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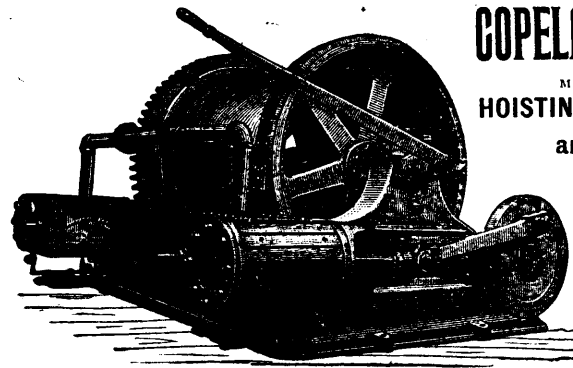
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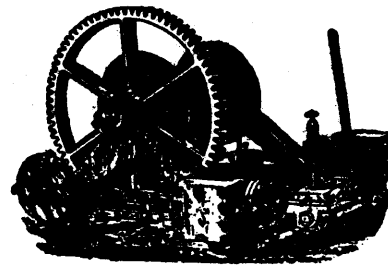
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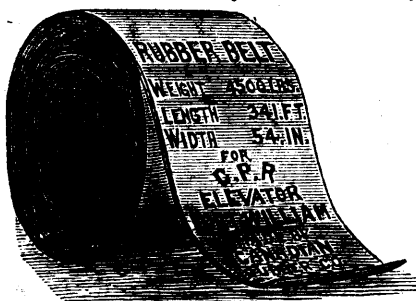
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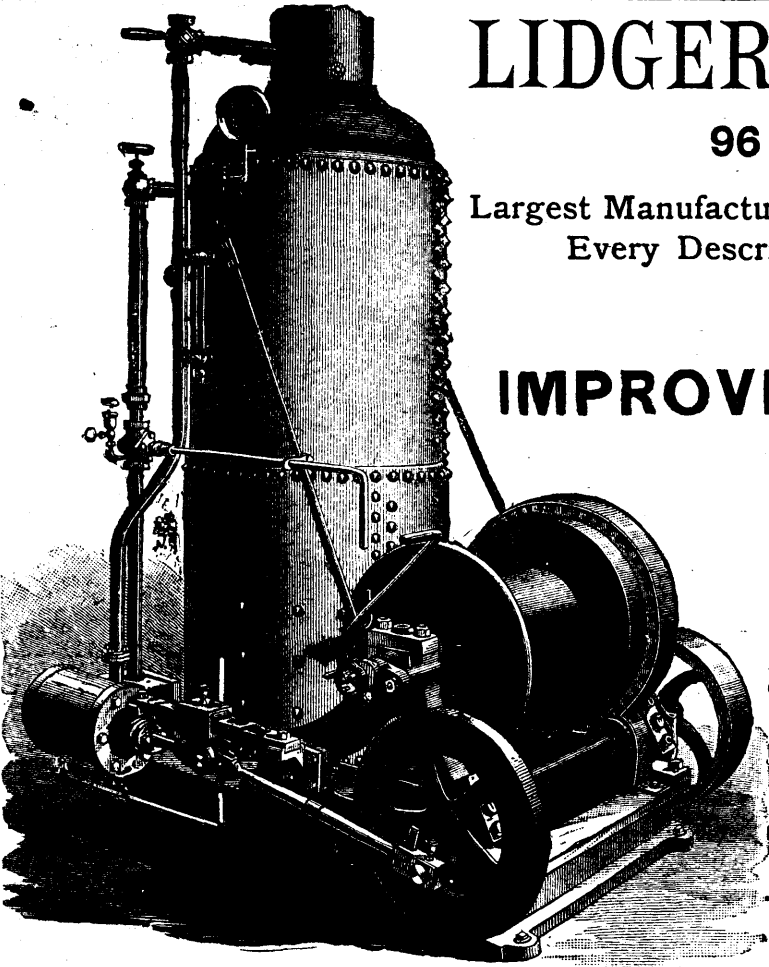
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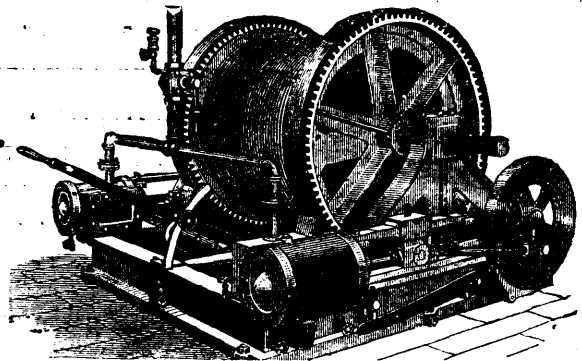
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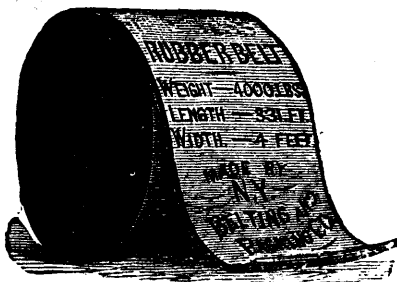
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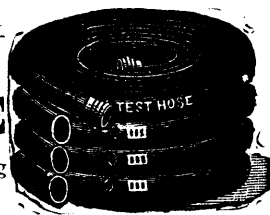


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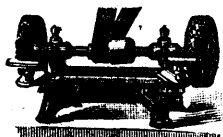
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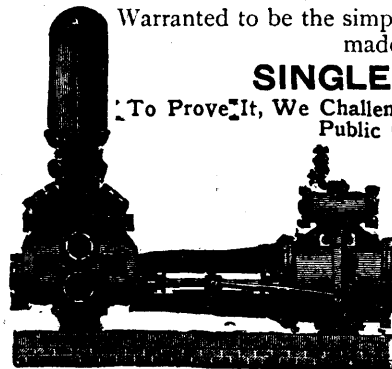
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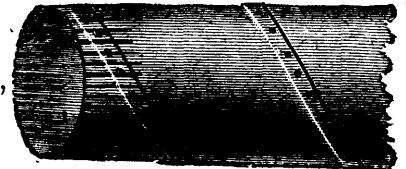
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**ONTARIO
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The following summary of the principal provisions of the General Mining Act of the Province of Ontario is published for the information of those interested in mining matters in the Algoma 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 stake 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.

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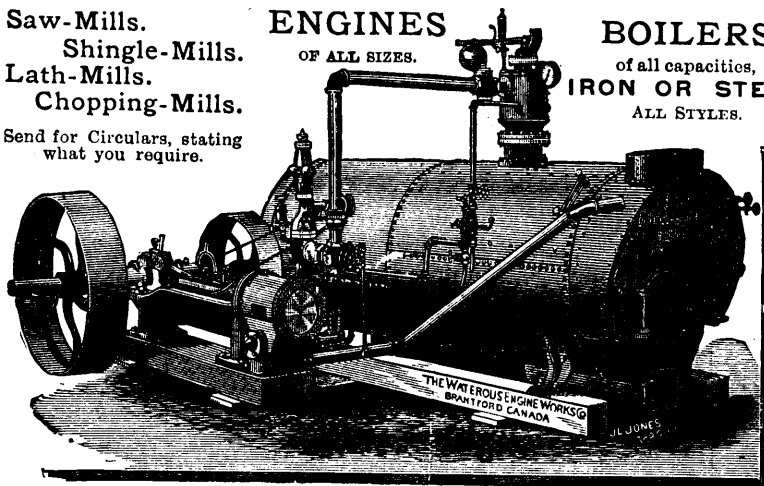
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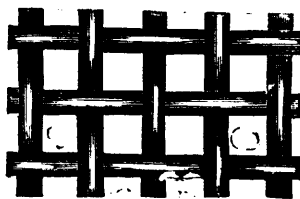
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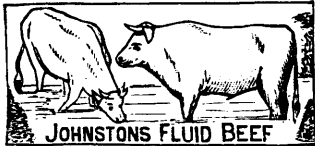
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H. ANN, PROP.

The Ontario Mining Company (Limited) are applying for a charter of incorporation for the purpose of acquiring and working mineral lands in the Province of Manitoba. The capital stock is to be \$20,000, in 2,000 shares of \$10 each. The applicants are:—Hon. Gilbert McMicken, Winnipeg; Hamilton Grant McMicken, Winnipeg; George Heenan, Rat Portage; John Albert Kirk, Stratford, Ont.; A. J. Parsons, Rat Portage; George Clayton Frisbie, Rat Portage; Mortimer Marcus Wheeler, St. Paul, Minn.; A. T. R. Blackwood, Winnipeg; J. H. Challoner, Rat Portage; J. G. Bennett, Winnipeg; A. C. McMicken, Winnipeg; C. S. Hoare, Winnipeg; G. H. R. Wainwright, Winnipeg; William Blackwood, Winnipeg; Herbert James Belch, Winnipeg, and the Hon. Thos. Howard, Winnipeg; of whom Hon. Gilbert McMicken, H. G. McMicken, J. H. Challoner, George Heenan and Mortimer M. Wheeler are to be the first or provisional directors of the company.

Edison's New Method of Separating Iron Ore.—Many iron men and others continue to flock to a secluded section of Washington Township, where experiments are soon to be made with one of Edison's greatest and most recent inventions, known as the Edison concentrator, the object of which is to concentrate the real ore dug from a mine, and get rid by mechanical means of all dirt and earthy matter that interferes with smelting. This machine has been successfully tested in Mr. Edison's laboratory. It is claimed that it will reduce immensely the cost of smelting and bring into use ores that cannot now be profitably worked. New York capitalists have purchased eight acres of iron ore land, where the experiments will be made. Building and machinery are now being put up at a cost of \$35,000. The invention, it is believed, will work a revolution in the iron trade. The working of the ore concentrator is not to be a secret, as supposed. The rock containing the ore, after passing through the crusher and broken to the size of an egg, is dumped into a large hopper. From here it drops down an incline within a few inches of a powerful magnet. This will be so heavily charged as to draw the ore from its course into one channel, and the rock and other foreign elements contained in the ore are permitted to pass through another channel into the refuse pile.

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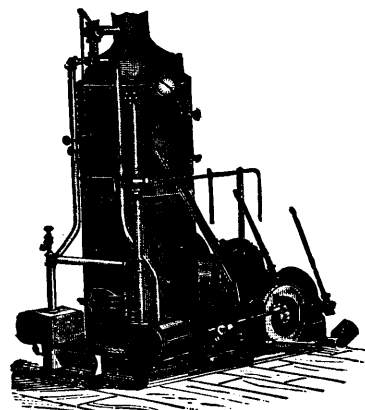
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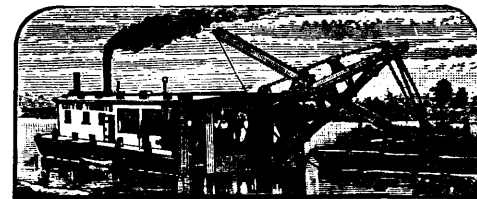
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The Canadian Mining Review

CONDUCTED BY . . . B. T. A. BELL

OFFICES:

UNION CHAMBERS, 14 Metcalfe St.

OTTAWA.

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Our Libel Suit.

We were not a little amused, a few days ago to read in the *Montreal Gazette* that a certain Charles Lionais, mine promoter and manager, proposed to enter suit against the REVIEW for the fabulous sum of *fifty thousand dollars*, being damages claimed for an alleged libellous paragraph which appeared in our last issue. There is certainly nothing small about Mr. Charles Lionais. The item in question was published in our Phosphate Notes, and was as follows:

Mr. C. Lionais, formerly superintendent of copper and asbestos mines in the Eastern townships, is reported to be making elaborate preparations for commencing work on some lots adjoining the Blackburn estate. Telephone communication to the station, electric light and a costly plant are said to be in course of erection. Perhaps it might be well to ascertain and prove the true value of the property before going to all this expense. Extravagance and illadvised management have in the past wrought enough harm to our Canadian mines, as a number of properties with which Mr. Lionais is not unacquainted, can testify.

Mr. Lionais, it is stated, takes exception to this simple, outspoken paragraph on the ground "that owing to the extensive circulation of the REVIEW in Great Britain and the United States it will have the effect of deterring capitalists from investing their money in his property."

It will be observed that we have said nothing against the *value* of the property, other than to suggest that being comparatively undeveloped and entirely unproved it does not, in its present state, warrant anything like the elaborate and costly works which are reported to be in course of construction upon it. Dr. Selwyn, the able Director of the Geological Survey, made a thorough examination of the property in 1887, and a few weeks ago having occasion to be in the district again, became acquainted with what is now going on there. Writing under date of 18th Dr. Selwyn says: "I have no hesitation in saying that unless some extensive developments, of which I am not aware, have been made since I examined the property in 1887, I do not consider such expenditure as you refer to advisable. The money would, I consider, be more wisely expended in actual mining operations to develop the undoubtedly good indications which there are on the property."

We could cite many similar expressions of opinion by practical engineers and mining men did we consider it at all necessary to do so.

It is the duty of the mining press to bring about a truthful and honest representation of all mining ventures whether they be mines fully developed or mere "prospects" about to be, or partly opened up, in order that a fair bargain may be arranged between the vendor and the purchaser. Investors must be warned against the payment of excessive figures for undeveloped properties—no matter how good indications they may contain—until sufficient work has been done to prove them *mines*. Mr. Lionais is credited with being a miner of "large and varied experience." Has he forgotten the history of mining all the world over, and the many deplorable instances in Canada where extravagance, incompetence and visionary management have resulted in a lamentable loss of capital? Surely

he must be aware that perhaps no other line of enterprise has suffered so much from a total disregard of the fundamental principles of business.

At the instigation of Mr. C. B. Falardeau, a number of Mr. Lionais' friends have written evidently with the object of inducing us to withdraw the paragraph. We will do nothing of the sort; and if Mr. Lionais is really serious, and is not catering for a little cheap notoriety, we will meet him in Court, and substantiate any opinion we may have expressed in these columns.

Another Bubble Burst.

The collapse of the Mineral Phosphate Company and its promoters has lately been the chief topic of conversation among mining men and the phosphate trade generally. It is admitted by everyone that the price asked for the property was ridiculously high, and far in excess of its true value, while the many discrepancies between statements and facts apparent in the Prospectus have been much commented upon. *Appropos* of this concern, an English exchange has the following pertinent remarks:

"We observe that the person upon whose figures the directors solely rely for the estimate of dividend is a Mr. McAndrew. A foot note informs us that Mr. McAndrew has been good enough to accept the appointment of manager. Is this gentleman a storekeeper at Buckingham Village, near by the property? And, if so, what does he know about phosphate mining? Mr. McAndrew bases his calculations upon a selling price of 1s. 2½d. per unit, or £5 1s. 6d. per ton of 84 per cent. phosphate. Where does he get his figures, and how comes it that the directors have accepted them as correct? We invite them to say whether it is not the fact that this price has not been obtained for the last four or five years, and that the present price is only 1s. per unit, or £4 4s. per ton? If we are right, then over 25 per cent. must be deducted from the net profits as estimated in the prospectus."

This should be a lesson to those stupid persons who place an infinite reliance upon the gullibility of the English investor, and who overreach themselves in order to "get ahead" of their neighbors. While the failure of the concern does not come as a surprise, it is greatly to be deplored, inasmuch as it may seriously affect the disposal of many excellent properties now in the market.

Mining in Nova Scotia during 1888.

The Annual Report of the Commissioner of Public Works and Mines, Nova Scotia, lies on our table, and containing as it does a large amount of valuable statistics and information respecting mining matters in that province, its summary is laid before our readers in as concise a form as possible. There is an increase in the yield of six and a decrease in five of the minerals recorded in the tables for 1888. Of gold, 22,407 ounces are returned as against 21,211 in 1887, the wet summer having militated against a larger yield, as in a converse ratio the dry season operated detrimentally in the previous year. Numerous fresh discoveries are reported from all points on the auriferous belt, and some of them it is confidently believed will prove valuable. All the gold mining of Nova Scotia is conducted by means of crushing, and placer diggings are unknown. Despite some

failures, mining business may be said to have improved, and outside capitalists are looking for investments. Salmon River, Carribou, Whiteburn, Lake Catcha and Stormont are the districts reported to have in their respective order afforded the highest returns.

The coal trade at the mines is almost the same as in 1887, the sales reported in 1888 being 1,576,692 tons against 1,519,684 in the previous year, the increase being 57,008 tons. There was an increase in home consumption, an increase of 28,000 tons in sales to Quebec, an increase of 28,000 tons in New Brunswick, and a large falling off in sales to the United States, amounting to 43,694 tons. The cause of the latter is not stated. During the past season the regular manufacture of coke has been commenced at the Gowrie mines, Cape Breton, on a small scale, and several hundreds of tons were shipped. This coke is largely used in copper concentration and smelting operations in Newfoundland. The inspector of mines seems to have exercised his duties very carefully, and the accidents reported have not been as fatal as in former years. Reports of coal discoveries are mentioned in Colchester and Cumberland counties, and should the tests now being made prove satisfactory the localities will be found to be advantageously situated, as the Intercolonial Railway runs through the district. Mention is made of the necessity of a constant supervision over pit ropes, and testing those made of wire. Attention is called to a new rope known as the "Lang locked wire rope," in which the wires are so moulded as when put together to make practically a homogeneous flexible rope, which is reported to have stood in use twice as long as the ordinary rope under similar conditions of wear and tear.

Of iron, 41,619 tons were mined by the Londonderry Co. and smelting operations were satisfactorily conducted, the yield showing a slight decrease compared with the previous year. Copper mining in Nova Scotia is in its infancy, but much interest was shown in the search for workable deposits of this ore, and the Report states that the question of their existence is satisfactorily answered in the affirmative. The lead mine at Smithfield is still awaiting capital to work it. The export of gypsum is on the increase; manganese shows a great falling off, owing to the great depreciation of its value in the early part of the year. The increase that has since occurred is expected to revive the workings of this mineral. Antimony is still only produced at Rawdon. In addition to the above mentioned minerals 1,100 tons of barytes, 1,760 tons of grindstones, 169 tons of mouldings and, and a large quantity of limestone are recorded as helping to swell the value of the products of the mine in Nova Scotia in 1888, and the Report closes with a table which gives the value of the exports from Halifax. This, however, representing only one fact, is very apt to be misleading, as a casual reader might look upon it as representing the *total* exports of the

province. It seems to us it would have been better either to give the total export of all the ports of the province, or else none at all. We merely allude to this to guard readers of the Report against an error they might unwittingly fall into.

Mines and Mining on Lake Superior.

The extent of area dealt with in the report by Mr. E. D. Ingall, M. E. A. R. S. M., being Part H of the Annual Report of the Geological Survey of Canada, just issued to the public, covers a tract of country from 81 to 91 degrees of longitude west along the shores of Lakes Huron and Superior, including the silver bearing area around Port Arthur, and about 3 degrees of latitude in the same space. Its geological features are treated, and its mineral resources are enumerated, viz: iron, magnetic and hematite; copper; silver; gold, both free and in its baser form; zinc blende, and a variety of other useful but less generally important minerals such as ornamental stones, mineral pigments, &c. A succinct history of the region follows, dating back forty years, when Sir William Logan called attention to it, and subsequently explored it, down to the discovery of the rich silver ores of Rabbit Mountain in 1882, and the still more recent operations of the present time. The opening of the C. P. R. and its facilities for communication with this district are compared with the former means of communication by water routes only, and the isolation which originally marked that district rendered all efforts to develop it difficult in the extreme. Under the existing mining laws large tracts become tied up for speculative purposes, and a change in the laws is needed "to ensure actual working and to foster discovery by rendering it as easy as possible for the explorer to get the full benefit of his toilsome and dangerous efforts." The area of the silver bearing rocks is estimated by Mr. Ingall at approximately 1200 square miles, and a map accompanies this estimate, the special groups being enumerated as the Coast, the Port Arthur, the Rabbit Mountain, the Silver Mountain, and the White Fish Lake group.

Under each of the above headings the different mines are described, commencing with that of Silver Islet, in which, though operations are now suspended, the yield of silver was immense, and the venture proved the most extensive and successful of all yet undertaken in the district alluded to. The total value of silver produced from the commencement to the close of operations at Silver Islet is quoted at \$3,250,000. Numerous other islands where silver mines exist are also fully described, together with the works thereon. The coast section and Pie Island are reported upon, and the Port Arthur group next occupies attention. Under this

heading, we find Thunder Bay and Shuniah mines, together with a number of smaller mines or workings, and under Rabbit Mountain heading the rich Rabbit Mountain and the Beaver mines come in for a full description. The latter is especially rich, for Mr. Ingall quotes the statement of an Algoma paper, where it is stated "the total value of the products of the Beaver mine for the past two and a half months is \$93,000. This may be relied on as authentic." Mr. Ingall goes on to say there is every reason to believe this to be correct, as the Port Arthur Customs entries show \$190,000 worth of ore exported during 1887, the greater part of which certainly came from this mine. In the Silver Mountain group attention is called to the native silver occurring at Silver Mountain mine in leaves, sheets and nuggets weighing often several ounces, but litigation, which too often seems to be the fate of mining companies when rich veins are struck, has put a stop to work for the present. The Whitefish Lake group exhibit numerous veins, but very little mining has been done there. Mr. Ingall in summing up the whole area says that where it has been prospected the work has not been thoroughly carried on, and the question of the capabilities of the veins as ore producers is still unsettled, a remark which also applies to many of the mines opened years ago and closed altogether. There is, however, evidence of the widespread occurrence of rich silver ores throughout the whole formation of the district, and the existence of very numerous veins, on many of which, if properly handled, successful mines may be opened up. Experience has taught that more extended underground developments are required to prove their value, and unless this is acted upon with a sufficient of the capital at the start the failures of the past will be repeated in the future. Irregularities in width of veins in some cases dishearten operators, who are led thereby to believe that their vein had "pinched out," but pluck and energy in following it will generally carry the miner through the disturbed parts to where the vein will again be rich and solid. This has been proved by actual experience. The formation of the enclosing rock and physical characteristics of the surrounding formation tend to produce here and there fractures, and the dips of veins have in most cases not been sufficiently worked out to form a basis for classification.

From Port Arthur as a centre, the shore portions of all the district above described can be easily reached by small craft or steam tugs, while the C. P. R., the Dawson Road, and boat and canoe routes over the lakes and rivers, give means of communication with the inland portions. This district must figure largely in the production of silver in the years to come, and to those interested in the locality we cannot remember any Report which will throw more or better light on it than this by Mr. Ingall. He has done his work well and faithfully.

Annual Report of the Minister of Mines, for British Columbia, 1888.

The above volume, just received, differs somewhat from ordinary Government blue books, being a series of reports from the various Gold Commissioners and Government agents of the province, each of which contains its own details, and no regular synopsis or summary, if we except the tables showing the yield of gold, as given in the Minister's report itself. From the latter tables we gather the fact that there was a decrease in the yield of gold during the past year to the value of \$76,978. This is shown to be attributable to various causes, in some cases, as at Cassiar, the mines being gradually worked out, without new discoveries, and in other cases from lack of business principles in conducting operations. In this connection Mr. Sutton, government assayer at Victoria, very wisely remarks that very many of the misfortunes attending mining ventures in the province are brought about from a too eager desire to turn the yield into bullion, mills and machinery being provided *before* the existence of a sufficient quantity of paying ore has been definitely ascertained. This, he says, ought to be patent to anyone who has followed the history of mining in British Columbia. "Why run the danger of having a mill on your hands with no grist to grind?" Mr. Sutton's report contains a valuable list of the economic minerals found in the province, giving their localities, and he expresses the hope that this "will answer as a commencement towards a systematic arrangement of definite information" on this subject. Such a synopsis has long been wanted, and we hope to see Mr. Sutton continue it yearly with annual additional remarks. Speaking of the mineral characteristics of the province, he goes on to say: "It is somewhat premature to lay down any rules or observations," owing to want of development, and he complains that the samples sent from different points for assay are invariably too small to give satisfactory returns: "Pet samples" are misleading, and calculated to destroy confidence; samples for assay should not be less than one pound in weight.

Slate of an excellent quality has been discovered near Golden, and close to the C. P. R. track. Slabs of any desired size can be taken out, for billiard tables, mantles, flagging, &c., and it is pronounced to be adapted for roofing purposes. This discovery may be of great value. Platinum yielded in 1888 1,500 ounces. The only locality in British Columbia where it is obtained in sufficient quantities to render it worthy of mention is at Nicola.

The inference to be drawn from the various reports from each mining district may be summoned up as follows:—Cariboo, successful; Keithly, falling off; Cassiar, yield decreasing; Kootenay, great promise, but requiring development; West Kootenay, far ahead for silver, of all other districts, both in quantity and quality; Jilloet, a shrinkage in yield;

Yale, great promise, and mining companies showing unusual amount of energy.

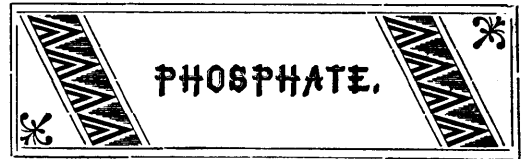
There has been a marked increase in the output of coal last year, it being 75,940 tons over that of 1887. The report states that the increased demand and the satisfactory price which it has realized in the market have greatly enhanced the prosperity of the coal industry of Nanaimo, Wellington and Comox, where upwards of 2,000 men are constantly working in and about the mines, who with their families and homes of their own are to all appearance contented, prosperous and permanent settlers. The exports of coal were chiefly to ports in California, and smaller cargoes went to other Pacific ports, whilst British and American ships-of-war, ocean mail steamers and other vessels have also drawn supplies from the province. Extensive works in connection with the coal mines have been carried on in the Comox district last year, and a railway has been constructed from the mines to a shipping terminus, at Union Bay, where commodious wharves have been built. This has involved the expenditure of a large amount of capital, for which good returns this year are anticipated. British Columbia affords every evidence of being the coaling station of the Pacific in the future. Detailed returns of the various collieries are given at the end of the report. The various Commissioners and Government agents afford very valuable information respecting the districts they supervise, and it is at once apparent that their examinations are not by any means superficial or unreliable.

Electricity as a Mining Power.

At a recent inaugural address in England, before the north of England Institute of Mining and Mechanical Engineers, delivered by Mr. J. Marley, upon "Improvements in Mining," it was stated that the tendency of mechanical invention is decidedly to "elaborate other means of steam raising at the expense of coal," and economy in the consumption of the latter was strongly urged. The transmission of power is a subject now attracting great attention both on this continent and in the old world, and compressed air, hydraulics and electricity respectively have their claims advanced by their own advocates. Electricity seems to us the most likely means for adoption in the near future. In England already several mining companies have undertaken the application of electricity to the operation of mining machinery, and in the United States this power is largely used. The best means of convincing the incredulous is to cite some instances for them, and we can only choose from those to be met with in England and America. In the St. John Colliery at Normantown, the electrical transmission of power has been installed to work a pumping engine at the bottom of a shaft. A volume of water of 23,000 litres (100 litres = 22 gallons) per hour furnished by a subterranean sheet of water has to be raised a height of about 270 metres (1 metre = 3.2808

feet). The pumps have been calculated for 32,000 litres per hour, and they have delivered regularly during the month of February last, 562,500 litres per day. The generating dynamo furnishes a current of 600 volts to the boundary, with an average of 66 amperes. The electromotive force at the boundary of the receiver is 575 volts. The result in water raised is about 33-horse power, and it follows therefore that the electrical transmission utilizes at least 50 per cent. of the power furnished by the steam motor. Compared with compressed air, electricity permits the realization of an economy of 25 per cent. on the expenses of first establishment, without counting the facilities of placing, inspection and maintenance presented by electrical motors. In the United States the installation is being prepared in Arizona for transmitting a force of 150-horse power to a distance of eight miles, between a waterfall and a mine. In Comstock the electrical transmission of power is to be applied to the workshops of New Nevada, where there are twenty crushing mills. In the Consolidated Virginia and California works there is a question of replacing by electricity the transmissions by metallic cables, which have caused very great disappointment. At Silver City some Sprague dynamos have been set up for a works of fifty crushing mills at a distance of four miles from a waterfall. These facts of recent date prove that the electrical transmission of force is making progress, and that opportunities are not wanting for it to be used. But its application in other ways; such as in driving vessels and the working of cranes, is indirect assistance to its extended employment in the mining industry. Pumping, winding, lighting, and accessory mechanisms are capable of good service from this source, and the miner who restricts himself to the employment of antiquated plant will find himself behind in the current of daily advance if he adheres to his old methods.

An Example of Bravery.—One of the most unexampled cases of bravery occurred at Hammond Colliery, near Girardville, recently. As an illustration of the devotion of one workman to another it was unexcelled. Thomas Hobin and Patrick Dougherty, two young men, were working together. A large piece of coal blocked the chute leading from one of the breasts to the gangway. This chute had a pitch of 75°, which is very near perpendicular. The block of coal was 18 feet from the gangway, and a plank was placed in position. Up this Hobin crawled, and after drilling a hole in the coal inserted a piece of dualin to which was attached a fuse. He lit the fuse and turned to descend. As he did so a rock fell from overhead and crushed the life out of him. Dougherty heard his death cry, but thought that he was merely caught, not killed. He could see the fuse burning, and knew that if the blast went off his friend would be blown to pieces by the flying fragments. In an instant he was up the steep plank, and snatched the burning fuse just in the nick of time. He was successful, but the cruel rock had crushed the life out of poor Hobin. There is a movement on foot to present him with some token. Mine Inspector Stein paid him a high compliment at the coroner's inquest.—*Colliery Engineer.*



In General.

Messrs. Couper, McCarnie & Co., the well known London firm of brokers and shippers, have dissolved partnership. The firm will hereafter be known as Couper, Miller & Co. The new partner is Mr. C. C. Hoyer Miller, one of the directors of the Canadian Phosphate Company.

B. L. Nowell, against whom six bills of indictment were laid for obtaining money under alleged false pretences and which were thrown out by the grand jury, has taken out an action for \$20,000 damages against James D. Macfarlane, who had preferred the charges.

The Canadian Superphosphate Company has been incorporated. The Hon. M. C. Cochrane, Wm. Abbott and Charles Colby, M.P., are provisional directors of the concern. The capital stock is placed at \$1,000,000.

Sales.

Sales of Canadian phosphates have recently been made in London at 9d. for 70 cent., 10d. for 75 per cent., while there have been enquiries for 60 and 65 per cent., which have not hitherto been asked for in England.

Du Lievre.

Navigation was resumed on the river on the 12th instant. Capt. Bothwell reports this to be the earliest opening within his recollection. The C. P. R. branch from Buckingham reopened upon the same day.

The transportation of ore will commence this week. The various stocks awaiting shipment and the preparations for handling them promise a busy season, but the difficulty of the passage at the Little Rapids, increased by the unfinished construction of the long desired locks, is realised by the shippers. The first scow of up freight for the mines has paid the penalty of the experimental trip by capsizing her contents, and scoring a heavy loss to the High Rock mines.

Acting upon the suggestion thrown out in our last issue, a deputation of mine owners, mine superintendents and managers, and others interested in the phosphate industry, waited upon Sir Hector Langevin at the House of Commons on the 24th instant. The party comprised Alonzo Wright, M.P., W. J. Poupore, M.P.P., W. W. Pickford, High Rock mines, J. Lanson-Wills, Canadian Phosphate Co., W. A. Allan, Little Rapids mines, A. Cameron and Capt. Bothwell, Buckingham, and B. T. A. Bell, editor of the REVIEW. Alonzo Wright, M.P., introduced the deputation, and Messrs. Wills, Poupore, Allan and Pickford urged upon the Minister the absolute necessity of the provision of a steam winch on float, or some other mechanical appliance, for the purpose of hauling craft up the channel at the Little Rapids, and it was pointed out that unless this was done without delay the various mines would be put to a very great inconvenience, and the transportation of phosphates and supplies would be very seriously interfered with. Sir Hector promised that the matter would be attended to, and referred the party to Mr. H. F. Perley, C.E., Chief Engineer of the

Department of Public Works, to whom he very graciously gave a letter of introduction explaining the urgency of the case. Mr. Perley, who was next seen, said he fully realized the importance of the matter, and led the party to understand that it would have his immediate and prompt attention. There is, therefore, every prospect that this obstruction to our local industry will be obviated at an early date.

Just as we go to press we learn that the Minister of Public Works has acceded to the request of the miners, and has given instructions to have the steam winch and float provided at the Little Rapids. This prompt recognition of the wants of the industry will give entire satisfaction to all concerned.

Mr. E. D. Ingall, M.E., and Mr. James White, of the Geological Survey, will shortly resume their investigations and survey of the phosphate region. The elucidation of the nature and origin of these deposits as a guide where and how to seek them, and the preparation of a map of the area under study on such a scale as will permit the delineation of the details of the distribution and association of the different rocks, are the chief aim and objects of this important work. Of the 210 square miles to be comprised within the limits of this map, the lakes, rivers, roads, &c., over some 125 square miles have already been surveyed by Mr. White. It is hoped that the balance of the work will be completed this summer, and that the report and map will be ready for the public by this time next year.

The Dominion Phosphate Company have improved their means of haulage at their No. 2 pit by completing the inclined track from the bottom to grass. The current output has been maintained during the development work by attacking the No. 5 pit. Prof. Donald has just sampled the stocks of ore for the buyers, Messrs. Lomer & Rohr, and shipments will commence forthwith. The steamer *Kate* has been thoroughly overhauled for this work, and is now afloat.

The output from the No. 11 pit at High Rock has shown a falling off during this month, but an improvement in their No. 5 is very encouraging. A new pier at the river landing is near completion, and preparations are made for discharging the scows by means of a steam hoister at Buckingham Village.

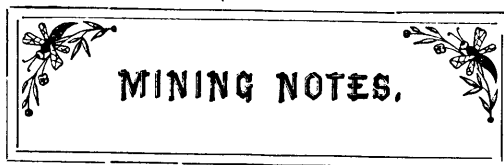
We have noticed a nice pile of ore from the Central Lake mines ready for shipping into scows at Chalifour's Landing. The exploratory work at these mines is evidently giving every satisfaction. Mr. Powers has uncovered some very fine shows which will afford good summer work.

The reports from the Canadian Phosphate Company's mines are satisfactory, the output being steady, and although the "Big Pit" at Star Hill shows a falling off, the last opened works are giving good results. The newly constructed scows have been successfully launched, and the wire tramway to river has resumed its activity.

The first down shipment of ore to the village has been made by the Ottawa Phosphate Mining Company from the Emerald mine.

Perth District.

Cap't. R. C. Adams, managing director of the Anglo-Canadian Phosphate Company, has been called to England on company's business. The pits at Bobb's and Otty Lake are looking well, and are yielding a fair output.



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

NOTICE.

At the Annual Meeting of the Gold Miners' Association of Nova Scotia, held at Halifax, on 6th March, a resolution was passed adopting the "Canadian Mining Review" as the official organ of this Association. Our readers may therefore rely upon the accuracy of all information published in these columns bearing on the gold mining industry of the Province.

Nova Scotia.

Darr's Hill District.

It is understood that a suit has been instituted by Chas. F. Mott, of Halifax, to set aside the sale of the Dufferin mine, made at public auction on the 14th March. The yield of the mine for March was 156 ounces.

Killag.

Last autumn Mr. Geo. W. Stuart and associates took out some quartz from a 4 inch lode on the edge of the big swamp. Five tons of this were recently crushed, and yielded 10 oz. 11 dwt. 10 grs., or over \$10 per ton. A steam plant of 15 h.p. is being placed upon the swamp shaft, and will be used to work pumping and hoisting gear. As soon as this gear is completed sinking will begin, and the work prosecuted all summer.

Stormont District.

The Palgrave Mining Company obtained 170 ounces of gold last month from about 270 tons of quartz. The lode keeps its size, and is maintaining its average yield. The prospects for the future look well.

South Uniacke.

The Witherow-Hartlin property owners are enlarging their mill by the addition of five new stamps, supplied by I. H. Matheson & Co., of New Glasgow. The original plant was supplied by the Windsor Foundry Company.

Renfrew District.

The new mill of the Empress Company dropped its stamps for the first time on the 3rd instant. Latest advices say the mill is running very smoothly, and is crushing at the rate of three tons per head per diem, which is the best performance yet on record in this province.

Oldham District.

The Oldham Gold Company is doing nothing but pumping water. The Standard Gold Company are pushing work, and their property never looked better. The yield for March was about \$5,900. The east shaft and main shaft are both sinking, and the 350-foot level is in good ore.

Mahone Bay.

Mr. John A. Anderson and associates have a force of men prospecting on Blockhouse Hill. Good drift has been found, but no lodes have yet been cut.

Miscellaneous.

The first concern to manufacture pig iron in Canada will probably be the New York and Nova Scotia Iron and Railway Company, which proposes to erect two furnaces at New Glasgow, N.S., one for Bessemer and one for foundry pig iron, one of which will have a capacity of 25,000 tons per annum, employing several hundred men in mining the required 50,000 tons of ore, 50,000 tons of coal and 25,000 tons of limestone. Tunnelling will be commenced this month to analyze and ascertain the extent of the deposit, but the outcrop gives good indications. A staff of ten engineers has been surveying railroad routes from the mines to New Glasgow and the Intercolonial Railway since December, and the citizens have offered 100 acres within the town limits to any company working the mines. Bessemer pig iron is made from non-phosphoric ore, of which there are several veins along the East River.

At the last meeting of the Gold Mining Association, held on the 9th instant, Mr. George J. Partington was elected secretary-treasurer, in place of Mr. Townsend.

Prospecting work will be commenced in the American Gold Company's area next month.

The first decision in the co-partnership suit of Putnam v. Hardman & Taylor, which has been going on in the Supreme Court for two years, was given on the 20th April, and was substantially a verdict for the plaintiff. The case will be appealed.

On the East River of Pictou, 342 tons were mined by the Messrs. Grant and shipped via Hopewell to the Londonderry furnaces. This is a limonite of good quality.

The fall in the price of manganese ore lessened the production of the mineral last year at Tenny Cape and Onslow; but as the value has risen it is expected that during this season business will be brisker at these points.

The returns of the shipment of antimony ore mined by Mr. Macnaughton at Rawdon are given as 308 tons of No. 1.

Official returns to the mines office show that 41,619 tons of ore were mined by the Londonderry Iron Co. last year, and that 164 men were employed about the mine above and below ground.

Mr. R. E. Chambers with a small force, took out 1,000 tons from his limonite deposit at Brookfield. The vein was cross-cut and proved to be 18 to 20 foot wide. The ore hitherto extracted, has been smelted at Londonderry. It is of excellent quality and very accessible, being within two and a half miles of the railway.

New Brunswick.

The Victoria Mining Company are applying for letters of incorporation. The capital is \$10,000, the offices in Andover, and the applicants as follows: John E. Stewart, contractor, Andover; F. P. Thompson, manufacturer, Fredericton; Daniel McQueen, contractor, Woodstock; J. W. Hoyt, claim agent, Blissville; Whitfield Giberson, lumberman, Aroostook; James Stewart, contractor, Andover; Chas. H. Lugin, barrister, Fredericton. The provisional directors are: John E. Stewart, F. P. Thompson, Daniel McQueen, J. W. Hoyt, and Whitfield Giberson.

Quebec.

The revenue derived by the province from the sale of mining lands for the year ended 30th June last was \$5,225.55. The fees on permits, etc., granted to parties interested in mining amounted to \$839.00, and the expenses to \$69.58. The Commissioner of Crown Lands states that it is evident that future results will be of much greater importance. A complete reconstruction of the present Mining Act is promised. This, everyone will admit, is urgently needed, and if the new laws are only modelled on lines similar to those of the sister provinces of Nova Scotia and British Columbia there can be little doubt that an impetus hitherto unknown will be given to the mining industry of the province, and the present depleted state of the Treasury will be amply replenished.

During the last four years the Villeneuve mica mines have supplied the trade with about 35,000 lbs. of mica, representing an annual output of 9,000. There has also been taken out a crystal weighing 281 lbs., which yielded about \$500 worth of merchantable mica. At present the pure white felspar is being successfully used in the manufacture of pottery.

Preparations for a brisk season are being made at the New Rockland slate quarries. Slate of excellent quality is being won from a bench at a depth of 200 feet. It is expected that the output this year will be much more satisfactory than that of 1888.

The output of asbestos last year from Mr. W. H. Jeffrey's mine at Danville was in the vicinity of 207 tons. A blast on the 23rd inst. yielded 11,133 lbs. The daily output at present is 4,500 lbs.

Mr. Scater, of Fenwick & Scater, informs us that the actual output from the Megantic asbestos mine was 125 tons, as follows: *First* 30 tons, *Seconds* 50 tons, *Thirds* 45 tons. An average number of ten men were employed.

We understand that the Ward Ross asbestos mine at Thetford is at present on the English market, and is likely very soon to change hands. The property, owing to the limited means of the present owners, has only been worked on a very moderate scale. The pit at present shows an exceedingly good quality of asbestos and gives indication that if properly worked with ample capital it would prove a fair investment for any one taking hold of it.

The gold industry of the Chaudiere district has been prosecuted more vigorously lately than in former years. The four companies at present working are the Horace Sewell Co. on the Des Plantes, McArthur, and Coupal at St. Francis, Capt. Richard's on the Cumberland, and the St. Onge Bros. on the Famine.

The Shaft at the Des Plantes works is down to a depth of 30 feet, is about 60 feet east of the stream and half a mile north of the bridge near the mouth. Dr. Ells, in his recent report states that coarse gold in good paying quantities is taken from this spot. The head of the river at one time yielded a large quantity of coarse gold.

The most extensive workings in the district are now carried on at the Ruisseau Meul, a branch of the Millbrook near St. Francis village.

A tunnel has been driven into the hill to a distance of 600 feet, in an old channel which at 400 feet was 30 feet below the adjoining bed of the brook from which it was separated by slate reefs. The gravel of the old channel has yielded considerable coarse gold, nuggets from \$5 to \$15 value having been taken out during the past season. Drifting near the upper end of the tunnel is now being carried on, but much difficulty is experienced from quicksand. Neither here nor at the Des Plantes are there any appliances suitable for saving fine gold, and some changes in this respect will be necessary before satisfactory results will be obtained. From 12 to 14 men were employed during the past season.

The work done by Capt. Richards on the Cumberland has been very largely of an exploratory nature and no returns of gold taken out are to hand. Difficulty from quicksand is experienced here in sinking shafts.

The St. Onge Bros. have driven in the east bank about a mile above the road across the mouth of the Famine, for several hundred feet in what they claim to be an old channel of that stream, and gold has been taken out in small quantities.

From the prospectus of the White's Asbestos Company (Limited), recently formed in London, we glean the following particulars regarding the new concern:—The capital is £100,000, divided into 100,000 shares of £1 each. The directors are John A. Hamilton (Messrs. Alston, Hamilton & Co.), 21 Mincing Lane, London, chairman; Major Henry Creagh, 29 Gwendor Road, West Kensington, London; T. B. Forward (late of Forward Bros. & Co.), Hawkhead House, Hatfield, Herts; J. Pellat Rickman (Messrs. Apsley, Pellat & Co.), 17 St. Bride street, London; and Alfred H. White, Quebec. The property conveyed consists of lots 5 and 6, 1st range South Garthby, 67 acres; lot 16, 3rd range South Garthby, 100 acres; lot 7, 6th range Coleraine, 105 acres; and lot 9, 10th range Coleraine, 100 acres; in all 379 acres. Lucius J. Boyd, Quebec, is the engineer of the company.

Justice Stirling has granted a petition before the High Court, England, to wind up the Canadian Asbestos and Antimony Company, on the ground that the vendors never acquired a title to the estates sold to the company.

The Glasgow Canadian Asbestos Company are making preparations for a resumption of work at their mines. An excellent quality of the mineral is now being produced.

Our last issue contained a reference to the Scottish Canadian Asbestos Company. We desire it to be understood that no reflection against the management of Mr. John J. Penhale, the able superintendent of the mine at present, was intended.

We are informed that the Excelsior Copper Company has decided to erect smelters at Harvey Hill, and a great quantity of ore will not be raised until these works have been erected. Col. Drew Gay, superintendent of the mines, is at present in England on the company's business.

Major Short, of Quebec, has commenced to open up an asbestos property in which he has an interest in range 9, Coleraine.

The American Asbestos Company is the title of a new private company shortly to be registered in England, and formed by the Wertheims to operate their property in Coleraine. The shares will not be offered to the public for some time, and are not to be quoted on the market. Mr. Louis Wertheim is chairman of the board, and Mr. Edward Wertheim managing director. At a recent meeting it was decided to put in an extensive plant to enable the production of a larger output. Prior to the sale of this property in November last some 60 tons were raised by Dr. Reed, and since it has changed hands a similar quantity has been quarried by a small gang during the winter. The present output is about 30 bags, or 1½ tons per day, but this will be very largely increased as soon as the machinery has been got into working order. Dwelling houses for the accommodation of a strong working force are in course of construction.

An engineer who has just returned from a visit to the Graphite plumbago mines speaks very highly of the new plant and the many improvements which have recently been made to the buildings there. By the way, we hear that the Hon. Mr. Chapleau, when on the continent, succeeded in floating a company to work the concern, but at time of writing we have been unable to ascertain the truth of the statement.

Ontario.

No new oil wells of value were bored in the province last year. The entire production in 1887 was 594,273 barrels, produced from about 2,700 wells, in the county of Lambton. The average depth of the oil rock in this county is estimated to be from 490 to 500 feet from the surface.

The oil well at Comber, Essex county, is 1,300 feet deep and is said to yield about one barrel of oil per diem.

The recent discovery of natural gas in the county of Essex has led to the proposal to form the Canadian Natural Gas Company limited. The incorporators are: N. A. Coste, of the township of Malden; Hiram Walker, Edward Walker, Franklin Walker, James Walker and Chandler Walker, of Walkerville; John Atkinson, of Detroit; John G. Haggart, of Ottawa, Postmaster-General of Canada, and others. The chief place of business is to be at Walkerville, and the total number of shares 25 at \$500 each.

A short time ago Mr. Chas. Moore sold a quarter interest in the Sultana gold mine, Lake of the Woods district, to Messrs. Galt & Bros., of Winnipeg. Recently Dr. Scovil sold a quarter interest to Mr. Hartt, coal merchant, Montreal, for \$2,750.

Sudbury District.

We understand that Dr. R. Bell, Assistant Director of the Geological Survey, will read a paper at the next meeting of the Royal Society upon "The Copper deposits of the Sudbury district."

We have received a copy of the prospectus of the Sudbury Mining Company recently incorporated. The capital stock is stated at \$100,000 in 10,000 shares of \$10 each, payable 25% on allotment, 25% in thirty days, and balance on call after notice of not less than thirty days. The directors of the concern are: Joseph Cozens, Saulte Ste. Marie, president; Robert McClain, Toronto, vice-president; Geo.

Dunstan, Toronto, sec. treas.; Alex. Mackie, Toronto; Lt.-Col. George A. Shaw, Toronto; Thos. E. Johnson, San Jose, Cal. The property proposed to be worked is known as the north half of lot 6, con. 3, township of Denison, consisting of 160 acres. The property is said to contain copper and gold quartz in paying quantities.

The Canada Copper Company's smelting works continue to produce large quantities of matte; 154 tons were given in twenty-four hours lately.

Port Arthur District.

The arrival of the first steamer from Duluth has created quite a stir in mining circles. Americans are evidently keen to get a good hold of the silver and iron finds, and several of the moneyed men are keeping parties of explorers in the Silver Mountain and Arrow Lake region all summer. Applications have also been made for extensive iron lands, in view of the almost certain take off of the American import duty on that article, the necessity for which is daily becoming more apparent.

The lead deposits in Black Bay are also receiving considerable attention.

The Badger, Beaver, Elgin, and Silver Mountain West mines are continuing their steady, uniform, satisfactory progress. The Silver Mountain East is, however, coming to the front again in a very marked manner, the ore from the west shaft being of the exceedingly rich kind which was first encountered in this mine.

The Wolverine mine has been working with such encouraging results that the adjacent "Queen" mining property has started to work again with renewed vigor; supplies, &c., are being teamed over the roads to Whitefish Lake, in spite of the great cost incurred at this season of the year.

The placing of a steamer on Whitefish Lake by the Silver Fox Company is a move which is duly appreciated by property holders in that region. It is not unlikely before the season closes that another will be placed on Arrow Lake also.

The matter of the railroad to the silver mines is the absorbing topic, but unfortunately great delay has occurred from a want of harmonious action of those concerned.

Several gold properties at the Lake of the Woods have recently changed hands, in view of the probable erection of a smelter, which has received a handsome bonus.

It is officially stated that the year's expenses of the Badger, including expenditure for land, mining and improvements are less than \$50,000. From September to February the shipments included three car loads of smelting rock, valued at \$24,000, \$40,000 and \$75,000 respectively; two lots of bullion, 6,269 and 3,916 ounces, value \$9,900. This statement was sworn to before the United States Consular Agent at Port Arthur. Thus the total receipts were \$142,650; total expenditure, \$50,000; net profit, \$92,650.

Manitoba and North-West Territories.

The Lords of the Admiralty have granted an interview to Macleod Stewart, President of the Canada Anthracite Coal company, regarding the use of Banff coal for the Pacific squadron, in lieu of Welsh coal. The Admiralty is arranging to test the fitness of the coal. Mr. Stewart expects favourable results.

The revenue derived by the Department of the Interior from the sale of coal lands in 1888 was \$74,700, being an increase of \$67,050 over the previous year. The total area of coal lands sold up to date is 12,078½ acres, and the total amount received therefor, \$124,508.82.

By an Order-in-Council dated the 10th of February, 1888, the price of lands containing anthracite coal was raised from \$12.50 to \$20, the latter being the price of this class of lands prior to December, 1885. By an Order-in-Council dated the 11th of July, 1888, the regulations for the disposal of coal lands in the Province of Manitoba and the North West Territories were made to govern the disposal of Dominion coal lands in the Railway Belt in the Province of British Columbia.

Returns from the Dominion Lands Agents show that during the past year 29 entries were made for mining locations other than coal. The revenue for mining lands for the year was \$430.75, made up as follows: Fees for entry and registration of assignments, \$231.75, and \$199 in payment of a mining location in British Columbia. The total area of mining locations sold up to date is 1,080.86 acres, which realized \$5,406.50.

The chief output of coal has been at Lethbridge, by the North West Coal and Navigation Company, and has been probably double that of any preceding year. The widening of the gauge of their railway and a connection with the American railway system at Fort Assiniboine would probably lead to a quadruplication of their output. Both of these enterprises will probably be accomplished this year. Within the past few weeks a Diamond drill has been added to the plant at these mines.

The output from the mines at Medicine Hat during 1888 has been meagre; legal complications have retarded operations. These, it is stated, have been adjusted, so that a renewal of operations may be anticipated. The Medicine Hat Railway and Coal Company assert that they will shortly build their railway and develop their coal properties.

The C. P. R. has during the past few months been developing some of its coal lands at Crowfoot Creek, at a point about four miles from the line of railway, so far with very favorable results. Tests are being made with the Diamond drill.

During the past season the original Bow River mine at Cochrane have been closed down; another has been opened with, it is stated, ample capital to back the enterprise, and coking furnaces are to be put into operation. As a coking coal it ranks "A 1," and the establishment of these furnaces should prevent a great deal of waste, which heretofore from its character had to be left at the pit mouth. With proper coking appliances it could be cheaply converted into coke, and a good market in connection with smelting works will no doubt be

obtainable in a year or two, as well as for fuel. The coming year will probably witness several diamond drill tests made in that neighborhood, which it is to be deplored was not made at the inception of mining in that locality.

British Columbia.

The new reduction works at Barkerville consist of a furnace building 75 feet long by 27 feet wide; a mill building 40 feet long by 22 feet wide; a pan room 30 feet long by 22 feet wide; and an engine room 40 feet long by 23 feet wide—all good, strong, substantial buildings. The contract price was \$4,700. The machinery consists of one Kendall stamp mill, capacity five tons in 24 hours; one twenty-horse power engine and boiler; one five-foot improved pan; one six-foot settler; the necessary shafts and pulleys for the above, and door frames, bolts and buckstays for a fifty-foot reverberatory roaster, which has a capacity of three tons of concentrated sulphurates in 24 hours.

The mining population of West Kootenay district numbers about 500 persons, and it is estimated that the capital invested figures about half a million dollars. The product for 1888 was about \$10,000 gold and \$75,000 silver. It is thought that these figures will be largely increased during the present year.

At Weaver Creek Mr. Leonard, a miner of great perseverance, who has stuck all alone to this creek for years, took out last summer about \$5,000 in coarse gold.

The Findlay Creek Mining Company has a first-class ditch and flume about 5¼ miles long and of a capacity of about 700 inches of water. The head at lower end is about 200 feet. The hydraulic plant consists of a 15-inch water pipe, No. 2 giant, and about 400 feet of 30-inch sluice, and has a capacity of about 1,000 cubic yards per day of 24 hours in ordinary gravel. The dead work, through clay and cement, is about finished, and a gravel bank of about 100 feet deep, which prospects well, has been all but reached. It is thought that the bed rock of one of the old channels coming in from the north will be struck in June or July, and that good pay will be the result. The company has erected good houses, a blacksmith shop, storehouses, &c., and has all the necessary tools and appliances to carry on the work; also a circular sawmill of average capacity. A prosperous season is expected this year.

The Perry Creek Gold Mining Company, owing to there being no waggon road to their mines and to the different pieces of metal being too heavy for pack animals, were unable last season to have the machinery for their large pump transported to its destination, and consequently the shaft, which, with much expense, skill and labor, had been sunk to bed rock last year, had to be temporarily abandoned, it being impossible to contend against the water without the aid of machinery. They have, however, during this year concentrated all their energies upon their mining ground known as the "Mount Ceniz Tunnel," lower down the creek. This ground is supposed to be rich, but requires a large capital to thoroughly test it. Substantial buildings have been erected, comprising dwelling and boarding house for employés, storehouse, and an office. A dump house has been fitted up, wherein everything, under the able management of their efficient foreman, Mr. Dow, an old Cariboo miner, has been placed in perfect order for the summer's work—stove, dump box,

water heads and gates, and hydraulic air pipes for the tunnel being in place and order. The length of the tunnel, which gives evidence of first class work all through, is now about 580 feet. This tunnel is run at a higher level than the old one, and for the most part goes immediately over it. Pay was not expected till bed rock was reached and the canon through which the old channel originally ran was passed. By latest accounts bed rock had been struck, and although quite smooth, being not yet past the canon, a condition which generally prevents it from retaining the gold upon its surface, a very fair return from the last week's work (only one shift employed) was produced, about \$515 being taken out of the dump box. The company are now sanguine as to the success of their enterprise, to which, in the opinion of all, they are fairly entitled, considering the amount of capital they have invested and the courageous perseverance they have evinced under many difficulties.

The Star Mining Company (Yale district) have shown unusual energy in developing their mine by sinking a shaft 100 feet in depth, at the mouth of which a horse whim and blacksmith shop have been erected. The ledge is 4 feet in width, with a pay streak of about 20 inches. The assays range from \$20 to \$600 per ton.

The Planet mine, which is also the property of this company, is being developed in a businesslike manner. A shaft 40 feet in depth has been sunk, and at the bottom a level has been driven in a northerly direction which exposes a magnificent body of ore which has assayed an average of about \$95 to the ton. The owners of these mines were engaged during the summer in drifting, taking out rock for milling purposes, and shipping concentrates. The rock was hard quartz, showing galena, iron sulphurets and gray copper. The copper did not run over 4 or 5 per cent. The result of several assays of picked specimens, of which the following are two:—576 oz. silver and 2½ oz. of gold per ton; 407 oz. silver and 1½ oz. of gold per ton. The nearest point of shipment is Kamloops, to which place it costs about \$10 per ton to haul. The plant of the Star Mining Company is very complete, but not large enough to be profitable. It consists of a rock breaker and a quartz mill and two Triumph concentrators. The last named have done their work well, but the quartz mill is not a success, owing to the hardness of the rock.

A few days ago the Perry Creek Mining Company struck a rich pocket which yielded in the last wash-up \$1,327.50. A letter from the mine says: The place where we have struck the good pay is a deep hole, the dirt in which was literally full of gold, as it could be seen while handling it in the tunnel. There is a considerable quantity of it still in sight, and we expect still greater things in our next wash-up. The total clean up for January and February was \$3,200.

The Government Immigration Agent at Victoria states that the Belgian colliers who arrived at the mines last year are doing fairly well. Not knowing any English when they commence work in the pits is a great drawback to their immediate usefulness. After this objection is more or less removed by contact with English-speaking miners, their future, with sobriety and industry, is assured. Colliery managers report favorably of their work, care and economy in the use of explosives being one of their charac-

teristics. Three or four of these people lost their lives by the disastrous explosion in No. 5 pit, Wellington, nearly a year ago, but with this exception no other casualty has occurred among them. The opening up of the Comox coal field under the same management as the Wellington collieries will ensure employment for all the Belgian miners and those of other nationalities that are likely to come during the ensuing year.

Phosphates and Agriculture.

(Liverpool Journal of Commerce.)

Every matter connected with the cropping of the lands of any country is embraced in one formula—it is matter reconstructed. In nature's laboratory change is continually taking place; that which existed yesterday exists to-day, but in another form. The growth of a plant or an animal is but matter reconstructed; it may be natural, or nature may be helped by the wisdom and knowledge of man. The growth of plants is reconstruction of matter, which must exist, and be available at a given place—in the position in which it is required—in order that the plant may take it up. The chief constituents which a plant requires are nitrogen, phosphates and potash. In all soils these exist in some proportion. Nitrification is continually going on in every soil, and when the sun shines the nitrification is especially great. Active nitrates are the dearest of all our manures, simply because they are essential in their action on the other constituents of the soil, and because also they are evanescent, for being once in the soil, unless they are taken up at the moment by the plants, they may be washed away by the first shower of rain. They cannot be stored. Phosphates are not continually being formed in the soil, and the limit of its fertility is the amount of this necessary mineral existing in it. Phosphates are brought within the range of plant food by means of the active nitrates in the soil, and one of the great evils of the excessive use of nitrogenous manures, which has been common in English farming for many years, has been that the soils have become exhausted of their phosphates, and to a certain extent of their potash. Nature does not reproduce these, and once they are gone they have to be supplied by the hand of man.

British agriculture is what it is at the present day simply because we have exploited the whole world in our hunt for phosphatic manures. "England," once wrote the late Baron Leibig, who himself was the greatest agricultural reformer the century had seen, "is robbing all other countries of the conditions of their fertility." We have not even spared the graveyards of the gallant soldiers who have fought the battles of the world. But our manure manufacturers are finding that to these even there is a limit, and in December last the manager of probably the greatest existing manufactory uttered the plaintive cry that the phosphatic deposits were getting exhausted, while, at the same time, America is discovering the fact that her soils are becoming unfruitful in consequence of the exhaustion of the natural phosphates. Such excellent deposits as those in the valley of the Somme in Europe and the guano beds of South America, are showing signs of exhaustion and new sources of supply are absolutely essential if our soils are to "go the pace," and produce the large crops which they have for the last 20 years. This new source of supply is already on the eve of development. It is curious that they have not been developed before to day. The wonderful deposits of apatite in the valleys of

the Ottawa River, in Canada, have a richness in phosphate superior to those in any other part of the world. Apple green in colour and as pretty to the eye as any of the precious stones, they yield from 88 to 92 per cent. of tribasic phosphate of lime. The American Government, in the report of the geological survey, places these as the best in the world, and far superior to the phosphatic rock in Carolina, and declares that the future of American agriculture depends upon its development for their development.

The Treatment of Ores.

MILL MACHINERY.

Crushers—The ore, as received from a mine, is usually in large pieces, requiring a preliminary breaking before the succeeding finer crushing. This operation is performed by jaw-crushers, mostly some modification of the well-known Blake rock breaker. This machine is too well known to need description, and is the most desirable form of crusher for stamp mills. The Dodge crusher differs from the Blake chiefly in the fact of the oscillating jaw being pivoted below instead of above; and from this it results that the product is more uniform in size, as the discharge opening remains nearly constant. Where comparatively fine crushing is needed, as for instance, in sampling works or in preparing ore—for rolls—the Dodge is preferable to the Blake. The Comet crusher is an improvement on the Blake as far as capacity is concerned; the motion being rotary, every portion of the stroke is effective. For smelting works and concentration mills, when large crushing capacity is required at one point, the Comet crusher is the most effective yet introduced, being capable of breaking 40 to 50 tons per hour of hard rock.

Stamps.—In gold and silver mills, and some fine concentration works, stamps are used for the final crushing of the ore. Though a simple form of machine there is much greater difference in the results of differently constructed stamps than inexperienced men would anticipate. The form of mortar and cams, the material entering into stems, shoes and dies, and the placing of camshaft and guides, all exert influences of greater or less importance; and experience is alone the safe guide in such matters. It is a common expression that stamps are "crude and clumsy and wasteful," but this opinion is held most firmly by men of little real experience with good mills. For the actual work of crushing, with a clear discharge as in wet mills, the stamp can be scientifically defended as an effective form of the application of power; while in actual practice it has held its own against all competitors for economy and effectiveness. For dry crushing the stamp is not so easy to defend, its capacity being less than in wet crushing, and the matter of dust requiring great experience and care to prevent proving a nuisance.

Still, for fine crushing, on many ores, the dry stamp has not yet been superseded, in spite of the numberless death warrants pronounced against it by inventors of new pulverizers. In some cases fast-running rolls may be preferable to stamps with the limitation mentioned below, under the head of rolls. The great advantages of stamps are as follows:—They are simple to keep in order; easy of repair by an ordinary blacksmith; generally understood; susceptible of almost constant running; capable of being stopped, a few at a time, for repairs, so not delaying a whole mill; the wearing parts are simple castings; when once erected they

will last for years; they are, practically, economical; and when they are put up it is known positively in advance that they will do their work without any risk of failure or delay in starting. For mining purposes these advantages are so great that mining men must be credited with common sense in their continued preference for stamps.

Rolls.—The ordinary cornish rolls constitute an effective, simple and cheap machine for crushing rock after a rock-breaker, either wet or dry. Rolls are mostly used where the crushing is not to be carried very far, as in coarse concentration mills and sampling works. Of late years they have been improved in form of construction and driven at a much higher speed than formerly, and now have their strong advocates as superior to dry stamps, for even fine crushing. For this purpose the shells must be of good material, kept true in surface, and fed regularly and evenly across their full width. In a few cases, crushing to pass a screen of 20 to 30 mesh, rolls have actually been used with great success. There are, however, ores which are clayey in character, on which the success of rolls for fine crushing, is still very doubtful; and sufficient evidence is not available to settle the question of their applicability to crushing any ore finer than 30 mesh. Millmen differ much among themselves as to the need of fine crushing for roasting silver ores, but the general tendency in gold and silver mills at the present day is towards a coarser crushing than formerly employed.

For leaching mills, the use of rolls offers several obvious advantages over that of dry stamps. The limit of the coarseness of crushing is determined here simply by the results obtained in roasting, and the reduced proportion of fine dust produced by rolls greatly facilitates the subsequent leaching process. In amalgamation mills the employment of settlers limits the coarseness of the crushing.

Pulverizers.—During the last 20 years a great number of new pulverizing machines have been invented, brought to public notice, put in limited operation, and, after failure, allowed to drop out of sight. New machines still keep coming out, most of them embodying some fatal weakness which has already ruined previous machines equally promising in their time. The greater part of these machines depend either on the attrition of the rock particles between surfaces of the machine or the crushing of the ore under rapidly running balls or rolls. The weakness in these forms of machines is either in the excessive wear of the grinding surfaces (for no metal can be economically employed as a purely grinding surface on hard rock) or in the wear of the driving portion in roll or ball machines. The use of attrition surfaces will condemn any new machine, however constructed. The most successful roll pulverizer is the Huntington mill, which introduces the novelty of an oiled bearing for the crushing rolls, and a suspension of the same from above, so that the whole wear is on the crushing surfaces, as the rolls run round against a horizontal steel tire. Any advantage there may be in a fast running roll or ball is here obtained with the minimum of power and wear, owing to the use of oiled bearings and a horizontal travel. A vertical revolution is obviously inferior to a horizontal one, because the motion is, in part, against gravity, and, as a consequence, an uneven force is exercised and uneven wear induced, while power is lost.

Huntington Mill.—This is used only for wet crushing, and has been by far the most successful competitor against stamps which has yet appeared. It has in its construction avoided the

fatal defects of previous pulverizers, and represents most nearly a combination of fast running rolls with the mortar and screening advantages of the stamp mill. It has been largely used in California, and its most obvious advantage consists in decreased cost of transportation, from small weight compared with stamps, the practical absence of heavy expenses in erection, and decreased power required to run it. These advantages have made the mill very favorably considered for preliminary work on a mine where distance is great or capital limited. It is the only mill which, for mining purposes, has a record of continuous work on a large scale, and with successful results.

Sturtevant Mill.—This mill has been used in smelting works where very large capacities are required. The machine consists of two cylindrical heads revolving in opposite directions within a screen-lined casing. The heads become filled with a conical lining of the material to be crushed, and these rock faces throw, by centrifugal force, the pieces of ore which fall on them, against the pieces thrown in an opposite direction by the other head. In this way the rock is made to break itself. To prove that this is no theory of the action of the machine, it is possible to feed into it when in motion balls of hardest white cast iron which rapidly smash themselves to pieces without injury to the machine. This mill has been used successfully on some materials to crush as fine as 40 and 50 mesh, by using outside a revolving screen and returning to the mill with the coarse ore, the part not yet fine enough to pass the screen. As a preparatory machine, combining the work of rock-breaker and coarse rolls in one operation, the enormous capacity of this mill offers great advantages. Its wearing parts consist simply of short cast iron cylinders easily replaced.

Another Dobson.

A little over three years ago a Mr. George Henderson, who gave out that he was a mining expert, arrived in this city from Portland, and registered at the Driard. He became acquainted with a number of gentlemen interested in mining matters, and through the combined efforts of himself and an associate a bonus of \$5,000 was placed in the estimates of the session of 1886 for the erection of a smelter. It was proposed to place this at Esquimalt. For some reason or other this project fell through, but Henderson had become acquainted with men of means, and his plausible manner of conversing on mining subjects secured to him their confidence. In the spring of 1886 he heard of a mine on the Fraser, near Big Slide, about 20 miles west of Clinton. He visited it and returned with some of the ore, and spoke in glowing terms of the mine. It was just what he had been looking for, and he could guarantee an immense success if a company was formed for its development. A company was formed, composed of the leading capitalists of Victoria, and a number of miners were imported for the purpose of opening the property up. The results of assays and mill tests of the ore were in favor of Mr. Henderson's theories, and the prospects were bright for the Foster Gold Milling and Mining Company (Limited). Stock was liberally subscribed. A crushing and roasting plant was purchased at San Francisco by Mr. Henderson, who up to the present point had declined to accept salary, thereby increasing his confidence with the

directors. He spoke of the wonderfully rich returns which would be received when the mill was in working order, and the stockholders looked forward with pleasant anticipation to the golden bars that would soon be forwarded to Victoria from the mine. Matters went along swimmingly; roads were built, the works placed in position, and after the supreme moment had been postponed from time to time the crushers and roasters and concentrators began their work. Some difficulty was experienced in working the machinery, but at last Mr. Henderson arrived in Victoria with a piece of flat yellow metal which he said was gold and the product of the mines. He still glowingly decanted upon the big yield that was sure to come, and prophesied that shares would advance a thousand per cent. However, he took good care to sell several thousands of dollars worth of the shares allotted to him. Every possible effort was made to successfully work the machinery, but at last it was given out as a failure, and the company closed down the works, after the voluble George had succeeded in getting rid of about \$75,000 of the stockholders' money.

The ore discovered in Nicola then attracted his attention, and George went in and bonded a couple of ledges. He was never known to work himself, his time being occupied in blowing, living on the fat of the land, playing cards and billiards, and smoking fragrant Havanas. He spent the money he had gained through the sale of the shares, and was about "broke" when he applied to several gentlemen formerly interested in the Foster. Surprising to relate, he secured advances, and his first report from the Star mine was to the effect that he had purchased a team of horses and was about to build a house. This was strictly against instructions, and George was compelled to relinquish cash received and the agreement of partnership, and this "deal" was killed.

But his cheek and loquacity were not lost, and he induced other gentlemen to go in with him, and thus secured funds to proceed with work. He sunk a shaft and developed a body of good ore. Then he purchased a small crushing and concentrating plant and a diminutive steam engine, and by dint of making others work hard—he was never guilty of anything of that sort himself—he at last succeeded in getting a car load of concentrates together, which he shipped to San Francisco, and they returned \$40 or \$50 per ton, or about one-fifth of their cost. He returned to Victoria, remained for a few days, and again departed for San Francisco. He has not been seen since. Altogether he managed to run up about \$15,000 debts for his too-confiding associates, Nicola ranchers and others, who would like to see him once more.

During his work in Nicola he brought up quartz miners from Grass Valley, Cal., and failed to pay them a dollar, although he had thousands of borrowed money in his possession, and they and their families were forced to borrow money to return to where work could be secured. Altogether, from a business point of view, Mr. Henderson has made a very bad reputation for himself, and should he ever revisit Victoria the people he has duped and robbed will have the satisfaction of placing him where he belongs—in the meshes of the law.—*B. C. Colonist.*

The North American Chemical and Mining Co. have made application to the Federal Government for a rebate on machinery imported from England for the manufacture of Portland cement.

Canadian Mining Companies in England

| | Price Per Share. |
|--|---------------------|
| General Mining, Limited £219,752 fully-paid shares of £8 | 4½ 5 |
| Low Point, Barrarois and Lingan, \$309,100 fully-paid shares of \$100 | — |
| Ditto, \$200,000 vendors fully-paid shares of \$100 | — |
| North-Western Coal and Navigation, Limited, £160,500 6 per cent. debentures; coupons June 30 and Dec. 31; principal 1904 | — |
| Ditto £149,500 fully-paid ordinary shares of £10 | — |
| Ditto £900 fully-paid deferred shares of £100 | — |
| Sydney and Louisburg Coal and Railway, Limited, £50,000 cumulative 10 per cent. first preference shares of £10, £6 paid | 7 9 |
| Ditto, £14,560 fully-paid non cumulative 6 per cent. second pref. of £10 | 3 5 |
| Ditto, £250,000 fully-paid ordinary shares of £10 | 1 2 |
| Vancouver Coal Mining and Land, Limited, £66,850 fully-paid shares of £10 | — |
| Ditto, £118,150 shares of £10, £9 paid | 6½ 7½ |
| Excelsior Copper, Limited, fully-paid shares of £1 | — |
| Ditto, shares of £1, 17s. 6d. paid | — |
| Shuniah Weachu, Limited, £99,888 fully-paid shares of £1 | — |
| Silver Wolverine, Ltd., £68,465 fully-paid shares of £1 | — |
| Anglo-Canadian Asbestos, Limited, £39,132 fully-paid shares of £2 | — |
| Anglo-Canadian Phosphate, Limited, £46,340 fully-paid pref. shares of £10 | — |
| Ditto, £15,050 fully-paid deferred shares of £10 | — |
| British Columbia Smelting, Ltd., £25,000 preference shares of £1, 10s. pd. | — |
| Ditto £40,000 fully paid ordinary shares of £1 | — |
| Canadian Asbestos and Antimony Company, Limited, £160,000 fully called shares of £5 | — |
| Canadian Phosphate, Ltd., £100,000 fully paid shares of £1 | ¾ 1 |

General Mining.—Accounts to December 31 submitted in April, but an interim meeting is held in November. Dividend for 1884, 5 per cent; for 1885 and 1886, 3½ each year; and for 1887, £4 13s. 9d. per cent. Reserve fund, £29,850.

Low Point.—The vendors' shares, up to the end of 1888, do not rank for dividend until 7 per cent. per annum dividends have been paid on ordinary. Accounts to Dec. 31. For 1887, 5 per cent. was paid on the ordinary shares other than those held by the General Mining Assoc., that Company foregoing their dividend rights.

North-Western Coal.—The deferred shares receive on dividend until 15 per cent. per annum (cumulative) has been paid on the ordinary. Accounts to June 30. Dividend for 1887-8, 5 per cent.

Sydney and Louisburg Coal.—Accounts to Dec. 31 submitted about May. Out of the profits of 1884 one half-year's dividend on the first preference shares was paid. No dividend since. Debit to Dec. 31, 1887, £1,574.

Vancouver Coal.—Accounts to June 30 and December 31 submitted in November and May. In the half-year to June, 1888, there was a net profit of nearly £11,000. Debentures, £57,200. Reconstruction has been decided on.

Excelsior Copper.—Registered September 26, 1888. Authorized capital, £450,000; purchase consideration, £400,000, in cash or shares. Fully-paid shares issued to the vendor; partly paid to the public.

Shuniah Weachu.—Accounts to Nov. 20 submitted in February. No dividend yet.

Silver Wolverine.—Registered October 19, 1888, with a capital of £100,000, of which £80,000 was the first issue. Most of the shares were issued to the vendor.

Anglo-Canadian Asbestos.—The Company was registered in November, 1885. Accounts to October 31 submitted in March. No dividend yet. Debentures, £3,450. Reports are not obtainable, but this information is official.

Anglo-Canadian Phosphate.—The preference shares rank first for 7 per cent., and after a like rate has been paid on the deferred shares, both classes rank equally.

British Columbia Smelting.—The company was registered May 9, 1888. The ordinary shares were issued to the vendor, and they do not rank for dividend until the preference shares have received dividends amounting to 100 per cent.

Canadian Phosphate.—Accounts to November 30 submitted in February. Eleven months to Nov. 30, 1888, resulted in a profit of £2,576, which was carried forward.

Nickel Mining.—The nickel industry of the world is a most peculiar one. It has only been about sixty years since it first came into use as a mineral, though it has been known to Japan and the eastern nations for centuries. There are nickel mines in France, Germany and Wales, in Pennsylvania, Nevada and Oregon. Nickel is not, as is generally supposed, a mineral that is mined like silver, and then smelted and reduced from an ore. It is a chemical element which is extracted from arsenides, cobalt and sulphides. The yield from these substances, as found in France and Wales, is only about 2 per cent. nickel, but the yield of some mines in Nevada not yet developed is fully 20 per cent. of pure nickel. About thirty years ago there was discovered in New Caledonia, a French penal colony, a wonderfully rich deposit of nickel. A French company was immediately formed, and this company to-day almost controls the trade in this country. It also almost controls the nickel trade of the world, and it has frequently declared its intention to ruin every other nickel manufacturer and run them perpetually out of the business.

The Late Canadian Asbestos and Antimony Company.

The following circular has been issued to the shareholders of the Canadian Asbestos and Antimony Company, Limited. It will be seen that the directors have decided to repudiate the purchase of the properties, and to return in full the amounts received from the shareholders:—

SIR,—I am instructed by the directors of this company to explain to you the delay which has occurred in communicating with you, and which has been unavoidable. From information which the directors received after the allotment of shares had been made, they thought it desirable to obtain, through the Dominion Government of Canada, an official report on the properties to be purchased.

By cablegram from the Government it appeared that the several properties were at the time inaccessible, owing to the ground being covered with snow, and that it would be impossible to report upon them without some delay. The directors thereupon applied to the vendors for an extension of time. This it was not within the power of the vendors to grant except on terms which would have necessitated the directors parting with the control of a large portion of the shareholders' money. Then followed communications between the directors and vendors, the result of which is that the company, acting under the advice of Sir Horace Davy, Q. C., and Mr. Alexander Young, has repudiated the purchase. The directors have resolved to personally defray all outgoings and expenses of the company, which represent in the aggregate a considerable sum, in order that the shareholders may receive back their subscriptions in full, and free from any deduction whatever.

The directors are advised that it is necessary that the company should first be formally wound up, for which preceding the initiatory steps have been taken. Enclosed herewith is a form for your signature, which the directors will be pleased to receive from you duly signed by return of post. I am desired to express the regret of the directors that you should have had any trouble in this matter, and their hope that you will appreciate their action in protecting, as they have done, the interests which you had committed to their charge.

I am, sir, your obediently,
GEORGE WM. LAKEMAN,
Secretary.

St. George's House, Eastcheap, London, E.C., April 4th, 1889.

Remarkable Rock Drilling.—Several months ago, Mr. Edward Askew started work upon a contract for driving a tunnel at the Suffolk colliery, St. Nicholas, Pa. He reports having driven with two three-inch Allison rock-drilling machines, worked by air-compressors, during the month of January, one hundred and thirty-five and two-thirds feet through hard sandstone and rock, size of tunnel 8 by 12 feet. He claims this remarkable drilling to be unparalleled in history of rock-drilling or tunneling.

The Natural History of Coal.

(Contributed by Francis D. Taylor, M.E., Brockville.)

The subject which I have undertaken is one that is surrounded with considerable difficulty, and will require care on my part not to indulge in mere supposition and hypothesis. I shall purposely avoid the pursuit of many tempting fields of scientific enquiry that might legitimately be regarded as connected with this paper from a desire to make the subject as practical and useful as possible. My aim will not be to astonish or confound but to teach; not to puzzle, but to make plain. I shall therefore try and put into as clear and condensed a form as I can, those truths in connection with the subject of the present enquiry that the investigations of scientific and

practical men have made certain and satisfactory, leaving to others, whose powers of mind, and range of observation are greater than my own, the task of elucidating and developing many important and deeply interesting questions connected with the natural history of coal that are at present obscure and problematical.

I think it will help in the recollection of the subject if I place my observations under the following heads:

First—The geological formations with which coal is usually associated, with some remarks on their character and mode of deposition.

Second—The composition of coal and the circumstances under which it is found.

Third—The present position of coal, and the changes to which it has been subjected.

Fourth—Some general and miscellaneous remarks suggested by the subject, that cannot properly be arranged under either of the above heads.

(1.) Under the first head your attention must be called to the fact that the geological range in connection with the natural history of coal extends from the top of what is called the upper silurian strata to the base of the permian or new red period, a range which embraces the most important, the most wonderful, and the most interesting period of the past geological history of our planet.

Comparing the various rocks of which our earth is composed to the leaves of a book, there is no part of that book more interesting to the philosopher, more important to the student, and more valuable to us all, than the carboniferous range.

The rocks of which the earth is composed, from the ancient granites which form the loftiest mountain ranges of the world, and which often (as in the Himalayas of Asia, the Andes of South America and the Alps of Europe) send their peaks through the clouds, to the recent tertiary strata that form the plains of the North-West Territories of the Dominion of Canada, may be regarded as so many tablets on which the Great Architect of the Universe, has written with the finger of infinite wisdom, and almighty power, the history of the world; and evidently it is the design of the Great Creator that His intellectual creatures should investigate, read and learn the handwriting that is to be found upon the rocks for themselves. It is not merely the language of poetry, but of fact, that we have

"Sermons in stones, and good in everything."

In speaking of those rocks that form the base of the carboniferous or coal-bearing strata, it is well to remark that, while as a rule the mountain limestone usually forms the base, basin or trough in which the coal strata lies, in many parts of the world this great geological formation is absent, while in other cases, both the mountain limestones and the old red sandstones are absent, and we have the coal resting directly on the silurian rocks. This is the case in the marvellous coal field of South Staffordshire, England, and the investigations of Prof. Jukes in connection with this subject, have shown that, while the old red, and lower carbonaceous rocks of the rest of England were being deposited, there was a belt of country stretching from Shropshire, through South Staffordshire, and into Warwickshire that was dry land, and formed an island in that ancient sea.

By observations like these, important facts are arrived at, and the geological history of our earth is developed with as much certainty, and accuracy as the motions of the heavenly bodies, or the results of mathematical calculations.

In Scotland, on the other hand, the coal measures rest on the old red sandstone, the mountain limestone being absent, and this, together with several other facts, prove that the Scotch coal fields are of prior date to most of the English and Welsh coal fields.

The coal fields, including that of South Wales, Dean Forest, Gloucester and Somerset, have many geological features in common, and were evidently formed at the same time and under pretty similar circumstances. Each of these coal fields rests on a base of old red sandstone, a siliceous coarse red and brown conglomerate rock of immense thickness, in many cases from 8,000 to 10,000 feet in thickness.

This rock is peculiarly barren of fossils in this district, though rich in this respect in Scotland, and many other parts of the world, thus giving evidence of having been found in comparatively a shallow sea and during a very rough and stormy period of the world's history. The character of the fossils that have been found, the angular and breccian character of many of the beds that compose this formation, show that where the old red sandstone was formed, the earth was much shaken by volcanic action and the sea agitated by terrific storms. Upon the old red sandstone (in the southern coal fields) rests the carboniferous or mountain limestone, which is from 600 to 1,000 feet in thickness, consisting of dark shales, with immense bands of lime rock. This huge mass is full of organic remains of the most wonderful and beautiful character, and not the least striking and important feature in connection with this formation is the fact that in passing from the old red sandstone to the mountain limestone, a distance of only two or three feet, will suffice to carry you from a very barren strata in regard to fossils to a formation so rich in the evidences of organism and life as almost to baffle our powers of belief.

It is an interesting and important enquiry as to whether the absence of fossils in one strata, and their abundance in the other, is due entirely to the original absence of life; or the subsequent obliteration and destruction of the evidences of that life? Probably both causes have helped to produce this result, for the period of the formation of the old red sandstone was peculiarly unfavorable to the existence of life; and its chemical composition is also most unfavorable to the preservation of life.

(2.) As to "the composition of coal and the changes to which it has been subjected." The vegetable origin of coal has been for many years doubted and disputed, but the evidence on this point, has been so overwhelming and conclusive, that no one of any scientific knowledge now doubts the truth. Among the proofs that can be given of this fact are:

First—That coal contains the same chemical constituents as vegetable products.

Second—That the results of its decomposition and destruction is to produce the same elements.

Third—Coal can be traced through all its stages from vegetable fibre to peat, lignite, brown coal, jet, bituminous coal and anthracite—the different classes of substances chiefly differing in the proportions in which their elements are combined, and especially in the different proportions of carbon they contain.

Fourth—The remarkable traces of vegetable remains in coal, especially in the overlying shales, is proof positive that coal is of vegetable origin.

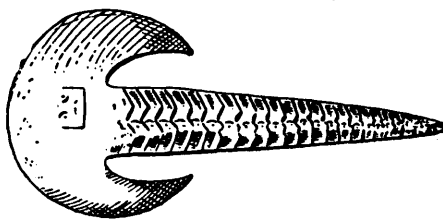
Assuming that this point is admitted without further argument, let us consider the way in which the great mass, or carboniferous, or coal-bearing strata, was deposited. This formation

of strata is, generally speaking, from 10,000 to 12,000 feet in thickness, taken from its base at the top of the "grit" to the surface of the carboniferous beds, which usually lie unconformable to the new red sandstone. This gives a total thickness of over two miles of coal-bearing strata.

The number of workable seams of coal in different sections of England and Wales (only including those above 2 feet in thickness) are between twenty and thirty in number, and the aggregate thickness of the whole is from 90 to 100 feet, or say 10 feet of coal to every 1,000 feet of carboniferous strata. In the southern coal field it is estimated that the entire thickness of the coal-bearing ground is about 6,000 feet, or a little over one mile in thickness, while in the centre of the Somersetshire coal field (Mr. Radstock) it is about 8,000 feet, or over $1\frac{1}{2}$ miles. There are 27 workable seams of coal at the northern end of this coal field, of an aggregate thickness of 61 feet.

The percentage of coal to coal strata in the Bristol and South Wales coal fields may be taken as nearly equal, the difference in the two fields being rather commercial than geological. In one case in South Wales the seams are fewer, but thicker, more regular, and for steam purposes superior in quality to those of the Bristol coal fields.

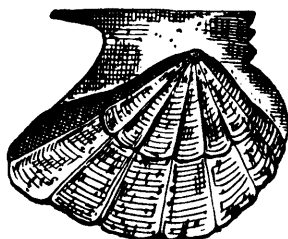
The question now is, how this mass of vegetable matter we call "coal" and the matrix or coal strata in which it lies embodied was deposited. For many years it was supposed that all strata in which coal is found was of fresh water origin; but this theory always appeared to contain many difficulties which could not be very well explained. For instance, take the great coal field of Central America, extending, as it does, over an area greater than the whole area of the British Isles, or about 150,000 square miles. The formation of this immense deposit would have required a lake six or seven times larger than the whole of the present vast American lakes united. Of course this is not impossible, but it appears to be highly improbable; and the discovery of marine fossils in the coal strata, has removed some very great difficulties out of the way of our present enquiry. In the northern coal fields there have been discovered in the shales overlying some of the coal seams, the remains of fishes and shells, such as the



Cephalopodous

fish (about $6\frac{1}{4}$ in. long), which is an extinct soft-bodied creature, with the organs of motion arranged round the head.

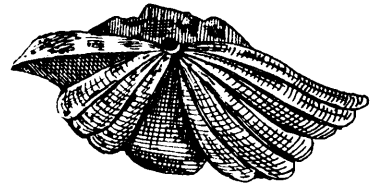
Then the *Avicula pecten* is another of the



Mollusca.

fauna found in the northern coal shales. They, too, are of marine origin, and are bivalves of the conchiferous order. This class includes that numerous family of mollusca that have shells for their protection like oysters.

Spirifer have also been found in the coal beds



Mollusca.

in Scotland, and as all these fossils are of marine species there is no resisting the conclusion that most, if not all, our coal strata fossils are either of marine or semi marine origin.

At the same time the smooth, fine-grained and beautifully laminated shales of our coal formation show that its deposition was free from those violent agitations of sea action which marked the period of the old red sandstone. And, looking at all the evidence afforded, both by the fossiliferous and chemical character of our coal shales, it looks as if it were due to depositions placed in vast lakes or inland seas, which formed receptacles for land floods and river drainage, and at the same time were open to tidal action of the sea. This view removes a mass of difficulties that otherwise would stand in our path, and makes the question much clearer and freer from doubtful hypothesis.

Having arrived at the conclusion that coal is a vegetable formation and coal shales (or the matrix in which coal is found) are of marine or semi-marine origin, we are now in a position to enquire how the coal beds and the shales came into their present position and relationship, and in no way can the phenomena be accounted for but upon the following principles:

First—That each bed of coal once formed, the surface of the ground.

Second—That there was a gradual depression or alteration of level that gave an opportunity for the deposition of the intervening strata.

Third—This theory, of course, supposes that the depression or sinking of the strata was stayed periodically for a sufficient length of time to allow each coal bed to form.

And this, again, involves a fourth point, namely, that the process must have been slow and gradual, and the period required to form the whole immense.

To make the matter clear as to the process by which coal was formed, it is desirable to begin at the first or lowest bed of the series, and will again refer to the strata of 6,000 feet before mentioned. In the centre of this southern coal field the veins lie at a depth of 5,000 or 6,000 feet (or over one mile) below the level of the sea, and yet according to the theory propounded the present position of this bed of coal must have been once the surface of the ground and the site of a vegetable formation that baffles conception or description. And when it is understood that the thickest forest the world has ever seen would hardly suffice to produce a bed of coal 3 feet thick the wonder is increased.

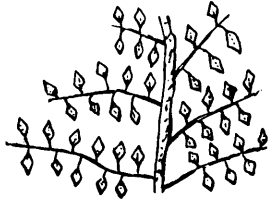
Further on reference will be made to some of the atmospheric and other conditions that probably assisted in the production of this marvellous flora, but for the present we will confine attention to the formation of coal rather than the peculiar circumstances under which it was formed and the flora of which it is composed.

The reader will please suppose a luxuriant, rank and peculiar tropical vegetation, covering the surface of the ground on which it grew in vast abundance and great variety—ferns (the largest number of species of which are now extinct), over 200 species of which have been discovered in the different coal fields in the world. Then judge of the vast preponderance of this

flora in the carboniferous era. The whole British Isles to day only produce about 50 species now of ferns.

The most numerous family were the *Pocopteris*, or comb-leaf fern, of which there are in the coal measures about 60 species.

Spenopteris, or wedge-leaf fern, of which there



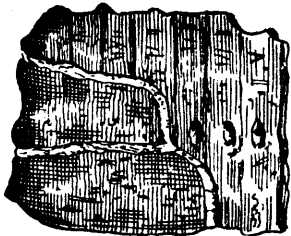
about 28 species. This plant has a wedge-shaped leaf.

Neuropteris, or nerve-leaf fern, of which there



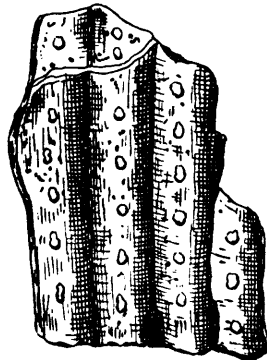
are about 25 species. The best illustration of this class of flora is to be found in Ceylon, the islands of the Pacific and the Indian Archipelago.

Calamites, a reed. These are very abundant



in the coal measures. They are reedlike in form. This family are now found from the extreme north to the equator, but they differ essentially from the fossil calamite, in the absence of a sheath that encircles the present trile at the joints. The calamite generally occurs leafless, and in the fossil state often reaches from 20 to 40 feet in height.

Sigilaria, a seal, so called from the seal-like impressions on its trunk; roots or trees grow from 30 feet to 70 feet high, and from 1 to 5 feet diameter.

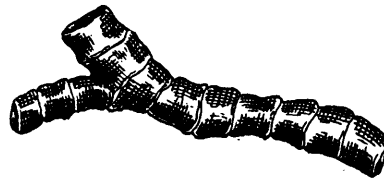


Stigmaria, roots of the *Sigilaria*.

The *Sigilaria* is a most important and abundant species. This plant was the most abundant and probably the most remarkable of the carboniferous period. About 60 species have been discovered. They had a conical stem; deeply

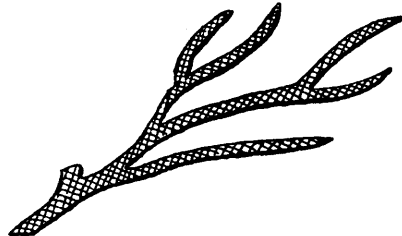
furrowed; not jointed with scars; each furrow arranged in vertical columns. The scars are supposed to be the point at which the leaves of the tree were connected with the stem. The height of these trees often reached 60 or 70 feet, and they have been discovered 7 or 8 feet in diameter at the base, and sometimes standing in an upright position. The plant called the *Stigmaria*, of which the underclay of nearly all coal seams is full, is now proved to be the root of this important plant. There are no living species with which we can identify the *Sigilaria*. Brongniart, the French naturalist, has, however, discovered, by a very careful examination of the tissues of the plant, that it belongs to a peculiar family of "coniferous trees," and was therefore of a high order of vegetation.

Lepidodendron, or scale tree, was another



abundant and large sized plant of the carboniferous age. These trees have been found in many places from 30 to 40 feet in length, and, notwithstanding their vast size, Brongniart has shown that this species belong to the *Lycopodium*, or club moss species of our own heaths.

Lycopodium—



Natural size.

But the largest species now known are in New Zealand, and there they only reach the height of 2 or 3 feet. There are about 40 species of this in the fossil flora. The stem looks scaly, hence the name, and may be easily distinguished. The trunks of this plant often con-



tain seed vessels called *Lepidostrophi*, and these seed vessels are found parallel to the tree.

The presence of coniferous trees, which are allied to pine more than the European firs (no sketch) prevents classing the coal flora as low in the scale of vegetable structure, the coniferous ranking high; thus proving that, while no doubt the great bulk of the flora of the carboniferous period was of a lower organism than the present, that there was also flora of a high order.

Try to conceive the growth of these vast peadomite forests, covering, as they did, the marshy, low, swamps of our globe, and that through these forests there crawled few reptiles, whose remains

have come down to us, with some few insects or other creatures.

Try to think of this dense, dark, untrodden, unexplored forest, growing for years and centuries, perhaps, to the wonder of the beings who inhabit other worlds, to whom, perhaps, the Almighty explained that in ages yet to come He was going to create a being to inhabit this world whose organism and wants would be different to theirs, and that one of his wants the mineral we call coal; and that these forests were to be covered up, so that in their decay and preservation this future want of the future inhabitants of our world might be supplied (this ought not to be regarded as fancy); and then think of vegetation being submerged and covered with a fine muddy deposit, which, when hardened, formed our coal shales.

Think of this, and you will understand how the formations of coal and the strata of coal in which it is embedded are formed.

And the vegetable formation having become sufficiently extensive and dense, a sinking of the country takes place, and over the vegetation which has been described the sea flows, and vast rivers and streams from the adjoining country pour in their waters, bearing in their course the detritus of the rocks over which they have passed. This deposit, with portions of the vegetable structure which it covered, formed the black, grey and white carbonaceous deposits called coal shales.

(To be continued.)

The Utility of Mica for Electrical Purposes.—Mica is used very largely in connection with electric plants. Its lightness and value as an insulating material has, especially for commutator use in dynamos, motors, &c., superseded all other materials. The color of the mineral, unless largely caused by iron association, does not affect its value for electrical uses.

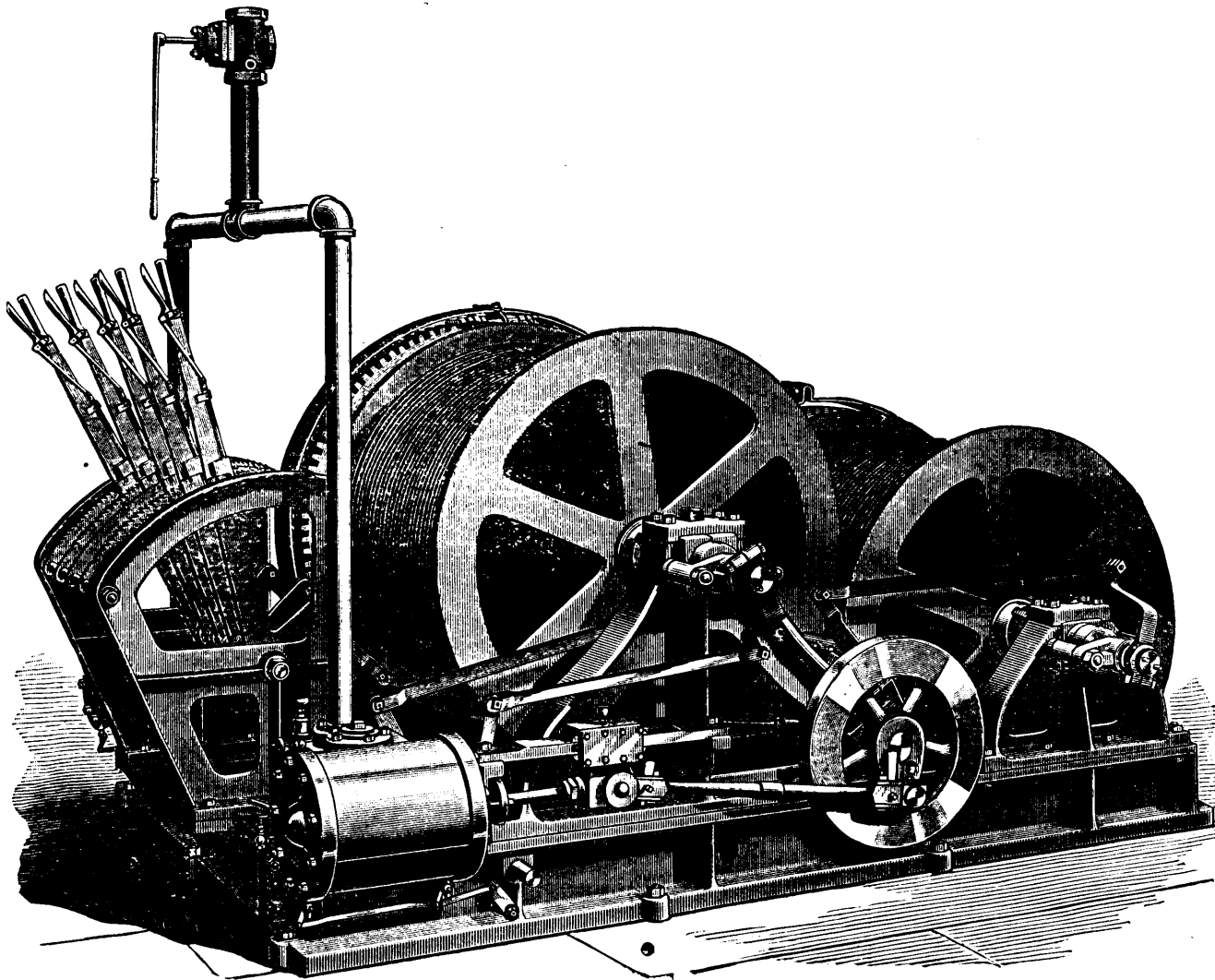
A Mechanical Slate Picker.—There are half a dozen devices patented, some of them being in successful operation, for separating the slate from the coal in our breakers. Of all inventions, the simplest yet planned is that recently exhibited as the joint contrivance of Mr. Thomas E. Phillips, superintendent of the Lehigh and Wilkes-Barre Coal Company, and John E. Evans, a miner of Wilkes-Barre. The apparatus is the perfection of simplicity. A common chute having a sheet-iron bottom, is placed beneath the screens, and into this the coal and slate fall. Four or five feet down the screen the bottom bulges up in a sort of ridge crosswise of the chute. The sliding pieces of coal and slate are slackened in their speed by this ridge. Just below the ridge there is a hole through the bottom of the chute, crosswise, and six or eight inches wide. Beyond this opening the bottom of the chute consists of a piece of sheet iron, which may be moved so as to leave the opening narrower or wider. This piece may also be raised or lowered. The sliding pieces of slate, being heavier and rougher than the coal, move more slowly, and, on striking the ridge, are slackened in their speed so that they drop through the opening. The coal being lighter and more glassy, slides so swiftly as to jump over the opening and continues on down the chute into the bunkers. The appliance is a wonder of effectiveness, simplicity and cheapness, its cost being little more than a plain chute. It is to be put into one of the large breakers for a test, and its operations will be watched by all the superintendents of the anthracite region, as they have great confidence in it.

Lidgerwood Improved Hoisting Engines.

One of the best known establishments especially devoted to the manufacture of hoisting machinery and boilers in the United States, is that of the Lidgerwood Manufacturing Company, 96 Liberty street, New York, N.Y. This firm manufacture a great variety of hoisting engines, with and without boilers, single and double, for mining, manufacturing and general hoisting purposes; also hoisting locomotives, improved pile-driving derricks and high-speed geared coal hoisting engines. By additions of special tools

engine is used largely, and is recommended for use in connection with the tail-rope system, double track inclines, or double compartment shafts. It is also especially well adapted for hoisting and conveying material by means of a suspended wire cable. Both drums are loose on the drum shafts, and entirely independent of each other in operation. They may be thrown in and out of gear with the engines in motion, either separately or together, or one drum may be lowering while the other is hoisting; or both drums may be thrown into gear, and the engine used as a regular reversible engine, one load being hoisted while the empty cage is being lowered. The obvious advantage of this style

reversible link motion hoisting engine) made by this company in the position of the friction drums and the arrangement of the brake levers for handling same. The patent friction drums are of large diameter, and placed one ahead of the other. This arrangement of the drums admits of leading the ropes nearly straight to the head frame, and will be found suitable for those places where the former engine will not answer on account of its width. The drums are spirally grooved for wire rope, and simple, durable and effective. The reverse friction and brake levers are placed in front of the engine, arranged to work in a vertical position, and have the usual thumb-latches engaging with notched qua-



LIDGERWOOD IMPROVED HOISTING ENGINE FOR MINES.

and labor-saving appliances and improvements and alterations in designs they have increased the good quality of their machines, and now offer them as the standard, modern high-speed hoisting engines, both as regards high duty and economy, durability and simplicity, combined with ease and rapidity of operation. A type of hoisting engine manufactured by them, which is especially adapted for mining purposes, and which is meeting with great success throughout the mining regions of both North and South America, is shown in the engraving on this page, which represents their improved double-friction drum and brake, and reversible link motion-hoisting engine for mining work. This

of engine for the tail-rope system is evident, for as one drum being thrown into gear winds up the main rope, the other drum being out of gear and loose on the shaft pays out the tail-rope, while by reversing the engine the tail-rope is wound up and the main rope paid out. This is done with the minimum of friction and wear on the engines. The same independence of drum action is also very desirable at times on inclined and mine shafts, under either of which condition the engines will work with perfect satisfaction. In general design the engine is solid and compact, and is intended for high speed and large hoisting duty. It differs from the original style (double-friction drum, and brake, and re-

drants, so that they will stay in any position desired. This is a great convenience, and contributes materially to the easy and rapid handling of the machine. The brakes are of the band type, and are self-acting and very powerful, so that they simply have to be applied by the hand levers and do not require any great pressure. There are over 5,000 hoisting engines manufactured by the Lidgerwood Manufacturing Company in use, and all give perfect satisfaction.

The company have just issued a new catalogue, finely illustrated, describing their various styles of engines, which they will be pleased to send to those making application for same.

The Yukon Gold Region.—From the Report of the Minister of the Interior just published we learn that recent exploration has shown that this district has a much greater value than was previously supposed. It would seem that for gold the best paying streams so far as discovered are in Canadian territory. About 300 miners were in the country in the summer of 1887, but it is difficult to say what amount of gold they have taken out, as they are somewhat reticent on the subject. They all agree, however, that \$8 per day is poor pay, hardly enough to cover expenses. Taking this as an average, they cannot have made less than \$500 each, or \$150,000 altogether. Obtained with the crudest and most primitive appliances this result shows what may be expected so soon as communications with the interior become more easy, and the importation of improved mining machinery possible. Drift coal was found at various places, indicating the existence of seams further up.

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SEALED TENDERS addressed to the undersigned, and endorsed "Tender for Post Office, etc., Almonte, Ont.," will be received at this office until Wednesday, 24th April, 1887, for the several works required in the erection of Post Office, etc., Almonte, Ont.

Specifications can be seen at the Department of Public Works, Ottawa, and at the office of Mr. Andrew Bell, C.E., Almonte, on and after Wednesday, 10th April, 1889, and tenders will not be considered unless made on form supplied and signed with actual signatures of tenderers.

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

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

By order,
A. GOBEIL,
Secretary.

Department of Public Works,
Ottawa, April 4th, 1889.



Notice to Contractors.

SEALED TENDERS addressed to the undersigned, and endorsed "Tender for Toronto Works," will be received at this office until Friday the 3rd day of May next inclusively, for works at the Eastern entrance to the harbour of Toronto, in accordance with the plans and specification to be seen on and after Friday, the 19th inst., at the office of the Resident Engineer, 25 Toronto Street, Toronto, and at the Department of Public Works, Ottawa.

Intending contractors are requested to bear in mind that tenders will not be considered unless made on the printed forms supplied and accompanied by a letter stating that the person or persons tendering have carefully examined the locality, have satisfied themselves as to the nature of the materials to be dredged, and the facilities which exist for procuring the materials required for crib-work, etc.

Tenders must be signed with the actual signatures of the tenderers.

An accepted Bank cheque, not limited as to time of payment, for the sum of \$20,000, payable to the order of the Minister of Public Works, must accompany each tender. This cheque will be forfeited if the party declines to enter into a contract when called on to do so, 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, 15th April, 1889.



TENDERS.

SEALED TENDERS addressed to the undersigned, and endorsed "Tender for Indian Supplies," will be received at this office up to noon of

THURSDAY, 9th MAY, 1889,

for the delivery of Indian Supplies during the fiscal year ending 30th June, 1890, consisting of Flour, L'acon, Groceries, Ammunition, Twine, Oxen, Cows, Bulls, Agricultural Implements, Tools, &c., duty paid, at various points in Manitoba and the North-West Territories.

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

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

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

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

The lowest or any tender not necessarily accepted.

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

L. VANKOUGHNET,
Deputy of Superintendent-General
of Indian Affairs.

Department of Indian Affairs,
Ottawa, April, 1889.

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OTTAWA.

INSOLVENT NOTICE.

In the matter of **BRADFORD L. NOWELL & Co.**, of the City of Montreal, Insolvents.

Lands and Phosphate of Lime Mining Rights in the Province of Ontario and Quebec for Sale by Authority of Justice.

I am instructed by the undersigned Curator to sell by Public Auction, within my Sale Rooms, No. 1747 Notre Dame St., on

Tuesday, the 28th day of May next,

At 11 o'clock in the forenoon,

All and singular those certain tracts or parcels of land and premises situate, lying and being in the Township of Loughborough, in the County of Frontenac, in the Province of Ontario, and more particularly described as follows, to wit:

Lot No. 1.

Ninety acres, more or less, of the North part of lot Number Six, in the Tenth Concession of the said Township, described as follows: commencing at the North-East angle of said lot, thence West the width of said lot or thirty chains, thence South along the side line thirty chains, thence East thirty chains, thence North thirty chains to the place of beginning. Together also, with all mines and quarries of metals and minerals, in or under the land upon that portion of said lot being West of the West Bay or Gold Lake, whether already discovered or not, with liberty of ingress, egress and regress for the purpose of removing the same only.

Lot No. 2.

All the Phosphate of Lime in and upon lot Number Ten, in the Eleventh Concession of the said Township of Loughborough, with full, free, irrevocable sale and exclusive license to mine and work all and every or any of the mines, veins and seams of Phosphate of Lime opened as well as unopened in, under or upon the said lot with out any interruption, claim or disturbance from or by the Proprietor of said lot or any other person whomsoever, and to carry away and dispose of all such Phosphate of lime as may be found therein, to and for their own use and benefit and for the purpose aforesaid to sink and make shafts, pits, levels, trenches, ways, gates and watercourses, and to erect and use any machinery, workmen's or other houses, and to use all lawful ways and means whatsoever for finding and removing the said Phosphate, and also to take and use sufficient ground-room, heaproom or pitroom, for placing the said Phosphate and for leaving the waste, refuse or rubbish to be from time to time produced from the said mines, and also with the full and free liberty to erect, construct or use any part of the said premises, or any roads or ways therein for any purposes connected with the said mines, and the removal, sale and delivery of the produce thereof, provided in so doing they do not injure the crops or other property on said lot.

Lot No. 3.

All the Phosphate of Lime and the full rights to mine the same in certain parcels or tracts of land situate, lying and being in the Township of Buckingham, in the County of Ottawa, in the Province of Quebec, comprising 200 acres more or less, and being west half of lot 21, and east half of lot 22, of the Eleventh Concession of the said Township of Buckingham. These rights are wholly undeveloped, no mines having as yet been opened on the property.

The lots will be sold separately, subject to existing mortgage and the reservations, limitations, provisions and conditions expressed in the original grant from the Crown.

Terms cash, or half cash, and the balance on approved security at three and six months.

All information can be had on application to the undersigned,

SAMUEL C. FATT,
Curator,

WILLIAM H. ARNTON,
Auctioneer.

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Montreal, 25th March, 1888.

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ASBESTOS.



Mining Regulations

TO GOVERN THE DISPOSAL OF

Mineral Lands other than Coal Lands, 1886.

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

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

QUARTZ MINING.

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

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

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

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

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

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

IRON.

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

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

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

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

PLACER MINING.

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

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

The Regulations apply also to

BED-ROCK FLUMES, DRAINAGE OF MINES AND DITCHES.

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

THE SCHEDULE OF MINING REGULATIONS

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

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

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

A. M. BURGESS,

Deputy Minister of the Interior.

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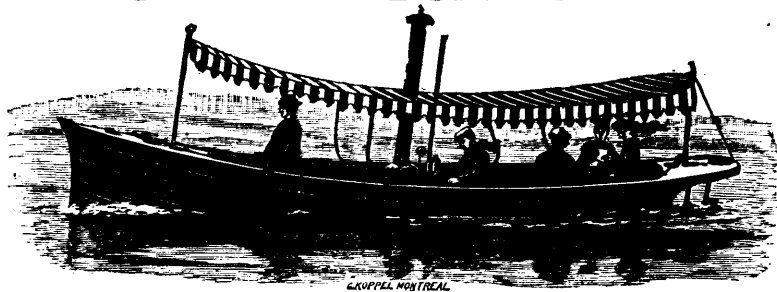
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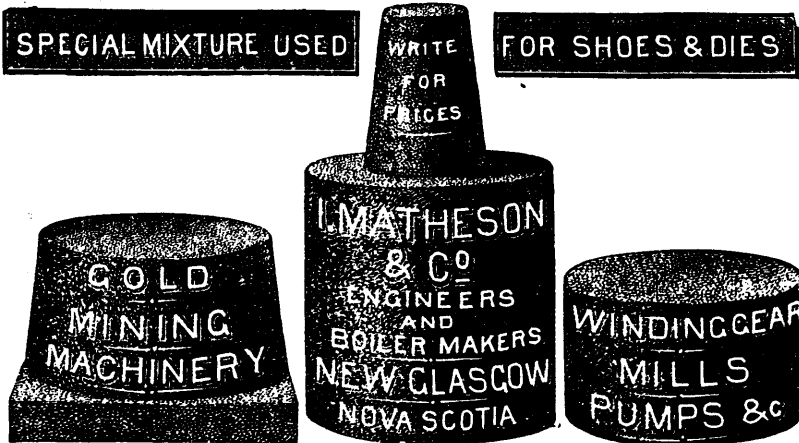
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**Mineral Lands
FOR SALE,**

IN THE TOWNSHIP OF BUCK-
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1st.—Lot 28, in the 6th range, containing 100 acres, in addition to the salina of the lake.

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

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

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

The Plumbago Deposits

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

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has also been discovered in quantity

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

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

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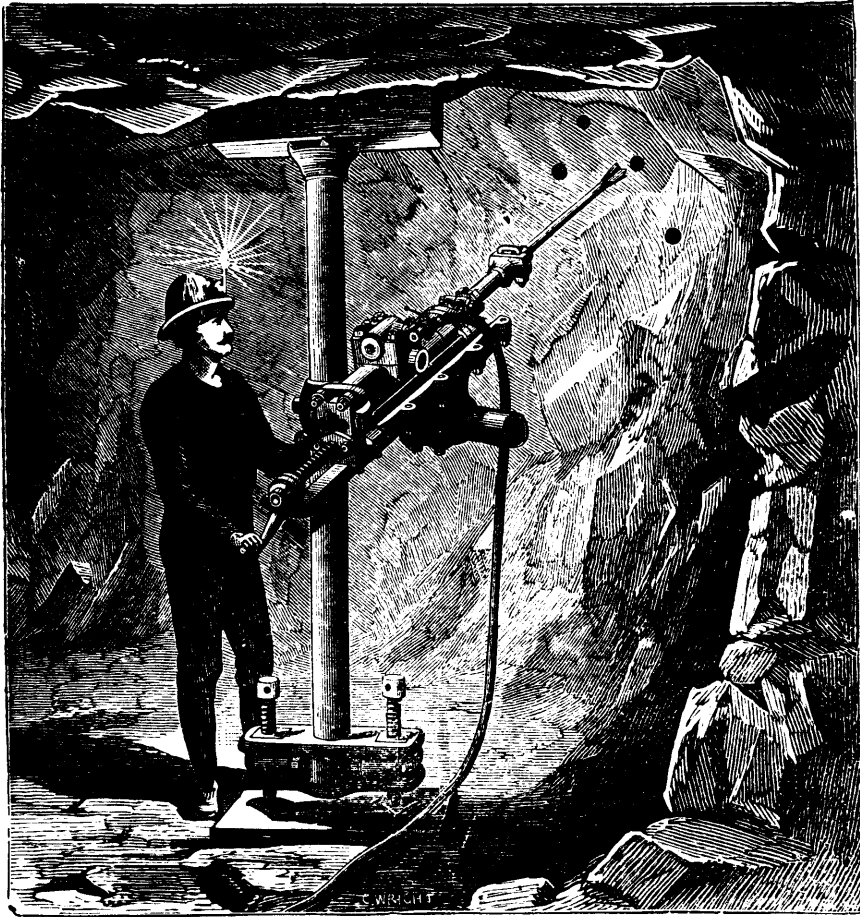
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DEPARTMENT
OF
Inland Revenue.

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 per-

centage of constituents mentioned in the manufacturer's certificate accompanying the same, shall be liable in each case to a penalty not exceeding fifty dollars for the first offence, and for each subsequent offence to a penalty not exceeding one hundred dollars. Provided always that deficiency of one per centum of the ammonia, or its equivalent of nitrogen, or of the phosphoric acid, claimed to be contained, shall not be considered as evidence of fraudulent intent.

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

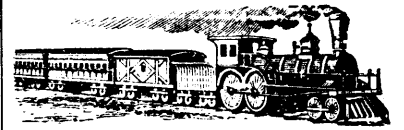
A copy of the Act may be obtained upon application to the Department of Inland Revenue, as well as a copy of a Bulletin which it is proposed to issue in April, 1888, concerning the fertilizers

E. MIALL,
Commissioner.

January, 1889.

PROPERTIES FOR SALE.

Parties having developed or undeveloped mineral lands for sale will find the REVIEW an admirable medium for bringing them before the notice of CAPITALISTS and INVESTORS in GREAT BRITAIN and the UNITED STATES.



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The Royal Mail Passenger & Freight
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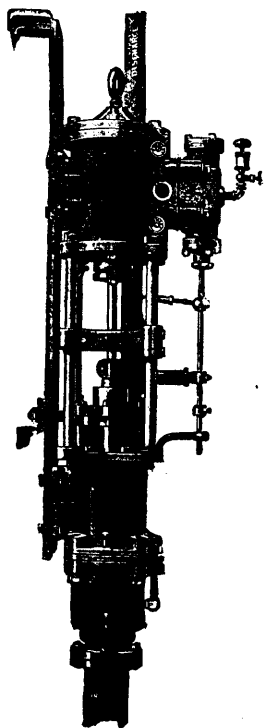
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| " 30, " " 40..... | 40c. |
| " 40, " " 50..... | 50c. |

For further information see OFFICIAL POSTAL
 GUIDE.

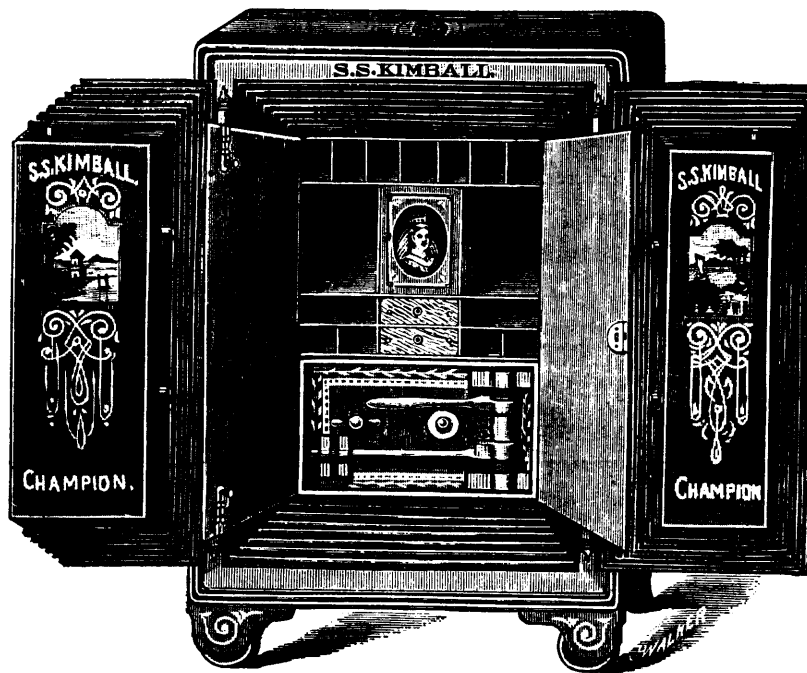
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STATE OF MAINE ASSAY OFFICE,
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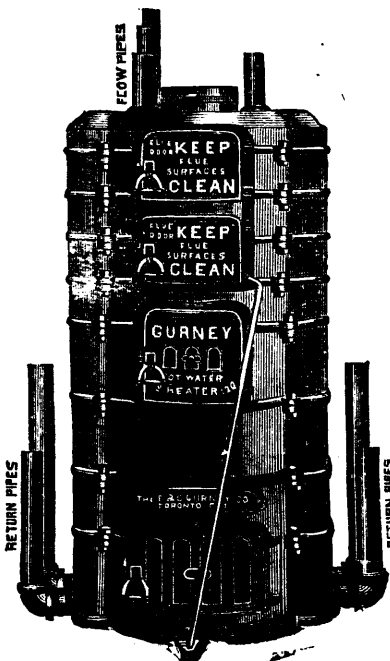
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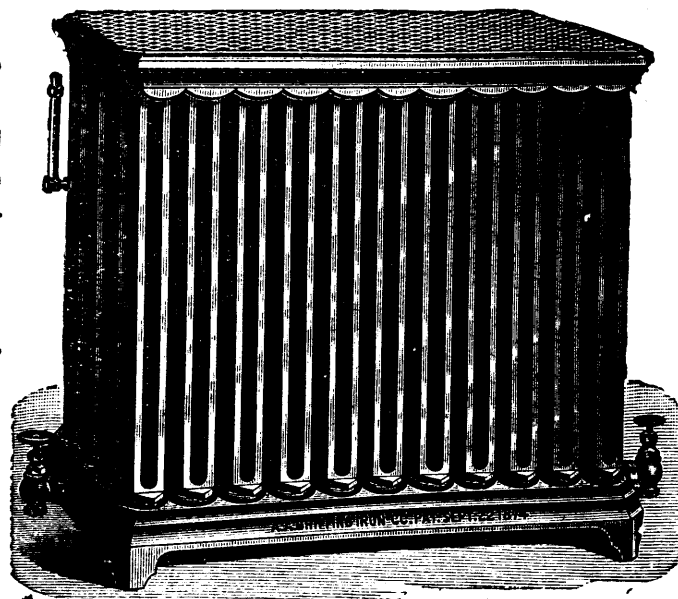
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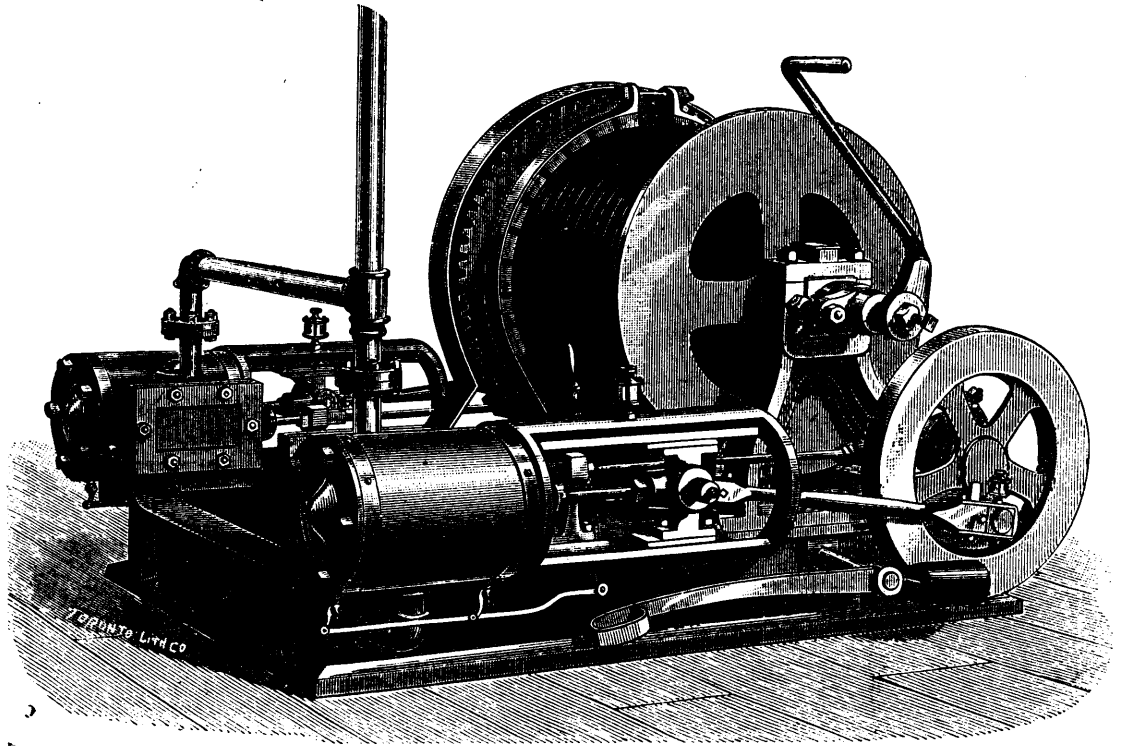
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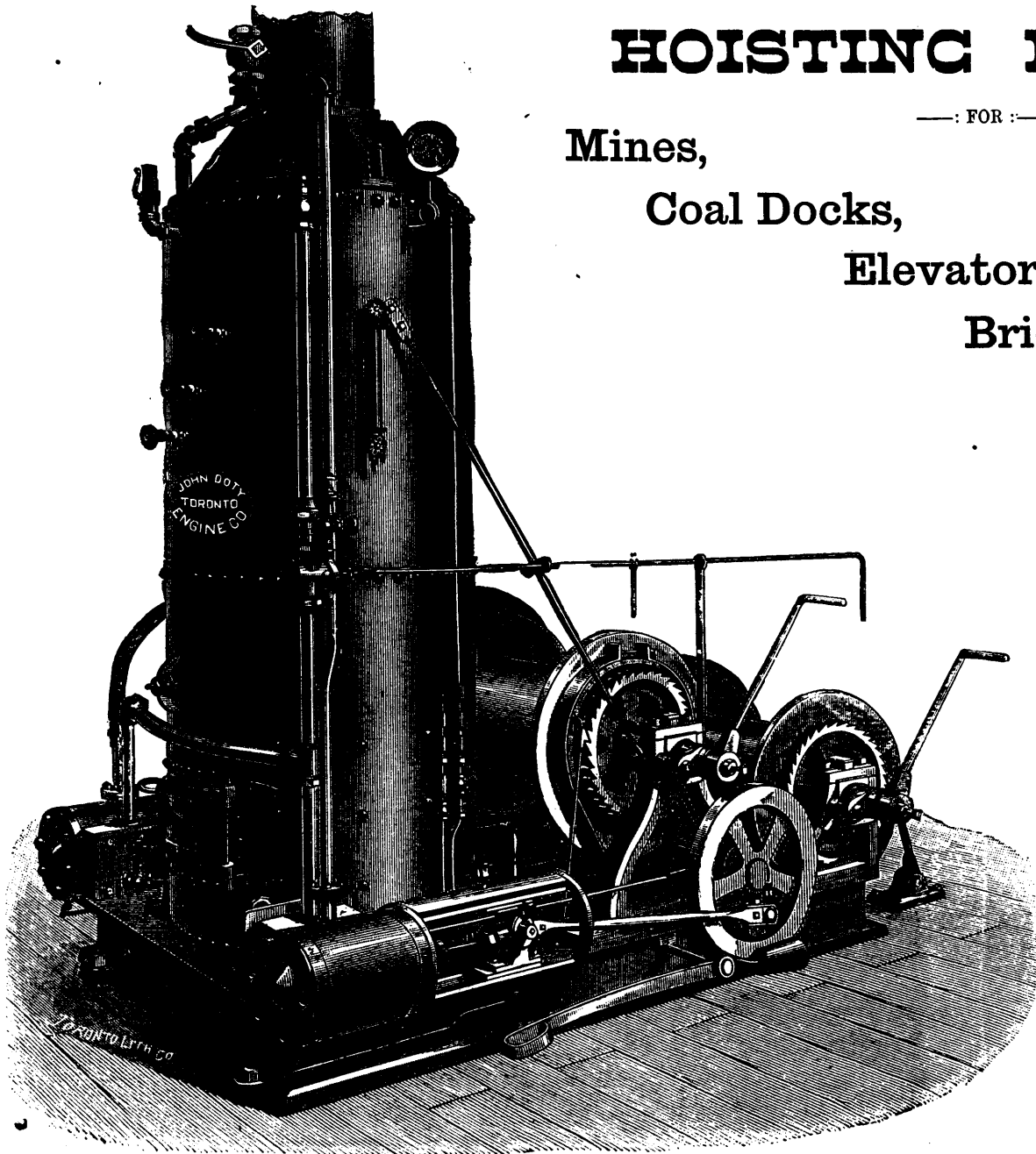
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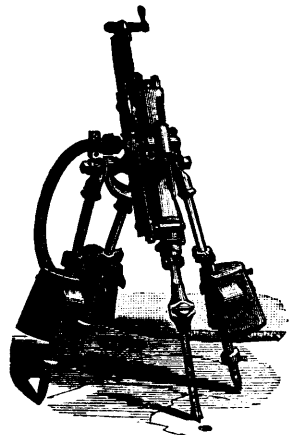
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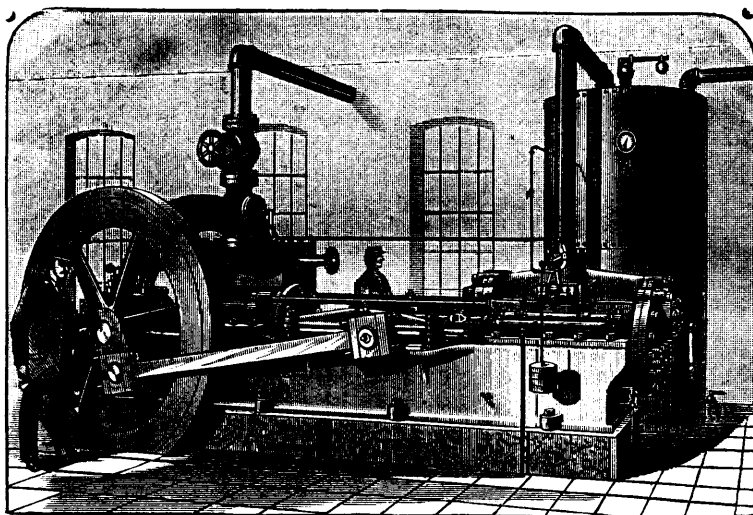
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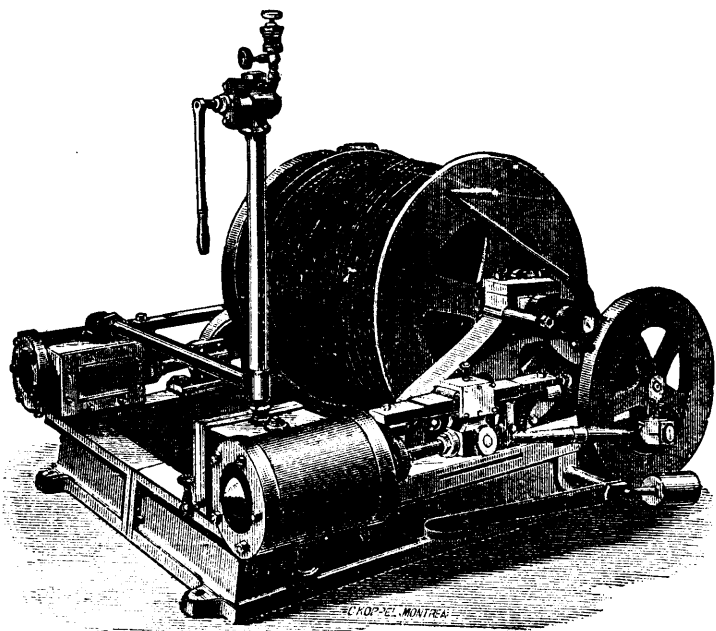


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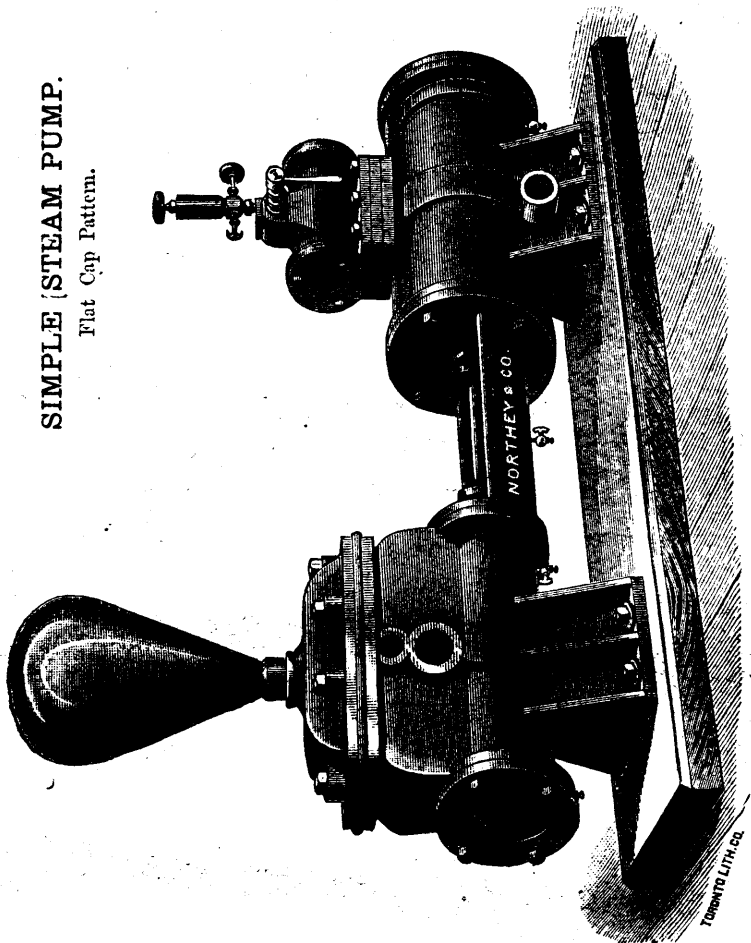
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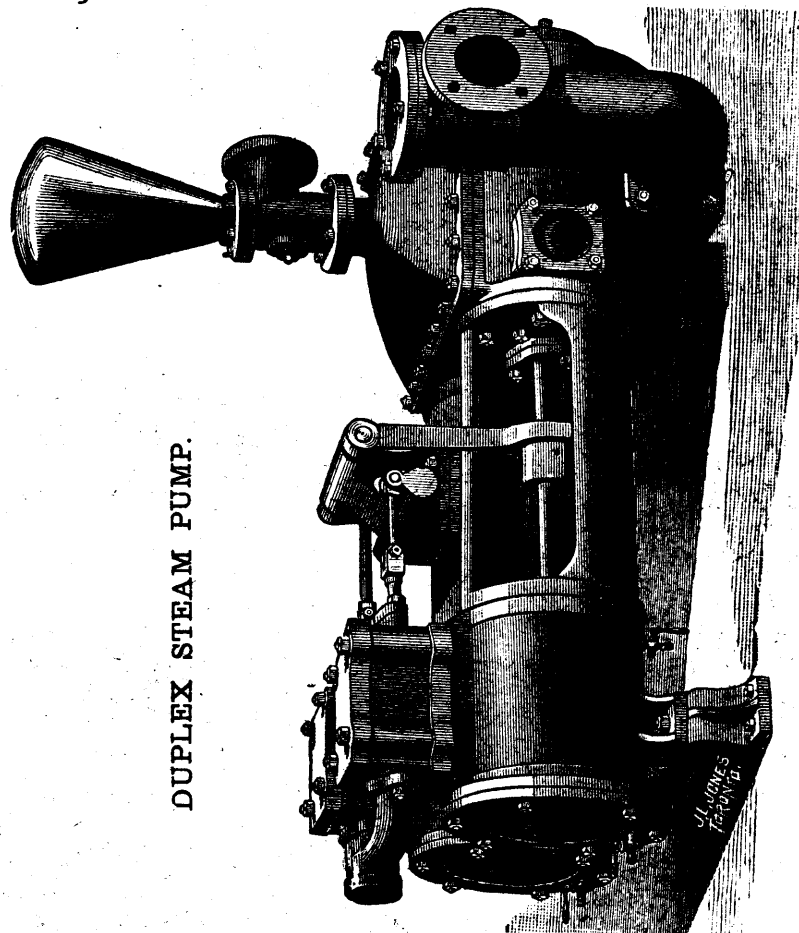
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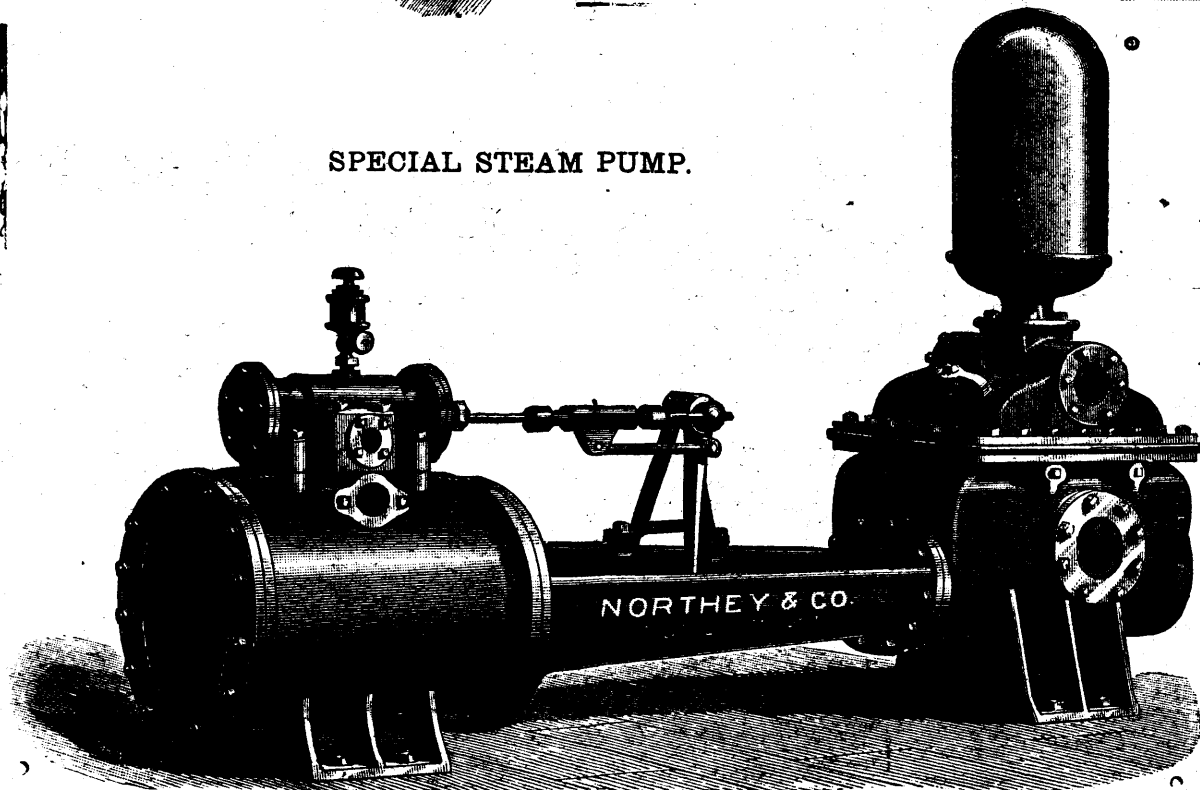
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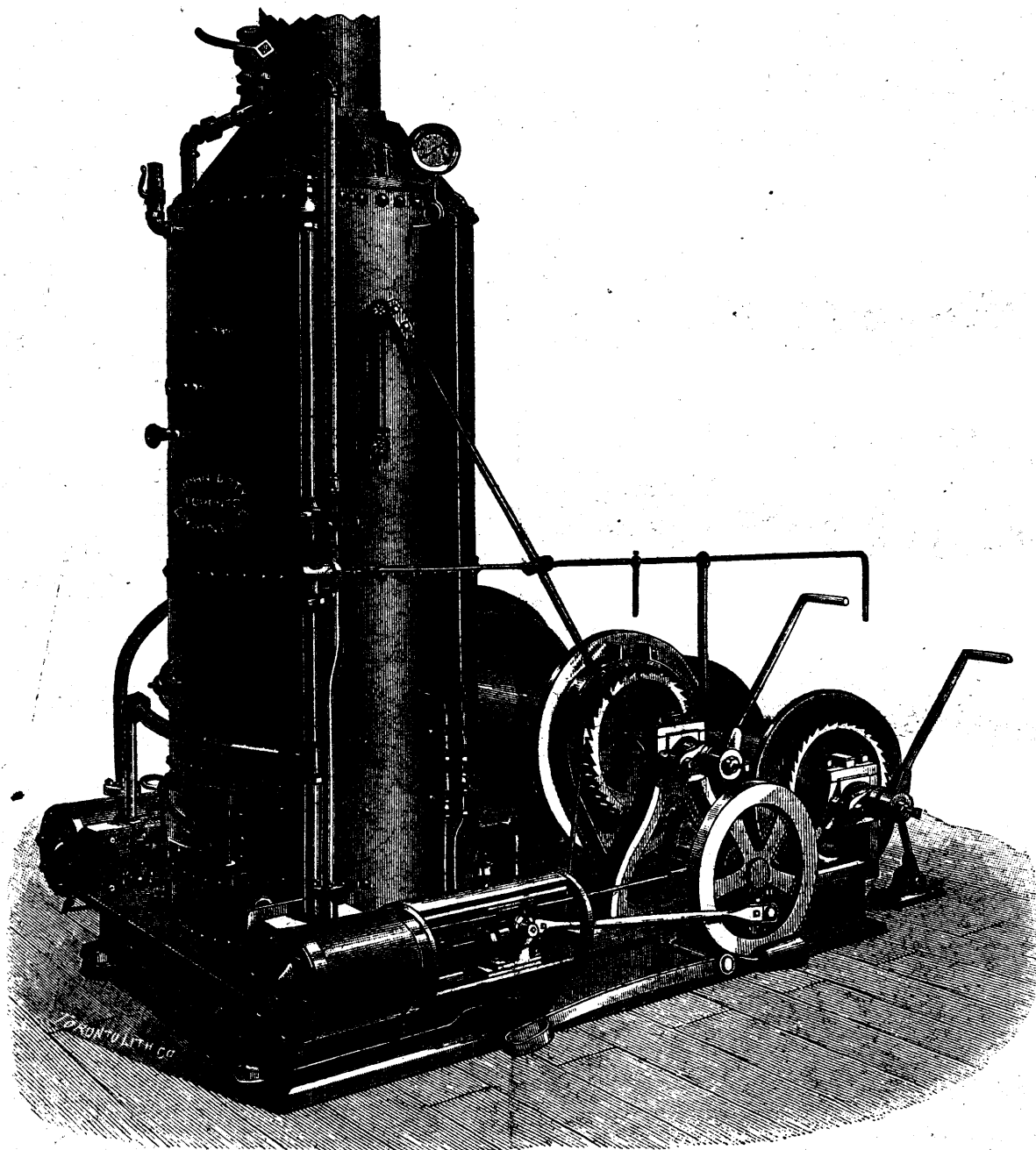
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