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Vol. VII.—No. 12.

1888.—OTTAWA, DECEMBER—1888.

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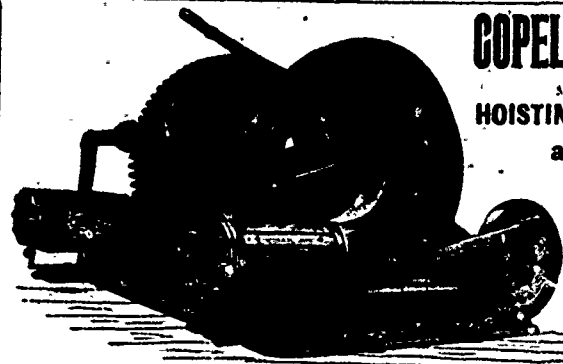
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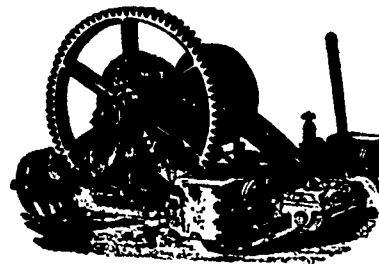
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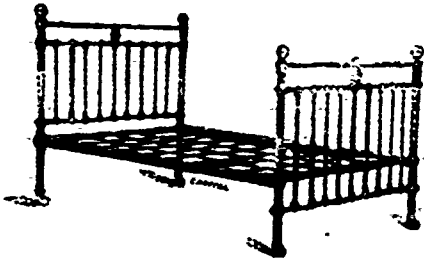
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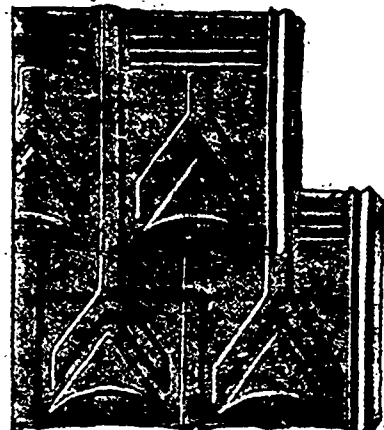
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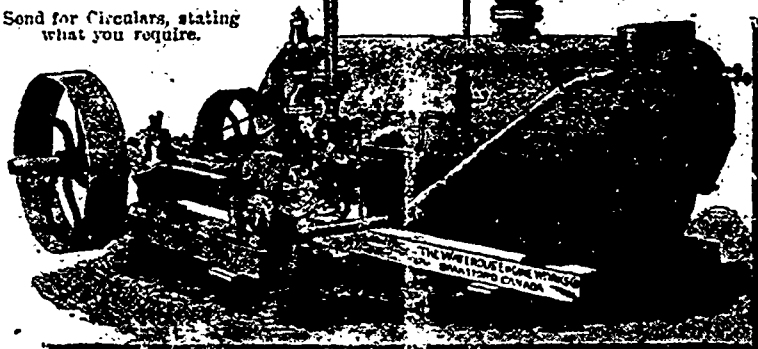
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The Sulphur Mines of Sicily.—The United States Consul at Palermo, states, in a recent report, that although sulphur exists more or less in all countries, Sicily is the only place where it is produced on a large scale, and that island accordingly commands the market. The mines have been worked there for over 300 years, but until 1820 the export was confined within narrow limits. At present the number of mines in Sicily is about 300, nearly 200 of which, however, are said to be destined to stop shortly owing to want of capital. It is estimated that the Sicilian sulphur deposits amount to 30,000,000 tons, and the annual production is about 400,000 tons. If the former estimate be true, and the rate of production is maintained, Sicily will be denuded of sulphur in about 75 years. The royalties vary from 12 to 45 per cent., according to the quality of the ore and the facilities for producing the sulphur: 25 per cent. may be taken as the average. There is a land tax of 36 per cent. of the net income, and the export duty is about 8s. per ton. The lessees receive from 10 to 40 per cent. of the sulphur produced. The external indications of the presence of the sulphur are the appearance of gypsum and sulphurous springs. Frequently several borings have to be made to get at the seam, but when it is found the passages or galleries follow it, and are therefore most irregular. When the miners detach the ore from the surrounding material, vast cavities are often 1-ft which have to be supported on pillars of rock, which often give way, with disastrous results. Water is the greatest difficulty in the way of the miner, and pumps are constantly necessary. At one time miners were allowed to dig where they pleased, with the result that one mine often fell into or upon another, and accordingly a law has been passed requiring plans of the mines to be deposited in a public office. The total number of mining laborers is said to be 25,000; as a rule they can neither read nor write, and are described as indolent and dishonest. They frequently sleep in the mines or the open air, according to the weather, and they violently oppose a relief fund for the families of those who die in the service, because from 1 to 2 per cent. is deducted from their wages to maintain it. There are seven different qualities of sulphur, which are decided by color and not by test. Between 1840 and 1860 the Sicilian sulphur industry was at its zenith; it was free from official interference or taxation, and sulphuric acid was derived exclusively from the sulphur. But science soon discovered that it could be obtained from iron pyrites, and, indeed, it is said that two-thirds of the sulphuric acid used in England is manufactured from pyrites. The decrease in price produced by this discovery caused many of the mines to suspend operations. —*Colliery Engineer.*

The Last of the "Great Eastern:"—A three-days' sale by auction of the entire vessel and her fittings has taken place at Liverpool. The catalogue contained 893 lots, and as a rule satisfactory prices were obtained. The hull and fittings realized over £43,000, the copper bringing \$2,960, the gun metal, etc., £1,800, brass £3,950, lead £4,185, outer iron plates £12,500, inner iron plates, beams and rivets £12,300, and anchors about £300. The engines and engine fittings sold for about £10,000 in addition, bringing up the total to more than £50,000. The breaking up of the steamer will commence on January 1st, will occupy a year, and will, it is estimated, cost in labor from 10s. to 15s. per ton of material.

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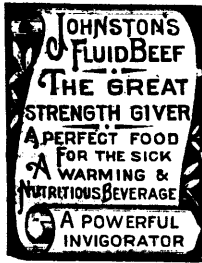
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Coal in the North-West.—Mr. Maltby, an eminent mining engineer of Chicago, who has been prospecting for coal and examining locations in Alberta and British Columbia during the summer for the C. P. R. Company, was in the city Tuesday on his way to Montreal to submit his report to the directors. Mr. Maltby states that he has been working chiefly on the Crowfoot Creek, fifteen miles east of Gleichen, and a few miles north of the C. P. R. A shaft was struck in that locality a couple of years ago, but as it filled up with water and as the operators had no machinery to pump it out the work was abandoned. Mr. Maltby continued this shaft to a depth of 470 feet, penetrating four seams of coal, the first being eighteen inches thick, the second nine inches, and the third and principal one nine feet. Mr. Maltby mined the last mentioned seam and took out several car loads of coal, which were tested in the C. P. R. locomotives with highly satisfactory results. This bed of coal, Mr. Maltby says, extends from near the C. P. R., where outcroppings are seen, to the Red Deer River, a distance of thirty-five or forty miles. The coal is similar to the Lethbridge coal, but while it has a strong blaze, it does not emit any smoke, and is suitable for steam or domestic purposes. Mr. Maltby made an examination of the coal at Cochrane, where a company has been mining on the outcroppings. He says that good coal will not be obtained there until deeper shafts are sunk to the beds that have not been affected by the upheaval of the mountains. He also says that the Canada Anthracite Company made a mistake in working the outcroppings instead of sinking deep shafts. Mr. Maltby made an examination of land in the vicinity of Vancouver, and expresses the opinion that vast coal beds exist there, but at a depth of 1,000 feet. He thinks it is the same bed that crops out on Vancouver Island. Being asked as to the probable extent of the coal beds in the North-West, Mr. Maltby said there was sufficient coal in the country to supply Canada with fuel for centuries. The C. P. R. will probably open mines in the Crowfoot district next year. Mr. Maltby has been engaged for years in coal mining in England and the United States, and understands the practical as well as the scientific branch of the business. He is now superintendent of several mines in Illinois.

Forced Draught and Coal Consumption.—A forced draught invention calculated to lead to a diminished consumption of coal is at present attracting some attention in the shipping trade. The inventor is Alderman Wilson, of Stockton, England, who has just sent out a first installation to the order of the Irrawaddy Flotilla Company, British Burmah, which has the largest fleet of steamers in the world. An installation has been in operation on board the Cunard Company's steamer "Servia" during the past twelve months, and it has not only increased the speed of the vessel, but has diminished the quantity of coal used between New York and back to the extent of 195 tons. In consequence of this result the Cunard Company have ordered a supply of the installation for all the boats in their fleet. Ald. Wilson's invention, it may be remarked, is one of many that have been recently produced in the direction of coal economy on board steamers. The results in several instances are stated to have been very satisfactory, and in some cases it is anticipated that a market for the worst classes of coal will in the near future be forthcoming.

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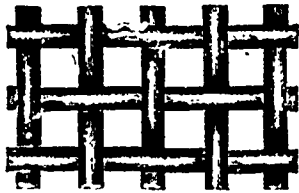
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S. E. LEFEBVRE, Secretary
 Office: 19 St. James St., Montreal, Can.

The Vancouver Coal Mining and Land Company (Limited).

The semi-annual general meeting of the above com-
 pany was held at the Cannon street Hotel, London, on
 Monday, 3rd ult., under the presidency of Mr. John
 Galsworthy.

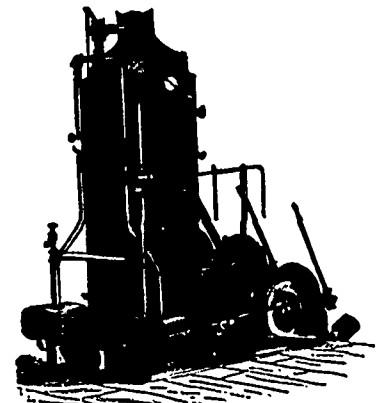
The Chairman moved the adoption of the report and
 accounts, and said the former showed that in the past
 half-year they had made a profit of £20,858, after
 deducting £1,937 for repairs and maintenance. That
 was a most satisfactory state of things, and he did not
 think they had ever had so much profit in any half-year
 before. The output for the half-year had exceeded any-
 thing they had had before; it amounted to 87,000 tons,
 and the profits on those sales realized about 5s. a ton.
 The Chairman then described the state of the shafts and
 levels at the present time, from which it appeared that
 the No. 1 north level, which had been reported as run-
 ning out of coal, was still unfavourable. No. 3 north
 level in the No. 1 shaft, which also had run out, had
 now got to a seam of 6 feet good coal. At the No. 2
 shaft, they would remember, they had been boring to
 see if they could get at coal supposed to be underneath,
 and a telegram which had been received that day told
 them that at the 590 feet, where they were down,
 they were in promising conglomerate. With regard to
 the South Field scope, from whence they had been
 getting the large bulk of their coal, in the No. 1
 shaft No. 3 north level there was 6 feet of good coal;
 No. 1 level was unfavourable; No. 4 South Field Slope
 was in poor ground; No. 2 and No. 3 were going well.
 In the North Field shaft they had got to the bed of rock,
 and purposed putting a shaft down, and hoped to strike
 the seam which Mr. Dumsuir had got not very far off,
 which was an excellent one. As to the bore-holes, there
 were seven in the South Field, indicating coal ranging
 from 1 to 14 feet. In the East Field, where the shaft
 was, there were four bore-holes, ranging from 6 feet to 9
 feet of coal. There were three bore-holes in the West
 Field, and there was no coal found yet. In the Gabriola
 they had sunk down to 1,950 feet, and were still in shale,
 and the coal supposed to underlie it was at any rate some
 distance ahead. Referring to the balance-sheet, it would
 be observed that the reserve fund and the insurance had
 been increased, and the estate fund now amounted to
 12,000l., while the land sales reserve amounted to
 10,000l. On the other side of the account it would be
 seen that they had nearly eliminated a deficit balance,
 bringing it from 20,985l. to 127l. The directors had
 issued 5,000 new shares at a discount, but that turned
 out, according to decisions given to be illegal; therefore
 that 12,500l. must be provided some day, and it could
 only properly come out of profits. At the present
 moment they could only keep the item there and keep
 the profits available for it when they could deal with it.

The motion was seconded by Mr. Joseph Fry and
 carried.

The meeting was then made special, and the chairman
 submitted a provisional agreement for bonding the com-
 pany's property to Messrs. John Rosenfeld & Sons.
 Referring to the property, he admitted it was an excel-
 lent one, but it wanted a capital of £100,000 or £150,-
 000 at the back of any one who wished to make it what
 it ought to be. They could not get that money from the
 shareholders. They had tried once, and had the greatest
 difficulty to get £37,000, and he was sure if they tried to
 get £50,000 they would fail. That being so, it was not
 surprising that they should enter into this agreement to
 give the opportunity to Messrs. Rosenfeld to find the
 capital to work the property, especially at a price which
 he ventured to say was an excellent one. The price
 which they would give the shareholders, supposing
 Messrs. Rosenfeld took the property to-morrow, would
 be £12 per share, so that after the misfortunes the
 company had had, including the explosion, they would
 get their capital back with a bonus of £2. The acreage
 of the freehold land was 19,506. Then they had bonded
 on the other side various other estates
 which amounted to 23,000 acres, but before
 they could call them their own they would have to
 pay £26,000. They had also bonded some other small
 estates, upon which they would have to pay nearly £12,-
 000 to get them. They had been selling town lots at
 £300 an acre, but pending the purchase being completed
 under the agreement, all the profits, all the sales, and all
 the capital which might be laid out, and all additions of
 exploration would be added to the price to be paid by
 the purchasers. They might sell the whole of the town
 lots at any price they liked and keep the money. The
 shipments of coal up to the present time since June had
 been 121,000 tons. In conclusion, the Chairman stated
 that Mr. Rosenfeld had made this proposition:—"That
 assuming he formed a combination to carry on the
 property, he would offer to the shareholders of this com-
 pany one-third of the capital upon the scale amount
 which he himself paid for the property." A motion was
 subsequently put and carried agreeing with these terms.

M. BEATTY & SON,S

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—BY—

Professor E. J. CHAPMAN

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The Canadian Mining Review

CONDUCTED BY B. T. A. BELL.

OFFICE:

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OTTAWA.

Vol. VI. DECEMBER, 1888. No. 12.

The Duty on Mining Machinery.

The question of the remission of the duty on mining machinery having been brought before the Minister of Customs, Mr. Powell said that the matter was one of great importance to every province in the Dominion. He recognized that the mining industry should be encouraged and every facility afforded for the development of our great mineral resources that could legitimately be given. The Government has the whole question of the free admission of mining machinery under consideration. At the present time the Minister recognizes that certain implements and classes of machinery used in mining are at present being made in Canada, that this interest is rapidly being extended, and that great care would have to be exercised to see that this industry was not interfered with.

Asbestos in the United States.

From the "Mineral Resources of the United States" for 1888, just issued, we note that the total product for last year hardly exceeded 150 tons, worth \$4,500. In addition several hundred tons of fibrous actinolite were used for weighting paper. The figures of the production of asbestos during recent years have been: 1882, 1,200 tons, value \$36,000; 1883, 1,000 tons, value, \$30,000; 1884, 1,000 tons, value \$30,000; 1885, 300 tons, value \$9,000; 1886, 200 tons, value, \$6,000; 1887, 150 tons, value \$4,500. No wonder Cousin Jonathan is anxious to acquire some of our rich asbestos lands.

The Phosphate Season of 1888.

The shipping season for phosphate has now closed, and a review of its principal features may be taken.

The total export from Montreal has been 14,392 tons, 384 bags, 30 barrels, or in round figures, 14,432 tons, a falling off from last year, which is mainly owing to the difficulty of transportation on the Lievres river. This will eventually be obviated by the canal now being constructed at the Little Rapids. Work on this was delayed during the best months of the summer in consequence of a lawsuit arising out of a large claim against the Government for right of way. A show of phosphate was struck by the contractors during their excavations, before the price had been settled, and the owner, finding that a "phosphate mine" was to be destroyed, raised his price

some \$50,000. He, however, lost his suit, and the phosphate was soon cut through, and now work is proceeding with a prospect of completion in 1890. In consequence of this trouble in bagging phosphate, considerable quantities have been held over.

SHIPMENTS.

The following have been the shipments of phosphate from Montreal to ports in United Kingdom, France and Germany during season of navigation for 1888, as per Custom House manifests:

Date.	Name of Vessel	Destination.	Shippers.	Tons.	
May 17	Sully	Havre	Lomer, Rohr & Co	520	
18	Oxenholme	Liverpool	Wilson & Green	150	
22	Raumwall	Hamburg	Lomer, Rohr & Co	180	
25	Durham City	Liverpool	Wilson & Green	230	
25	Washington C's	London	Lomer, Rohr & Co	384	
31	Cynthia	Glasgow	"	210	
June 1	Cremon	Hamburg	"	49	
1	do	do	Wilson & Green	410	
2	Caropus	Liverpool	"	317	
7	Dominion	Avonmouth	Millar & Co	100	
8	Holsten	Hamburg	Wilson & Green	310	
9	Bonnington	Dublin	Lomer, Rohr & Co	168	
15	Wandrahan	Hamburg	Wilson & Green	300	
22	Lake Winnipeg	Liverpool	Lomer, Rohr & Co	480	
23	Giovino	London	"	318	
31	Fremons	do	Millar & Co	100	
30	Lake Superior	Liverpool	Lomer, Rohr & Co	149	
30	Grasbrook	Hamburg	Wilson & Green	657	
July 4	Oxenholme	Liverpool	"	150	
6	Cynthia	Barrow	Lomer, Rohr & Co	150	
10	Circo	Glasgow	"	200	
17	Colina	do	"	220	
29	Escalona	London	"	200	
25	Jas. L. Harway	Bristol	"	407	
25	Canopus	Liverpool	Wilson & Green	312	
Aug. 1	Bothal	London	Millar & Co	170	
1	Murciano	do	Wilson & Green	127	
4	do	do	"	25	
4	do	Antwerp	Lomer, Rohr & Co	156	
6	Lake Superior	Liverpool	"	120	
13	Fremona	London	"	100	
13	do	do	Millar & Co	130	
13	Lake Nepigon	Liverpool	"	335	
17	Oxenholme	do	Lomer, Rohr & Co	435	
17	do	do	Wilson & Green	65	
21	Henry IV	do	Miller & Co	400	
Sept. 15	Canopus	London	Lomer, Rohr & Co	75	
24	Lake Huron	Liverpool	Millar & Co	138	
27	Fremons	do	Wilson & Green	165	
27	do	do	Miller & Co	250	
27	Lake Huron	Liverpool	Wilson & Green	138	
27	Ripon City	London	Millar & Co	130	
27	do	do	Wilson & Green	193	
Oct. 3	Oxenholme	Liverpool	"	657	
4	Cremon	Hamburg	"	365	
9	Dominion	Avonmouth	Millar & Co	223	
10	Sarnia	Liverpool	Lomer, Rohr & Co	75	
15	Lake Superior	do	Wilson & Green	220	
15	Circo	Glasgow	"	205	
15	do	do	Lomer, Rohr & Co	200	
16	Oregon	Liverpool	"	100	
25	Montreal	do	"	120	
25	do	do	Wilson & Green	202	
27	Ontario	Avonmouth	Millar & Co	165	
30	Vancouver	Liverpool	"	55	
30	do	do	Lomer, Rohr & Co	100	
31	Colina	Glasgow	Wilson & Green	200	
31	Barcelona	London	"	130	
Nov. 7	Raumwall	Hamburg	Lomer, Rohr & Co	100	
7	Concordia	Glasgow	Wilson & Green	170	
8	Toronto	Liverpool	Millar & Co	85	
10	Avlona	London	"	251	
10	Grasbrook	Hamburg	Wilson & Green	215	
14	Fremona	London	"	150	
14	do	do	Lomer, Rohr & Co	100	
14	Sarnia	Liverpool	Millar & Co	30	
				Total tons.....	14,432

RECAPITULATION.

	Tons.	Bags.	Barrels.
Wilson & Green, Montreal	6,619	384	30
Lomer, Rohr & Co	5,381		
Millar & Co	2,392		
Point of Shipment	Tons	Bags	Barrels
Hamburg	1,536		
Liverpool	5,890		
London	4,422		
Glasgow	1,125	384	
Dublin	310		
Avonmouth	707		
Barrow	150		
Antwerp	232		
Havre			30
Total Exports from Montreal	14,392	384	30

EXPORTED TO UNITED STATES, (Buffalo, Chicago, and Philadelphia), as per Shippers, Station Agents, and U. S. Consulate returns.

From	Quantity.
Ottawa Valley	2,000 Tons.
Kingston District	814 "
Total	2,814 Tons.

SUMMARY OF EXPORTS FOR 1888.

	Tons.
To European points	14,432
To United States points	2,814
Home Consumption	200

Total Exports..... 17,446

OUTPUT.

The output from the various mines to date may be fairly stated to be as follows:

DU LIEVRE DISTRICT.

	Tons.
Phosphate of Lime Co	7,500
Canadian Phosphate Co	4,000
Dominion Phosphate Co	3,500
Ottawa Phosphate Co	2,500
W. A. Allan	200
Total	17,700

TEMPLETON DISTRICT.

Blackburn mines	2,500
Templeton & Blanche River Co	170
Jackson Rae	170
Canada Industrial Co	150
Total	2,990

PERTH DISTRICT.

Anglo Canadian Co	600	600
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KINGSTON DISTRICT.

Capt. Boyd Smith	1,500
Jas. Foxton	500
Total output for 1888, tons	23,200

FREIGHTS.

Freights during the season have been at 6s. to 7s. per ton until the fall, when they advanced to 12s. 6d. for London. But the break in the Cornwall canal detained cargo from the steamships in Montreal, and they accepted phosphate at 2s. 6d. for Liverpool in order to get away. This enabled some phosphate to be shipped that would otherwise have been held over. Deal freights that opened in the spring at 40s., advanced in the fall to 80s. and greatly checked shipments, so that the supply of ballast tonnage for phosphate from this source was much reduced. It is estimated that 50,000 tons of lumber has been held over in the St. Lawrence, and a large fleet of vessels may be expected next year. This promises cheap phosphate freights.

MARKETS.

Markets abroad have been steady, with some tendency to increase at the close of the season, owing to high freights, which caused a decided advance in the price of Carolina phosphate. Prices for 80 per cent. Canadian were 11d. to 1s. per unit at the beginning of the season, and considerable sales were made at these figures.

Later on the demand turned towards lower grade phosphates, which had been quite neglected the year before. Sales were made of qualities as low as 65 per cent. The markets closed in England at about 9d. per unit for 70 per cent. and 10d. for 75 per cent. Aruba phosphate has been selling in competition with Canadian, and the French phosphates from the Somme district have been largely used in England. The supply of these threatens to be exhausted within two years. The English farmers are distinctly better off than they were last year, and they will be better able to buy artificial manures. Sales have already very much increased. There seems, therefore, good reason to expect better prices and a larger demand for all grades of Canadian phosphate.

The American market for pulverized phosphate of low grade is extending, and a good trade in this direction is assured.

New Discoveries.

The unscrupulous speculator who "booms" properties that he knows to be worthless, and the too gullable newspaper which accepts as gospel his plausible stories, and extensively puffs his reported finds of minerals—be they phosphate lands, coal seams, or gold leads—does incalculable harm to the mining industry and retards the development of the country. We do not say that any of our contemporaries would wilfully misstate the facts in connection with any reported discovery, but it is often apparent that some of them are too easily imposed upon and assume too quickly the truth of flying reports.

The other day a Provincial Government official startled us with the following communication, "in the strictest confidence":

"In a few days the Government will announce important mineral discoveries in the Ottawa Valley which will electrify the whole country. There's millions in it! Gold is nothing to it! I am not at liberty to tell more, but you will soon hear, for I think it will be made public in about a week."

We wondered what could it be. In all probability "Natural Gas!"

Co-operation.

As we have pointed out in these columns, there is much need of greater harmony and combined effort among our miners. Lately we have been pleased to see an improvement in this regard, notably on the Lievre River, where, during the autumn, the steamers of two mines which have in the past treated each other with scant courtesy and indulged in an expensive jealousy, were combined into a joint service, one above the rapids and the other below, thus saving expense to both companies and hindering neither. The dog in the manger spirit that begrudges benefit to others should give place to the sentiment that the prosperity of one tends to the prosperity of all.

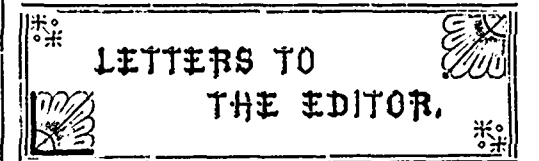
Comparative Power Drill Test.

During the past season a test to determine the amount of air consumed respectively by a Rand "Little Giant" and a Sargent rock drill was made at the Ludington mine with the following result. We understand that the Rand drill was taken out of a mine where it had been at work for about nine years, while the other drill, about which so many claims have been made, was practically a new one:

DATE.	RAND DUPLEX 18" x 30" COMPRESSOR.		INDICATED H. P.		Cu. ft. of air produced per revolution.		Drills boring in hard Granite Boulders.	Drills boring in hard Granite Boulders.
	Number of Revolutions while Drilling.	Per Min.	St. Cyl. Air Cyl. Loss.	H. P.	Free.	60-lbs.		
Test July 24th and 25th.	487	8.51	23.62	19.46	17.9%	23.42	5458	3 1/4"
Rand No. 3	571	9.32	26.47	21.24	"	26.61	5661	3"
Sargent No. 2	364	7.47	20.74	17.03	"	100.26	1,016	4 1/2"
Test July 30th and 31st	504	7.31	20.29	16.66	"	98.07	7159	4 3/8"
Rand No. 3						114.16	5458	3 1/4"
Sargent No. 2						125.11	5661	3"
Test July 30th and 31st						197.73	1,016	4 1/2"
Rand No. 3						19.30	7159	4 3/8"
Sargent No. 2						22.47	5458	3 1/4"
Test July 30th and 31st						24.62	5661	3"
Rand No. 3						209.1	5458	3 1/4"
Sargent No. 2						247.2	5661	3"
Test July 30th and 31st						98.7	1,016	4 1/2"
Rand No. 3						137.1	7159	4 3/8"
Sargent No. 2						137.1	7159	4 3/8"

Studying the amounts of air consumed per inch drilled, we find that in one case (when used on columns) the Sargent drill uses 18.22 per cent more air than the Rand, and in the other case (on tripods) the Sargent uses 40 per cent more air.

The compressor used is an 18x30 duplex, which works 20 drills; at say 4 lbs. coal per H. P. per hour to run the compressor, and 200 working days in the year, the total coal consumption, at \$5 per ton, would be \$12,000 when using the Rand drills. If the Sargent drills be used, in the first case the coal bill would be \$14,186, and in the other case \$16,800, or an average of \$15,493—an increase of \$3,493, which is 5 per cent on a capital of \$69,860.



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.

The Utility of Waste Sawdust as Fuel.

BROCKVILLE, ONT., 11th Dec., 1888.

The Editor

THE CANADIAN MINING REVIEW:

DEAR SIR,—I read with much interest the letter from "Engineer" published in your November issue on the "Utility of Waste Sawdust," in which he states that "sawmill waste has been used with economy and success in the manufacture of iron in the United States."

Feeling much interest in the development of the iron industries of Canada, I would like "Engineer" to inform me in what district in the United States "sawmill waste" is now being used for the manufacture of iron.

Now, as this question is of such great importance to the Provinces of Ontario and Quebec, on account of the many large deposits of iron ore available, that could be utilized and manufactured into iron and steel; and (as I understand), all that is wanted is a cheap and economical fuel to attain this end. Therefore, "Engineer" (I consider) would confer a great favour upon the general public if he would give in detail particulars as to how these "waste wood supplies" are being practically, economically and successfully (which I presume means profitably) worked so as to compete with the iron and steel produced by coke fuel in the United States, and I shall feel obliged if "Engineer" will kindly answer the following questions:

1. What kind of wood does this "refuse" consist of for making the charcoal?
2. Is it burned in kilns, or pits?
3. What is the percentage of waste?
4. What is the average percentage of carbon from the coal produced?
5. What is the cost per bushel made ready for use for the furnace?
6. What kind of "ore" is used?
7. What is the percentage of metallic iron?
8. If calcined with sawdust, please describe construction of the furnace?
9. What are the material and labor charges for calcining?
10. Is the "ore" calcined for "Gray" or "Forge" pig?

11. What number of bushels of coal used to produce one ton of "pig," say "grey."

12. What is the size of the furnace, that is, height and "Bosh?"

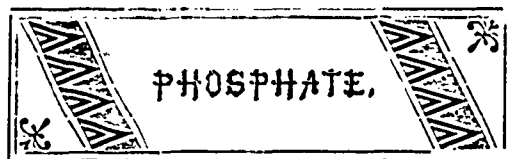
13. Is "hot" or "cold" blast used and at what pressure per square inch?

14. If used for puddling, or re-heating, please state how prepared?

15. Please state the quantity used to the ton of finished iron?

In asking these questions I presume that "Engineer" will be able to satisfy all who are interested in the iron industry of the provinces named, that we have only to "pluck" up courage enough to emulate our cousins over the border line, and by doing so we shall be able to produce iron at a profit by the use of our "sawmill wastes." Apologizing for troubling, I remain, dear sir,

Yours faithfully,
FRANCIS D TAYLOR.



In General.

Mr. Adolph Lomer, of Messrs. Lomer, Rohr & Co., has returned from a flying trip to Europe, having been absent only about a month, going and coming by the crack Cunard steamers Etruria and Umbria. He reports a good outlook for next season's business.

Shipments.

The following are the shipments of phosphate from Montreal from 16th of October to close of navigation:

Date.	Name of Vessel	Destination.	Shippers.	Tons.
Oct. 25	s. s. Montreal	Liverpool.	Wilson & Green.	202
25	do	do	Lomer, Rohr & Co.	121
27	s. s. Ontario	do	Millar & Co.	165
30	s. s. Vancouver	do	Lomer, Rohr & Co.	100
31	s. s. Colima	Glasgow.	Wilson & Green.	200
Nov. 6	s. s. Barcelona	London.		139
7	s. s. Baumwall	Hamburg.	Lomer, Rohr & Co.	100
7	s. s. Concordia	Glasgow.	Wilson & Green.	171
8	s. s. Toronto	Liverpool.	Millar & Co.	85
10	s. s. Grassbrook	Hamburg.	Wilson & Green.	215
10	s. s. Aylona	London.	Millar & Co.	229
10	s. s. Erinoda	do	Lomer, Rohr & Co.	100
10	do	do	Wilson & Green.	150
				1,966

RECAPITULATION.

SHIPPERS.

Wilson & Green	1,076
Lomer, Rohr & Co.	420
Millar & Co.	470

DESTINATIONS.

Liverpool	672
London	609
Glasgow	370
Hamburg	315

Freight.

Freight prospects for the next season are favourable as the lumber and deal shipments are expected to be very large, but on the other hand the prospects are that the output of Canadian phosphate will be larger than ever before and all the available tonnage can be utilized.

Market.

English markets for phosphate may now be quoted one penny per unit higher than last spring. This is owing mainly to the rise in ocean freights which has put Charleston phosphate almost out of the range of buyers and turns attention to other phosphates less affected by this cause. Canadian phosphate, having the advantage of ballast rates of freight with deal cargoes, is in a favourable position for competition whenever tonnage becomes scarce for full cargoes from

the ports of other phosphate producing countries.

The demand in England is directed towards the lower grades of Canadian phosphate, which is partly owing to the enhanced value of the Carolina phosphate (which analyzes 55 to 60 per cent.) and partly to some mysterious change in the opinions of buyers. For years past guarantees of eighty per cent and upwards have been insisted on and woe to the unlucky shipper whose phosphate turned out 79½%. Such "inferior stuff" was not wanted and a heavy reduction had to be made to secure its acceptance. Now however, there is but little demand in England for phosphate over 75 per cent. in quality and large contracts could be made for 70 per cent or even as low as 65 per cent. This will be of great advantage to the Canadian industry as the expense of keeping the quality up to eighty per cent. in the average run of mines has been greater than the increase of price gained. If foreigners wish to buy our phosphates in an impure state, or mixed with dirt instead of buying a pure article and supplying the adulteration themselves it will save expense to miners and permit a large increase of production, as there is any amount of dirt to be had at small labour cost.

Germany still requires a certain proportion of the highest grades and all that Canada can profitably produce at present of this class can be marketed in that country.

The market quotation may be stated to be 9½ for 70 per cent. with ¼ d per unit rise up to 75 per cent. but no rise beyond.

Du Lievre.

Mr. S. P. Franchot has presented to the Montreal Amateur Athletic Association five tons of Pulverized Phosphate to try its virtues upon the turf of their new athletic grounds, the only place where this enterprising association "lets the grass grow under its feet."

Mr. J. Keith Reid, who has for several years been connected in business with Capt. R. C. Adams, of Montreal, and has of late aided him in the affairs of the Anglo-Canadian Phosphate Co., has removed his residence to Buckingham, and will be associated with Mr. Franchot in his phosphate, mica and spar enterprises. Mr. Reid is not only one of the most enterprising business men of the day, but is foremost in promoting athletic sports and social entertainments, so that the Lievres River may not only expect a boom in its enterprises, but the little village of Buckingham may look forward to a lively winter.

The Phosphate of Lime Company proposes to increase its capital in order to facilitate its extensive operations. A little over 6,000 tons of their output for the present year have gone to Europe, and some 500 tons have been sold to the Milling Company for shipment to the States.

Messrs. Miller & Co., Montreal, have shipped for the Canadian Company 3,925 tons. Of this quantity 2,392 tons have gone to Europe; 1,420 tons ground, to United States; 195 tons ground, and 18 tons crude, averaging from 80 to 85 per cent., have been sold to home consumers.

We are informed upon good authority that the scheme mooted by American capitalists to establish fertilizing works on a large scale in this district will go through.

It is thought that the shipments of ground phosphate from the Ottawa Valley to points in the United States for quarter ending 31st December, will exceed 300 tons.

Templeton District.

Mr. Robert Blackburn, owner of the celebrated Blackburn mines, informs us that the output of his mines for the year has been 2,500 tons. Of this 1,513 tons have been forwarded to Europe, and the balance is held over at the pits. A large amount of development work has been done on the property.

A rumour is current that a large company is being formed in New York with a capital of one million dollars, to acquire and work the old Goldering mine.

The North American Phosphate Company are still negotiating with New York people with a view to acquiring increased capital, but at the time of writing we have not heard with what success.

Perth District.

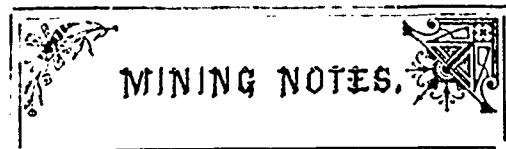
At Bobb's Lake mines, in Belford, Ont., the Anglo-Canadian Phosphate Co. will haul out a thousand tons this winter, all mined since June with a force averaging about fifteen men, which is one of the best records ever made in this industry. At the Otty Lake mines, North Burgess, the same Company continues to secure a fair output.

Kingston District.

The Foxton Phosphate mine in Sydenham, is to be offered for sale with 300 to 400 acres of land close by. They have about 300 tons of phosphate on hand, which will be sold with the mine. The shaft is down 120 feet and is provided with steam hoist and machine drills. The whole will be offered for \$50,000.

The shipments from Capt. Boyd Smith's Blessington mines for the year will figure close upon 1200 tons. Of this quantity 400 tons have gone to Hamburg and the balance to Philadelphia. A steady output and a high percentage is being maintained. A saw mill is the latest addition to the plant of these well equipped mines.

A typographical error in our last issue made the quantity exported from this district to the United States 314 tons. From figures received from the American Consulate, we are in a position to state that 814 tons, valued at \$14,652 were exported across the line.



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

Nova Scotia.

Messrs. I. Matheson & Co., of New Glasgow, who make a specialty of gold mining machinery, have supplied the machinery for the mines of the Minnesota Mining Company at Malaga Lake. The new stamp mill, consisting of 21 stamps, is pronounced one of the best equipped mills in the province.

The work now being done at the mines of the Eastern Development Company at Coxheath is showing large bodies of chalcopryrite ore. Recent advices show that the anticipations of the existence of extensive veins of this ore are being rapidly realized, while the surface work of the western extension of the lode, known as the "Argyle" mine, which was lately purchased, is thought to demonstrate the con-

tinuance of the same veins that are now being worked on the original area.

The returns for November for the Dufferin mines, Dav's Hill, are 202 ounces of gold from 750 tons of quartz.

At Lake Catcha, the Oxford mill yielded last month 133½ ounces of gold from 117 tons of quartz, while 21½ ounces from 20 tons of quartz was got from the Cambridge mill.

At South Utiacke the Withrow property yielded 112 ounces from 30 tons crushed.

The Miners' mill, Sherbrooke, reports its product of gold for November to have been 47 ozs. from 250 tons quartz crushed. The Goldenville mill yielded 11½ ozs. from 49 tons crushed, and the London mill 14½ ozs. from 130½ tons. The latter is evidently a new property or an old property, but lately reopened.

Circulars have been sent out by the inspector of mines to the members of the Examining Board and others, informing them that the Government have under consideration the following plan of instruction for those desirous of qualifying themselves for positions in coal mines, and asking suggestions:

"The appointment of, say seven men in the most convenient localities, each of whom would be paid a small retainer, provided that he prepared not less than two candidates, also, a fee for each candidate prepared by him, and passed by the Examining Board as an Overman; and a larger fee for each candidate prepared by him, and passed as an Underground Manager. In addition he would be allowed to charge each candidate instructed by him a small fee, not exceeding \$2. The appointment of teachers to be annual."

The Neptune Mining Co., of Gold River, Chesler Basin, have just ordered a ten stamp mill, with engine and boiler complete, from I. Matheson & Co., New Glasgow, N. S.

There is considerable excitement in Gay's River over the prospect of the development of the gold mines there on an extensive scale. Mr. William Frost, of Brooklyn, New York, a mining expert of experience, visited the grounds last week in the interest of a number of American and New Brunswick capitalists, and if he reports favorably operations will be commenced on a large scale.

The promising gold mining property situated at Gold River, owned by Messrs. F. B. Wade and Wilson & Wade, was sold on Friday to W. J. Nelson for \$30,000, and by him immediately conveyed to a Minneapolis syndicate at an advanced price. The recent mill, taken from one of the many leads upon the property, gave \$65 to the ton, the lead being twenty inches in width. The purchasers have secured the services of C. E. Willis as manager, and will commence the work of developing and the erection of a ten stamp crusher at once. Experts consider this property one of the best in Nova Scotia.—*Gold Hunter*.

The *Critic* says: It is rumored that the copper mines at Dorchester are again to be operated. The Colonial Copper Mining Company and the Westmorland Mining Company, known as the "Couch" company, are to be amalgamated and the mines worked by one company. Two Amer-

ican gentlemen are expected shortly to complete the necessary arrangements. The increased price of copper is said to have caused the movement.

New Brunswick.

The mines of the Brunswick Antimony company, at Frederickton, have been closed, and for the present, operations have been suspended at the company's works at Glenwood, Mass.

Letters patent have been granted at Frederickton incorporating Daniel W. M'Vicar, of Moose Brook, miner; James H. Stevens, farmer; Alexander Robertson, farmer; Robert Bacon, farmer, of Ardoise; John T. Dimock, farmer; Judson J. Dimock, farmer, of Newport; Frederick Knowles, of Avondale, merchant; Everitt A. O'Brien, of Noel, shipowner; Curwen C. Crow, of Lower Selmah, prospector; Henry T. Harding, of Truro, solicitor; all in the province of Nova Scotia, and John H. Harding, Saint John, for the purpose of developing gold and silver mines and other mining properties, etc., by the name of The Ardoise Gold Company (limited), with a total capital of \$50,000, to be divided into 10,000 shares of \$5 each.

Quebec.

Capt. Adams, of Montreal, confirms his report of the discovery of gold on property of the Anglo-Canadian Phosphate Co., in Wakefield. Though giving a small average to the ton, the immense size of the vein of quartz may make it possible to work it immediately. The vein measures 69 feet in width and extends several hundred feet across a hill and descends into the valley on each side. The late Mr. Venor in several of his reports referred to the probability of gold being found in Wakefield in paying quantities, and it may be worth while for owners of lands in that region to make tests of the quartz.

The Megantic Mining Co. (Messrs Fenwick & Selater) have taken out 100 tons of asbestos since the 15th of August with a force of ten men.

The Wertheim property is being opened up and gives good promise of being an excellent mine. Capt. Learmonth has 14 men at work, and is taking out on an average one ton of asbestos per day, worth \$50 per ton.

Macdonald Bros., Sherbrooke, have made a discovery of asbestos which promises well, on lot 8, 12th range of Coleraine. The fibre is of good length and quality.

Col. Drew Gay has arrived and will superintend operations at the Excelsior Copper Company's mines. The daily reports from the mines are said to be most encouraging. The veins are reported to improve with depth, and richer ore is being taken out.

The shares of the Bell Asbestos Company (Limited), which were issued only a few months ago at £5, are now quoted in London at £19, and are still going up. The directors of this flourishing concern are: John Bell, sole member of the firm of Messrs. John Bell & Son, chairman; Francis Corbett Bell, of the same firm, managing director; Herbert A. Bell, Messrs. Bell & Co., Cardiff; Arthur J. Burnett, Kingston on Thames; James Hartley, D.L. (Messrs. Paton & Charles, Tunnel Soap Works), London; Thomas B. Lightfoot, C.E.,

The Thetford mines continue to turn out satisfactory outputs.

A rich discovery of gold has been made at St. Francis, Beauce, near St. Joseph.

Ontario:

Mr. Robert R. Hedley, analyst, lately of Sudbury and more recently of Sault Ste. Marie, will leave next month to take charge of the metallurgical department of copper mines in Venezuela, South America.

We hear that negotiations for the sale of the Frontenac mica mine to English capitalists are in progress.

Sudbury District.

The output of the mines of the Canadian Copper Company for October was close upon 4,500 tons. At Copper Cliff the smelting works are nearing completion. The trestle-work over the roast heaps is fully two-thirds of a mile in length and is now ready for track-laying. Twelve hundred tons of ore are now in process of roasting. Dr. Peters, an able copper metallurgist, is general manager. Capt. Frank Andrews is the general superintendent, and his extensive practice serves him well in mining and handling the deposits of this district. Mr. John Grigg, late master mechanic of the Tamarack mine, fills the same responsible position here. Mr. Frank L. Sperry, late of Yale College, is the chemist and assayer. Each department appears systematic and orderly.

The Vermilion mine closed down on the 1st ult. This is said to be "a weak invention of the enemy," or, in other words, a game of "freeze out," it being well understood that the discoverer cannot meet the necessary assessments levied upon him. This is an ore deposit comprising a great variety of minerals and two analyses resulted in five ounces of platinum to the ton. Nuggets of gold have also been extracted from this interesting deposit, while the amount of nickel in the ore from special tests made in Toronto for your correspondent resulted in from 17 to 30 per cent of nickel. But, notwithstanding all this rare combination of the "economic and ornamental," work is closed down *pro tem.*, and the poor prospector is left to reflect on the possibility of his having too much of a good thing.—*Engineering and Mining Journal*.

A late despatch reports that the Canadian Copper Company has purchased the interests of the original shareholders of the Vermilion company.

Port Arthur District.

The Badger mine still continues to produce silver ore of the same extraordinary richness as heretofore. So far it has proved a miniature Silver Islet, with this advantage, however, that the cost of operating the former is only a very small per cent of the latter. Every little while a carload is shipped to the States to the smelters.

The Beaver mine, being a close corporation, keeps steadily on full force without making any ado about it. The manager of this mine, we learn, is at the Lake of the Woods gold fields, seeking more fields for investment. The Elgin mine, under his able management, is now a pronounced success, and we expect before long to be able to record some of the solid results after the necessary preliminary work is all in good shape for increased output.

Silver Mountain mine, since last reports, has continually improved in drifting west from No. 3 shaft at the 360 foot level. The management are highly pleased, and an expert from England has just arrived on the ground to make a report on present appearances and future developments.

The "West End" of Silver Mountain is in high feather—every opening shows silver, and the finding of silver at 360 feet deep, just east of the main on the same vein, establishes the value of this magnificent property. The managers have been visiting Denver, Col., to arrange for the smelting of all their shipping ore.

The Silver Fox mine, owned and operated by the "West End" Co., is doing the best it can in that remote region—almost inaccessible for the want of railway facilities. There is nothing new to report since last issue.

The Wolverine mine, about a mile to the east of the Silver Fox, has been purchased by a London syndicate, who have already dispatched a working force to the ground, and will employ one hundred men as soon as they can be worked to advantage.

The iron lands at the Kaministiquia station, west of Port Arthur, are being thoroughly tested by a party from Pittsburgh, who has invested heavily. Iron lands elsewhere are likewise receiving attention from capitalists who are buying up likely properties wherever available.

Several minor sales of silver locations are likewise reported, and a new life seems to have taken hold of this district, now that the Privy Council of England have finally settled the fact that the Province of Ontario can now give indisputable title to lands between Port Arthur and Rat Portage.

The stone quarries and lead mines east of Port Arthur are keeping steadily at work, with nothing special to report.

Port Arthur should have a mining school and a smelter to keep pace with the advancement of the district.

Rat Portage District.

The Privy Council award settling the titles troubles has been received with joy. A by-law granting a \$15,000 bonus to smelting works will now be passed and the works started at once. Already Americans are on their way to Toronto to get their patents, and preparations are being quietly made, plans discussed, for a special boat to bring ores in from all around the Lake of the Woods to the smelter. The boat is to be nearly flat on the bottom and have a novel plan of loading and unloading ore.

British Columbia.

Nanaimo Free Press: The foreign coal shipments from the port of Nanaimo, representing the Vancouver Coal Company, the Wellington collieries, and the East Wellington colliery, for the month of November amounted to 46,887 tons, being the largest shipment from this port in the history of Nanaimo. The shipments of last July amounting to 40,158 tons was the largest reached before November. November month therefore beats all previous records by 6,729 tons of coal.

There is an apparent mistake in the London dispatch concerning the bonding of Rosenfeld's Nanaimo coal lands to the Vancouver company. Mr. Rosenfeld has no land in Vancouver island.

The dispatch, doubtless, should have read that the Vancouver company have bonded their property to Mr. Rosenfeld for three years at a certain figure.

A late arrival from Granite Creek states that placer mining is finished for the season, and there is nothing being done at present but a little drifting, preparatory to next year's work. Some new quartz finds have been made in different parts of the district, but their richness has not yet been learned. Work will be resumed in March, when it is expected a large number of new claims will be opened.

At the Hot Springs camp, 30 miles north of Nelson, G. B. Wright has 20 men at work on his No. 1 mine. An assay from an average sample of the ore taken from the full width of the face of the ledge gave \$500 to the ton. Mr. Wright will run a 300-foot tunnel this winter. He is also building a 150-ton steamer to ply between his claims and Bonner's Ferry. Mr. Davenport has made a 30-ton shipment from his Little Donald claim, and is now working 10 men. W. Wheeler has 10 or twelve men at work on his great carbonate ledge. The Hendryx Company are working 20 men; and there are a number of other claims in both the new and old camps working from two to four men each.—*Truth*.

For week ending 8th inst., the Monarch mine at Field shipped 5 cars of ore to the smelter at Vancouver, making 10 cars in the last two weeks. The shipments will approximate 200 tons. The ore carries about \$26 a ton in silver and a large percentage of lead. Pig lead was selling in New York city on November 29th at $3\frac{1}{2}$ to $3\frac{3}{4}$ cents a pound; therefore, it is safe to estimate the metal value of the ore at \$50 a ton, which would make the two weeks' shipment, worth fully \$10,000. British Columbia at last, has become a permanent ore shipper, and in the next twelve months its total output will outrank that of many of the older bullion-producing states and territories south of the boundary line.

The owners of the locations on Toby creek are negotiating with parties with a view of placing a bond on the property. There are five claims in the group, and they ask \$15,000 each for four of the claims. These figures are considered too high by the parties who wish to place the properties.

As an indication of the richness of the ore found in the district tributary to Donald, the following assays, made by Bredemeyer of Vancouver are given. The ore was a picked sample of grey copper: Sample No. 1 carried \$169.41 in silver and \$48.23 in gold to the ton, and 46 per cent copper. Sample No. 2 gave a return of \$146.99 in silver and \$48.25 in gold to the ton and 41 per cent of copper. The owner of the claim, of course, holds it at a high figure. Well, \$300 rock is not to be sneezed at.—*Truth*.

An Electric Omnibus.—An electric omnibus has been successfully tested on some of the most crowded thoroughfares in London. This is said to be the only electric omnibus in the world capable of steering to right and left, and of running on a common road without rails at a speed greater than that of horses.

The Petroleum Fields of Ontario.

ROBERT BELL, B. A., S.C., M. D., L.L.D.

(Continued from November Issue.)

The petroleum of the Enniskillen region was early conceived by Logan and Hunt to occur on the course of the great Cincinnati anticlinal, which was, however, thought to be connected with the anticlinal of the head of Lake Ontario; and, following up this view, maps were published, and much was written by others, tracing the supposed position of the anticlinal, and shewing where oil might be looked for along its course. In the "Geology of Canada" (p. 379) Sir William Logan says: "The general course of the main anticlinal can be readily traced by means of the distribution of the formations. It would appear that the crown of the arch runs in a gentle curve from the western extremity of Lake Ontario, by Woodstock in the neighborhood of which the base of the Corniferous folds over it. Proceeding thence by the Thames in the general course of the Great Western Railway, it would reach the town of Chatham, and then pass to Pigeon Bay, on Lake Erie. The Springs of Enniskillen would appear to lie north of this axis, and they may probably be on a subordinate one, parallel with it; which may be connected with the undulation that has been already mentioned as affecting the outcrop of the Guelph formation at Rockwood." It is stated ("Geology," p. 363) that "a belt of higher Devonian rocks crosses the country from Lake Huron to Lake Erie, and divides the region into two areas. These newer strata occupy a saddle-shaped depression on the great Cincinnati anticlinal, which runs nearly east and west through the peninsula; while the course of this depression or synclinal is nearly north and south from Plympton on Lake Huron to Orford on Lake Erie. There seems to be no doubt that the occurrence of petroleum in Enniskillen is connected with the Cincinnati anticlinal, but the writer, after having done a considerable amount of geological work in Western Canada at various times since 1859, and having carefully studied the question, has come to the conclusion that this anticlinal, coming up from Ohio, does not run eastward, as Logan supposed, into Lake Ontario, but that it maintains its northward course, and runs into the Southern extremity of Lake Huron. This geological axis is not marked by a conspicuously visible fold in the strata, as in narrower and sharper anticlinals, but it nevertheless constitutes a remarkable feature in the geology of North America. Southward of Lake Erie, in the form of a long, wide swell, it is plainly traceable by the geological distribution of the formations through Ohio and Kentucky, and again, in Tennessee and even in Northern Alabama. It separates the Pennsylvania from the Illinois and Michigan coal fields. Northward of Lake Erie, an impartial study of what is actually known of the geographical structure, as well as of the distribution of the formations, indicates that its axis, after crossing the lake, continues on, as we should naturally expect it would, in the same general north-north-eastward bearing through the counties of Essex, Bothwell and Lambton, from about Little's Point on Lake Erie, to about Kettle Point on Lake Huron, from which it probably continues in the same course under the latter lake, and parallel to its eastern shore, to a point opposite Southampton, where, turning a little more to the north-east, it would cross the Indian Peninsula parallel to another anticlinal; that seems to run through Saginaw Bay and the

gap between the extremity of this peninsula and Grand Manitoulin Island.

Following the line of axis above indicated, northward from Kentucky where the Trenton limestone forms the surface, the different geological formations become successively more and more deeply buried as they fold over this line, one after another, each forming a long curve or "nose" to the north. Judging by the records of the borings, the northern point of the Niagara formation, where it curves round this axis, may touch the north shore of Lake Erie, while the Onondaga formation probably occupies a great part of the county of Essex, and is in turn followed by the Corniferous, Hamilton, and the Portage and Chemung, in Lambton. Northward of Plympton and Bosanquet the axis of the anticlinal gradually rises, and in following it on in the same direction the order of the re-appearance of the formations in succession along it becomes, of course, the reverse of what it had been to the south of that region, and we get the Corniferous in the county of Huron, followed by the Onondaga, Guelph and Niagara in that of Bruce. The south-west course of the Onondaga formation, on the east side of Lake Huron, first pointed out by the writer in 1861, proves the existence of an anticlinal to the west under the lake. Owing to the existence of the synclinal or belt of higher Devonian rocks, which Sir William describes as crossing the country in a nearly north and south course from Lake Huron to Lake Erie, shewing that the strike is really in that direction it would necessarily follow, from structural considerations, that there must be an accompanying anticlinal to the west of it, and we have just seen that this brings to the surface the older Devonian rocks under the drift in the Enniskillen region, and that it is, in fact, the Cincinnati anticlinal. Prof. Edward Orton, State Geologist of Ohio, has published a valuable report on the recent discoveries of petroleum and inflammable gas in the north-western part of that State. He thinks the Trenton limestone received its low arched form along the Cincinnati anticlinal in that region before the next formation was deposited upon it, which would indicate extensive movement at a very early geological time. He says: "There is a smaller measure for these shales by 200 feet in the central region than there is immediately to the eastward. In other words, there is an arch in the underlying Trenton, revealed by the drillers, of which no hint whatever could be obtained by the surface exposures" (p. 29). A further upward movement of the anticlinal may have taken place in Ontario after the formation of the Corniferous limestone, and before the deposition of the Hamilton shales upon it, for in certain parts we find the Marcellus shale eastward and westward of the axis, but not directly upon it. The Onondaga formation is shown by borings to carry important beds of salt near its base, and to be greatly augmented in volume in Western Ontario along a belt to the east of the anticlinal, and apparently parallel to its axis, all the way from the county of Huron to Essex; and it is possible that the shallow sea or bay in which these deposits took place had the same general direction, and that it was held in position by the arched form of the older strata, the successive beds of salt being forced as slight changes in the sea level took place from time to time. Beds of salt of considerable thickness are found again westward of the axis, along St. Clair River.

The cause which produced the Cincinnati anticlinal must have begun at a very early geological period, and appears to have been of continental extent. It is worthy of notice in this con-

nection that, if its general course were prolonged northward in the vast regions of the more ancient rocks, it would pass through the central and clearly volcanic portion of the great Huronian trough of the Abitibi region, and further on would follow the deepest and longest part of the immense physical and geological depression of Hudson Bay and Fox Channel. The line would next pass through an elongated Silurian area in the midst of the Archean, and thence by Smith Strait, Kennedy and Robertson channels, or the direct chain of waters followed by explorers to the most northern points which have ever been reached by man. The long chain of volcanic islands in the eastern part of Hudson Bay lies directly along this line, and the existence of immense north and south dykes of trap for a great distance south of James Bay, was pointed out in my report for 1875. Great north and south masses of trap occur on this line around Lake Temagami; and at the mouth of French River which is also on its course. I am informed by Commander Boulton, R. N., that there is a large abnormal deviation of the compass. The line above indicated measures thousands of miles in length, and, as will be observed, it is almost straight. The fact that the axis of the Cincinnati anticlinal lies in direct continuation of this long chain of geological and geographical features, is probably more than a chance coincidence, as the latter may well be supposed to have constituted a line of weakness which would be affected by any east and west movement or force in the crust of the earth, and slight, but persistent, elevations of the Palaeozoic strata south of the Archean area may have easily taken place along its course, and these disturbances may have occurred at different geological periods, as some of the above mentioned facts would seem to indicate. Leaving the subject of the cause and general course of the Cincinnati anticlinal, some practical results may be obtained by a study of the peculiarities or details of this great arch. The trend of its crown varies locally, of course, but the geological distribution of the formations at the surface show that this axis, coming northward from Kentucky and passing under the town of Findlay, would strike the south shore of Lake Erie about midway between Toledo and Port Clinton; but in this vicinity the general wave is divided by a small synclinal into two subordinate anticlinals. Professor Orton has shown, by the result of borings, that the form of the Trenton area in north-western Ohio, as indicated by a horizontal plane at 500 feet below the sea level, would prove that the axis at that depth points directly towards Toledo. Notwithstanding the difference in the courses of the deeply seated and surface folds, the main axis of the anticlinal will intersect the north shore of Lake Erie in the vicinity of Little's Point, in the county of Essex; then running about north north-east through Essex, Bothwell and Lambton, it will reach the southern shore of Lake Huron near Kettle Point. Its general bearing from Lake Erie to Lake Huron is about N. 30° E., but it appears to curve gently to the south-east of a straight line and to pass under Petrolia.

South of the edge of the Archean nucleus, which forms the north shore of Lake Huron and Georgian Bay, the axis of the numerous anticlinals in the Palaeozoic strata run south and south-west and their average course corresponds with that of the Cincinnati anticlinal but as we recede from the outcrop of the ancient rocks, and the newer strata deepen over them, the inequalities in the old foundation become covered up and more and more obliterated, and smaller undulations running in other directions manifest

themselves. The Cincinnati anticlinal in south-western Ontario, as elsewhere, is a gentle swell of great breadth, but within its general area, and especially near the summit, are minor anticlinals, sometimes of a sharper form, running both parallel with and transverse to its general course. One of these secondary anticlinals, having the former course, is shown to exist in Euphemia, both by the dip and distribution of the rocks. At Smith's Mills, in this township, it interrupts the overlying Portage group, and brings to the surface the limestones of the Hamilton formation, with a north-westward dip of 40 or 45 feet to the mile. (Report of Mr. Alex. Murray, for 1850, p. 29). Between this undulation and the main axis in Enniskillen, about 150 feet of the black Marcellus shales have lately been found by borings in a trough between the two anticlinals, in the north-eastern part of Dawn. In the Ontario oil field, the drillers consider it a bad sign to strike these black shales, as experience has taught them that, in such cases, no oil is to be found in the underlying Corniferous limestone, the reason apparently being that these shales occupy only the synclinals in the oil-bearing formation.

The transverse undulations appear to follow two principal courses, one about east and west, and the other north-westward. The anticlinal of the head of Lake Ontario, and the sharper one of Rockwood and others further north, are examples of the former. In northern Ohio the formations dip northward at very low angles along the line of the Cincinnati anticlinals, but a transverse uplift seems to run east and west through the natural gas field of Lima, for Prof. Orton says (p. 28) that "the surface of the Trenton limestone is approximately at the same level at Van Wert, Lima, and Upper Sandusky, or along an east and west line 60 to 70 miles in length." The great spread of the Corniferous formation in north-eastern Indiana is probably due, in part, to an elevation of the rocks running in this direction from the vicinity of Lima to the south end of Lake Michigan. About latitude 42° the strata strike east and west all the way from the Hudson River to the Mississippi, except where this parallel intersects the Cincinnati anticlinal, and it is somewhat remarkable that west of the Appalachian range the southern boundaries of all the Archean areas, just above this latitude, lie in an east and west line across the entire continent. These facts are mentioned as having a possible bearing on the formation of east and west anticlinals in the regions under discussion. The course of the oil producing belt in Enniskillen and Euphemia is probably evidence of the existence of a north-westward undulation in these townships, and the fact that the Bothwell oil-field lies south-east of this region, may be an additional fact pointing in the same direction. An undulation in the Corniferous limestone, running nearly north-west, is to be seen on the 13th lot of the 1st range of Rainham, on the north side of Lake Erie ("Geology of Canada," p. 379.) In the vicinity of Milwaukee there are distinct evidences of north-westerly folds in the strata. It may be worthy of note in this connection that if a straight line be drawn at right angles to the centre of the great north-westward curve in the folded strata of the Alleghany Mountains in Pennsylvania, it would have a west-north-west course, and would pass in the vicinity of the Enniskillen oil-field.

From what has been said in regard to the anticlinal theory and the accumulation of petroleum, it follows that the most probable sites for searching for this fluid in the regions just described, are at points where the great anti-

clinal is intersected by one of the transverse folds whose existence has been indicated. Owing to the depth of the drift and the infrequency of exposure of the underlying rocks, we must depend principally on the "legs" of wells drilled, in various parts of the possible oil region for the data to guide us; hence the importance of preserving these records, even if the wells have failed to answer the purpose for which they were originally sunk. These records are also of much value in determining the actual thickness of the Silurian and Devonian formations in western Ontario, where their increase or decrease goes on at pretty regular rates, so that we are able to predict with tolerable accuracy the depth at which any one of them may be found by boring at a given locality.

Dr. T. Sterry Hunt, in his valuable Report for 1866, has put on record the "logs" of a large number of wells which had been bored up to that time in western Ontario, and which would have been otherwise lost. It is to be regretted that the registers of the still greater number of wells which have been sunk since that time, have not been systematically preserved. In regard to general deductions, from information obtained by well-boring, the extensive experience of our neighbors in the analogous regions of Ohio and Michigan, is of great value to us.

The petroleum of the Enniskillen region has hitherto been supposed to have originated in the Corniferous formation, but from circumstances which have lately come to light, it seems possible that it may have its origin, wholly or in part in the Trenton limestone. Without necessarily adopting this view, the writer may mention the following, among other circumstances which appear to favour it:—

1. The Trenton limestone along the Cincinnati anticlinal has proved to be eminently an oil-producing formation in north-western Ohio, as well as near Barksville and elsewhere in Cumberland County in Kentucky, where great flowing wells of petroleum were found in boring for brine in 1822. Wells sunk in the same region in later years have yielded large quantities of oil. (Dr. Hunt's Report for 1886, p. 253). This formation is not likely to have lost its oil-producing character within a short distance on passing into Canada. On the contrary, we know that much further to the north it yields petroleum on Manitoulin Island, where the writer has seen wells drilled into it near Weginmakong and at Pine Lake. Petroleum, or pitch resulting from it are found in this formation in other parts of the Dominion. At one of these localities near Chicoutimi on the Saguenay, where petroleum exudes from the Trenton limestone, gallons of it have been collected, by breaking open the cavities in the rock. Again, to the west, the Lower Silurian limestones in the vicinity of Chicago, are said to hold petroleum.

2. The Trenton formation is of a more generally bituminous character than the Corniferous, and it is also much thicker. In various parts of the provinces of Quebec and Ontario it ranges from 600 to 750 feet in thickness, including the Black River and Birds-eye, but not the Utica; and at Findlay in Ohio, the drill has passed through 550 feet of it. (Prof. Orton's Report, p. 18).

3. In the States of New York and Ohio, the Corniferous is not a petroleum-bearing formation. Although oil has been observed in its cavities in some places in the south-western part of Ontario, there is nothing to show that it was originally formed in these rocks. Its thickness in western New York is only ninety

feet, but in the townships of Woodhouse and Townsend in Ontario, seventy miles west of Niagara River, it has attained 160 feet. In Ohio, its thickness is from 75 to 175 feet, and at Mackinaw, in the northern part of Michigan, it is 275 feet. In south-western Ontario, well-borings have given the following thickness for limestones believed to represent the Corniferous: Port Lambton, 520 feet; Petrolia, 248 and 378; one mile south-west of Belle River, 209; Leamington, 310; but it is difficult in all cases to draw a line between the limestones of this formation and those of the underlying Lower Helderberg or upper part of the Onondaga (salt) formation. For example, the following thickness of limestones were obtained in wells starting on the Corniferous: Test Well at Petrolia, 623 feet; artesian well at London, 1,900 feet; at Comber, 520 feet; at St. Mary's, 500 feet; at Tilsonburg, 854 feet; at Clinton, 975 feet. In boring salt wells at Goderich, 775 feet, and at Kincardine, 508 feet of limestone of the Onondaga formation alone were passed through.

4. The petroleum of Enniskillen has the same pungent or sulphurous character as that derived from the Trenton limestone of Ohio and Manitoulin Island, and its chemical constitution appears to be identical, as it requires the same peculiarities in the process of refining to deodorise it; whereas petroleum known to originate in Devonian rocks, are of a different character in various respects. Dr. Sterry Hunt, from whose valuable report for 1866, some of the above figures are taken, hinted (on p. 254) at the possible Trenton origin of the petroleum of Oil Springs, although elsewhere he always maintained that its probable source was in the Corniferous limestone. If all the formations are present under Enniskillen, with their probable volumes, and if the writer's estimate of their thickness be correct, the top of the Trenton limestone will lie some 2,600 feet, or half-a-mile, below that of the Corniferous formation. Notwithstanding this considerable depth of the intervening strata, it may have been quite possible for petroleum to have come up from the lower formation and stored itself in the cavities and fissures of the upper one; and indeed it may even now be steadily rising through natural channels from great accumulation remaining in the deeper source, and this may, perhaps, account for the large, long continued and nearly uniform yield which this small territory has kept up and is still maintaining. But if the Cincinnati anticlinal had been formed in the Trenton in this region before the deposition of the overlying strata, as appears to have been the case under Findlay in Ohio, this formation may be considerably nearer the surface than has been supposed. A careful comparison of the gas and the bitter saline water which accompany the Enniskillen petroleum with those from the Trenton limestone in Ohio and different parts of Canada, might be of service in helping to determine the question of the original source of the petroleum. In recent years, no wells have been drilled in the Enniskillen oil-field beyond the depth known to give the best return in petroleum, but, in 1878, Mr. J. L. Englehart, with commendable enterprise, sunk a well to a depth of 1,505 feet, on the 12th lot of the 11th concession, about seven-eighths of a mile north of the centre of the town of Petrolia. The last 400 feet were said to consist of gypsum and rock-salt and the 500 feet just above these were stated to be light colored hard limestone with sandy beds.

The strata in this field are so nearly horizontal, and so constant in thickness, that, over considerable areas, the drillers count with cer-

tainty on striking the same beds at nearly the same depths. The following is the average descending section in the thousands of wells which have been drilled around Petrolia:—

	Feet.
Stiff blue clay, with stones and some boulders.....	100
Upper limestone, with a little black shale occasionally at the top.....	50
Bluish gray and drab shale "Soap stone", with a few hard layers.....	120
Middle limestone.....	75
"Soapstone", with two or three hard beds.....	40
Lower limestone (Corniferous) in which oil is found at 45 ft. "upper show" and also "lower show" at.....	135

Total from the Surface..... 460

The Corniferous limestone has a thickness in this vicinity of about 300 feet, but it has been found by experience that it is seldom worth penetrating more than 135 feet into it. In Sarnia township, the drift clay is 145 feet deep, but the oil is met with at 385 feet from the surface, or only 240 feet in the rock, instead of 360, as at Petrolia, shewing that more of the solid strata had been denuded away in Sarnia than at Petrolia before the clay was deposited.

The wells are bored by tubing the drifts deposits, so as to shut off the surface water, when the work of boring in the solid rock is begun—the motive power being a small engine. The drilling apparatus is suspended by wooden rods, which constitute the peculiar, and, it is claimed, a superior feature, of the Canadian method, which is now in universal use in this country. The rods, which are of hardwood, measure 18 feet in length, and two of them fastened together, end to end, make what is called a "length". The lengths are joined to each other by a tapering screw at the one end, fitting into a corresponding trealed socket at the end of the next. They last throughout two or three years of constant use, although unscrewed and screwed together again very frequently. The rods are withdrawn from or lowered into the hole by means of a derrick, and latterly by a tall tripod, erected over the well. Boring for oil has developed into an established trade, and about 130 skilled men are employed in it. The process has become so systematised and cheapened that it costs only about \$100, and requires but one week, working day and night, to sink an average well at Petrolia. Mr. W. K. Gibson, an oil merchant, of that town, informed me that 2,392 wells had been in operation at Oil Springs, Petrolia, and in Sarnia Township, in 1885, but that 193 of these had been shut down during the year, leaving 2,199 in operation on December 31st. The writer is indebted to Mr. James Kerr, the obliging secretary of the Petrolia Oil Exchange, for the most of the following statistics. He states the number of wells which had been pumped in 1886 at nearly 2,600, and the number of new wells sunk during the year at about 200. Some 500 of the above wells are situated around Oil Springs. For the last few years, the proportion of successful wells to the "dry holes," or those not worth pumping, has been 80 per cent. In the early days of the industry a separate engine was used to pump each well, but now, by an ingenious contrivance of rods and cranks, called "jerkers," 20 to 40, and even 50 wells, are pumped by one engine, and this of much smaller power than would be supposed necessary. In one case, Mr. Englehart worked no fewer than 70 wells with a single engine by this means. The rods, which are small, are made of hard wood, spliced together with iron, and, in order to diminish friction, they are hung from a horizontal wooden rail about four feet from the ground, by means of very light iron suspenders, which swing back-

ward and forward with each stroke of the engine. The direction of the force is changed, whenever required, by means of horizontal cranks. With such economy in the cost of pumping, it has become possible to work profitably wells which yield only small quantities of oil. Indeed, in 1886, the average production per well per day in the Petrolia region was only twenty three imperial gallons, or not much more than half-a-barrel. The ten largest wells in the district furnished an average of twenty barrels each, of thirty-five imperial gallons, per day. In 1886 the total quantity of crude oil produced in the entire region was 576,000 barrels of the above capacity; and of this amount, Oil Springs contributed 180,000 barrels. At

the latter place the yield diminished rapidly from 1860, the time of the discovery of the spouting wells, till 1865, when operations ceased, and nothing was done for sixteen years. But, in 1881, some of the old wells were revived by means of torpedoes; new wells were drilled in 1882, and operations were again active in 1883, when some 45,000 barrels were produced; in 1884, 130,000, in 1885, 145,000, and in 1886, 180,000 barrels, or a total of 500,000 barrels since the revival.

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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 TEN 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 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.



ONTARIO Mining Regulations.

The following summary of the principal provisions of the General Mining Act of the Province of Ontario is published for the information of those interested in mining matters in the Algoma District, and that part of the Nipissing District north of the Mattawan River, Lake Nipissing and French River.

Any person or persons may explore for mines or minerals on any Crown Lands surveyed or unsurveyed, not marked or staked out or occupied.

The price of all lands sold as mining locations or as lots in surveyed townships is two dollars per acre cash, the pine timber being reserved to the Crown. Patentees or those claiming under them may cut and use such trees as may be necessary for building, fencing or fuel, or for any other purpose essential to the working of mines.

Mining locations in unsurveyed territory shall be rectangular in shape, and the bearings of the outlines thereof shall be due north and south, and due east and west astronomically, and such locations shall be one of the following dimensions, viz: eighty chains in length by forty chains in width, containing 320 acres, or forty chains square,

containing 160 acres, or forty chains in length by twenty chains in width, containing 80 acres.

All such locations must be surveyed by a Provincial Land Surveyor, and be connected with some known point or boundary at the cost of the applicant, who must file with application surveyor's plan, field notes and description of location applied for.

In all patents for mining locations a reservation of five per cent. of the acreage is made for roads.

Lands patented under the Mining Act are free from all royalties or duties in respect to any ores or minerals thereon, and no reservation or exception of any mineral is made in the patents.

Lands situated south of the Mattawan River, Lake Nipissing and French River are sold under the Mining Act at one dollar per acre cash.

Affidavits showing no adverse occupation, improvement or claim should accompany applications to purchase.

T. B. PARDEE,

Commissioner

Department of Crown Lands, Toronto.



SEALED TENDERS addressed to the undersigned, and endorsed "Tender for McGregor's Creek," will be received at this office until Friday, the 23rd November next, for the construction of pile protection work at McGregor's Creek, town of Chatham, Kent County, Ontario, in accordance with a plan and specification to be seen at the Department of Public Works, Ottawa, and on application to Mr. A. McDonnell, C.E., P.L.S., Chatham.

Tenders will not be considered unless made on the form supplied and signed with the 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 tendered 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. GOBEIL,

Secretary.

Department of Public Works, Ottawa, 29th October, 1888.

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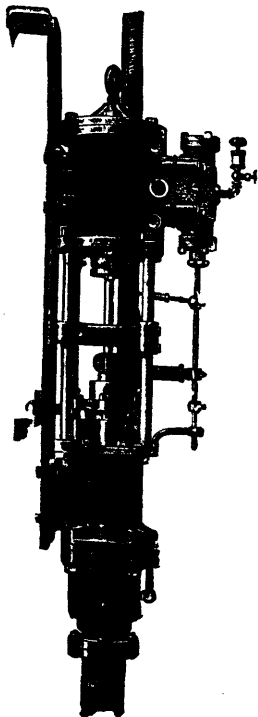
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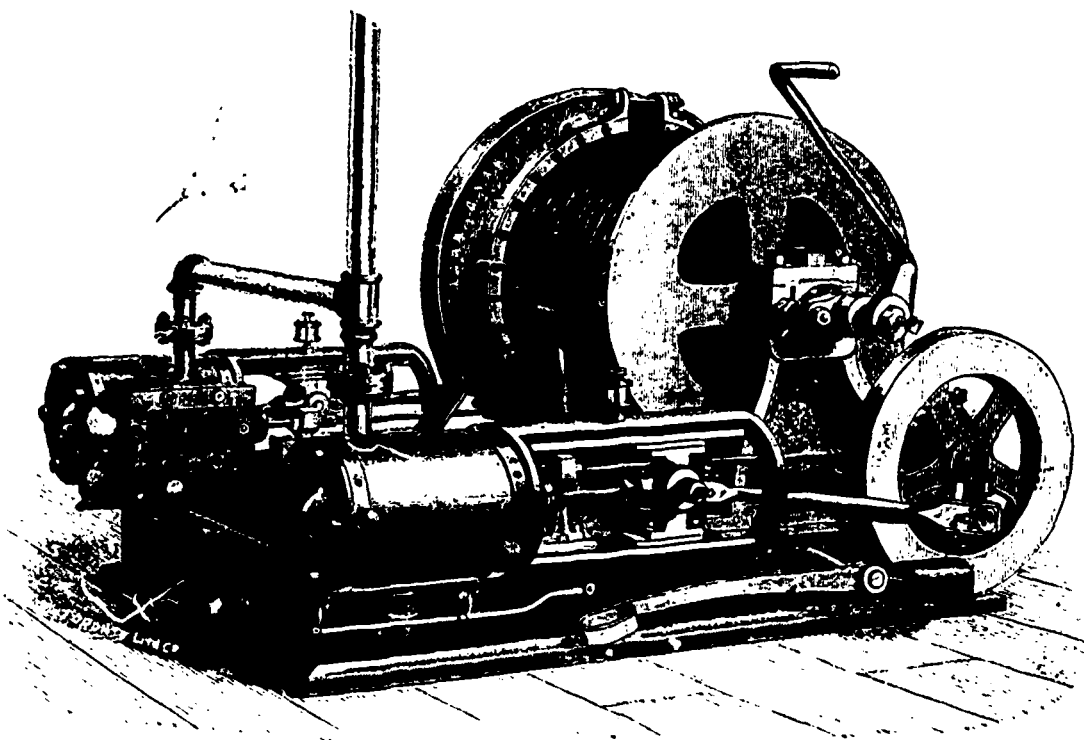


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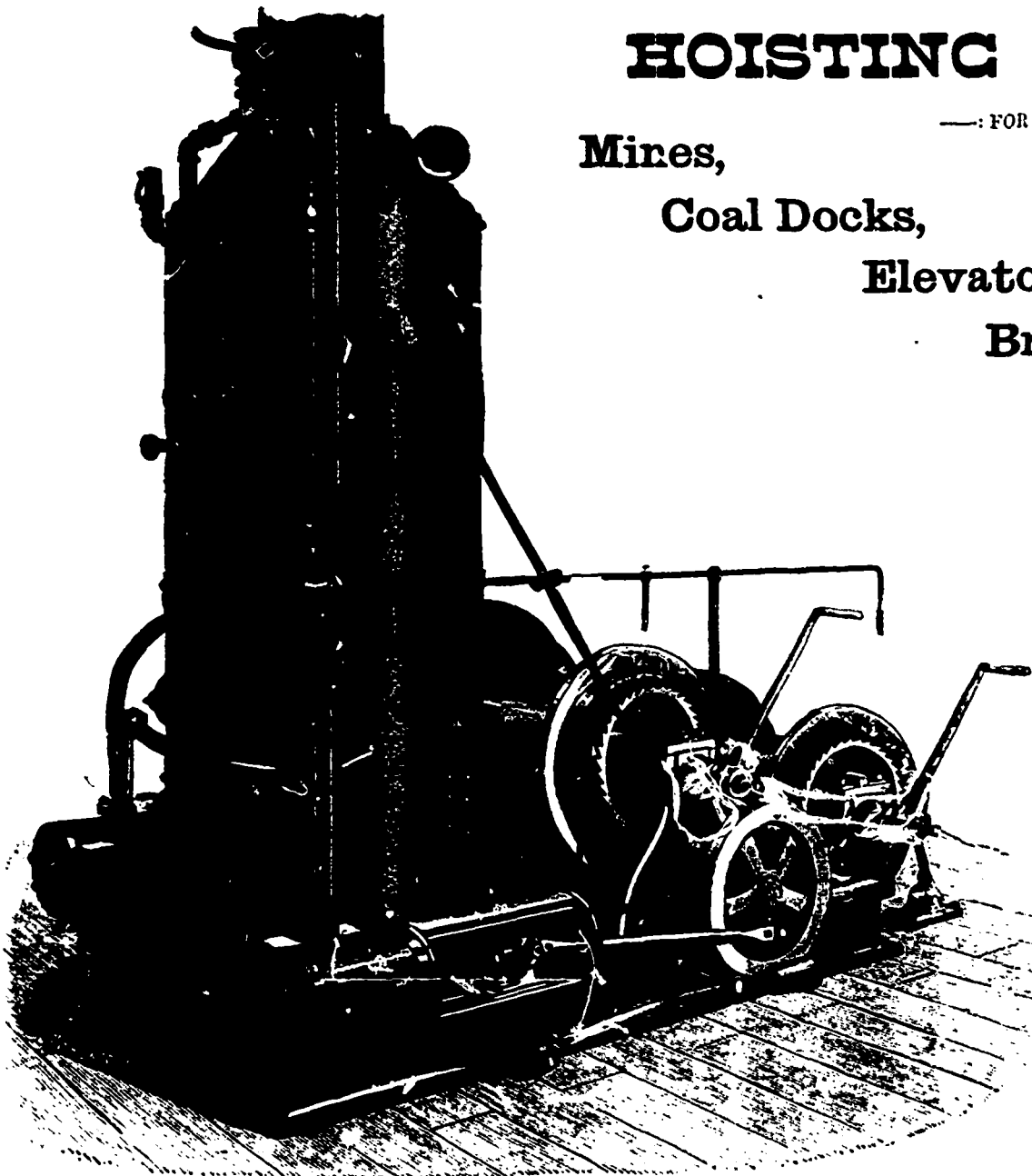
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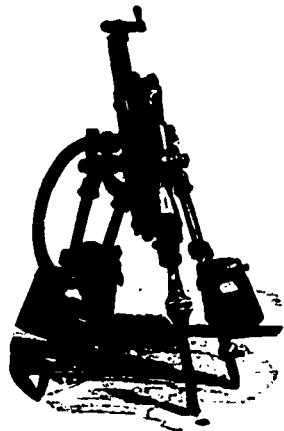
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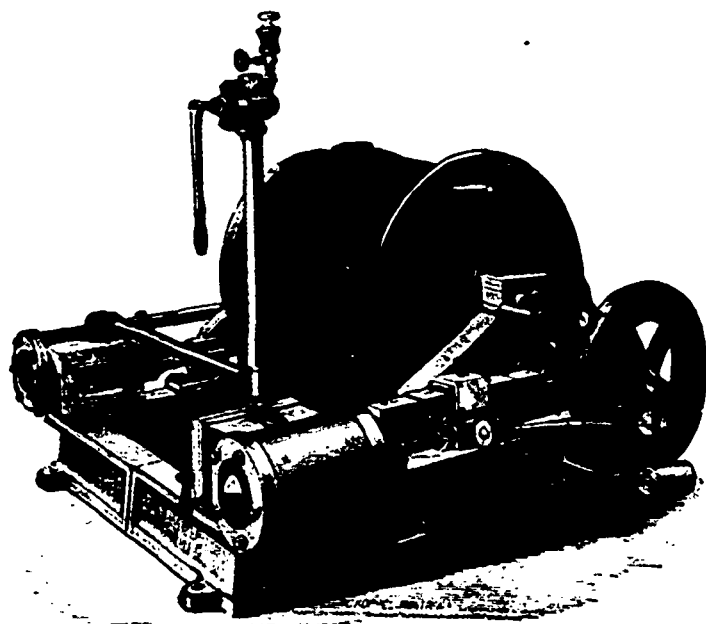
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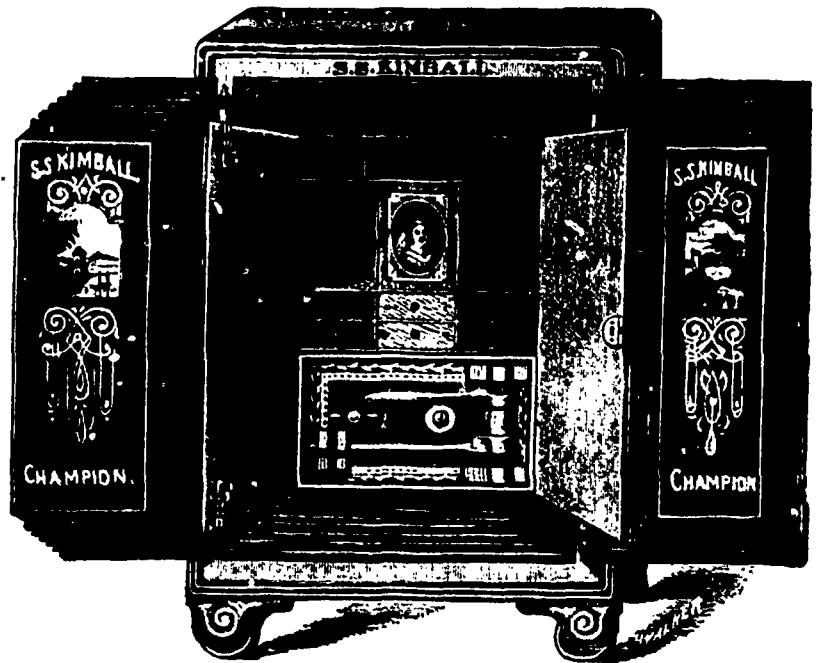
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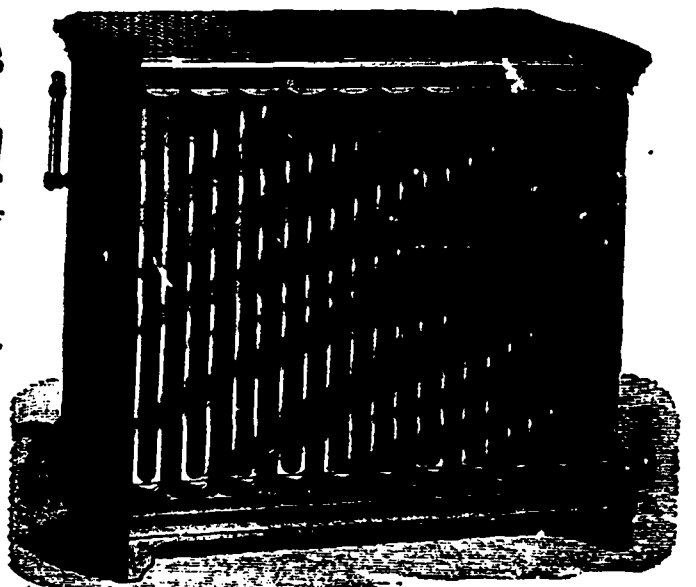
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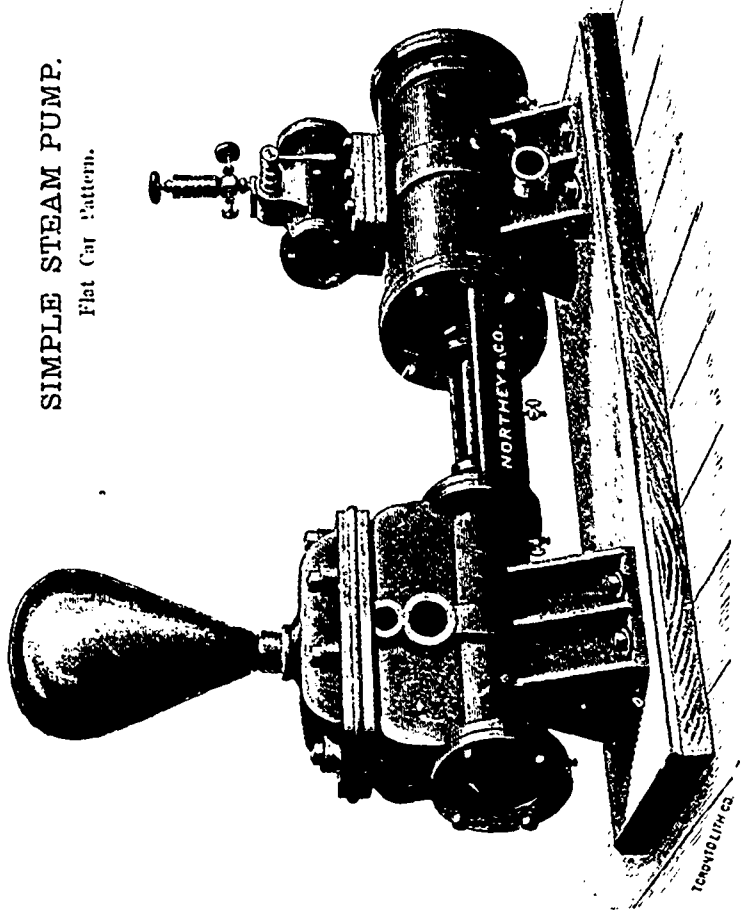
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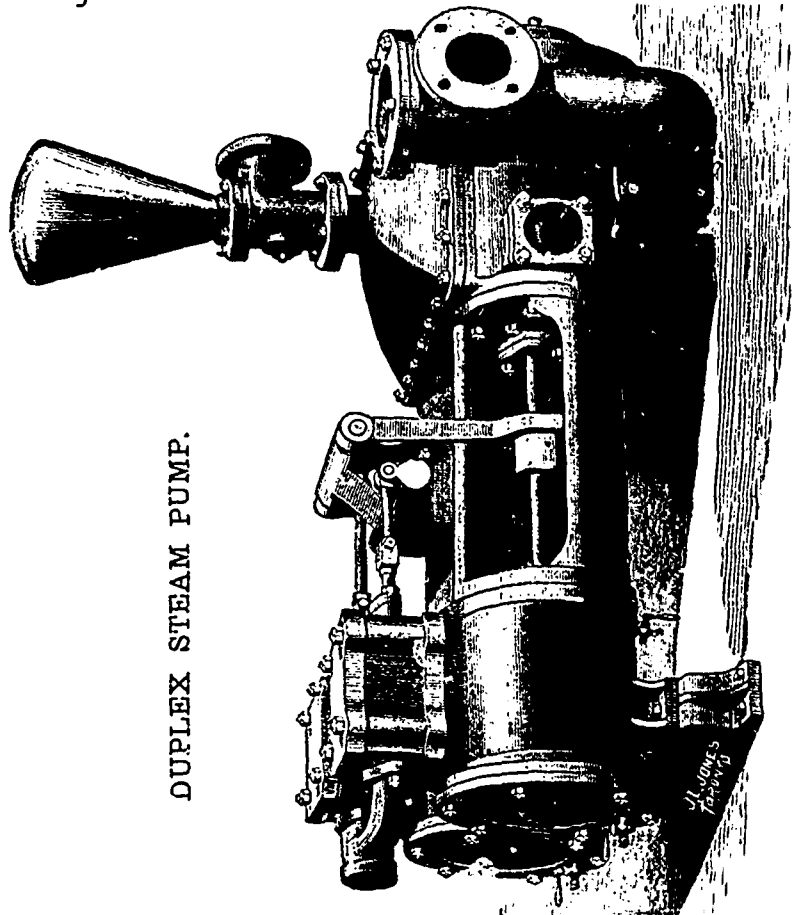
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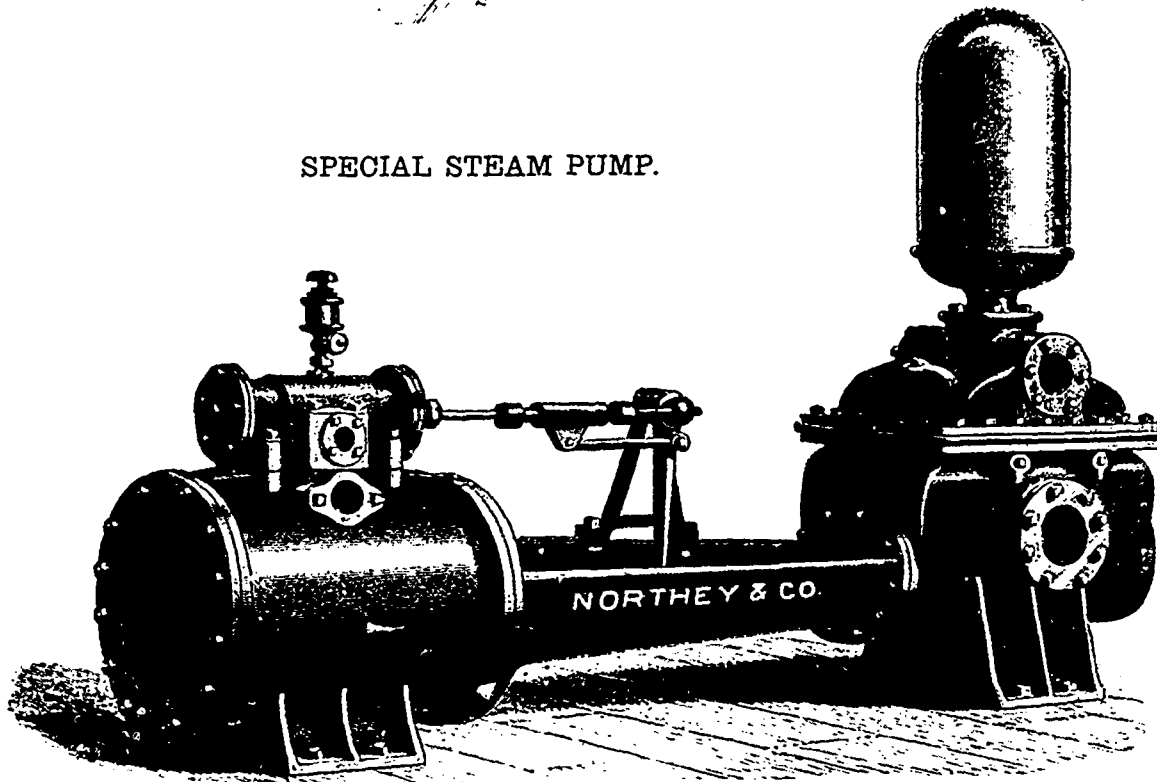
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Mining Regulations

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 no fee 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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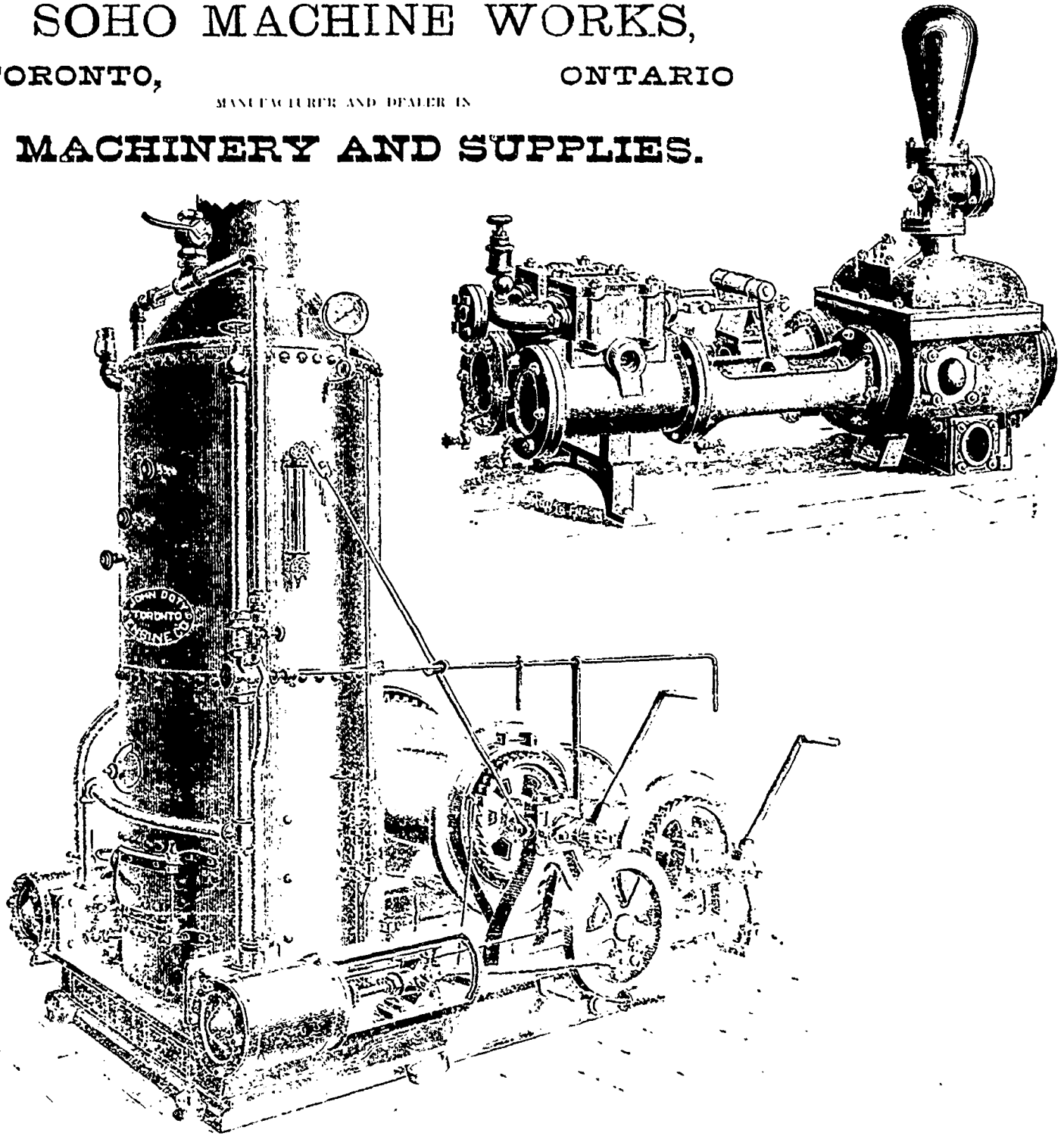
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