revolve freely, but when it becomes necessary to impart motion to the dilly the friction bands are tightened, and, coupling being made to the cars, the train is drawn out. Supporting rollers are placed in this system about 20 feet apart, and are usually 6 inches in diameter and from 12 to 18 inches long. When the single-track system is employed, the rollers supporting the loose rope are of the same diameter, but from 6 to 12 inches in length.

Fig. 45 illustrates what I consider the most approved design for an endless-rope hauling-

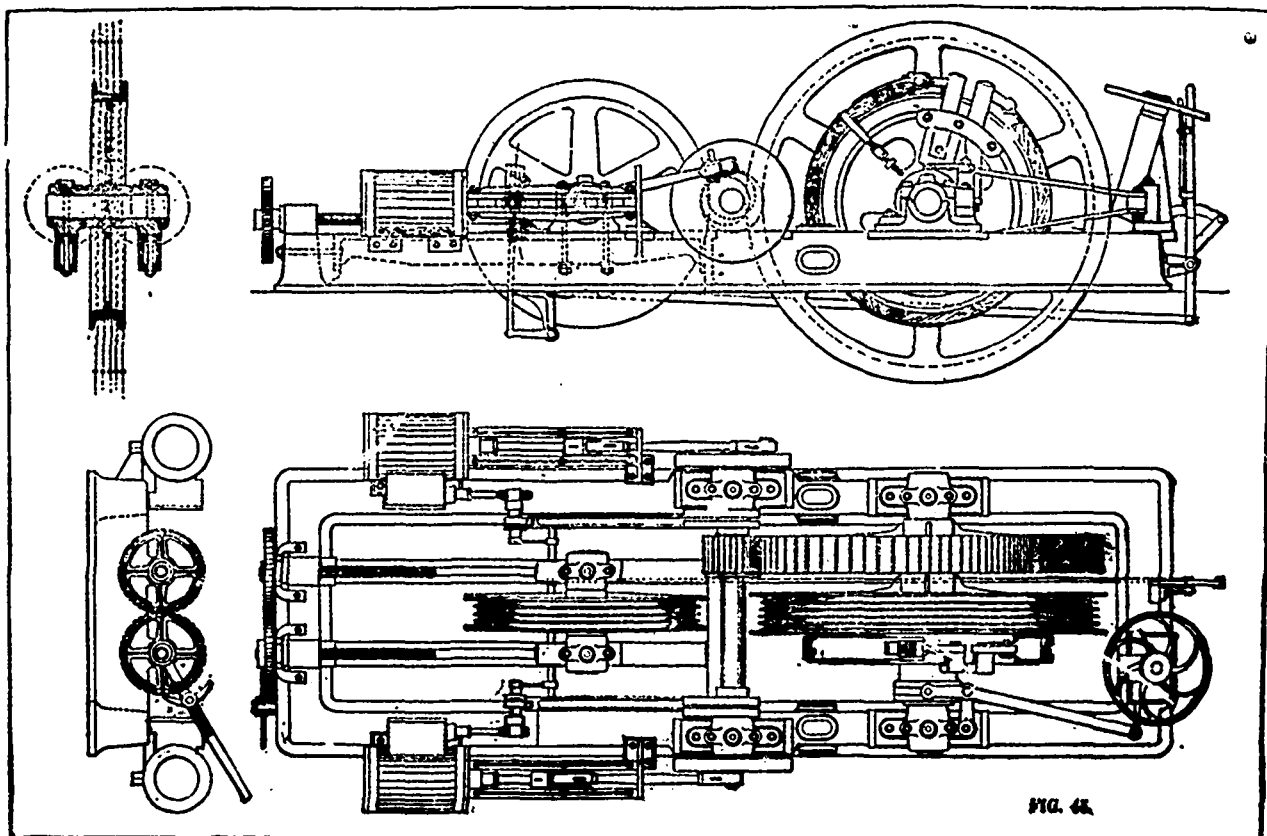


FIG. 45.

engine. It will be seen that there are here two drums placed tandem. The rope is first passed over the larger and then over the smaller drum, as many times as may be found requisite to secure the necessary tractive force. The motion of the larger or hauling drum is controlled by a friction-clutch. The motive power is furnished by two engines, actuating a pinion meshing with a spur-wheel keyed to the drum-shaft. The "idle" drum rests on sliding bearings, and slack rope may be taken up by drawbolts as shown.

In proportioning the size of wire-rope requisite for a haulage-plant, the factors mentioned under the head of hoists and inclined planes must be taken into consideration in this connection also. In the tail-and-counter-rope systems, the stress upon the rope is direct, and is due simply to weight and friction. In the endless-rope system, however, we have another factor to consider, namely, the amount of artificial tension introduced to prevent the slipping of the rope upon the drums. The tension depends, of course, upon the number of times the rope is passed over the hauling drum. In the case of the machine illustrated, where the rope has four half-wrappings around the drum, it is necessary to allow 20 per cent. more stress in the rope than in the case of the counter-or-tail-rope system.

Much surface-wear is encountered in this application of wire-rope; and for this reason it is advisable in all cases to employ the best steel wire rope, composed of six strands of seven wires each laid about a hempen center. The table on page 36 gives the various data concerning this class of rope.

#### CONCLUSION.

In designing a wire-rope plant of any description, it is necessary, in order to obtain economical results, to proportion the details of the system in accordance with results derived from theoretical calculations. The engine-power, the sizes of ropes, drums, supporting rollers and curve-sheaves, as well as the position of the latter with reference to each other and the line of the road, should all be based upon direct calculation. The scope of the present paper does not permit a discussion of the mathematical principles involved; but it may be declared that observation and experience have in every case supported these theoretical investigations.

Wire-rope has taken, by its own merits, a very important part in the development of the mining resources of the United States; and it is to be hoped that the few pages here submitted may contribute something towards a still further advance in the direction of economical mining operations.



#### In General.

The lawsuit of Alexander Fraser, of Westmeath, vs. the Department of Public Works of Canada was heard before His Honour Judge Burbidge in the Exchequer Court on the 12th ult. Fraser owns some 19½ acres of phosphate lands on the north half of Lot 8, 1st Range of Portland East, and claims from the Government the sum of \$40,000 expropriation for his phosphate property, which adjoins, and has been partly taken up by the Government for the construction of the new lock and dam on the Lievre River at Little Rapids. A large number of mining men were called as witnesses, including Messrs. Eugène Coste, M.E., Geo-

logical Survey, S. P. Franchot and Captain Henwood of the Emerald Mines, Captain Macnaughton, Buckingham, Demers Brosseau, and others. A good deal of interesting evidence was adduced, but, being altogether too voluminous, it has been impossible to reproduce even a small portion of it here. His Honour took the case to *avizandum*, and judgment will be given in a day or two.

There are now in operation in South Carolina fourteen fertilizer factories, employing 885 hands, with a capital of \$3,852,000. The value of last year's product was \$3,396,000. Major E. Willis, Charleston, gives the following interesting particulars in a recent Report:

"The activity of the fertilizing industry has not been confined to this city, nor to the State, for there are many manufactories in other Southern States that use the South Carolina phosphates for the manufacture of fertilizers. The business of these concerns is prosperous. This business is a boon to railroads and steamship lines. The shipments for the past three months, from Charleston alone, required over 1,500,000 sacks to hold the material. Over 2,062,500 pounds of burlaps were used in making the sacks, and over 11,250 cars were required to transport them, filled with fertilizers, over the railroads. The Charleston companies will consume, in making the year's supply of fertilizers, over 70,000 tons of phosphate rock, and nearly half as much sulphur, besides kaimit, marl, potash, blood, fishscraps, bone black, azotin, nitrogen, tankage, cotton seed meal, and other materials.

#### Markets.

Nominal quotations by cable from England are 1s for 80%, 10d for 75% and 8½ for 70%, all with 1-5d per unit rise. Large sales have, however, been made at 11½d per unit, with some small lots at 11¼d. The raisers of Carolina phosphates have been making arrangements for getting better prices by concentrating sales, and an advance of ¾d per unit is being asked. It is hoped this will strengthen the market for Canadian lower grades which have felt the competition of French and Carolina phosphates. Montreal prices range from \$11 to \$15 f.o.b. according to quality.

#### Freight.

Large engagements of tonnage have been made for the season at 6s 3d to Liverpool. The regular lines are asking 7s 6d, but outside boats will soon be arriving and lower rates are expected. There will probably be an ample supply of tonnage during the season.

#### Du Lievre.

Everything seems now to be favourable for the transportation of phosphate, of which there is a large quantity awaiting shipment at the various mines. The steamer Agnes commenced running on the 30th ult. and is doing a large business, while the Eva is kept busy towing phosphate down to the railway at the Landing.

The Plumbago Mill at Graphite City is again at a standstill. It may not be generally known that this is really a good property, but apparently in the wrong hands. It is not likely to be run this summer. It would cost something in the neighbourhood of \$5,000 to put it in good working condition.

The grinding mills at Bassin-du-Lievre expect to start very shortly; the first operations will be on 100 tons of ore from the High Rock Mine. These mills have been closed down since last fall.

Rumour has it that Mr. A. F. MacIntyre, of Ottawa, has succeeded in floating a company to operate his property adjoining the celebrated Emerald Mines. The lots were originally owned by the Buckingham Mining Company.

Mr. Wm. Macintosh is opening out his lots on the 8th range of Denholm. Some 200 yards have been stripped showing a well defined vein of the mineral.

The annual general meeting of the Dominion Phosphate and Mining Company was held at Montreal on Tuesday, the 15th instant. The attendance was not so large as might have been expected. The doings of the company during the year were regarded as most satisfactory. Messrs. Chas. Kyte and W. A. Nicholls, two of the New York directors, visited the North Star Mines on Thursday, and were very much pleased with all they saw there. Under the able management of Captain Williams a good output has been made. Many new and rich shows have been opened and at present everything looks very promising. The present main shaft is down about 600 feet.

The Canadian Phosphate Company have commenced their shipments, and between four and five hundred tons have been hauled down the river. Captain Smith is pushing along with the construction of the new tram line, and is providing ample accommodation for a largely increased force of workers. A new cobbing house 32 + 60 will be erected, and an endeavour will be made to secure a suitable tug boat and new scows to facilitate the movement of their output. Some new hoisting plant has been added during the month.

Close upon 600 tons of ore have been sent down from the High Rock Mines. At the time of our visit some difficulty was experienced on account of the dump pile still being in a frozen condition. Mr. Pickford has things well in hand at the mines.

Captain Henwood has between 40 and 50 hands working at the Emerald, producing a steady output. Shipping will be commenced at an early date.

The Little Rapids Mines look as well as ever; and here too a goodly quantity of ore awaits transportation.

Mr. S. P. Franchot reports favourably of his Central Lake Mines.

#### Templeton District.

Mr. Trimble and several directors of the Templeton & Blanche River Company, paid a visit to their mines on Thursday, the 17th inst., and found all the pits and openings looking well. Mr. Wm. Cassils, the President, has a large and very rich specimen of the mineral, weighing several hundred pounds on exhibition at his Montreal office.

#### Perth District.

Several parties are at present prospecting phosphate lands in the neighbourhood of Sydenham.

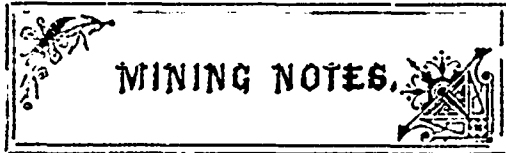
Mr. John Claxton, who has recently acquired the mining rights for the Conolly lot, has a number of men working and is meeting with encouraging success. Under the old management the property produced some 600 tons from surface workings, but as soon as enlarged operations became necessary the pits were abandoned. Mr. Claxton is a miner of experience, having been for a number of years at the Lake Opinicon mines.

Mr. James Foxton is working briskly on his location. Eight pits in all are being operated,

and at one point a tunnel 4+6 on a 15-inch vein of red phosphate is being driven into the hill. The shows in No. 1 pit are very promising.

Captain Moore, of Hurley, Wis., is expected on his newly acquired lots in a few days. His machinery will be in place by 1st of June, and operations will then be commenced with vigor.

Bush fires have commenced in alarming proximity to the Otty Lake Mines owned and operated by the Anglo Canadian Company.



We shall be greatly obliged to mine owners and superintendents for such authentic reports of their operations as may concern shareholders and the public.

### Newfoundland.

The Tilt Cove Copper Company, Limited, has been organized, with a capital stock of £160,000, shares £2 each, to lease or purchase mining properties at Tilt Cove, Newfoundland, granted to the vendors by the trustees of the estate of the late Charles Fox Bennett, June 24th, 1886, and made between Thomas Reynolds Smith, Charles Thomas Bennett and Arthur James Williams Bennett of the one part, and John Taylor of the other part.

### Nova Scotia.

Work at many of the collieries has been slack for some time past, but probably not more so than is generally the case prior to the opening of navigation. Steamers are now daily expected at the wharves.

The Black Diamond Colliery is being worked steadily, and present indications are such that the company may look upon their enterprise as a success. It is the intention to drive a level drift from a point some 1,500 feet down the old slope to a seam, supposed to lie about 200 feet below the one at present worked; this will enable the management to prove the value of their second seam in the most economical manner possible.

At the Drummond Colliery every preparation has been made to meet the season's demand which, it is thought, will be in excess of former years. No. 4 slope has been put in good working order and mining can be commenced there whenever necessary. Preparations have also been going on in the old slopes from which a very large output may be expected. The sinking of slope in the Scott pit is being pushed forward with vigour, and by the end of the present month will have reached a depth of 500 feet from the bottom of the shaft.

At the Albion Mines very little coal is at present being raised. The reopening of the slopes closed by the explosion has been suspended until sufficient water has been run into them to fill the opening between the two slopes; when this is done the work of reopening will be resumed. In draining the Food pit many difficulties have been encountered. The pumping engine can not be used as the pumps are not yet in running order, and owing to the damaged condition of the shaft the hoisting of the water is frequently interrupted. The sinking of the new slopes to the depth of the Cage pit seam is being continued day and night, and employers and employed look hopefully forward

to the successful reopening of this valuable and far famed seam.

At the Vale Colliery active operations are being conducted at both mines. Notwithstanding the influx of Belgians, good miners are still in demand. The latest arrivals here are a number of Welsh miners.

At the Springhill Mines things still continue dull, and many of the men are seeking employment. Early in the morning of the 13th inst. a fire occurred at the south slope, better known as the "Syndicate." Although it looked serious at one time the flames were subdued and no very serious damage was done. The slope has been idle for some time. Miners passed through the stables a few hours before, and found everything all right. This pit is free from gas and the origin of the fire is wrapped in mystery.

Latest advices from Bridgeport state that shipping has not begun yet owing to the coast being blocked with ice. Judging from appearances one is forced to believe that it will take a few days before the coast is sufficiently clear to admit of steamers getting into port.

Banking was suspended at Cow Bay during the last week in April. It is estimated that there are from 12,000 to 15,000 tons on the piles.

The *Stellarton Trades Journal* says: "The coke ovens are in full blast and turning out a superior quality of coke. There will be an addition to the number of ovens soon. Coke making may turn out an important industry in Cow Bay."

In addition to the work now being done in this district by the "Malaga Mining Company (Limited)" the *Critic* is informed that a crusher is about being erected on the Hall areas, which have been purchased by an American syndicate. Mr. Hall and Mr. Caldwell have lately been in the city arranging for the erection of the stamp mill. Indications point to the conclusion that this district will cause considerable stir before long.

From a lengthy advertisement in the *Royal Gazette* we gather that Charles R. Palgrave, of London, England, is the lessee of the gold areas situate at Hurricane Island, East Division of Isaac's Harbor Mining areas. That Mr. Palgrave means business is made evident from the fact that he is applying under the Act for authority to enter upon the land and prosecute mining, the ownership of the realty being uncertain. From all accounts gold mining in Guysborough County is to be vigorously prosecuted the coming season.

The following are the official gold returns so far received at the Mines Office for the month of April:—

District.	Mill.	Tons Crushed.	Ounces Gold.
Dart's Hill.....	Dufferin.....	780	276½
Oldham.....	Oldham United.....	153	53
Waverly.....	Wallace.....	7	2½
Caribou.....	Moose River G. M. Co.....	153	92
Rawdon.....	Rawdon United.....	200	46½
Whitburn.....	The McGuire.....	38	175
Stormont.....	Tributers.....	150	251½
Sherbrooke.....	No. 5.....	73	16

Londonderry despatches state that there is quite an excitement in town over the reported discovery of a very valuable seam of coal about half way between the blast furnace and Lon-

donderry station. It appears that a Mr. Patriquin and a practical Scottish miner went out in search of coal a few days ago, and after one and a-half hard days' work they struck, as he says, not a few bits of coal, but a big seam. As soon as it was discovered, they immediately covered it up, and Mr. Patriquin has secured the right of search, and will likely proceed at once to unearth the valuable deposit. It will be remembered that some two years ago there was a small company formed to dig for coal, and after they had expended some \$2,000, got discouraged and abandoned the search, and now Mr. P. has found what they were looking for, only a few yards from where they were digging.

### New Brunswick.

Owing to suspension of Messrs. W. C. Pope & Co., of Boston, who are largely interested in the manganese mines at Markhamville, these mines are temporarily shut down, but Major Markham expects to have the mines and works in operation again very shortly.

It is said that Col. Danville—who has great force in organization of joint stock companies—has taken hold of the Mineral Vale Mine. He will probably succeed in making a sale of the property which has excellent prospects.

Capt. Alley, of Bar Harbour, Me., has commenced work again on his manganese property, in Parish of Waterford, with a small force.

The New Brunswick Government made a small appropriation during last session for the development of the mineral resources of the Province, but your correspondent has not yet heard how the amount is to be expended. A portion of it should certainly go towards exploring some of the salt deposits of Kings County.

### Quebec.

The prospectus has been issued in London of Bell's Asbestos Company, to take over the business of John Bell & Son and buy and work the freehold deposit of asbestos at Thetford, Hayden and Belmina, Province of Quebec. The capital of the company is £200,000 in £5 shares. Only £100,000 will now be issued with £70,000 five per cent debentures, the latter redeemable at 15 premium at annual drawings. The company buys the Belmina estate from the firm at £8,391, Thetford at £41,300, and Hayden at £8,000.

The syndicate which purchased the mining rights on the "Nailon" property, near Buckingham, with a view to gold mining, will commence sinking a shaft there in the course of two or three weeks. The parties are determined to go through with it, and anticipate a handsome return for their investment.

Captain Bothwell, Buckingham, holds the following certificates of analysis from specimens of ore taken from his property:—

27th Sept., 1887, by Prof. J. T. Donald, Montreal, gold, 42 oz., 11 det., 16 grs per ton.  
7th October, 1887, by Prof. J. T. Donald, Montreal, gold, 1 oz., 2 dwt. per ton.  
23rd October, 1888, by Prof. J. T. Donald, Montreal, gold, 19 dwt. to the ton.  
14th April, 1888, by J. T. Gore, State Analyst, Utah Assay Office, Helena, Montana, found 6.854 ozs. of gold to the ton of 2,000 lbs, or gold value to ton of ore of \$141.68.

The Villeneuve Mica Company's mines continue to make steady output of merchantable mica.

### Ontario.

The Kingston & Pembroke Iron Mining Co. has shipped its first cargo of ore since navigation opened, consigned to one of the largest consumers of ore in Pittsburg. If the ore is satisfactory, they agree to take all the product of the Willer mine.

A deposit of merchantable mica, said to be of good quality, is reported to have lately been found at Smithville, near Hamilton. A shaft is being sunk, and the value of the find will soon be known.

The Hopkins well at Port Colborne, Ont., was torpedoed a few days ago, and there is now an abundant supply of natural gas, sufficient, it is said, to run a large factory if applied as power.

The Copper Cliff mine at Sudbury is yielding very rich ore in immense quantities as the result of the trial shaft which was sunk during the past winter.

The Provincial Government intend having a big mineral exhibit at the Centennial Exposition of the Ohio Valley and Central States, to be held at Cincinnati from July 4 to Sept. 28. It is 100 years ago since the Ohio Valley was first settled, and the Exposition is in honour of the event. Mr. A. Blue, of the Agricultural Bureau, has been entrusted with getting up the exhibit, and acting under instructions from the Government he will make it as large and diversified as it is possible.

A local exchange says that Mr. R. Tough, of Sudbury, has returned from Chicago, where he sold to American capitalists a part of his interest in the gold mine, known as the Tough & Stobie claim, for the sum of \$32,000. His visit to Chicago was made chiefly to purchase machinery for the use of the company in working the mine referred to. He succeeded in securing a five stamp mill, with all its appurtenances and other machinery required in gold mining operations, all of which will arrive at Sudbury in a few days. He reported that the cost of this will amount to \$70,000. The extraordinary value of this mine has profoundly interested the mining fraternity of America in the mineral deposits of Nipissing and Algoma, and these districts will be thoroughly explored by experienced prospectors this coming season.

At the Bristol Iron mines work has been, and is still, suspended until proper transportation facilities for the moving of the ore can be granted either by the C.P.R. or the Pontiac Pacific Railway, the mines being located about midway between these roads. During the present Session of Parliament the Pontiac and Renfrew Railway Co. secured a charter for a new line to connect the C.P.R. and P.P.R. by way of the Bristol mines, and the company expect that if the Government grants aid to any railway enterprise this year, this new line will not be overlooked. As it is of the utmost importance to the counties of Pontiac and Renfrew that these productive mines should be vigorously developed, nothing short of a railway—the distance from either line is only three miles—will suffice for the proper handling of the product of the mine. Parties from Montreal have been visiting the mines lately, with the object of establishing smelting works, but we understand no definite action has yet been taken in the matter.

In reply to an enquiry as to the recent gold discoveries reported in the Cartier district,

Dr. Selwyn, Director of the Geological Survey, writes us as follows :—

"I could not possibly say whether the gold discoveries you refer to will or will not turn out valuable. I only know that a number of persons have been prospecting in that region, and some have brought in samples of quartz said to have been found there. Some of these are very rich in visible free gold, others on assay gave variable, but small quantities of gold per ton, while in yet others no trace could be found. Geologically speaking, I may say that the rocks are similar, and probably of the same age as others elsewhere in which paying gold veins have been found, and it is highly probable that some of the veins will prove valuable, and others too poor to work. This can, however, only be determined by practical working tests in each case. Cartier township is a few miles N.W. of the C. P. R. Crossing of the Vermillion River, and the rocks there resemble closely the gold bearing rocks of Nova Scotia, so much so, indeed, that I have repeatedly told enquirers that I considered that district a very favourable one in which to prospect for gold, and the most likely places are near and around any granitic masses."

### Port Arthur District.

News from the mines is very scanty at present, owing to the almost impassable state of the roads. The melting of the snow, which fell to such an enormous extent last winter, has swelled every little stream into a torrent, and almost cut off communication with the Silver Mountain Section.

The Beaver and Badger mines pursue the even tenor of their way satisfactorily as usual, there being nothing new to report from them.

Silver Mountain, West End, appears to be at last likely to come to the front and take its place among the working mines. Messrs. Nichol & Falco representing, we believe, Chicago capital, have been for some time endeavoring to secure this property, and it would appear that their negotiations have come to a satisfactory conclusion from the announcement made in the *Sentinel* that Mr. Nichol had just started (18 May) for the "West End," taking tools and supplies for working, as far as such supplies can be forwarded at present. No property in this district has ever offered a more encouraging prospect than this, and we trust and believe that the working of it will result in greatly increasing the confidence of those who have already invested in the district.

### Manitoba and North-West Territories.

The special Mackenzie River Committee of the Senate, over which Dr. Schultz has so ably presided, will send an exploration party to the district; and accompanying it will be a naturalist to investigate the natural products of that great region, both as regards its vegetable as well as its mineral products. In the person of Mr. James Macoun the charge of making extensive collections both of the flora and fauna of that great basin has been entrusted. He is a son of Prof. Macoun, whose researches in the natural history of Canada are well known. Mr. Fawcett, D.L.S., has charge of the topographical part of the exploration.

Mayor Stewart, of Ottawa, President of the Canadian Anthracite Coal Company, reports a force of 160 men at work at the Banff mines. The daily output is about 400 tons. A new seam about 7½ feet thick is being developed. Shipments to San Francisco during the past

five months, when the first shipment was made, amounts to over 10,000 tons, and there are the brightest prospects of the trade being largely increased.

### British Columbia.

By the arrival of the steamer *Dunsmuir* last evening we learn, says the *Free Press*, that the work at the Comox Mines of Dunsmuir & Sons is progressing rapidly. Already three miles of the railway line have been cleared and the logs burned. The steamer *Pilot* took up a scow laden with machinery and rails for the new mines. The machinery will be hauled over the old road to the mines. The opening of the seam of coal is progressing vigorously. Mr. Bryden, the manager of the Wellington collieries, and Mr. Jas. Dunsmuir are at the mines superintending the work.

Work is progressing steadily at the Nicola Mines, sinking and drifting. The vein is now down 125 feet and increasing in width and richness, being 200 per cent. better at the present time than when work was commenced a short time since.

### MISCELLANY.

**Canadian Iron Mines.**—(1) In spite of the proverb that comparisons are odious, it is well to learn a lesson sometimes in this way, especially in commercial matters. Glancing at the comparative development of the mineral resources of this country and of the United States, we are struck at once with a sense of the absurdity of the difference. We have in the States the mineral area known as the Lake Superior region where the mining interests have been largely developed. The output of iron ore in this section has risen from 3,000 tons in 1854 to 3,179,511 tons in 1886, and this year will probably overrun 4,000,000; a very large proportion, certainly two-thirds, of this, goes to furnaces distant 500 to 700 miles from the mines. The trade also is chiefly in the same direction, so that there is not much return freight. In Canada we have deposits of equal value and from 100 to 300 miles nearer to the furnaces. What development have these deposits received? We could ship ore to these furnaces and get return freights of coke or coal wherewith to run furnaces at the mines or at any convenient points on the lines of railway or on the shores of Lake Ontario. In the State of Michigan there are 26 furnaces; 15 of these were in active operation in 1836, and made a total output of about 140,000 tons of pig iron; many of these furnaces are between 300 and 400 miles from the mines. How many furnaces have we in Ontario? There are furnaces in and near Detroit, which, besides getting their ore from the Lake Superior region, have to bring their charcoal 150 to 200 miles by rail. In Ontario we can place our furnaces within from 10 to 30 miles of the mines and have our charcoal made at the furnace, or supply them with coke and coal as above stated. Some people object that we cannot keep furnaces going in Canada without protection against the United States. What protection have the Michigan furnaces against the rest of the furnaces in the United States? All we want is a fair field and no favour. Others object that we have not the proper mixture of ores wherewith to run satisfactorily, especially on carwheel

iron. Being a practical furnace man and well acquainted with the Canadian ores, I can positively state that we have what is needed and of first class quality. The fact is that we have every natural advantage, and the only thing that prevents the development of our mines and the kindred industries to an extent of which few can form any idea is the unfortunate fiscal separation from our neighbors across the line. In what condition would the State of Michigan with her mineral and timber resources be if she had been protected from the rest of the States? Just as Canada is, and perhaps worse, though it is hard to imagine anything worse as regards mining matters.

**The Analysis of Natural Gas.**—Professor C. Phillips (2), in a report on the chemical composition of natural gas, states that in analysing the various gas samples the method he adopted was as follows:—The determination of the carbon and hydrogen existing in combustible form was conducted by combustion over copper oxide in a porcelain tube, kept at a bright red heat, the carbonic anhydride and water formed being collected and weighed. For the absorption of the water, sulphuric acid of 1.71 specific gravity, followed by phosphoric anhydride, was employed, and for the absorption of the carbonic anhydride a solution of caustic potash in glycerine. The gas was carried through the red hot porcelain tube by a slow current of dry nitrogen. No oxides of nitrogen could be detected in the condensed water. For the determination of the nitrogen in the gas a porcelain tube filled with copper oxide was heated strongly, and after the air present had been carefully expelled by carbonic anhydride, 100 cubic centimetres of the natural gas under examination was allowed to flow slowly through the tube, being carried forward by a current of carbonic anhydride. The gas being burnt, the residual mixture of carbonic anhydride and nitrogen was collected in the ordinary manner over caustic potash, and the nitrogen measured. The nitrogen so obtained was then treated again in a similar manner, to ensure the complete combustion of the other gases with which it was originally in admixture. In only a few cases, however, was the nitrogen collected after the first combustion found to be impure. The tests for oxygen on 100 cubic centimetres of gas, using an Elliott apparatus, and caustic soda and pyrogallic acid as the absorbent, were in all cases negative. The author, therefore, found it necessary to conduct the tests at the gas wells. A slow current of gas taken directly from the well or main was caused to flow successively

through solutions of caustic potash and pyrogallic acid for ten minutes, in order to expel dissolved air. The two solutions were then mixed without stopping the current of gas, which was continued for some time longer. If the mixed solutions then exhibited a brown colour, it was considered that the presence of oxygen was established. For the determination of the free hydrogen the method of Hempel was adopted: 100 cubic centimetres of the gas to be examined was freed from carbonic anhydride and washed with strong alcohol until the higher hydrocarbons were removed, this operation being performed in an Elliott apparatus having a water-jacket. The residual gas mixed with two or three times its volume of air, was then passed over asbestos coated with 30 per cent. of palladium sponge at a temperature of 90 degrees C. By this treatment the hydrogen alone is burnt, provided the higher paraffines, including ethane, have been previously removed by alcohol. From the contraction of volume after passing the palladium, the proportion of free hydrogen is easily determined. The method is very accurate when methane is the only hydro-carbon present, but is inaccurate in the presence of ethane and the higher members of the series. When these are present, the washing with alcohol must be long continued. The olefines, as a group, and carbonic oxide are much more easily determined in natural gas than the paraffines and free hydrogen. The olefines are rapidly absorbed and removed by bromine water, and carbonic oxide by cuprous oxide, these reagents being used in the order named. Unfortunately, however, they are also solvents, in less degree, for the paraffines ethane, propane, &c. Hence, a gas perfectly free from carbonic oxide and the olefines is liable, on being washed with bromine and cuprous chloride solution, to undergo a reduction in volume, which may lead to a wrong conclusion. For the determination of the olefines and carbonic oxide the following process, based on their solubility in cuprous chloride, was therefore employed:—At the gas well a stream of gas was caused to pass slowly for two hours or more through 100 cubic centimetres of a solution of cuprous chloride. A quart flask provided with a glass delivery tube and a funnel tube reaching to the bottom was then filled with boiled water, and the cuprous chloride solution poured into the flask through the funnel tube. The flask was then heated, the water boiled for three hours, and the gas evolved collected. The gas so collected was transferred to an Elliott apparatus and the olefines and carbonic oxide absorbed as before described. For the detection of ammonia

the gas at the well was caused to bubble through water purified by distillation with sulphuric acid and potassium permanganate. This water was afterwards tested by Nessler's solution. The author observes that the test for ammonia should be made in the case of an examination of natural gas, as solid masses of ammonium carbonate are reported to have been thrown out from the pipes leading from gas wells in the Murraysville gas field. The author also describes the manner of calculating the results of the analysis, and the method employed in taking the gas samples.

### Ontario to the Front!

#### A Matter of Vital Importance.

The following unsolicited opinions from your friends and neighbors, men and women, whom you know and respect, ought to carry conviction to any doubting mind. These words of gratitude are from those who have been afflicted but are now well, and the persons giving them are naturally solicitous that others, troubled as were they, may know the means of cure. There is no reason why you should be longer ill from kidney, liver or stomach troubles. You can be cured as well as others. Do not longer delay treatment, but to-day obtain that which will restore you to permanent health and strength:

296 McNab St. North, HAMILTON, Can., Nov. 2, 1886.—I had been suffering for over twenty years from a pain in the back and one side of the head and indigestion. I could eat scarcely anything, and everything I ate disagreed with me. I was attended by physicians who examined me and stated that I had enlargement of the liver, and that it was impossible to cure me. They also stated that I was suffering from heart disease, inflammation of the bladder, kidney disease, bronchitis and catarrh, and that it was impossible for me to live. They attended me for three weeks without making any improvement in my condition. I commenced taking "Warner's Safe Cure" and "Warner's Safe Pills," acting strictly up to directions as to diet, and took thirty-six bottles, and have had the best of health ever since. My regular weight used to be 180 lbs. When I commenced "Warner's Safe Cure" I only weighed 140 lbs. I now weigh 210 lbs.

*Mrs. E. J. Long*

St. CATHERINES, Ont., Jan. 24th, 1887.—About six years ago I was a great sufferer from

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33 Wellington St. East.

WHOLESALE MANUFACTURERS AND DEALERS IN

**BOOTS, SHOES, RUBBERS, SPORTING BOOTS, TRUNKS, VALISES, Etc.**

Will be pleased to supply Miners' or Lumbermen's Boots, Long Rubber Boots, &c., &c.

Our Patent FELT LAPLANDER is the best FELT BOOT made, as it is WATERPROOF as well as WARM.

We can supply any particular style if supplied with a sample, and shall be pleased to cater to the wants of mining and lumbermen's camps.

CORRESPONDENCE SOLICITED.

**CHARLESWORTH & CO.**

kidney disease, and was in misery all the while. I hardly had strength enough to walk straight and was ashamed to go on the street. The pains across my back were almost unbearable, and I was unable to find relief, even temporarily. I began the use of "Warner's Safe Cure," and inside of one week I found relief, and after taking eight bottles, I was completely cured.

*W. E. King*

Manager for American Express Co.

Toronto, (18 Division Street,) Sept. 17, 1887.—Three year ago last August my daughter was taken ill with Bright's disease of the kidneys. The best medical skill in the city was tasked to the utmost, but to no purpose. She was racked with convulsions for four-eight hours. Our doctor did his best and went away saying the case was hopeless. After she came out of the convulsions she was very weak and all her hair fell out. The doctor had left us about a month when I concluded to try "Warner's Safe Cure," and after having taken six bottles, along with several bottles of "Warner's Safe Pills," I saw

a decided change for the better in her condition. After taking twenty-five bottles there was a complete cure. My daughter has now a splendid head of hair and weighs more than she ever did before.

*Geo. Jas. Burns*

CHATHAM, Ont., March 6, 1888.—In 1884 I was completely run down. I suffered most severe pains in my back and kidneys, so severe that at times I would almost be prostrated. A loss of ambition, a great desire to urinate, without the ability of so doing, coming from me as it were in drops. The urine was of a peculiar color and contained considerable foreign matter. I became satisfied that my kidneys were in a congested state and that I was running down rapidly. Finally I concluded to try "Warner's Safe Cure," and in forty-eight hours after I had taken the remedy I voided urine that was as black as ink, containing quantities of mucus, pus and gravel. I continued, and it was not many hours before my urine was of a natural straw color, although it contained considerable sediment. The pains in my kidneys subsided as I continued the use of the remedy, and it was but

a short time before I was completely relieved. My urine was normal and I can truthfully say that I was cured.

*Wood*

GALT, Ont., Jan. 27, 1887.—For about five years previous to two years ago last October, I was troubled with kidney and liver trouble, and finally I was confined to my bed and suffered the most excruciating pain, and for two weeks' time I did not know whether I was dead or alive. My physicians said I had enlargement of the liver, though they only gave me temporary relief. Hearing of the wonderful cures of "Warner's Safe Cure" I began its use, and after I had taken two bottles I noticed a change for the better. The pains disappeared and my system seemed to feel the benefit of the remedy. I have continued taking "Warner's Safe Cure" and no other medicine since. I consider the remedy a great boon, and if I ever feel out of sorts "Warner's Safe Cure" fixes me all right. I weigh twenty pounds heavier now than ever before.

*John Lewis*

Inventor of the Maple Leaf Lance-tooth Cross-cut saw.

**E. GAUJOT,**  
MINING ENGINEER.  
BELLEVILLE, ONT.

(1) Samul. D. Mills in the *Mail*.  
(2) Report for the Geological Survey of Pennsylvania.

## Van Duzen Steam Jet Pump.

MINING.—Our \$16 Pump preferred to a \$200 Steam Pump.

STATE OF MAINE ASSAY OFFICE,  
F. L. BARTLETT,  
PORTLAND, ME., June 21, 1888.



"GENTLEMEN,—The No. 5 'L.' (\$16) Steam Jet Pump I purchased of you I have used for raising water from a mining shaft fifty feet deep. I set it to draught twelve and force thirty eight feet. It worked very well indeed, although I was obliged to carry steam 150 feet from the boilers and in weather often below zero. I carried 75 pounds of steam at the boiler, and the Jet Pump took the place of a No. 3 K (\$200 Piston Pump), that I had to remove.

"Yours truly, F. L. BARTLETT."

Address for further particulars,

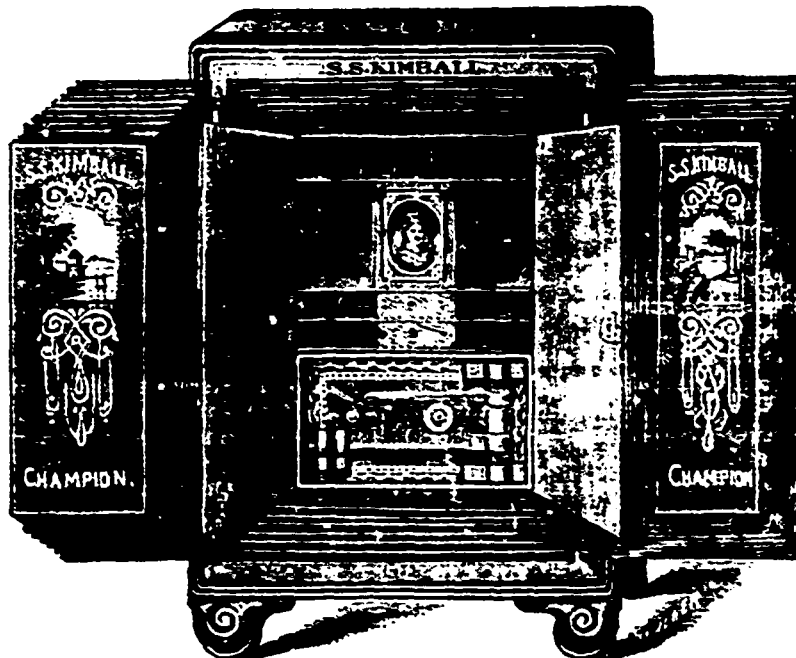
**CARTH & CO.,**  
MONTREAL.

**Champion Fire and Burglarproof Safes.**

These Safes have the best record of any in the Dominion. Price 30 per cent. cheaper than any other first-class Safe.

SEND FOR CATALOGUE AND PRICE-LIST.

**S. S. KIMBALL,**  
577 Craig St., Montreal.



### NOTICE.

SEALED TENDERS addressed to the undersigned, and endorsed "Tender for Indian Supplies," will be received at this office up to noon of THURSDAY, 7th June, 1888, for the delivery of Indian Supplies during the fiscal year ending 30th June, 1889, consisting of Flour, Bacon, Groceries, Ammunition, Twine, Oxen, Cows, &c., Agricultural Implements, Tools, &c., duty paid, at various points in Manitoba and the North-West Territories.

Forms of tender containing full particulars relative to the Supplies required, dates of delivery, &c., may be had by applying to the undersigned, or to the Indian Commissioner at Regina, or to the Indian Office, Winnipeg.

Parties may tender for each description of goods (or for any portion of each description of goods) separately or for all the goods called for in the Schedules, and the Department reserves to itself the right to reject the whole or any part of a tender.

Each tender must be accompanied by an accepted Cheque in favour of the Superintendent General of Indian Affairs on a Canadian Bank, for at least five per cent of the amount of the tender, which will be forfeited if the party tendering declines to enter into a contract based on such tender when called upon to do so, or if he fails to complete the work contracted for. If the tender be not accepted, the cheque will be returned.

Each tender must, in addition to the signature of the tenderer, be signed by two sureties acceptable to the Department for the proper performance of the contract.

The lowest or any tender not necessarily accepted.

This advertisement is not to be inserted by any newspaper without the authority of the Queen's Printer, and no claim for payment by any newspaper not having had such authority will be admitted.

L. VANCOUGHNET,  
Deputy of the Superintendent-General  
of Indian Affairs.

Department of Indian Affairs,  
Ottawa, May, 1888.

**VALUABLE  
PLUMBAGO  
AND OTHER  
Mineral Lands  
FOR SALE,**

**IN THE TOWNSHIP OF BUCK-  
INGHAM, COUNTY OF  
OTTAWA.**

1st.—Lot 28, in the 6th range, containing 100 acres, in addition to the sedina of the lake.

2nd.—North half of lot 23, in the 5th range, containing 100 acres.

3rd.—Nine acres of lot No. 28, in the 5th range, with water privileges thereto appertaining, being site of mill dam, etc., etc.

The property formerly belonged to the Montreal Plumbago Mining Company, and was worked successfully for several years, until the company's mill was destroyed by fire, but the mill dam remains almost uninjured, and there are on the property several houses, sheds, etc., built for various purposes when mining operations were carried out.

**The Plumbago Deposits**

upon the property are regarded as amongst the richest and most extensive in the Dominion. As to the quality of the Plumbago, it has been extensively used in the manufacture of crucibles, lubricating leads, stove polish, etc., etc., and given unbounded satisfaction. This is established by the experience of consumers, and by a certificate from the celebrated Battersea Crucible Works, London, England, a copy of which is open for inspection.

**MICA**

has also been discovered in quantities.

The lands are in the Phosphate region, and recent prospecting has disclosed a rich and extensive deposit of this mineral. There are unrivalled facilities for transporting the ore to and from the mines by the Ottawa River and C. P. Railway. Distance from mines to Railway Station 6 miles. Good road.

All that is required to make these valuable mines handsomely remunerative is a little capital and enterprise.

The Title is Indisputable.

For information apply to

**WM. H. DICKSON,**  
150 Waller St., Ottawa.

**H. E. DICKSON,**  
Russell House, Ottawa.

OR TO THE OFFICE OF

**THE CANADIAN MINING REVIEW,  
OTTAWA.**

**FOR SALE.  
VALUABLE  
Copper Mining Properties  
— IN THE —  
Eastern Townships**

**TOWNSHIP OF ASCOT.**

- 1st. Clark Mine, Lot 11, R. 7 Ascot ..... 187 acres
- 2nd. Sherbrooke Mine, part Lots 12 and 13,  
R. 7 Township of Ascot..... 329 "
- 3rd. Belvidere Mine, part Lots 9 and 10, R.  
9 and 10, R. 8 Ascot ..... 292 "
- 4th. Mining Rights in same vicinity on..... 250 "

All of the above properties lie within 1½ miles of the Village of Lennoxville, at the junction of the Grand Trunk, Canadian Pacific and Passumpsic Railways, and have been developed to a considerable extent, and veins opened 6 to 20 feet in width, yielding 3 to 5 per cent. of copper, also silver, and 35 to 40 per cent. of sulphur. These mines are only 2½ to 3 miles distant from the City of Sherbrooke, and evidently are of the same class of ores found at Copelton, only four miles distant, owned and worked by the Orford Copper and Sulphur Company, and by Messrs. G. H. Nichols & Co., of New York, which have proved so remunerative.

**TOWNSHIP OF ORFORD.**

5th. Carbuncle Hill Mine, Lots 2 and 3 R. 14, and 2, 3, 4 R. 15, 718 acres. Same class of ore as is found in the Ascot properties above described, but yielding a higher percentage of copper.

**TOWNSHIP OF CLEVELAND.**

6th. St. Francis Mine, ¼ Lot 25 R. 12, 50 acres, with dwelling houses, smith's shop, ore sheds and office, large winding and pumping steam engine, with boiler, winding and pumping gear, and about forty fathoms Cornish lifting pumps complete, railway tracks, ladders, etc., situated three miles from Grand Trunk Railway. A considerable amount of mining work has been done at this mine. A well defined vein richly charged with vitreous purple and yellow sulphurets of copper traverse the entire length of the property, five feet in thickness, yielding 8 to 40 per cent. metallic copper.

**TOWNSHIP OF GARTHBY.**

7th. Fifty-six lots of land, 2,938 acres. This property for the most part is unexplored, but copper is found on the greater part of the property. On one of the lots a vein about twenty feet in width has been found. Samples of the ore have yielded as much as 22 per cent. of copper, being also rich in sulphur. Other samples of pyrites from the same property, free from copper, have yielded as high as 48 per cent. of sulphur. The only drawback to this property is in its distance from the railway, it being about four miles from Garthby Station, Quebec Central Railway. A new line is chartered, however, which, when built, will run directly through the property.

**TOWNSHIP OF ACTON.**

8th. The Acton Mine, 100 acres, with engine, boiler, pumps and appliances. Within three years after this mine was first opened it produced nearly \$500,000 worth of copper. It is situated about half a mile distant from the stations of the Grand Trunk and South Eastern Railways.

9th. Brome Mine, part Lots 2 and 3 R. 4, 50 acres.  
10th. Bolton Mine, two miles from Eastman Station, Waterloo & Magog Railway, 400 acres.

The above properties formerly belonged to the Canadian Copper and Sulphur Company, and were acquired by the present owner at sheriff's sale, giving an indisputable title thereto.

The whole or any portion of the property will be sold at reasonable prices.

For further information apply to

**WM. FARWELL,**  
SHERBROOKE, P.Q.,  
CANADA

**RUSSELL & CO.**  
PROVINCIAL AND DOMINION  
**LAND SURVEYORS,**  
CIVIL AND MINING ENGINEERS,  
PORT ARTHUR, ONTARIO.

Mining Properties Surveyed, Reported on and Dealt in.

Latest and Most Complete Plans of Thunder Bay Mining District Always on Hand.

A. I. RUSSELL, A. H. MACDOUGLL, W. W. RUSSELL.  
P. L. S., D. L. S. P. L. S., D. L. S. M. E. A. M. C. A. S. O. C. E.

**The Canadian Anthracite Coal Co.**  
LIMITED.  
**Miners & Shippers of Coal.**

McLEOD STEWART, Pres., J. G. THORP, Vice-Prest.  
OTTAWA, CANADA. KAU CLAIRE, Wis.  
A. PUGH, General Manager, W. B. SCARTH, Secretary,  
ST. PAUL, MINN. WINNIPEG, MAN.  
O. H. INGRAM, Treasurer,  
KAU CLAIRE, WIS.

**Mines at Anthracite,**  
N. W. T., CANADA. v-1-1y

**F. D. LEDYARD,**  
**DEALER IN MINERAL LANDS**  
4 ONTARIO CHAMBERS, TORONTO.

Will buy or developed iron ore and other mineral properties.  
WANTED.—Deposits of Magnetic Iron Ore, Red Hematite, Brown Hematite, Galena, Iron and Copper Pyrites, Mica, Soapstone, Marble, Gypsum, Baryta. Samples can be sent by Sample Post for 1 cent for 4 oz. or up to 24 oz. in weight.  
Information regarding mines cheerfully given. Correspondence solicited. Crown Land business attended to.

**WOLFF & COTTON,**  
*Provincial Land Surveyors,*  
ONTARIO AND QUEBEC.  
OFFICE:—52 ELGIN STREET, OTTAWA.  
(Opposite Russell House.)

**WM. HAMILTON MERRITT, F.G.S.**  
Associate Royal School of Mines, &c.,  
*Mining Engineer and Metallurgist,*  
Will report on Mine and Mineral Properties.  
ADDRESS:  
15 TORONTO ST., TORONTO, ONT.

**JAMES HOPE & CO.**  
BOOKSELLERS,  
Stationers, Bookbinders and Printers,  
**OTTAWA.**

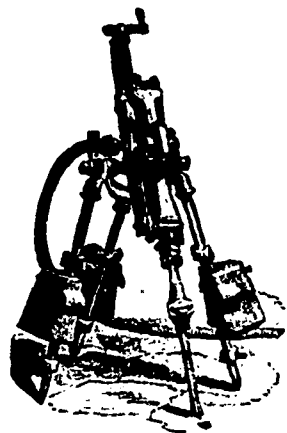
**J. HERBERT & SON,**  
401 and 403—Wellington Street—599  
**OTTAWA.**

Plain and Ornamental Slating, Felt and Gravel Roofing, &c.

**ESTIMATES GIVEN.**

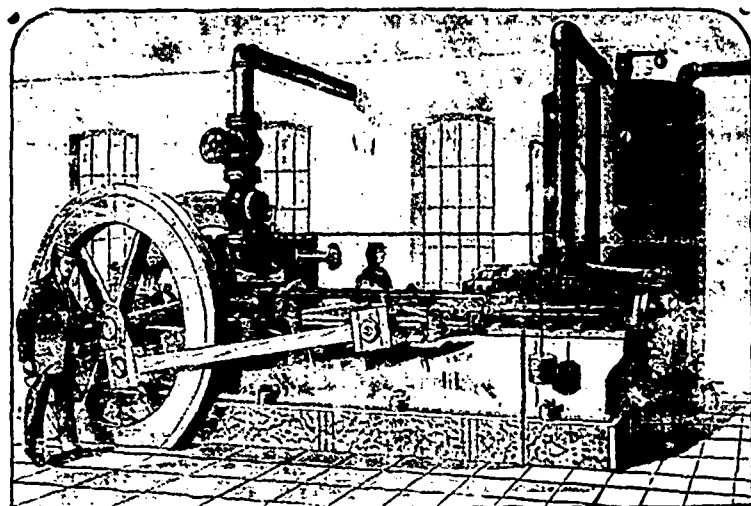
Orders Executed with Care under Personal Superintendence.



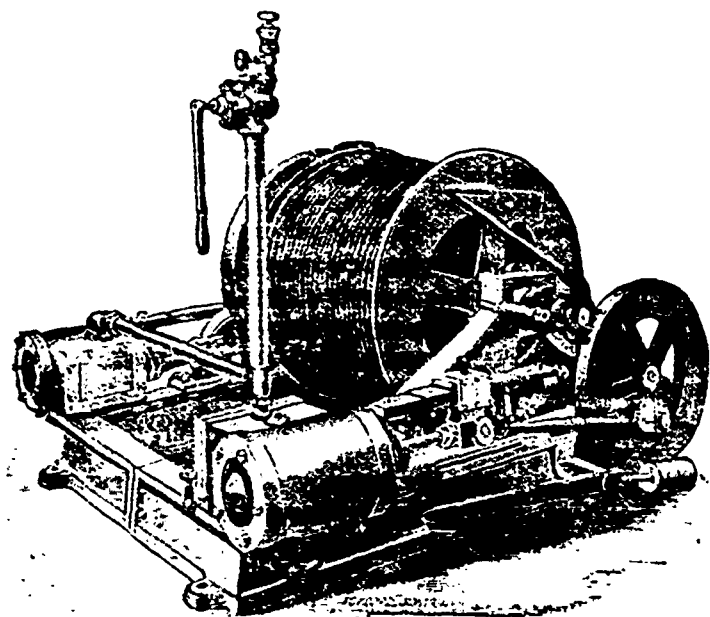


**INGERSOLL**  
**ROCK DRILL COMP'Y**  
OF CANADA  
**MANUFACTURERS OF**

Rock Drills,  
Air Compressors,  
Steam & Horse Power Hoists,  
BOILERS,  
—AND—  
GENERAL MINING  
—AND—  
Quarrying Machinery  
—AND—  
Contractors' Plant.



—ALSO,—



Drill Steel, Wire Rope,  
Derrick Castings,  
Steam & Air Hose & Couplings,  
Iron Piping, Fittings,  
—AND—  
ALL KINDS OF SUPPLIES  
—FOR—  
Miners & Contractors' Work.

For Estimates, Catalogues and information address

**Ingersoll Rock Drill Co. of Canada,**

204 St. James Street, or P.O. Box 1942, Montreal.

**FOR SALE.**  
**Asbestos Mines.**

On Lots 27, 28 and 29, in Range A, of Colborne, Megantic County, P. Q.

**300 ACRES,**

One Mile from Quebec Central Railway.  
Free from Reserves or Royalties.

**James Reed,**  
Roadsdale, Megantic, P. Q.

**CHEMICAL LABORATORY**

OF THE UNIVERSITY COLLEGE OF OTTAWA,

Under the direction of **PROF. C. F. MARSAN, M.A.,** Dominion Examiner of Public Analysts,  
and **A. L. TOURCHOT,** Demonstrator of Applied Chemistry.

**THE MOST COMPLETE OUTFIT IN THE DOMINION FOR ALL KINDS OF ANALYSES.**

**A SPECIAL DEPARTMENT**

Has been just completed for the **Analysis of Phosphate,** and will be found to answer most satisfactorily the wants of the Phosphate industry.

By Royal  Letters Patent.

**The Perfection Smoke Consumer & Fuel Economizer.**

FOR ALL HORIZONTAL BOILERS, STATIONARY AND MARINE.

At City Waterworks (Wheelhouse), C.P.R. Works and Canadian Rubber Co., Montreal  
Users of Lancashire, Cornish, and other flued boilers, invited to correspond.  
Improved method of testing for new and existing boilers.

**Dobson & Brodie,** - - **169 St. James St.,**  
**MONTREAL.**



Department of Inland Revenue.

**An Act Respecting Agricultural Fertilizers.**

The public is hereby notified that the provisions of the Act respecting **AGRICULTURAL FERTILIZERS** came into force on the 1st of January, 1886 and that all Fertilizers sold thereafter require to be sold subject to the conditions and restrictions therein contained—the main features of which are as follows:

The expression "fertilizer" means and includes all fertilizers which are sold at more than **75¢ DOLLARS** per ton, and which contains ammonia, or its equivalent of nitrogen, or phosphoric acid.

Every manufacturer or importer of fertilizers for sale, shall, in the course of the month of January in each year, and before offering the same fertilizer for sale, transmit to the Minister of Inland Revenue, carriage paid, a sealed glass jar, containing at least two pounds of the fertilizer manufactured or imported by him, with the certificate of analysis of the same, together with an affidavit setting forth that each jar contains a fair average sample of the fertilizer manufactured or imported by him; and such sample shall be preserved by the Minister of Inland Revenue for the purpose of comparison with any sample of fertilizer which is obtained in the course of the twelve months then next ensuing from such manufacturer or importer, or collected under the provisions of the Adulteration Act, or is transmitted to the chief analyst for analysis.

If the fertilizer is put up in packages, every such package intended for sale or distribution within Canada shall have the manufacturer's certificate of analysis placed upon or securely attached to each package by the manufacturer; if the fertilizer is in bags, it shall be distinctly stamped or printed upon each bag; if it is in barrels, it shall be either branded, stamped or printed upon the head of each barrel or distinctly printed upon good paper and securely pasted upon the

head of each barrel, or upon a tag securely attached to the head of each barrel; if it is in bulk, the manufacturer's certificate shall be produced and a copy given to each purchaser.

No fertilizer shall be sold or offered or exposed for sale unless a certificate of analysis and sample of the same shall have been transmitted to the Minister of Inland Revenue and the provisions of the foregoing sub-section have been complied with.

Every person who sells or offers or exposes for sale any fertilizer, in respect of which the provisions of this Act have not been complied with—or who permits a certificate of analysis to be attached to any package, bag or barrel of such fertilizer, or to be produced to the inspectors to accompany the bill of inspection of such inspector, stating that the fertilizer contains a larger percentage of the constituents mentioned in sub-section No. 11 of the Act than is contained therein—or who sells, offers or exposes for sale any fertilizer purporting to have been inspected, and which does not contain the percentage of constituents mentioned in the next preceding section—or who sells or offers or exposes for sale any fertilizer which does not contain the percentage of constituents mentioned in the manufacturer's certificate accompanying the same, shall be liable in each case to a penalty not exceeding fifty dollars for the first offence, and for each subsequent offence to a penalty not exceeding one hundred dollars. Provided always that deficiency of one per centum of the ammonia, or its equivalent of nitrogen, or of the phosphoric acid, claimed to be contained, shall not be considered as evidence of fraudulent intent.

The Act passed in the forty-seventh year of Her Majesty's reign, chaptered thirty-seven and entitled, "An Act to prevent fraud in the manufacture and sale of agricultural fertilizers," is by this Act repealed, except in regard to any offence committed against it or any prosecution or other act commenced and not concluded or completed, and any payment of money due in respect of any provision thereof.

A copy of the Act may be obtained upon application to the Department of Inland Revenue, as well as a copy of a Bulletin which it is proposed to issue in April, 1888, concerning the fertilizers

**E. MIALL,**  
Commissioner.

15th Dec., 1887.

**Canada Atlantic Railway**

THE  
**SHORT FAST PASSENGER ROUTE**  
BETWEEN  
**OTTAWA & MONTREAL**  
and all points East and South.

The only road in Canada running trains lighted with Electricity and heated by steam from the engine.

Luxurious Buffet Pullman Palace Cars on all trains between OTTAWA and MONTREAL.

Only line running through Sleeping Cars between

**Ottawa, Boston, New York and all New England and New York points.**

Baggage checked to all points and passed by Customs in transit.

During season of navigation close connections are made with Richelieu and Ontario Navigation Co.'s Steamers at Coteau Landing, shooting the St. Lawrence Rapids.

For tickets, time tables and information apply to nearest agent, or to

**S. EBBS,** City Passenger Agent,  
24 Sparks St., Ottawa.  
**GEO. H. PHILLIPS,** Gen. Agent,  
Valleyfield.  
**A. E. CAIRNS,** General Agent,  
136 St. James St., Montreal.  
Or at 260 Washington St., Boston, and  
317 Broadway, New York.

**PERCY R. TODD,**  
General Passenger Agent.

**E. J. CHAMBERLIN,**  
General Manager,  
General Offices, Ottawa.



**TENDERS.**

**SEALED TENDERS,** marked "For Mounted Police Provisions and Light Supplies," and addressed to the Honorable the President of the Privy Council, Ottawa, will be received up to noon on Tuesday, 15th May, 1888.

Printed forms of tenders, containing full information as to the articles and approximate quantities required, may be had on application at any of the Mounted Police Posts in the North-West or at the office of the undersigned.

No tender will be received unless made on such printed forms.

The lowest or any tender not necessarily accepted.

Each tender must be accompanied by an accepted Canadian bank cheque for an amount equal to ten per cent. of the total value of the articles tendered for, which will be forfeited if the party declines to enter into a contract when called upon to do so, or if he fails to complete the service contracted for. If the tender be not accepted the cheque will be returned.

No payment will be made to newspapers inserting this advertisement without authority having been first obtained.

**FRED WHITE,**  
Comptroller N. W. M. Police.  
Ottawa, March 20th, 1888.



**INDIAN LANDS**

**LANDS IN THE UNDERMENTIONED** localities are offered for sale to actual settlers through the following Indian Agents: On the Great Manitoulin Island, Lake Huron, Ontario; Mr. J. G. Phipps, of Manitowaning, is the Agent for the sale of lands, in the following Townships on this Island: Assiginack, Bidwell, Howland, Shequandah, Billings, Campbell, Carnarvon, Allan, Tekkumnah and Sandfield, and in the Townships of Shequandah, Manitowaning and Shafsbury (commonly called Little Current). Mr. B. W. Ross of Cockburn Island is the Agent for the sale of lands on that Island and in the Townships of Gordon, Mills, Burpee and Barrie Island, and in the Township of Gore Bay as well as for those in the Townships of Robinson and Dawson, on Manitoulin Island. Leading roads have been constructed throughout the Great Manitoulin Island.

On the Sauguee Peninsula, Ontario, the lands in the Townships Amabel, Albmarte, Keppel, Eastnor, Lindsay and St. Edmunds; as well as several Townships in the Peninsula, are offered for sale through Mr. William Simpson, Indian Lands Agent at Wiarton, County of Bruce, Ontario.

On the Garden River Reserve, Ontario, Mr. William Van Abbott, of Sault Ste. Marie, is the Agent for the sale of lands within this tract, and which are situated in the Townships of Macdonald, Laird and Meredith; also for lands within the tract commonly known as the Hatchewana Bay Indian Reserve, and comprised in the Townships of Aweres, Fenwick, Kars, Pennefather, Dennis, Herrick, Fisher, Tilley, VanKoughnet, Tupper and Archibald. There is a leading road through these lands which affords ready communication with other parts of the country to intending settlers.

The condition of sale in respect to the lands within the Townships above described can be ascertained on application to the respective Agents.

(Signed) **L. VANKOUGHNET**  
Deputy Supt. General of Indian Affairs.

Department of Indian Affairs,  
Ottawa, February, 1887.



**Notice to Contractors.**

**SEALED TENDERS** addressed to the undersigned, and endorsed "Tender for Post Office, etc., Prescott, Ont.," will be received at this office until Thursday, 21st May, 1888, for the several works required in the erection of Post Office at Prescott, Ont.

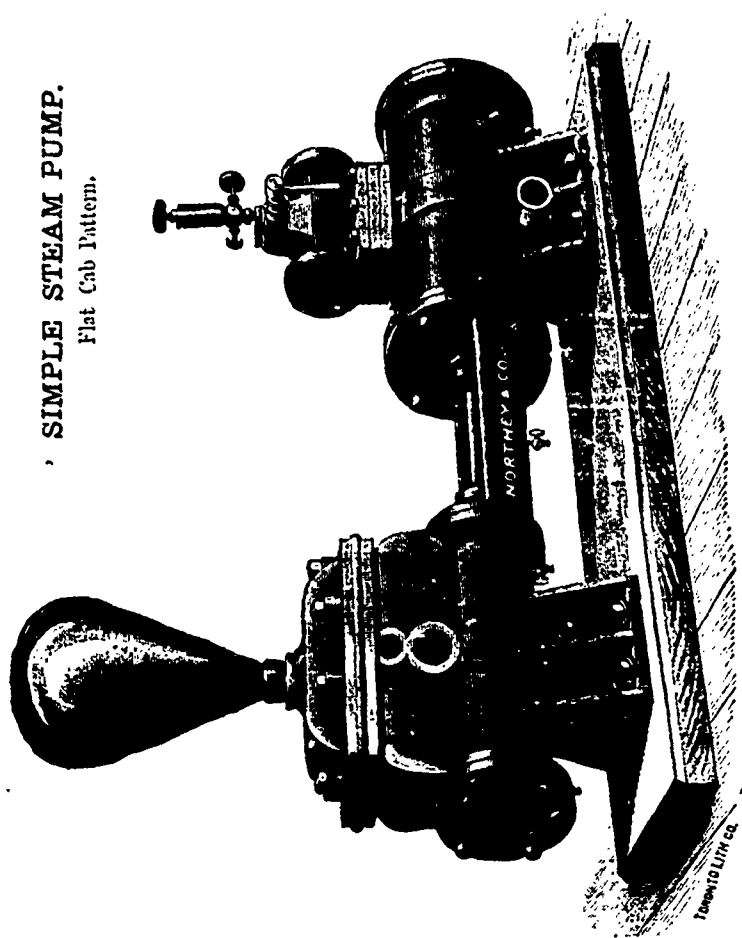
Specifications and drawings can be seen at the Department of Public Works, Ottawa, and at the office of E. Jessup, Esq., Collector of Customs, Prescott, on and after Saturday, 12th May, and tenders will not be considered unless made on the form supplied and signed with actual signatures of tenderers.

An accepted bank cheque, payable to the order of the Minister of Public Works, equal to five per cent. of amount of tender, must accompany each tender. This cheque will be forfeited if the party declines the contract, or fail to complete the work contracted for, and will be returned in case of non-acceptance of tender.

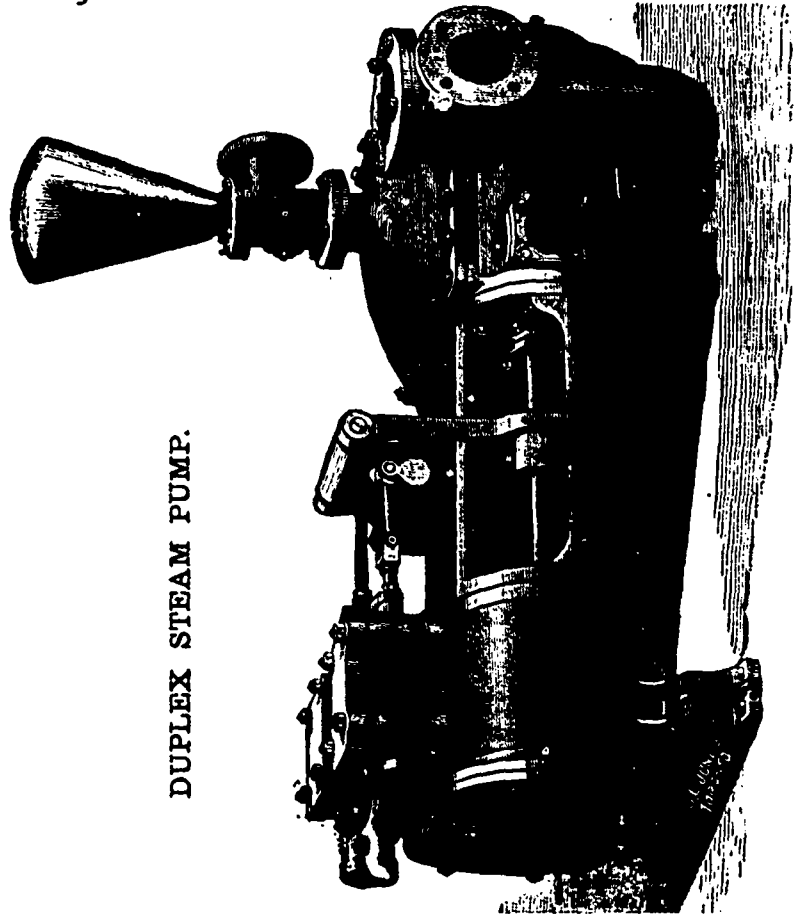
The Department does not bind itself to accept the lowest or any tender.

By order,  
**A. GOHEIL,**  
Secretary.  
Department of Public Works,  
Ottawa, 7th May, 1888.

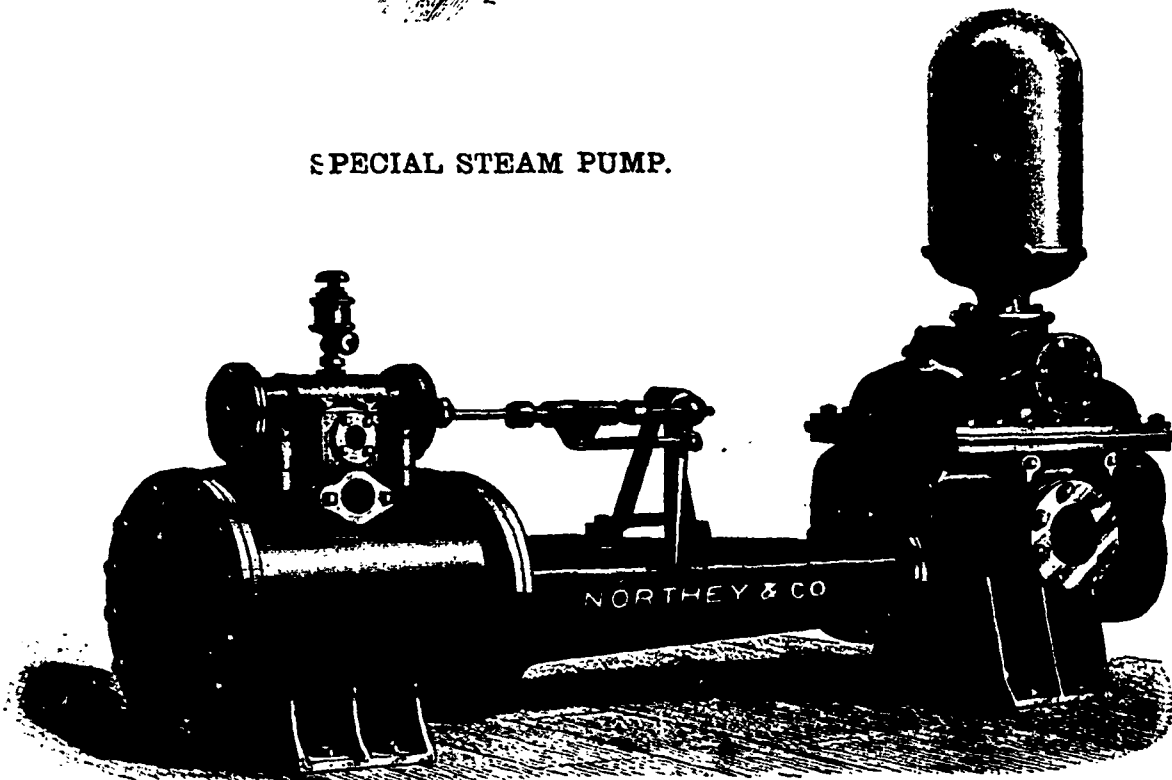
# Northey & Co's Steam Pump Works, TORONTO, ONT.



SIMPLE STEAM PUMP.  
Flat Cab Pattern.



DUPLEX STEAM PUMP.



SPECIAL STEAM PUMP.

Steam Pumps of the best and latest designs for mining purposes, Boiler Feeding, Fire Protection, and General Water Supply, etc.

**NORTHEY & CO.,**  
Mechanical and Hydraulic Engineers,      x      x      x      Toronto, Ont.  
WORKS—COR. FRONT AND PARLIAMENT STS.



# Mining Regulations

TO GOVERN THE DISPOSAL OF

## Mineral Lands other than Coal Lands, 1886.

THESE REGULATIONS shall be applicable to all Dominion Lands containing gold, silver, cinnabar, lead, tin, copper, petroleum, iron or other mineral deposits of economic value, with the exception of coal.

Any person may explore vacant Dominion Lands not appropriated or reserved by Government for other purposes, and may search therein, either by surface or subterranean prospecting for mineral deposits, with a view to obtaining under the Regulations a mining location for the same but no mining location or mining claim shall be granted until the discovery of the vein, lode or deposit of mineral or metal within the limits of the location or claim.

### QUARTZ MINING.

A location for mining, except for iron on veins, lodes or ledges of quartz or other rock in place, shall not exceed forty acres in area. Its length shall not be more than three times its breadth and its surface boundary shall be four straight lines, the opposite sides of which shall be parallel, except where prior locations would prevent, in which case it may be of such a shape as may be approved of by the Superintendent of Mining.

Any person having discovered a mineral deposit may obtain a mining location therefor, in the manner set forth in the Regulations which provides for the character of the survey and the marks necessary to designate the location on the ground.

When the location has been marked conformably to the requirements of the Regulations, the claimant shall within sixty days thereafter, file with the local agent in the Dominion Land Office for the district in which the location is situated, a declaration or oath setting forth the circumstances of his discovery, and describing, as nearly as may be, the locality and dimensions of the claim marked out by him as aforesaid; and shall, along with such declaration, pay to the said agent an entry fee of FIVE DOLLARS. The agent's receipt for such fee will be the claimant's authority to enter into possession of the location applied for.

At any time before the expiration of FIVE years from the date of his obtaining the agent's receipt it shall be open to the claimant to purchase the location on filing with the local agent proof that he has expended not less than FIVE HUNDRED DOLLARS in actual mining operations on the same; but the claimant is required, before the expiration of each of the five years, to prove that he has performed not less than ONE HUNDRED DOLLARS' worth of labor during the year in the actual development of his claim, and at the same time obtain a renewal of his location receipt, for which he is required to pay a fee of FIVE DOLLARS.

The price to be paid for a mining location shall be at the rate of FIVE DOLLARS PER ACRE, cash, and the sum of FIFTY DOLLARS extra for the survey of the same.

No more than one mining location shall be granted to any individual claimant upon the same lode or vein.

### IRON.

The Minister of the Interior may grant a location for the mining of iron, not exceeding 160 acres in area which shall be bounded by north and south and east and west lines astronomically, and its breadth shall equal its length. Provided that should any person making an application purporting to be for the purpose of

mining iron thus obtain, whether in good faith or fraudulently, possession of a valuable mineral deposit other than iron, his right in such deposit shall be restricted to the area prescribed by the Regulations for other minerals, and the rest of the location shall revert to the Crown for such disposition as the Minister may direct.

The regulations also provide for the manner in which land may be acquired for milling purposes, reduction works or other works incidental to mining operations.

Locations taken up prior to this date may, until the 1st of August, 1886, be re-marked and re-entered in conformity with the Regulations without payment of new fees in cases where no existing interests would thereby be prejudicially affected.

### PLACER MINING.

The Regulations laid down in respect to quartz mining shall be applicable to placer mining as far as they relate to entries, entry fees, assignments, marking of localities, agents' receipts, and generally where they can be applied.

The nature and size of placer mining claims are provided for in the Regulations, including bar, dry, bench, creek or hill diggings, and the RIGHTS AND DUTIES OF MINERS are fully set forth.

The Regulations apply also to

### BED-ROCK FLUMES, DRAINAGE OF MINES AND DITCHES.

The GENERAL PROVISIONS of the Regulations include the interpretation of expressions used therein; how disputes shall be heard and adjudicated upon; under what circumstances miners shall be entitled to absent themselves from their locations or diggings, etc., etc.

### THE SCHEDULE OF MINING REGULATIONS

Contains the forms to be observed in the drawing up of all documents such as:— "Application and affidavit of discoverer of quartz mine." "Receipt for fee paid by applicant for mining location." "Receipt for fee on extension of time for purchase of a mining location." "Patent of a mining location." "Certificate of the assignment of a mining location." "Application for grant for placer mining and affidavit of applicant." "Grant for placer mining." "Certificate of the assignment of a placer mining claim." "Grant to a bed rock flume company." "Grant for drainage." "Grant of right to divert water and construct ditches."

Since the publication, in 1884, of the Mining Regulations to govern the disposal of Dominion Mineral Lands the same have been carefully and thoroughly revised with a view to ensure ample protection to the public interests, and at the same time to encourage the prospector and miner in order that the mineral resources may be made valuable by development.

COPIES OF THE REGULATIONS MAY BE OBTAINED UPON APPLICATION TO THE DEPARTMENT OF THE INTERIOR.

**A. M. BURGESS,**

Deputy Minister of the Interior.

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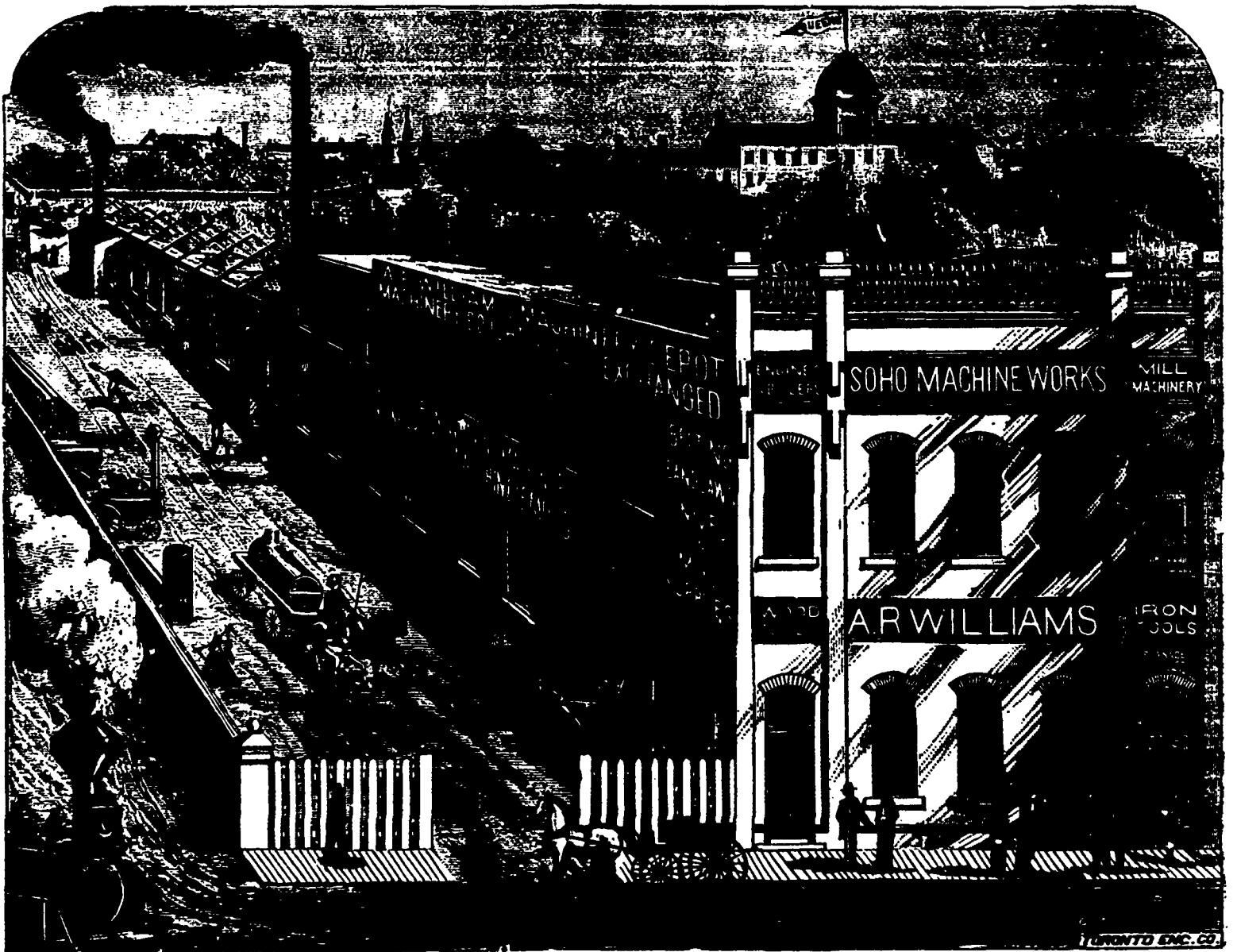
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