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The CANADIAN MINING REVIEW

Established 1882

Vol. XXIII—No. II.

OTTAWA, FEBRUARY 29th, 1904.

Vol. XXIII—No. II.

 <p>AIR COMPRESSORS GAS</p>	<p>THE CANADIAN RAND DRILL CO SHERBROOKE, QUE. BRANCH OFFICES IN MONTREAL, QUE. TORONTO, ONT. HALIFAX, N.S. ROSSLAND, B.C. RAT PORTAGE, ONT. GREENWOOD, VANCOUVER, B.C.</p>	 <p>ROCK DRILLS</p>
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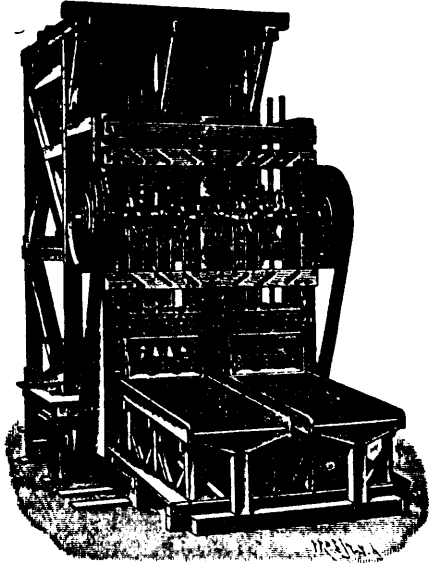
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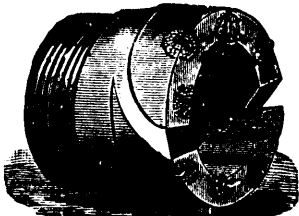
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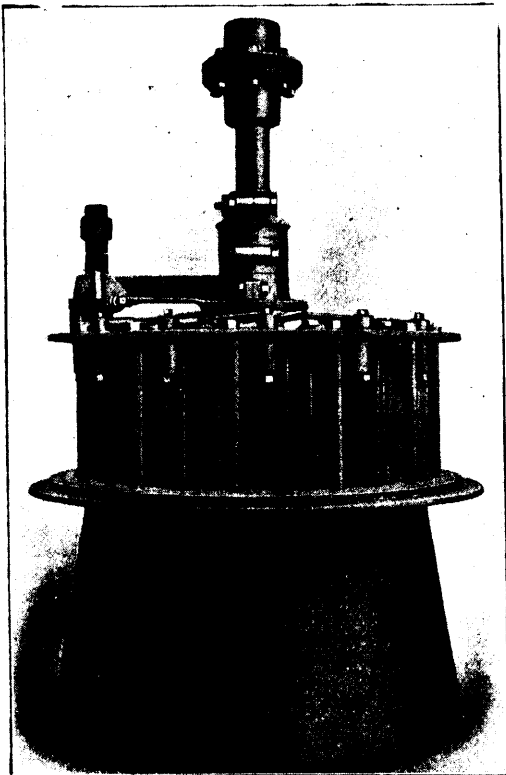
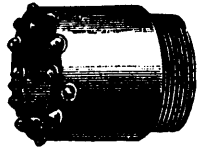
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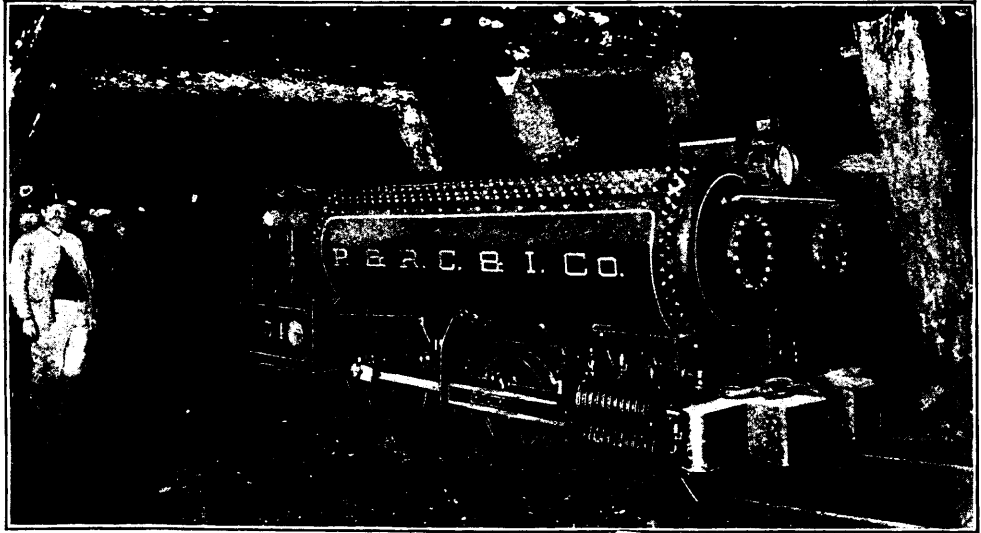
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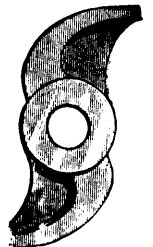
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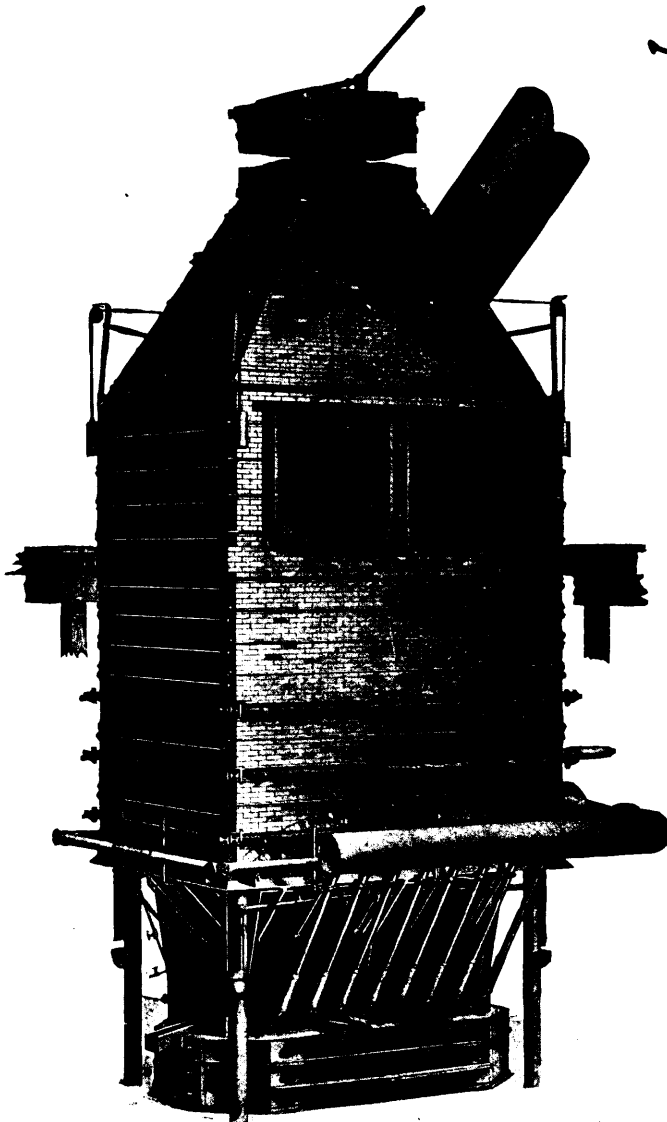
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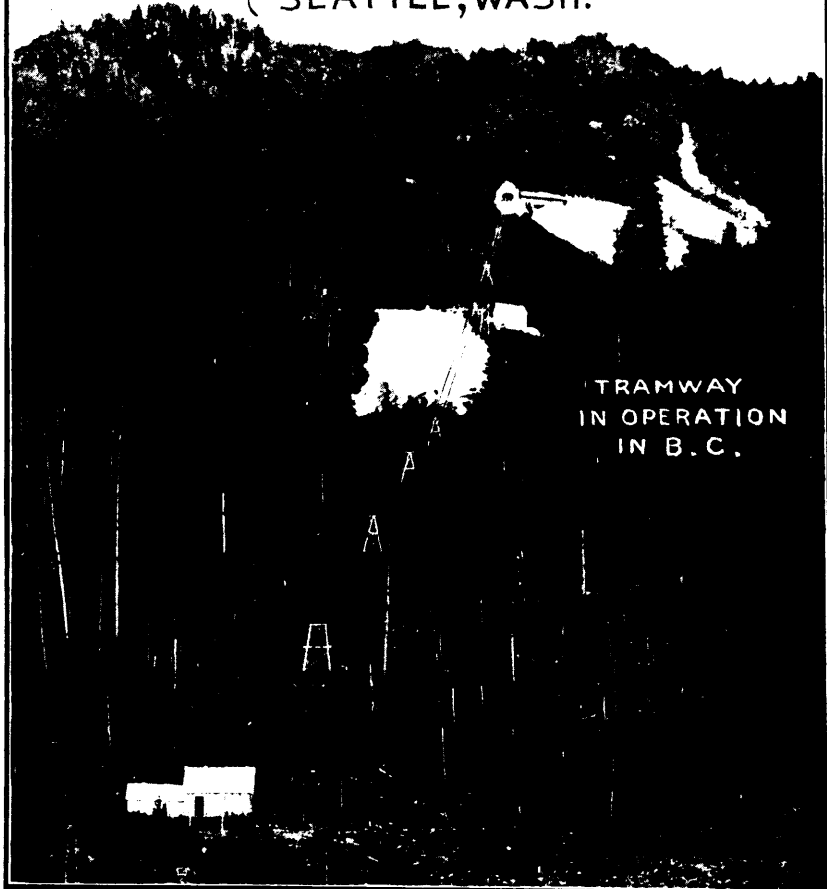
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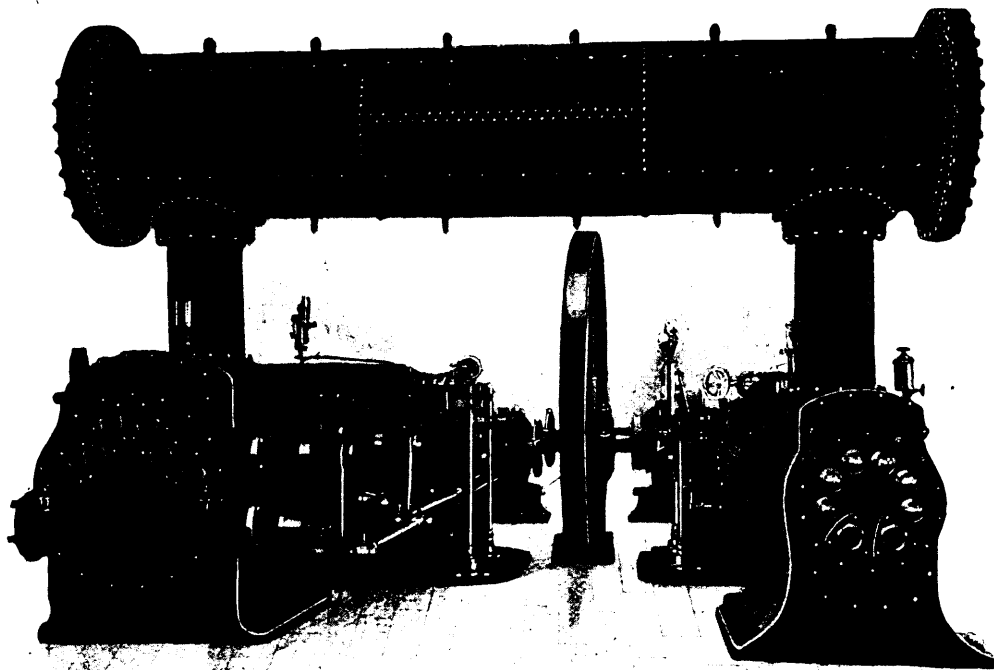
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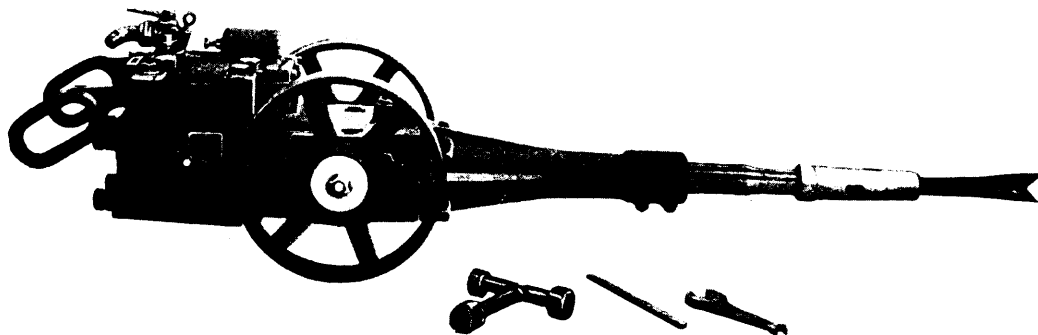
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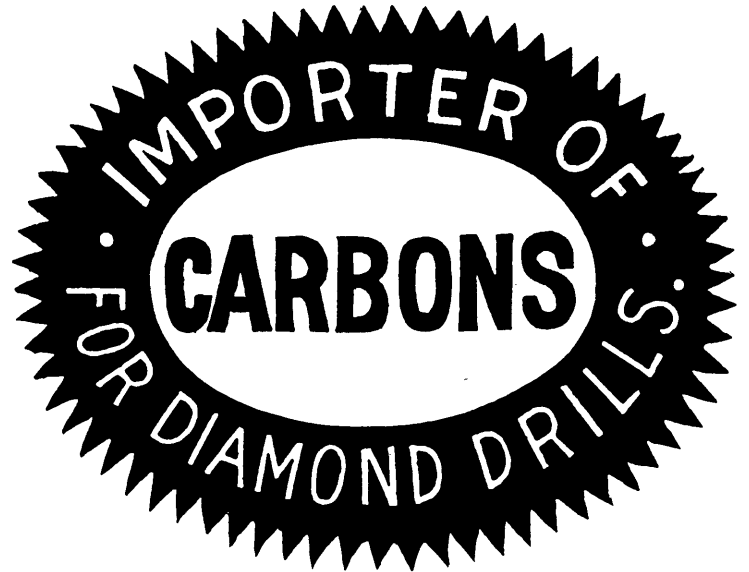
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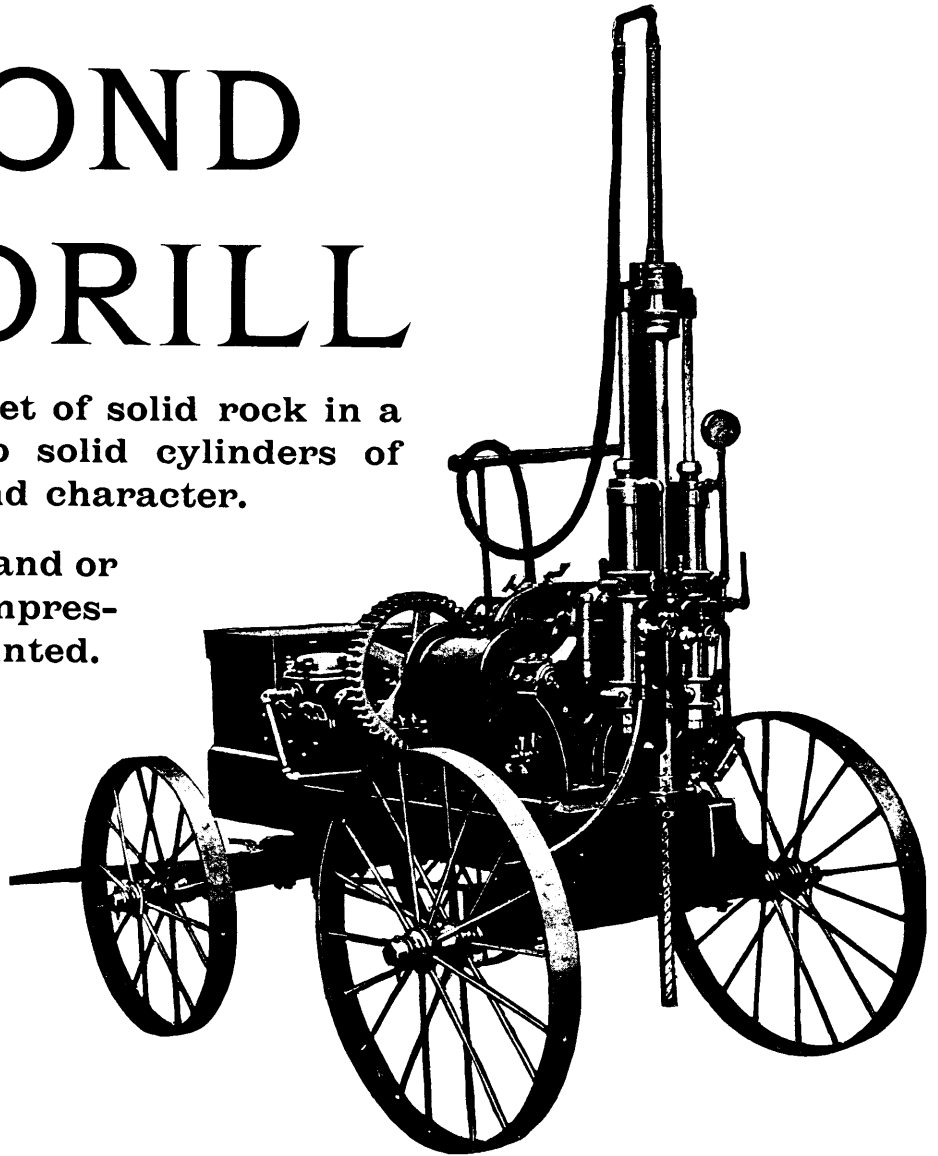
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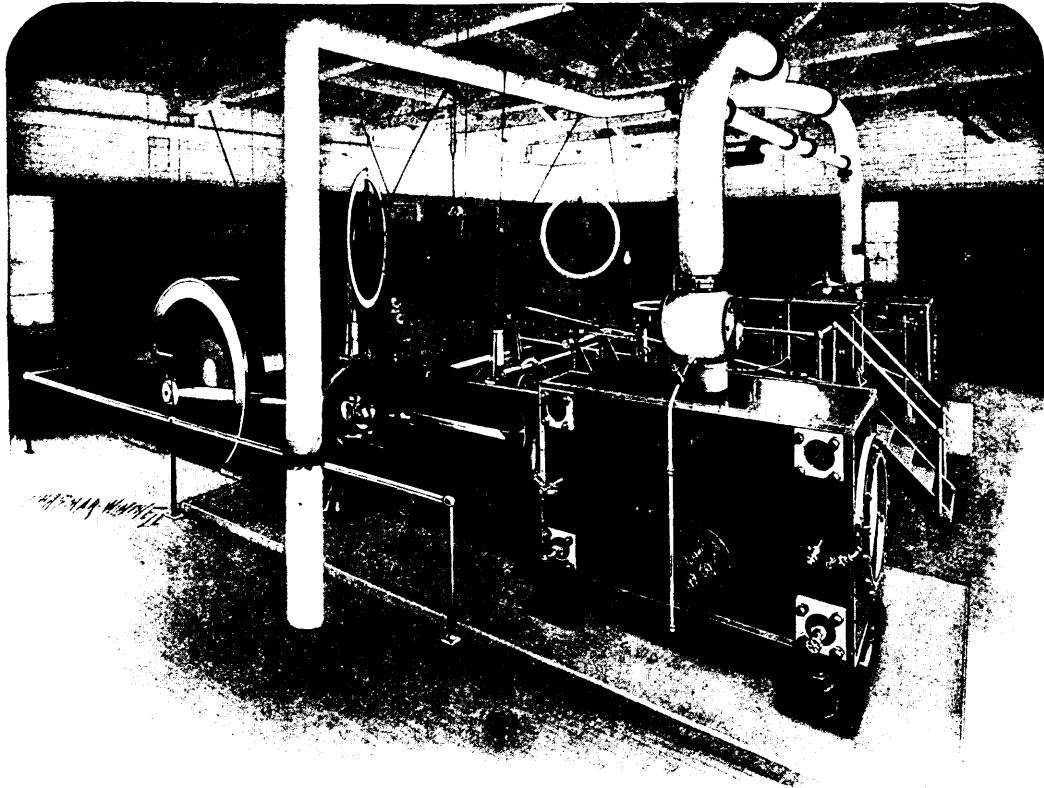
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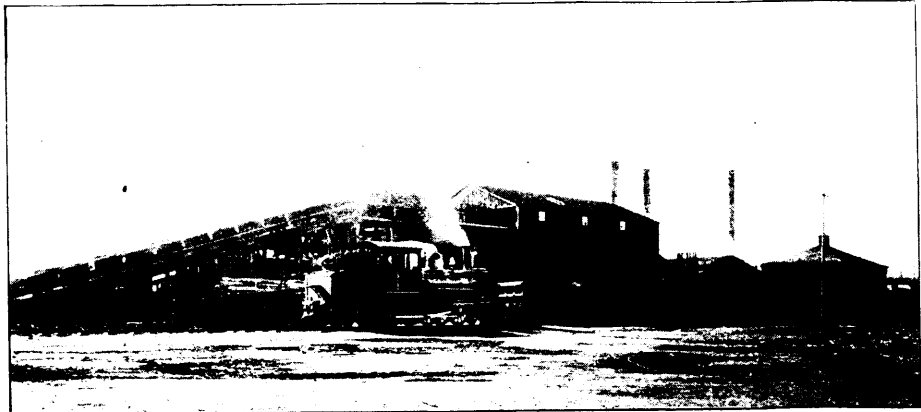
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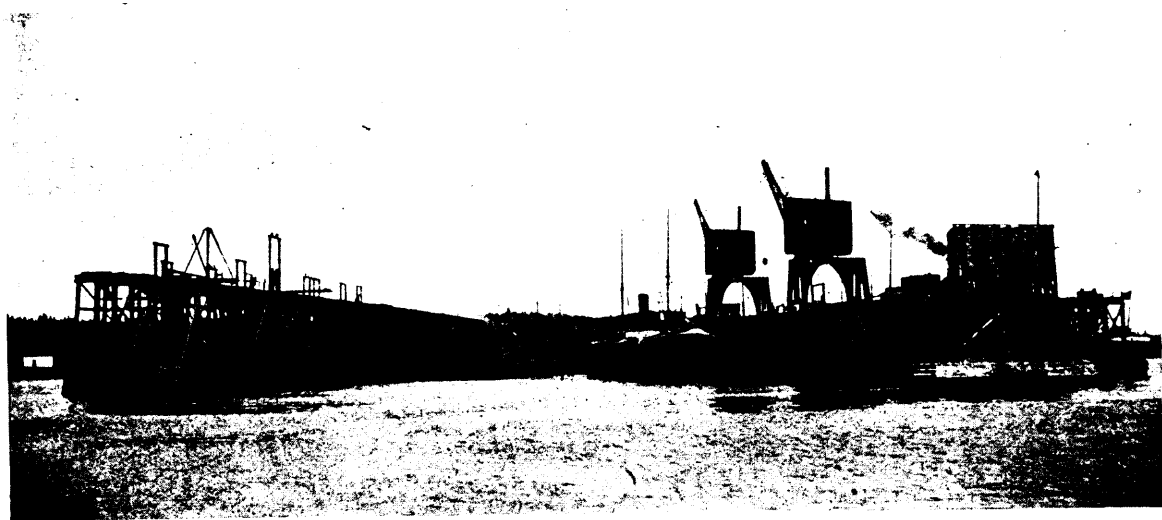
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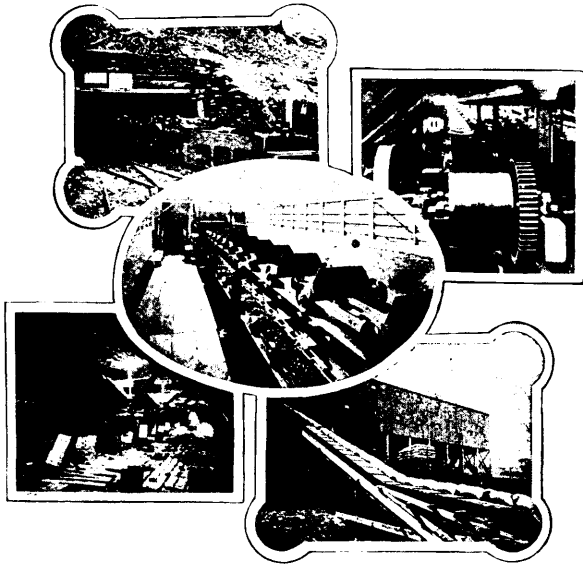
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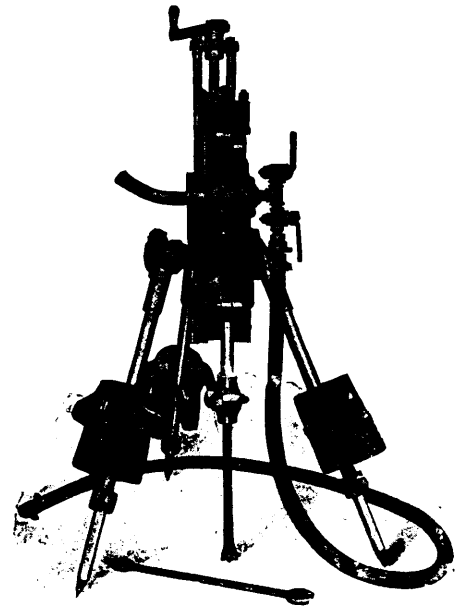
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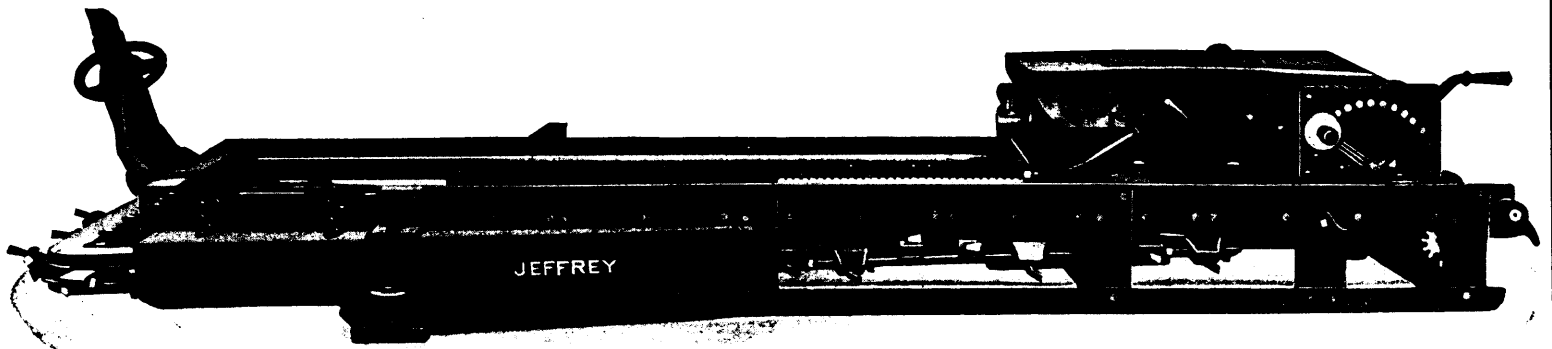
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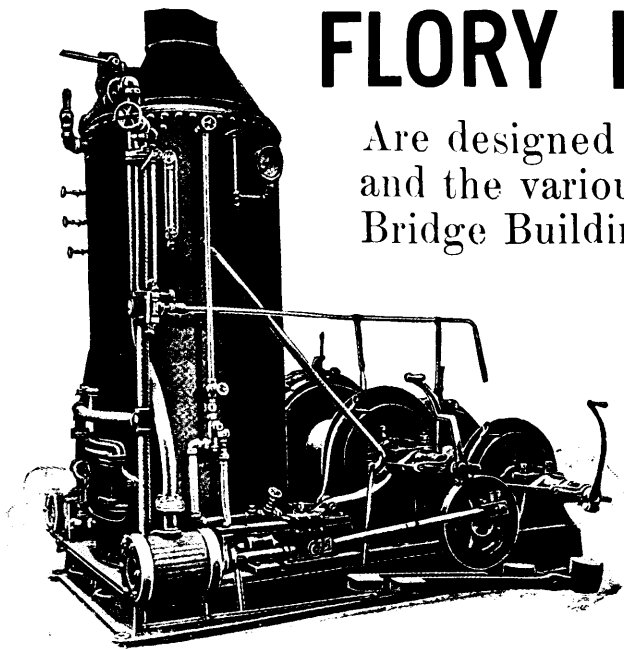
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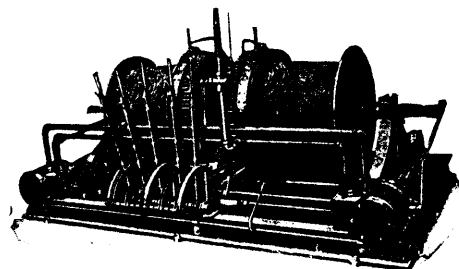
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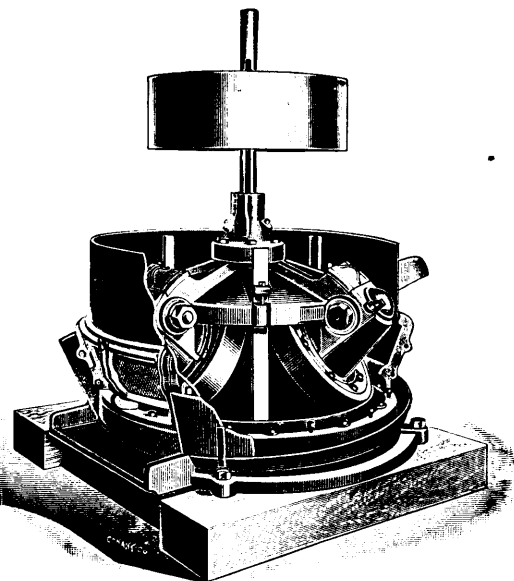
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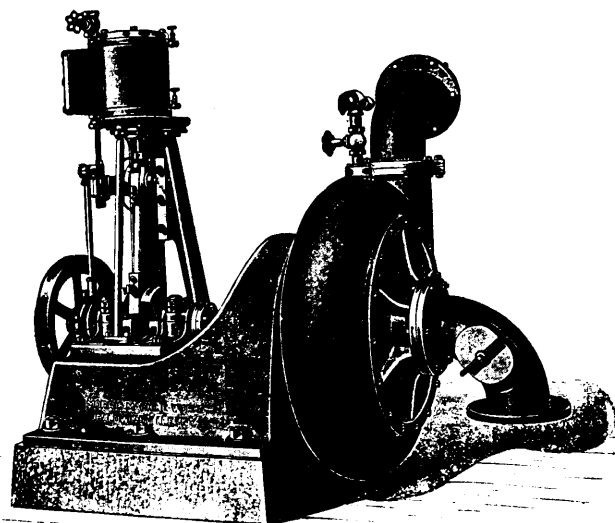
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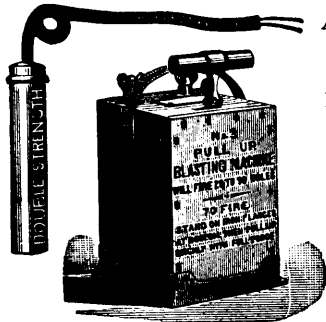


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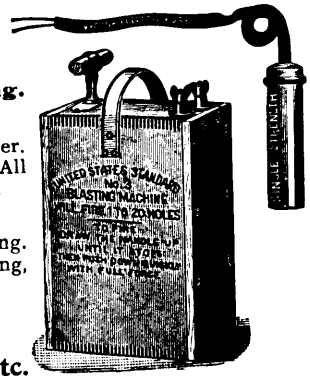
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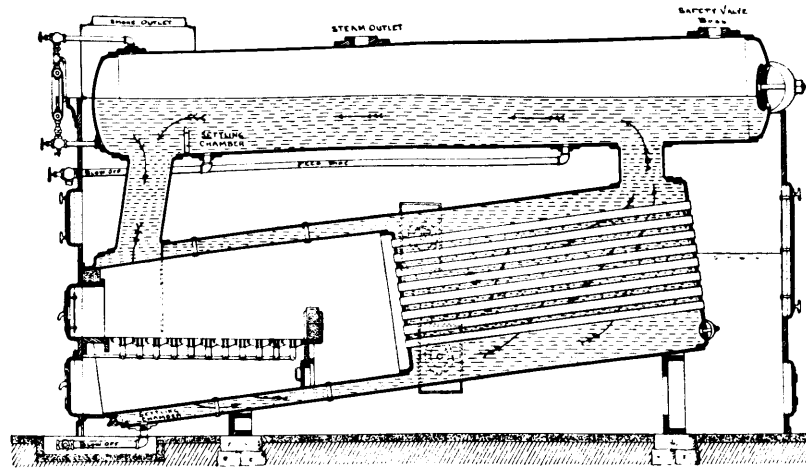
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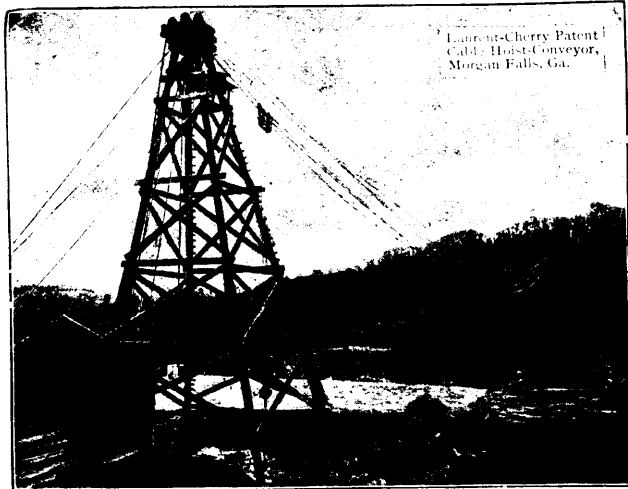
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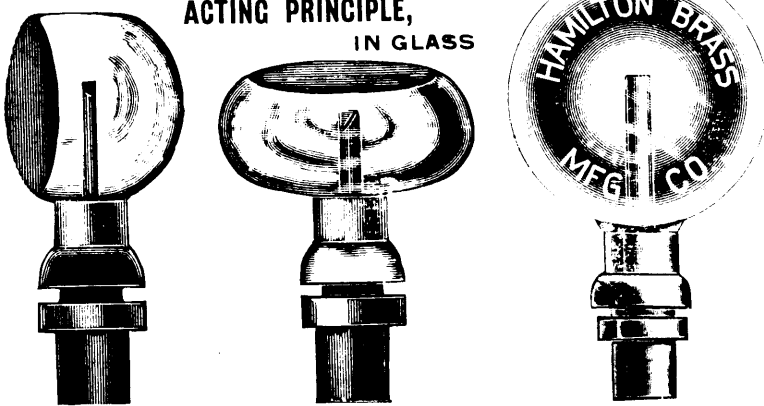
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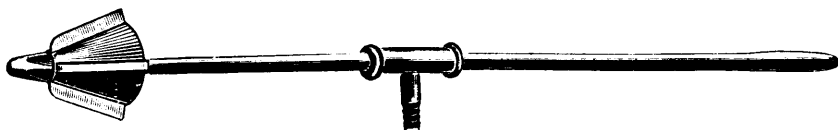
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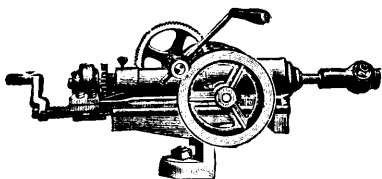
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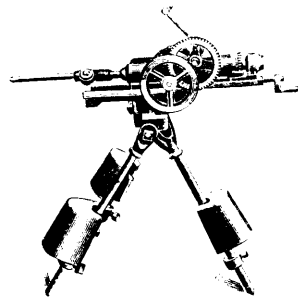
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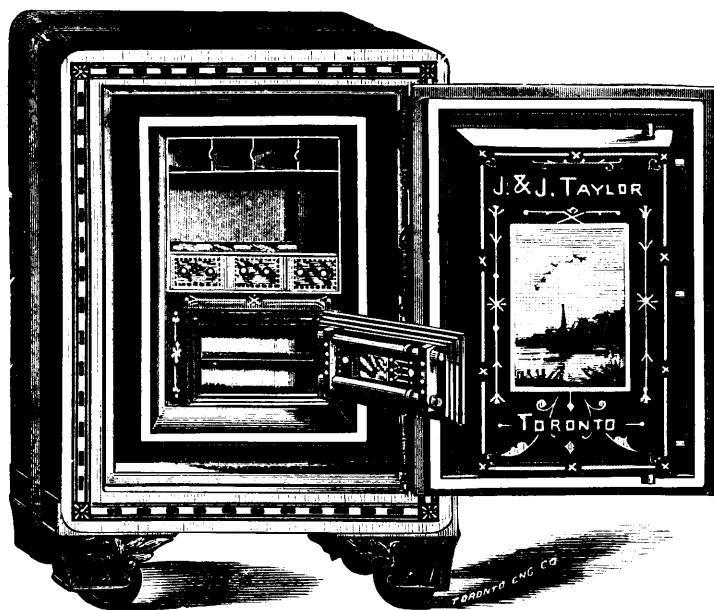
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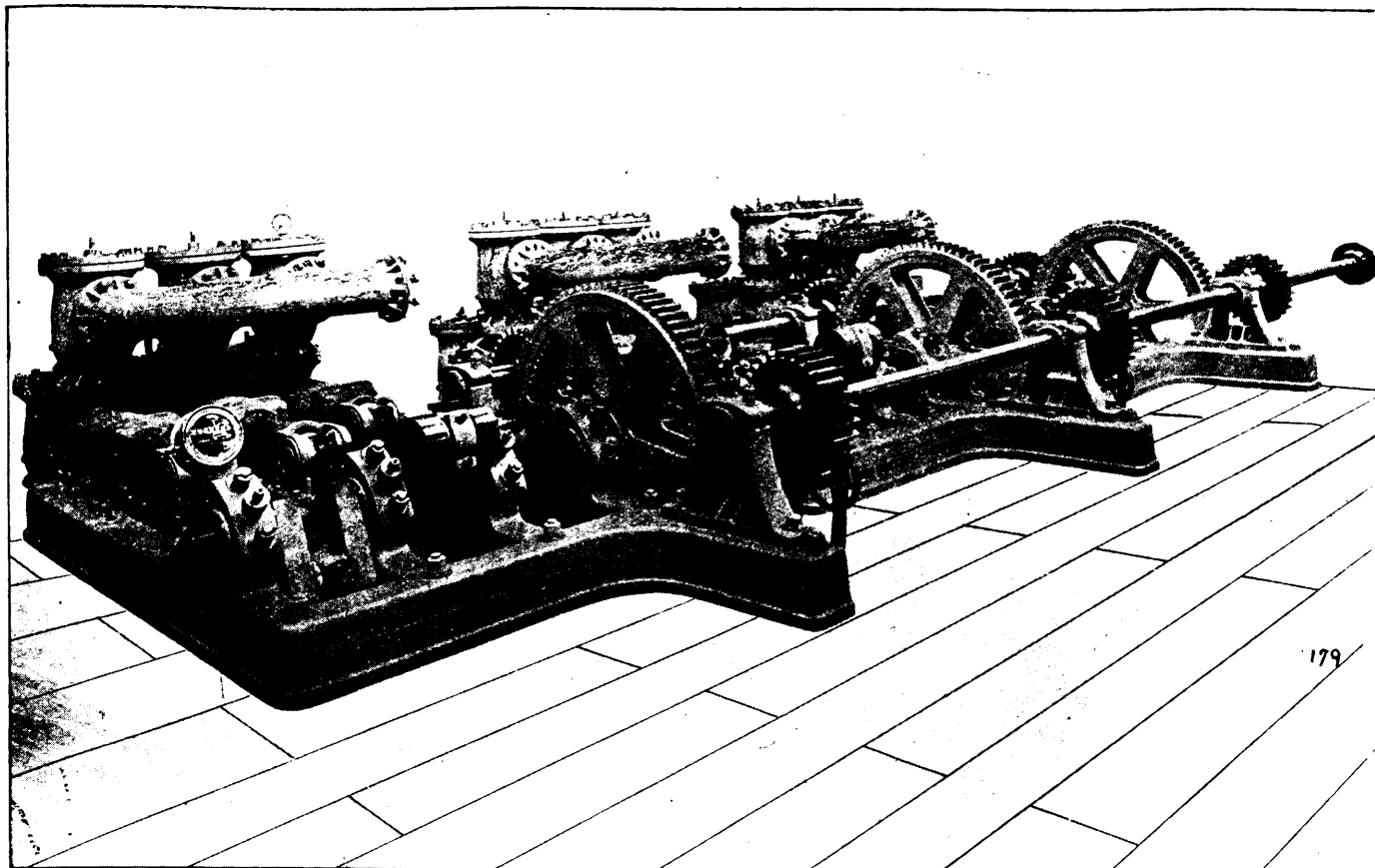
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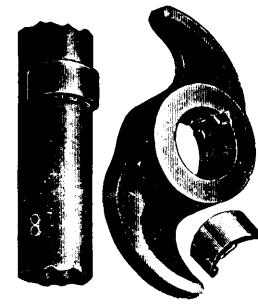
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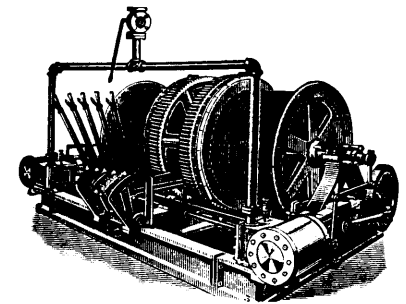
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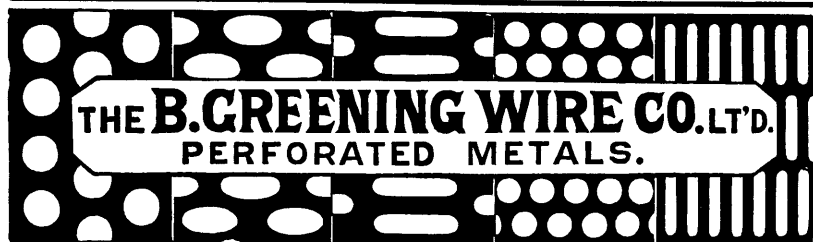
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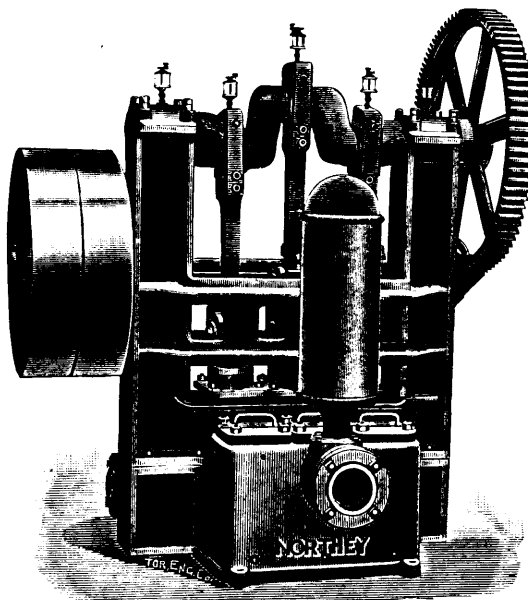
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VOL. XXIII., No. 2.

FEBRUARY, 1904.

VOL. XXIII., No. 2.

### Joint Stock Corporations Law.

The year of grace 1903 saw the collapse of many balloons which had been duly inflated by the methods of the Charter Mills established under various Governments here and elsewhere. And with the balloons fell many ballonists, an Earl or two, a Countess and other titled ladies, Knights a many of various orders, judges, clerics and laymen of high and low degree. Some went hence as suicides, others to hide their dimmed social lustre by change of abode, many to battle anew on life's billowy sea against wind and wave and tide and current hindering them from the desired haven. From how many have gone out any word to warn others of the doom which follows every effort to essay the empty air with wings not given to mortals? Has any, indeed, lifted up voice or pen to denounce the laws which afford facilities for cunning, and furnish plans and methods for the gamesters who exploit the mingled cupidity and ignorance of mankind?

"Under existing laws, it is possible for the president and directors of a company to play all sorts of tricks for their personal advantage," says one writer. President Roosevelt has asked the American people to adopt measures for their protection against crimes of cunning as effective as those in force for the suppression of crimes of violence. One has not far to seek the reason for a state of the law which meets with such wide condemnation. It is found in the concurrent effort of heads of State Departments to make their offices sources of public revenue, and of brokers to remove from the Statute Book any check against the facilities for flotation which they might find a hindrance to reckless business operations. It is on record that one reason advanced for certain amendments of a Joint Stock Companies' Act was that a certain Department was not getting a proper share of patronage from applicants for Charters. And it is also well known that the Mining Companies' Act of Ontario was in some measure the creation of stock brokers possessed of the notion that mining capital is most easily attracted by the offer of nominally paid up shares at a discount.

Mr. John Brisben Walker, in *The Cosmopolitan* for last January has pithily stated the causes of the scandalous state of Corporation law in the United States in terms quite applicable to the Dominion of Canada and some of its Provinces. "The Statutes," he writes, "have grown up by chance under local requirements. They have been framed in a large measure to meet special interests." "There has been no broad or disinterested intelligence used in preparing the Statutes authorizing incorporation. The public has not been safeguarded."

All this and more has been told the members of the Canadian Mining Institute and the readers of the *MINING REVIEW*. The diffi-

culty of obtaining capital for legitimate mining enterprises has become so great through lack of public confidence, due as much to mismanagement of company affairs as of mine affairs, that it is simply impossible for the large majority of people of average intelligence to believe that if they take shares in a Joint Stock Mining Company their money will be honestly invested, prudently managed, and truthfully accounted for. Because, as Mr. Walker states the fact, "there is no requirement by Statute compelling the issue of stock upon a basis which will give to investors an approximately exact idea of the property represented by the stock" and "there is no uniform requirement which will give stockholders a full, complete and fairly stated idea of their property at the close of each year."

What is the remedy Mr. Walker proposes for this evil? It is not cause for surprise that it is precisely what is needed under our own national system.—"A National incorporation law with registration at the Department of Commerce and annual reports placed on file for the examination of the business."

The hope that a uniform system of mercantile law would extend from the Atlantic to the Pacific was not unknown to the fathers of Confederation. The class interests of the legal profession may in some degree be opposed to this consummation. But while "the incorporation of Companies with Provincial objects" is assigned to the jurisdiction of local legislatures, it is indisputable that the gain to the community by the adoption of a uniform corporation law would stimulate enterprise to an extent in which the lawyer would find his advantage equally with the banker and the merchant. The Department of Trade and Commerce would find a new and most useful function which with the aid of a system of Inspection would render the operation of a well devised code of Stock Corporation Law, of incalculable benefit to the country.

The transfer to the Federal Department of Trade and Commerce of the granting of franchises to Joint Stock Corporations would obviously require the amendment of the British North America Act, and of necessity the consent of the Provinces. The revenue from the Provincial Charter Mills is considerable, and would certainly not be surrendered without an equivalent. There might be an arrangement to transfer the fees for charters to the provinces in which the Head Offices would lie, less some proportion for administration expenses. Any plan by which the system of joint stock incorporation could be elevated in public regard would be followed by an enormous increase of business. The facility with which banking enterprises are stocked is in some measure due to public confidence in Dominion legislation,

while the immense increase in the capital of banking and life insurance enterprises, is evidence that there is no lack of money in the country where security is offered the investor. To systematize the incorporation of joint-stock enterprises on a basis affording to the shareholders a degree of scrutiny they are in too many cases unable to give, would commit to limbo many concerns not worthy of incorporation, and while thus protecting the community would afford to legitimate enterprises the advantage of removing from competition those adventures whose perennial failures discredit more or less meritorious enterprises entitled to confidence. The great cause of co-operation would by a wisely administered federal law for the incorporation of joint-stock companies receive a great impetus in every direction of legitimate enterprise. Will the country arise to meet this demand of the hour?

#### **The Value of the Mining Engineer to the Mining Investor.**

The report of mining successes is inevitably followed by mining investment. Where money has been made, more may be made. A dividend-paying mine always occasions the purchase of an adjoining property, reputed to have an extension of the vein, and sometimes a whole district is bought up on the strength of one rich spot. The stories that have come from South Africa, Western Australia, Cripple Creek, Cariboo, Rosslund, Boundary, Eastern Ontario, Nova Scotia and other localities where mining is and has been profitably pursued have revived an interest in the mining industry as an investment. As there is every indication of a revival of mining investment in Canada, it may be well to endeavor to give some counsel to those who may be solicited to put their spare cash into mines. And first we would say to all such, do not spurn the request as a temptation of Satan and treat the proposal with scorn. But rather give it a serious consideration for two good reasons, one of which is that there are certainly great prizes to be had in mining, and the other is that such investment is one of the best ways of benefitting a country. Do not say as did a multi-millionaire the other day, when solicited to put a small sum into a legitimate and promising mining operation, "I would rather take the money and throw it into the ocean, then I should know it was gone, and have done with it; but if I put it into a mine I should lie awake nights and worry about it." There was perhaps some excuse for this good man's petulance, for his office was adorned with a large frame containing very ornamental share certificates of defunct mining companies.

As to prizes in mining, many examples have been furnished during the last twenty years in British Columbia, Nova Scotia, Quebec, and more recently in Ontario. Prospects that were bought from needy explorers at prices ranging from \$100 to \$1,000 have been sold for large figures, and again the investors in these mines are receiving dividends from the mineral production. Mines are not all swindles or mere holes in the ground to sink money in. They are frequently good, and when they are good they are often very good. Ore deposits that on the surface only yielded \$4 or \$5 a ton, upon being followed to a depth, have increased in value to \$50 or \$60 a ton and have paid handsome profits. New districts are being opened to which railway transportation will soon be given, and by development are sure in some localities to show rich pay centres that will make the fortune of the lucky investor, or else will prove to be of so good an average that considering the cheapness of mining and treating large masses of ore, the profits will be great and steady.

As to benefits to the country, we can hardly expect either patriotism or utility to have much influence in deciding an investment. Yet it may have its weight with some minds, and such should understand that money put into mines probably moves a more varied and larger

number of industries than any other investment. Every amount expended upon mineral production is divided among a multiplicity of interests, for a mine as a rule involves the creation of a little village of its own, and in the opening of the mine and the winning, transport and treatment of the ore a wonderfully diversified demand is made upon the other branches of production and industry. Mining investment has a good mental effect, and ought to be recommended as a tonic and stimulant for invalids. It is intensely interesting and gives a wide range to the thoughts and opens up enquiry about localities and methods of work that are both entertaining and instructive, and when the telegram comes that the pay steak has been struck and high assays secured, and that the vein has widened with depth, the excitement is so pleasurable that it is as good as a dividend in itself for its effect upon the happy investor.

The greatest difficulty, however, in mining investment is to decide what is a good venture, and it is on this point that we aim to give some advice to our capitalistic friends. There is no doubt that they have been woefully bitten by glib-tongued promoters, who, coming with all the romance of the wild and woolly west about them, effectually pull the wool over the confiding investor's eyes. Even when they have gone to visit the mine personally they have been equally deceived. After a wearisome journey and the discomforts of log cabin bunks and miners' grub, they toil up the tortuous trail or scramble through the thick underbrush until, when the spot is reached where the treasure is said to be, they are too exhausted to investigate properly, and too disgusted to feel any interest. They willingly accept the representations of others rather than make further effort to examine for themselves. Or if they go into the tunnel or descend the shaft, with eyes scarcely able to peer through the grim darkness, they see nothing but moist, black rock, until the well instructed and wily pit foreman strikes with his pick and hands up a glittering piece of ore, and then another, saying with each stroke, "It is here-and here-and here," until the visitor thinks the whole face of the tunnel is solid ore, whereas it may only have a few streaks that the miner knows just where to strike. Or if the visitor selects samples himself they may be salted. A man was recently met in the wilds of British Columbia looking for a gold mine to put a stamp mill on. He had a mill brought in 150 miles from a railway, but had no mine to employ it. Enquiring as to how so singular a thing happened, he said that he went to examine a mine and was particular to select all the samples of quartz with his own hands, but he incautiously laid the specimens down on the ground, and when his back was turned a man adroitly sprinkled some flour gold over them. The assays went so high that the mine was bought and the machinery ordered, but at last one of the men got faint-hearted and "blowed" on his partner, and new assays of rock proved the mine to be worthless. These stories are common enough, and are only alluded to in order to show how difficult it is for one, who has not the special experience needed for judging, to determine the value of the proposed investment. A novice will not venture to buy flour or grain without the inspector's certificate, yet men will buy mines or mining shares on the merest impulse or the recommendation of strangers, or else will venture upon their own judgment, which has not been trained to the work in view and is therefore valueless. The lesson to be taught is the value of expert testimony—the importance of consulting the men who know about such matters as much as can be known—for it must be admitted that a good deal is necessarily unknown about a mine and the practical miner often sneers at his skilled professional brother by saying, "One man can see into the ground as far as another." But this remark is not correct, for some men can see a long way into the ground, or at any rate can discern that there is hardly a chance of there being any value out of visual sight. The maxim we

would impress upon the investor is, look at the men, not at the mines. Consider that you are probably incompetent to judge of a mine by personal examination and that you must necessarily be at the mercy of some one. Mining investment is largely a matter of confidence: that is the bother of it. But being so, it behooves one to be wary whom he confides in. If a man high in his profession, of good repute and known to have been successful in his undertakings, offers an investment, let it be carefully considered, and give such an one a decided preference over the unskilled promoter who retails his hearsay stories into your ear. It is easy to find reliable men, of skill and experience in mining, and we advise intending investors to seek them out and profit by their counsels.

### The Carbides.

Ever since Wohler in 1862 made calcium carbide and showed that it formed acetylene when put into water, the possibilities of this and other carbides as substances of industrial importance might have been expected to emerge at any time. Wohler's method of making the substance, viz;—by heating calcium-zinc alloy with charcoal, was altogether too expensive for a commercial process, and the same statement is true of later methods, until Willson, in 1893, hit upon the process now in use. It is to be noted that Moissan made calcium carbide in his electrical furnace in 1892. The history of this subject is fruitful. It illustrates a fact often exemplified, namely; the preparation, which the study of pure science makes for industrial applications. The patient research of men who have no thought of making money by their discoveries, usually precedes, and indeed essentially, in most cases, the discovery of the process which finally brings into the market a new substance, a new machine, or perhaps a new luxury. The work of the earlier investigators does not make as much stir in the world. The world in general does not see its usefulness; and it is our object just now to point out what has already been done in the manufacture of compounds of industrial importance like calcium carbide, and to indicate some others already obtained on a small scale and perhaps likely to be used industrially in the future.

The possibility of making on an industrial scale this interesting class of substances was realized through the invention of the electrical furnace, which in the hands of men like Cowles, Willson, Moissan, Acheson, Hall, Heroult, and many others has worked such wonders in metallurgy as well as in the field which we are now investigating; but the furnace itself would have been useless without cheap electricity, which we owe to the labours of a succession of able men beginning with the purely theoretical work of Faraday and coming down to the perfect generators of to-day. The use of water power has been the final stage in this cheapening of the current; and in a country like this where water power is so widespread and easily available, it behoves us to study carefully the results of investigations, however theoretical they may seem, which deal with the manufacture in the electrical furnace, of substances like the carbides. Let us take stock of what has already been done. Almost contemporaneously we have Willson's discovery of the commercial manufacture of calcium carbide, and Acheson's equally interesting process of making silicon carbide or carborundum. The former has assumed an importance which could hardly have been anticipated at the time of its discovery. In countries where water-power is available, calcium carbide is now being made for the manufacture of acetylene gas, the use of which is extending rapidly. In fact this industry can now boast of having several journals devoted solely to its literature. Most of these are of course published in Germany. Carborundum is now manufactured on a large scale, and used extensively, not only as an abrasive but also in the metallurgy of

iron and steel, as a convenient and very pure form in which the necessary carbon and silicon may be added to the iron. It thus so far displaces ferro-silicon in the market. Of the  $3\frac{3}{4}$  millions of lbs. of carborundum made in 1902, nearly half was used for this purpose. Other uses have also been found for calcium carbide, viz —as a reducing agent for some of the metals, L. M. Bullier has lately used it in conjunction with common salt and similar materials to convert iron into steel. Considering the advances which have been made in these two substances during the ten years since they were first put on the market we are encouraged to look for industrial uses for the numerous other carbides, which have been made chiefly by Moissan. To show how rapidly events move in this region, we need only take up some of the books of a few years back dealing with this subject in which we find statements like this:—"Carbides. We have very little information regarding this class of compounds" (Watt's Dictionary 1888). Some half dozen carbides are mentioned, but the list does not include calcium carbide, although that substance was known at that time. In Thorpe's *Dictionary of Applied Chemistry* published in 1890, calcium carbide is not even mentioned. This was only 13 years ago; and, indeed, only seven years later, Moissan published a volume of 385 pages (*Le Four Electrique Par M. Henri Moissan, De L'Institut; Paris, G. Steinheil, Editeur*) dealing with the electrical furnace, and the carbides and other substances which he has been able to make by its means. A short review of this work of Moissan will not be out of place here. After a description of the electrical furnace, he discusses the formation of artificial crystals of lime, strontia, baryta, magnesia, alumina, the oxides of chromium manganese, iron, nickel, and cobalt. It is to be noted that the artificial crystals of alumina are identical with the natural corundum (not to be confused with carborundum). It would be opportune here to point out a curious slip in the Chairman's address for 1903 before the Canadian Section of the *Society of Chemical Industry* (Journal No. 9 Vol. XXII.) He writes "although deposits of corundum itself are found in Eastern Ontario, the artificial carbon silicide has practically supplanted the natural product as an abrasive agent." When we recall that only about 875 tons of carborundum (Carbon Silicide) were used as an abrasive in 1902, and that Ontario alone produced 1100 tons of corundum in that same year, it is easily seen how misleading the statement of the learned Chairman is. It is quite possible indeed that carborundum (with its misleading name) will extend its use in steel-making more rapidly than as an abrasive, although its qualities for the latter purpose are unquestionably very fine. The works at Niagara Falls find a ready market for their whole output.

But "to return to our muttens", viz:—Moissan.

The experiments on the crystallisation of the oxides of metals were carried out at a temperature of about 2,000 centigrade. In the following section the author describes his success in distilling a number of the metals, including copper, silver, platinum, aluminum, tin, gold, manganese, iron and uranium. He also succeeded in volatilising silicon, boron, and even carbon. Chapter 2 deals with the different varieties of carbon. His experiments lead the way to the artificial manufacture of graphite, lately carried out with such success in the graphitisation of carbon electrodes. The Chapter is closed by an account of his crowning triumph, the production of artificial diamonds, by the sudden cooling of iron highly charged with carbon. This was effected, as is well known, by plunging the molten iron into molten lead. In Chapter 3 the author gives an account of the reduction of chromium, manganese, molybdenum, tungsten, uranium, vanadium, and several other interesting metals of the rarer sort. Chapter 4 is devoted to the study of carbides and the similar compounds called silicides and borides. In addition to calcium carbide, Moissan has been able to

prepare up to this date, carbides of the similar metals, barium and strontium, lithium, cerium and other metals of that group, also carbides of aluminum, zirconium, chromium, molybdenum, tungsten, vanadium, manganese, and uranium. One of the most interesting carbides obtained by Moissan was titanium carbide (Ti C) which he made by the use of an electric arc of 1,000 amperes and 70 volts, acting on a mixture of titanous acid (160 parts) and carbon (70 parts) in the Moissan electric furnace. The action was complete in ten minutes and the new compound was obtained in part distinctly crystallised, with a density of 4.25.

The most interesting property of these crystals is their extreme hardness. Moissan found that they would scratch diamonds even, the first substance so far obtained hard enough to do this. This may eventually become a very important discovery. The two constituents titanium and carbon are very plentiful in Canada. There is abundance of iron ore containing as high as 20 or 30% of titanium. Another titanium mineral, sphene or titanite, is comparatively abundant in some of the counties of Ontario, particularly in North Renfrew. Is it too much to hope that methods will be discovered of bringing together these two elements titanium and carbon in such a way as to produce on a successful commercial scale crystals of titanium carbide for use as an abrasive, and, particularly, large enough to replace the diamond in such operations as drilling? When we consider the history of calcium carbide, of carborundum, and of artificial graphite, we may with some degree of confidence look forward to the time when titanium carbide will have taken its place as one of the commercial products of the electrical furnace.

## EN PASSANT.

The many friends of Mr. B. T. A. Bell, editor and proprietor of the REVIEW, will regret to learn that as we go to press, he is lying dangerously ill at his residence, in consequence of a severe accident which occurred to him on the morning of the 18th instant. The details of Mr. Bell's mishap will be found below, in the published account which was given in the Ottawa "Evening Citizen" of the same date. Mr. Bell's injuries are of such a severe character that it is impossible for anyone to see him, with the exception of certain members of his immediate family, and at present his attending physicians are not in a position to do more than conjecture, as to the chances of his early recovery. The accident could not possibly have happened at a more unfortunate period for Mr. Bell, as he was busily engaged in a number of important matters apart from his editorial duties. His time had been more than fully occupied in the preparation of his report on the evidence submitted before Judge Britton and himself, while members of the Yukon Commission in connection with the Treadgold Hydraulic Concessions. In addition to this the labor involved in his duties as Secretary to the Canadian Mining Institute and in superintending the numberless details in connection with its annual convention, in Toronto, on the 2nd, 3rd and 4th March next, was very heavy and exacting. Under these conditions those who know, and are familiar with Mr. Bell's personality, will readily understand that his progress towards convalescence will necessarily be slow, as the knowledge he has, that the work in which he was engaged, when so suddenly and shockingly interrupted, is largely at a standstill, will not be conducive to that mental repose which is so necessary a condition to an early recovery in a case of this kind. The staff of the REVIEW, join with the many kind friends who have shown their sympathy, by telegrams, letters and personal inquiries; in the sincere hope that our genial and esteemed chief may in a short time, once more be found filling the editorial chair with his accustomed vigour and cheerfulness.

"About 10.30 yesterday morning, Mr. B. T. A. Bell, editor and proprietor of the Canadian Mining Review, was seriously injured by falling down the elevator shaft in Orme's music store, Sparks Street. Tenants of the Orme block, facing on Wellington Street, where Mr. Bell's office is situated, have been in the habit of securing entrance by a short cut through the Sparks Street store, from which a door leads on to the alleyway running between the two blocks. Instead of proceeding by way of this door, Mr. Bell opened the door, also in the rear of the Sparks Street store, leading into the elevator shaft. The machine was at an upper floor at the time, and hence he fell to the basement, a distance of ten feet. He landed on the concrete floor, on his right side, sustaining injuries to his head and shoulder. Dr. J. F. Kidd, O'Connor Street, was summoned, and he had Mr. Bell removed to St. Luke's Hospital.

Dr. Geo. MacCarthy, his brother-in-law, speaking of Mr. Bell's condition, said: "His chances of recovery are fair, but all depends on what complications, if any, set in. His strength is keeping up well. We are not certain yet whether his skull is fractured or not, but there are injuries to the base of the skull. It will be impossible for a day or so, to say what the outcome will be. It all depends as to whether or not inflammation sets in at the seat of injury. If it does not, then the patient's chances of recovery will be better. There is also a fracture of the collar bone, but all depends on the injuries to his head."

At a late hour last night Dr. MacCarthy said: "I am more hopeful of Mr. Bell's recovery than I was earlier in the day. He recovered consciousness for a few hours but complained of pain. For the greater part of the time he is in a comatose condition. There is no great discharge from the ear and this is a hopeful sign. There is no indication of compression, but it is impossible as yet to say anything of the outcome."

Mr. Bell's friends are hoping that his vigorous constitution will pull him through, but the fact is not lost sight of that the injury to the base of the skull is a very serious one."

In view of the part played by his firm in the defence of Mr. Whitaker Wright, the following quotation from Sir George Lewis's article in a London paper is interesting:—

I have been asked by the Editor whether I think that fraud has on the whole increased in the City during the past twenty years, and whether the tendency is for it to increase further. I fear I can only answer "yes" to both these questions. It seems to me that fraud has been, and is, on the steady increase, both in volume and in scope. As the law tightens its grip, so the dishonest rascal exercises greater ingenuity in his methods, and the result in the end is the same—the surplus money of many fools slides into the pockets of one wily and unscrupulous individual. There is an old Yankee saw which says that a man who steals a nickel is a thief, but the man who steals a million dollars is a genius. Many of the huge fortunes which have been amassed by mushroom "financiers" and promoters during the past decade have been built up on foundations of trickery, deceit and fraud, and if we examine the methods employed we find them little different from those of the racecourse thimble-rigger.

Says the *Engineering and Mining Journal*: The number of blast-furnaces reported in operation on February 1 showed a remarkable increase over that on January 1. The total weekly capacity of the active furnaces on February 1 was 287,700 tons of pig iron. This is 92,100 tons more than at the opening of the year, and is the highest capacity reported since October 1, 1903. The increase is chiefly due to the starting up of a number of furnaces by the United States Steel Corporation near the end of January, when it became apparent that



the reduction of output in December had been greater than was really warranted by the conditions. This seems to be proved by the fact that unsold stocks showed a small decrease, falling from 689,000 to 681,000 tons during January. In the basis of the February statement, our blast-furnaces are now making pig iron at the rate of about 15,000,000 tons per year. This is less than last year's output, but still promises a very respectable production. The total make of iron in January was about 970,000 tons; in February it will not be far from 1,050,000 tons.

The exports from Cape Colony, South Africa of the products of the mine for the ten months ending 31st October, 1903, as compared with the same period in 1902 are stated by the "Cape of Good Hope Government" to be as follows:

|                    | 1903.             | 1902.              |
|--------------------|-------------------|--------------------|
| Gold.....          | £4,381,000        | £ 9,643,000        |
| Diamonds .....     | 4,293,000         | 4,641,000          |
| Copper Ore.....    | 171,000           | 345,000            |
| <b>Total .....</b> | <b>£8,845,000</b> | <b>£14,629,000</b> |

Being a falling off in value of £5,784,000, principally due to the difficulty at present existing in securing a sufficient supply of unskilled labor.

A recent editorial in the *Canadian Manufacturer* has the following respecting the production of crude petroleum in Ontario at the present time:

The Imperial Oil Company's petroleum refinery at Sarnia, Ont., is said to be running at less than one-half its capacity, being unable to obtain crude oil to keep the plant in full operation. The Canadian production is going down, and the duty of five cents a gallon on the American oil is prohibitive, as it cannot be brought in and refined in Canada at a profit. It is claimed that the industry is in a serious position, and that the only relief which will be effective is to admit oil from the United States by reducing the duty to two cents a gallon. Advocates of this measure say that the Canadian oil will still find a market, as it will cost the refiners about twenty cents a barrel less than the imported crude oil. The consumer will get the benefit of the lower price of Canadian refined oil, about one cent a gallon, on the extra production of the Canadian refineries. The capacity of the Sarnia refinery is 780,000 barrels a year and of the Petrolea refinery 96,000 barrels. At the present proportion of 54 per cent. of refined oil from 100 per cent. of crude, this would call for 1,600,000 barrels of crude oil annually. The Canadian production for 1903 is estimated to have been 483,500 barrels.

Regulations for the payment of bounties on lead contained in ores mined in Canada have been approved of by the Dominion Government on the recommendation of the Department of Trade and Commerce. It is provided that the smelting of ores is to be under the supervision of an officer of the department, who can at any time demand and receive a portion of the floor sample of any ore delivered at the smelter for smelting purposes. All claims for bounty are to be substantiated by oath of the manager of the smelter works, and verified and certified to by a departmental officer. The cost of supervision must be born by the claimants.

A recent despatch from Vancouver states,—“ Acting on behalf of the Yukon territorial government, A. J. Beaudette, Yukon government engineer, is here from Dawson, and will proceed to California, where he will make a study of the latest methods of hydraulic mining. His information will be utilized by the territorial government on his

return, for the benefit of the mining community of the Yukon. He will also look into the best practice of modern installations of stamp mills and of recovery of values from free milling ores by amalgamation and concentration.” Mr. Beaudette is well known to many in the East and is one of the latest additions to the membership of the Canadian Mining Institute.

The Canadian Mining Institute.

REPORT OF COUNCIL, 1903.

The Council takes pleasure in submitting the following brief review of the work and status of the Institute during the year 1903:—

MEMBERSHIP.

The following statement shows the membership by provinces and countries as at 31st December, 1903, compared with the same period in each year since the organization of the Institute:—

|                           | 1898 | 1899 | 1900 | 1901 | 1902 | 1903 |
|---------------------------|------|------|------|------|------|------|
| Nova Scotia ..            | 16   | 16   | 19   | 27   | 31   | 30   |
| New Brunswick.....        | 2    | 1    | 2    | 2    | 1    | 1    |
| Quebec.....               | 66   | 77   | 77   | 77   | 79   | 69   |
| Ontario.....              | 44   | 68   | 91   | 83   | 107  | 108  |
| British Columbia.....     | 42   | 65   | 72   | 67   | 72   | 68   |
| Manitoba.....             | ..   | ..   | ..   | ..   | 2    | 2    |
| Newfoundland.....         | ..   | 1    | 2    | 2    | 2    | 2    |
| Alberta.....              | 5    | 5    | 5    | 6    | 6    | 7    |
| Yukon.....                | ..   | ..   | ..   | 2    | 5    | 11   |
| Great Britain.....        | 4    | 9    | 7    | 12   | 14   | 12   |
| United States.....        | 11   | 17   | 26   | 30   | 36   | 36   |
| China.....                | ..   | 1    | 1    | 1    | ..   | ..   |
| Hawaii Islands.....       | ..   | 1    | ..   | ..   | 1    | 1    |
| Spain.....                | ..   | 1    | 2    | 2    | 1    | 1    |
| Australia.....            | ..   | ..   | ..   | ..   | 1    | 1    |
| Tasmania.....             | ..   | ..   | ..   | ..   | ..   | 1    |
| South Africa.....         | ..   | ..   | 3    | 4    | ..   | ..   |
| East Africa.....          | ..   | ..   | ..   | 1    | 1    | 1    |
| Alaska.....               | ..   | ..   | 1    | ..   | ..   | 1    |
| Mexico.....               | ..   | ..   | 1    | 1    | 1    | 3    |
| Labrador.....             | ..   | ..   | ..   | 1    | ..   | ..   |
| South America.....        | ..   | ..   | ..   | 1    | 1    | 2    |
| Students.....             | 2    | 15   | 14   | 12   | 92   | 78   |
|                           | 192  | 277  | 323  | 331  | 453  | 435  |
| Died during the year..... | 2    | 4    | 4    | 4    | 2    | 3    |

The Council reports with profound sorrow the deaths of Mr. James Cooper, of Montreal, Col. King, Sherbrooke, and Mr. John McAre, D.L.S., of Toronto. Owing to the fluctuations of the mining business and removal from the country a number of resignations go into effect at this meeting, but it is confidently anticipated that the number of new members to be elected will more than compensate for these losses.

LIBRARY AND READING ROOM.

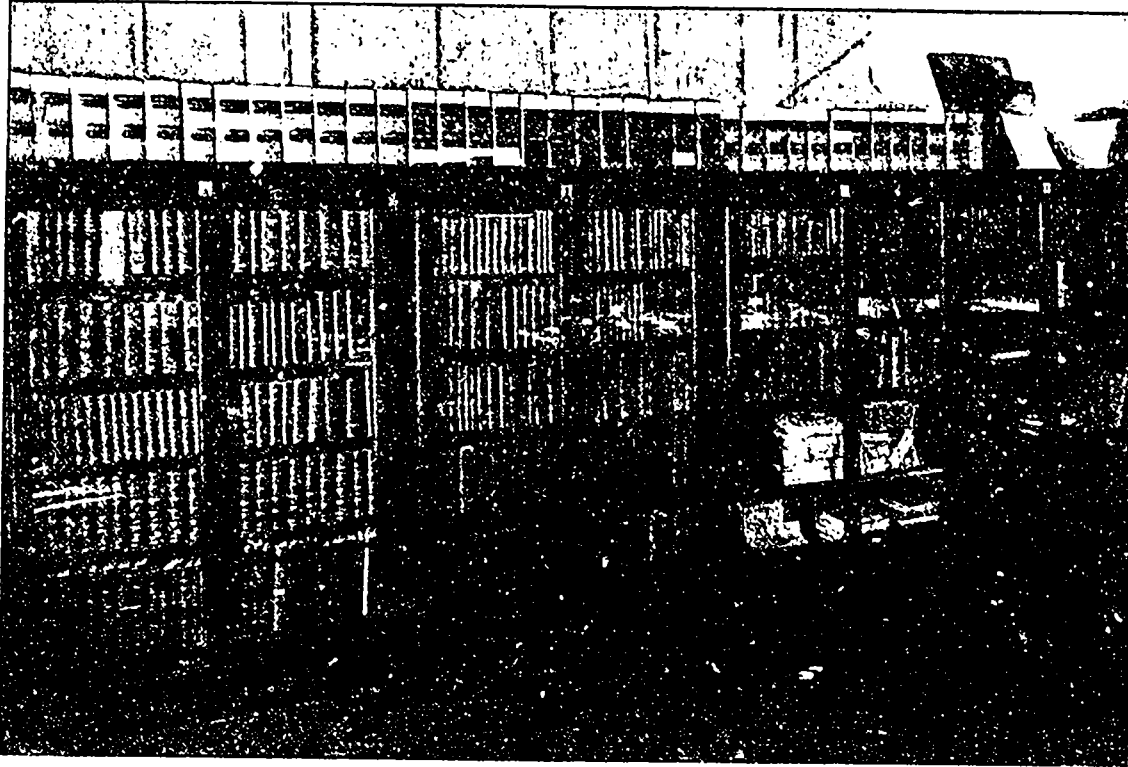
The premises occupied by the Institute in Room IV, Windsor Hotel, Montreal, having become too small for the proper accommodation and growing requirements of our library, the Council, at a special meeting called for the purpose, decided by a vote of 19 to 3 to remove the collection to Ottawa, where it now is under the personal supervision of the secretary.

The new premises in Orme's Hall, Wellington Street, Ottawa, are most conveniently located and, as will be seen from the accompanying photographs, are large enough for the purposes of the Institute for many years to come.

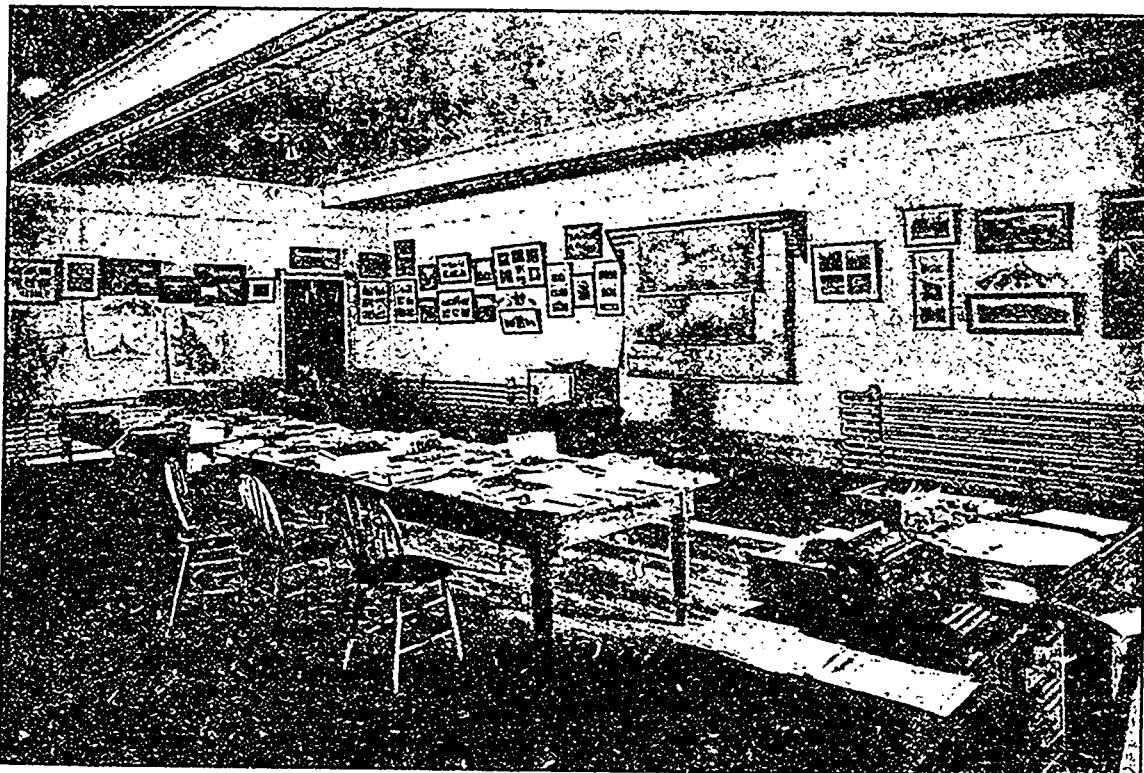
By this change a saving of \$100 per annum is effected in rent. Members may now obtain a loan of any work of reference in this collection for a limited period by giving a receipt and surety



## THE CANADIAN MINING INSTITUTE.



Library and Reading Room, Orme's Hall, Ottawa.—From photo showing portion of Book Cases.



Library and Reading Room, Orme's Hall, Ottawa.—View looking East.

THE CANADIAN MINING INSTITUTE.



Library and Reading Room, Orme's Hall, Ottawa.—View looking West.



Library and Reading Room, Orme's Hall, Ottawa.—From photo of a portion of Book Cases.

for the value of the book or books so loaned. Already this system has been taken advantage of by a number of members. A new catalogue is being prepared for the printer and will be distributed among the members when completed.

#### MEETINGS.

The Annual meetings were held at Montreal on the 4th, 5th and 6th March, 1903, and were exceedingly well attended. The proposal to hold a joint meeting with the Lake Superior Mining Institute at Sault Ste. Marie, in September, was abandoned in consequence of the unsettled condition of the mining and metallurgical industries of that district. Several meetings of Council and special committees were held in Montreal and Toronto.

A meeting of the Eastern Ontario section was held in Kingston in November and a number of interesting subjects discussed.

#### PUBLICATIONS.

The papers read before the British Columbia meetings held at Nelson in September, 1902, and at the annual meetings in March last year, some thirty in all, constituting the contents of Volume VI of the Journal of the Institute, were, unfortunately, destroyed by fire in June on the eve of the completion of the volume. Owing to delay in the re-equipment of the contractors' printing plant and the the Secretary's absence, first in the Yukon and later in Great Britain, the work of resetting the lost volume was not begun until his return early in December, but, by dint of hard work, it has been completed and will be in the hands of the members on or about the date of our annual meetings. In order to meet the increasing demand for our publications a larger edition has been struck off.

Several hundred copies of each of the papers by Messrs. MacDonald, Miller, Hille, Coste and Robinson were printed in pamphlet form and distributed during the year.

A revised List of Members containing the Charter and By-Laws of the Institute was also printed and distributed among the members.

At the close of the year the Secretary compiled and printed in pamphlet form a very complete and handily arranged volume of Indices to the authors and papers read before the Institute and its antecedent organizations from 1891 to the end of 1903. This useful little volume, which has also been incorporated in the Journal for 1893, is now tabled for your inspection.

#### PROPOSED CHEMICAL AND METALLURGICAL SECTION.

Arising out of the admirable suggestions contained in the paper presented by Mr. W. Dixon Craig at our last annual meeting circulars have been issued, not only to our own members, but to many other Canadian chemists and metallurgists, with the object of bringing to a focus the question of organizing a Chemical and Metallurgical Section. Such an organization can accomplish much, not only for Canadian chemistry and metallurgy, but for mining and its associated industries. A meeting for the purposes of promoting this organization will be held on Thursday afternoon, 3rd March.

#### STUDENTS' COMPETITION.

Nine papers were submitted by Student Members. The Committee of Award in the Geological Section (Messrs. Goodwin, Adams and Walker), recommended that the cash prize of twenty-five dollars be given to Mr. S. H. Boright for his paper "On the Geology of the Northern Portion of the Boisdale Hills Anticline." In the Mining Division the Committee (Messrs. Hardman and Coste), recommended that Mr. Norman W. Parlee be given a similar cash prize for his paper on "Rock Drilling and Blasting."

None of the papers being deemed to have sufficient merit to warrant its award, the President's gold medal was not given.

#### MINING STATISTICS.

The importance and necessity for greater uniformity in the compilation and publication of official mining statistics by the Provincial and Dominion Governments, was prominently discussed at our last annual meeting and the question referred to a committee, which has held several meetings. Their report will be submitted for your consideration.

#### FINANCES.

The audited Statement of the Treasurer, which will be submitted to you in detail at the annual meeting, shows a cash balance on hand of \$2,912.73. This unusually large balance is, of course, largely due to the fact that the publication of Volume VI was, owing to the fire, not issued during the year. The following statement shows the receipts and disbursements from the organization of the Institute to the end of our last financial year, i.e., 31st January, 1904:—

|           | Receipts.  | Disbursements. |
|-----------|------------|----------------|
| 1898..... | \$2,674 67 | \$2,454 85     |
| 1899..... | 3,421 10   | 3,156 05       |
| 1900..... | 3,601 50   | 3,455 76       |
| 1901..... | 4,076 50   | 3,749 71       |
| 1902..... | 6,330 89   | 5,655 80       |
| 1903..... | 7,743 79   | 4,831 06       |

Submitted on behalf of the Council.

EUGENE COSTE,  
*President.*

B. T. A. BELL,  
*Secretary.*

#### On the Manufacture of Sulphuric Acid at Sydney, C.B.

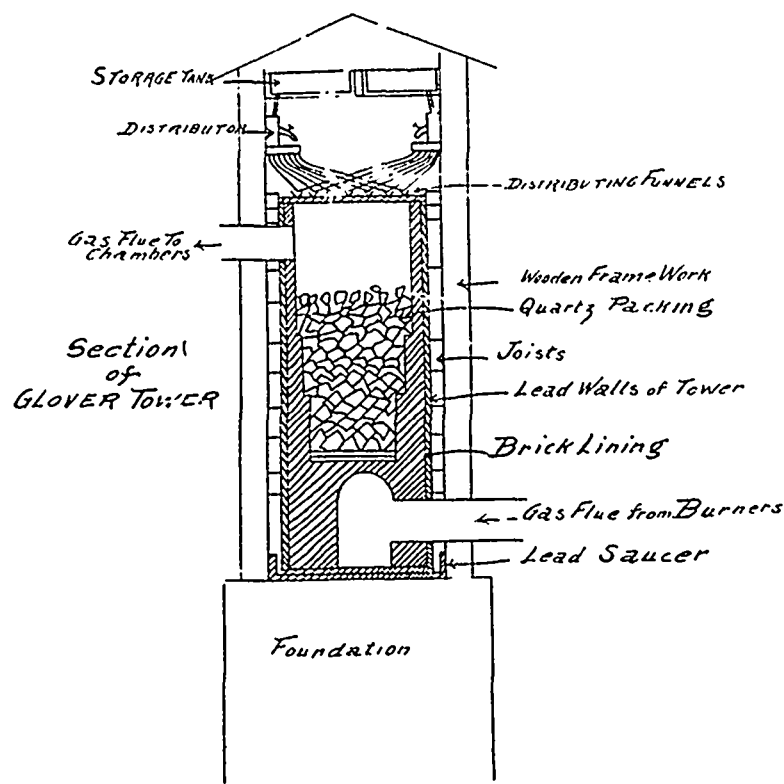
By C. A. MEISSNER, Sydney, Cape Breton.

(Continued from January issue.)

Gay-Lussac's invention consists of a leaden tower called after his name, and constructed on very similar lines to the Glover tower. It is generally made considerably higher than the Glover tower, say from 40 to 50 ft., and is given either a square or a circular cross section. Its capacity is usually proportioned according to the size of the chambers, 1 p.c. of the capacity of the latter being a very frequent proportion, though an increase to 2 p.c. secures a very much more efficient scrubbing of the gas and a recovery of the nitrogen acids. In some cases, the interior of the tower is lined with brick, whilst in others no lining is used. The usual packing for the tower is coke. Ordinary gas coke is of no use, only the hardest burnt oven coke, giving a clear ring and as little porous as possible, of a silvery white, not of a dull black color. A third of the tower is filled with large pieces of the coke about a foot or so in length, then some pieces next in size, and for the last third smaller lumps may be used, but nothing which will go through a riddle with three inch-holes should be allowed to go into the tower. The tower is covered in, in the same way as the Glover tower, and is provided with a distributing table and storage tank.

The principle on which this tower acts depends on the fact that strong sulphuric acid of 60° Be, possesses the property of absorbing nitrous acid when brought into contact with it, forming nitro sulphuric acid, or the nitrous vitriol of the trade. It will be remembered that the acid obtained from the base of the Glover tower is strong, of 60° Be, and has been deprived of its nitrous acid. This is in a fit state to be used in the Gay-Lussac tower, to the top of which it is pumped and allowed to run down through it. This liquid meets the ascending gases and absorbs the nitrous acid contained in them, running out at the base of the tower as nitrous vitriol, available for use over again in

the Glover tower, where the nitrous acid is restored to the process. It will thus be seen that the two towers act one with the other, the one absorbing the nitrous acid gas from the gases leaving the chambers, the other restoring it to the fresh gas entering the chambers, so that there is a constant interchange going on. The waste gases which reach the top of the Gay-Lussac tower should consist, theoretically, entirely of air. In practice, however, small traces of sulphur and nitrogen acid gases are always present, though, it is possible to keep them down to a very low amount. In Great Britain the Alkali Act prescribes that the escaping gases from the end of the process shall not contain more than four grains of acids calculated as sulphuric acid in a cubic foot. In practice it is quite possible to keep the acidity of the escape below this limit. At the end of the process is fitted the arrangement for producing the draft, which causes the gases to pass regularly from the burners to the Gay-Lussac tower. This may consist of a steam jet introduced into the exit pipe from the top of the



tower, or else the exit pipe is carried down to the base of a tall chimney stack where a damper is placed to control the sucking action of the stack.

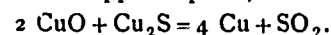
In a room at the base of the towers are placed the tanks for receiving the acids running from the towers, and the pumping arrangements for raising the acids to the top of the towers.

The successful and efficient working of the process depends very much on the regularity with which every operation, such as charging the pyrites and nitrate of soda, testing the drips around the chambers, running the acids down the towers, and controlling the draft is observed.

The manner in which the waste product from the nitre oven is disposed of has been mentioned.

The other waste product is the cinder from the roasted pyrites called purple ore. In case this contains copper in paying quantities, 4 p.c. or above, it is usually shipped to the copper smelters for the extraction of that metal. When roasting copper ores it is usual to mix them with salt, which converts the copper into chlorides, but can be leached out with slightly acidulated waters, and the subsequently precipitated copper smelted. The purple ore from copper ores after leaching is very free from sulphur, and in that way makes a very good

blast furnace ore. The reason ores containing copper are more free from sulphur after roasting is because the copper oxide formed during the roasting reacts on the copper sulphide, according to the formula :



In case of iron pyrites this reduction to metal or self purification does not take place, but somewhere from 1/2 to 1 1/2 p.c. of sulphur usually remains according to perfection of roasting.

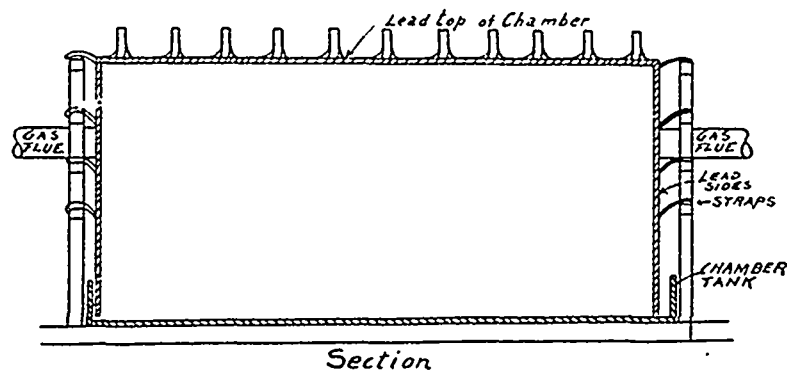
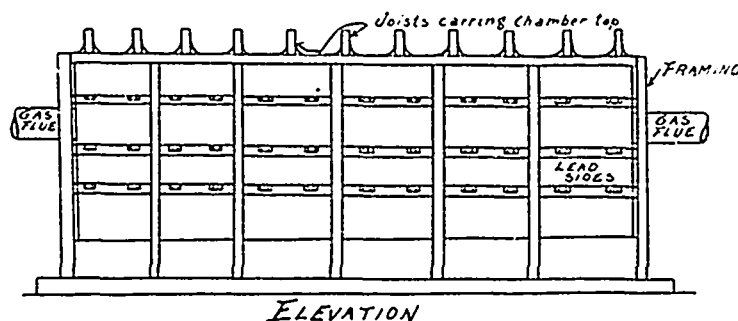
When copper is below 1 p.c. or only in very small quantities, then the purple ore is usually higher in sulphur, as above shown. It is, therefore, not as good for blast furnace material, and yet is used very largely in furnaces that have not the burden with very high sulphur in their other raw material. In many cases where it is not desirable to use it direct as a part of the burden, it is used for damping down the bell of the furnace, so that it is incorporated with the charge in small quantities :

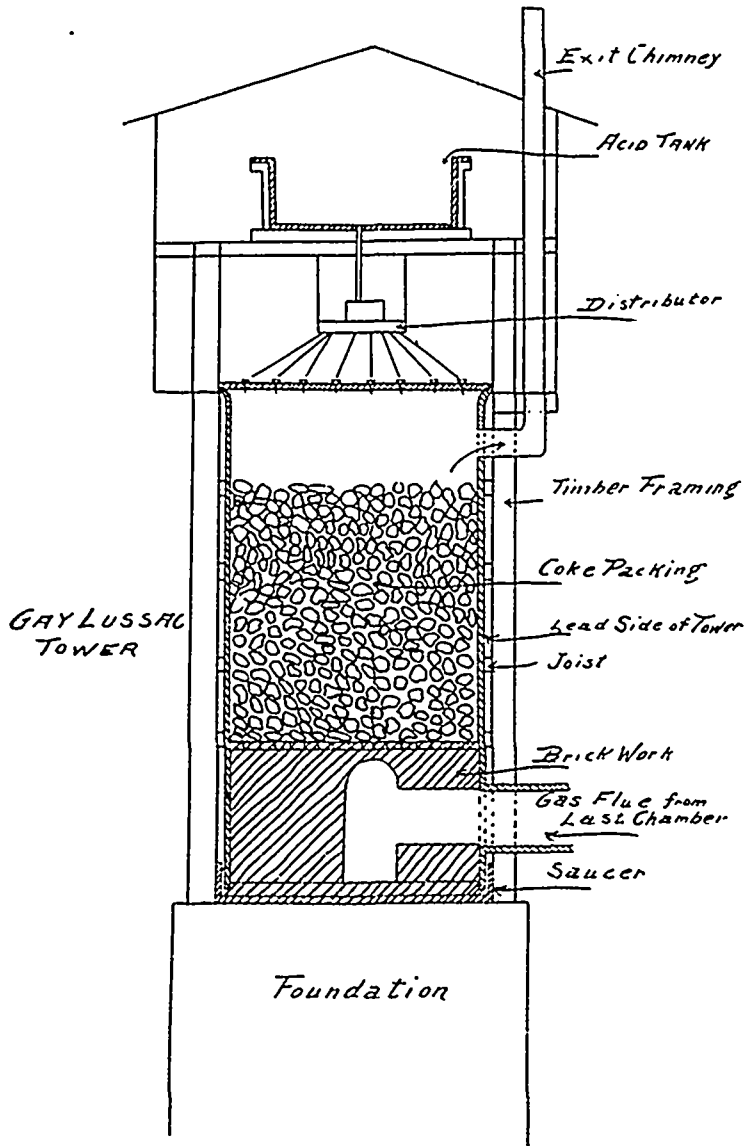
It may be of interest to show the analysis of some of the Newfoundland and Spanish ores and also analysis of some of the purple ores.

ANALYSIS OF PYRITES :

| Description.                               | Iron. | Silica. | Sulphur. | Arsenic. |                                                                                    |
|--------------------------------------------|-------|---------|----------|----------|------------------------------------------------------------------------------------|
| 1. Pilley Island.....                      | 43.55 | 5.30    | 47.17    | .29      |                                                                                    |
| 2. Fines from Acid Pit....                 | 43.91 | 1.19    | 50.07    | .27      | Moisture .38<br>Zinc 1.63<br>Copper .96<br>Alumina .37<br>Lime .60<br>Magnesia .51 |
| 3. Pilley Island.....                      | 44.04 | 3.42    | 49.03    | .09      |                                                                                    |
| 4. Pilley Island.....                      |       |         | 51.04    |          |                                                                                    |
| 5. Pilley Island.....                      | 40.51 | 4.68    | 46.98    | Trace    |                                                                                    |
| 6. Pilley Island.....                      |       |         | 49.03    |          |                                                                                    |
| 7. Spanish Fines.....                      | 43.47 |         | 50.03    | .16      |                                                                                    |
| 8. Spanish.....                            | 44.34 |         | 49.33    | .08      | Copper .36<br>Barium 1.01<br>Selenium 15                                           |
| 9. Port Au Port, Nfld....                  | 45.57 | 1.42    | 51.63    | None     |                                                                                    |
| 10. do do.....                             | 44.76 | 2.04    | 50.04    | None     | Copper none                                                                        |
| 11. Hunting Island, Gulf St. Lawrence..... | 42.39 | 2.37    | 48.55    | Trace    | Copper none<br>Nickel, trace                                                       |
| 12. Pyrrhotite Sudbury....                 | 61.06 |         | 36.03    | Trace    | Copper trace<br>Nickel 1.09                                                        |

ACID CHAMBER





|                    |       |                     |       |              |      |
|--------------------|-------|---------------------|-------|--------------|------|
| Pb.                | 1.07  | Trace               | 1.34  |              |      |
| Zn.                | 0.25  | Trace               | Trace |              | .52  |
| CO.                | Trace |                     |       |              | .24  |
| As.                | 0.03  |                     |       |              |      |
| Sb.                | 0.04  |                     |       |              |      |
| S.                 | 0.47  | 0.17                | 0.36  | 0.75 to 1.75 | 1.47 |
| Cl.                | 0.20  | 0.01                | 0.10  |              |      |
| Na.                | 0.10  | from salt admixture |       |              |      |
| P.                 | 0.01  |                     |       | 0.10         | .015 |
| BaO <sub>2</sub> . |       |                     |       |              | 1.29 |

\*Wedding. \*\*Mostly from Spanish Pyrites.

Another use to which purple ore is put is in the manufacture of pigments. The ore, after it is taken from the furnaces where, in this case, it is not allowed to become any hotter than is absolutely necessary for the burning off of sulphur, is ground to a coarse powder. It is then put into retorts and heated to certain temperatures. According to the degree of temperature, the color of the ore is changed. Hence, any color from a light red to a dark red can be obtained by merely regulating the temperature to which the ore is heated. It is then ground to a very fine powder, thoroughly washed and floated, thus extracting from it any grit which may be present. The fine powder thus washed is separated according to the different degrees of fineness, and is sold sometimes in the pure state, other times mixed with anilines or other coloring matter. This sells from 1/2 c. to sometimes 1 c. per pound. It is largely used in the manufacture of paper, especially the so-called "Express" paper where a red color is required. The powder is mixed with the pulp in the beating engine and is retained in the pulp when this goes over the paper machine by the presence of the sizing agents which are mixed in with the pulp. Thus, when the paper comes off the machine, manufactured, it will have any color from a light red to a dark red depending upon the amount and kind of pigment used. It is also used as adulterants in paints, etc.

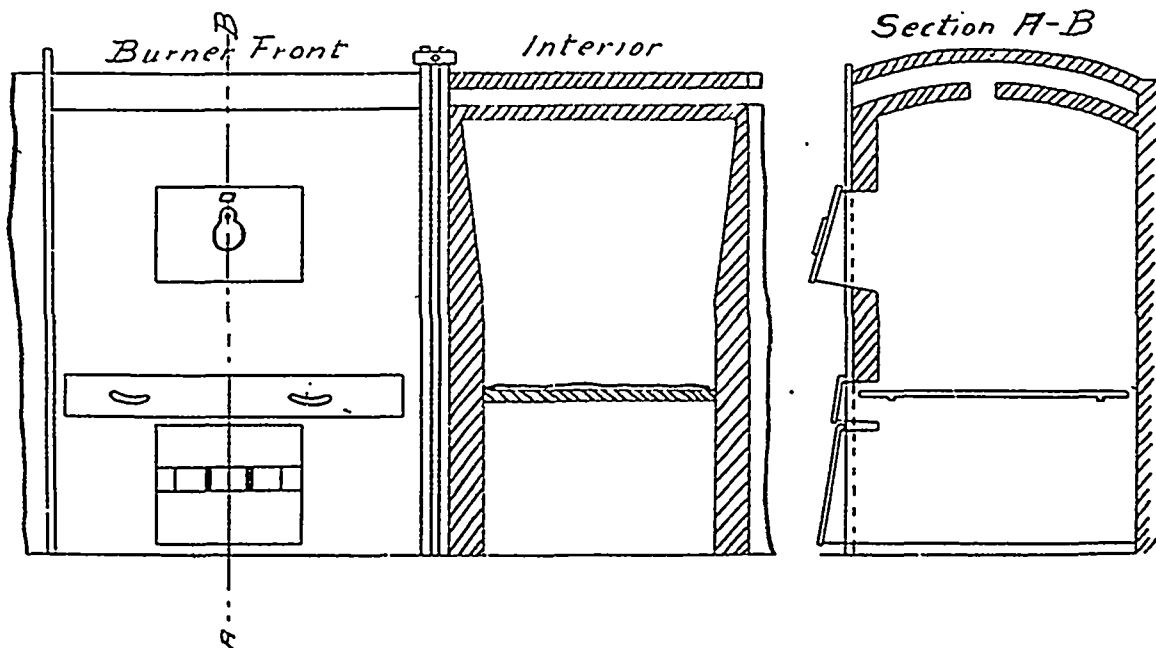
**The Testing of Safety Lamps.**

The following interesting letter on the above subject appeared in a recent issue of the *Colliery Guardian*, of London, Eng. The writer is a gentleman well known to most of the mining engineers in this country and has several times contributed articles on the question of safety lamps at the meetings of the Canadian Mining Institute. Mr. Ashworth is recognized as one of the most eminent authorities on this and kindred subjects concerning the safeguards used to prevent the death dealing explosions caused by the ignition of accumulations of noxious gases in coal mines:—

**ANALYSIS OF CINDERS OR PURPLE ORE.**

|                                  | Spanish. | Norwegian. | Average of German Practice. | Average of Spanish Sydney Practice. |
|----------------------------------|----------|------------|-----------------------------|-------------------------------------|
| Fe.                              | *64.94   | *57.00     | **65.00                     | 60.00                               |
| Mn.                              | 0.02     |            |                             | 62.30                               |
| SiO <sub>2</sub> .               | 2.77     | 14.30      | 2.55                        | Trace                               |
| Al <sub>2</sub> O <sub>3</sub> . | 0.26     | 3.00       |                             | 1.85                                |
| CaO.                             | 0.41     |            |                             | 1.00                                |
| MgO.                             | 0.07     |            |                             | .10                                 |
| Cu.                              | 0.12     | 0.15       | 0.15                        | .43                                 |
|                                  |          |            |                             | .30                                 |

**PYRITES BURNERS**



SIR,—In your edition of the 15th inst., I notice an article on "Experimental Galleries for Testing Explosives in Germany and Belgium." In these galleries actual firedamp from the mine has been used after passing twice through a purifier. The writer of this article, having described these galleries, goes on to say that at the Consolidation Colliery, Gelsenkirchen, and at the Frameries, near Mons, there are also galleries for testing safety lamps, and that Herr Beyerling (Gelsenkirchen) performed several tests on gauze cylinders to show their behaviour in an 8 per cent. mixture of firedamp and air. The reported results of these experiments appear to deserve very considerable explanation, as a single cylinder of brass gauze (diameter not named) was burned through when the velocity reached 16 ft. per second (duration of test not given), and a single cylinder of steel gauze withstood the mixture until it attained a velocity of 23 ft. per second, and he adds, even then the gauze did not burst. (Can anyone produce a gauze which has been burst by an explosion of gas within it if properly made?) Also that no explosion was caused when a double cylinder of steel gauze was exposed to a velocity of 36 ft. per second. Coal-dust was used in the explosive tests, why not also in the safety lamp tests? The results of these experiments are so widely different from those obtained by English experimenters that some explanation seems to be highly desirable. M. Stassart's experiments at Frameries pointed out the unreliability of the Mueseler lamp (and other lamps also might have been added) when using interior igniters. It would be interesting to have the dimensions of the earthenware chimney used in the Mueseler, and also to have more details of the experiments made on safety lamps in denser atmospheres than at the surface, which would be tantamount to tests with low and high barometrical readings.—Yours, &c.,

Chaddesden, Derby,  
January 18, 1904.

JAMES ASHWORTH.

#### A New Area of Copper-bearing Rocks in the Eastern Townships of the Province of Quebec.

By JOHN A. DRESSER, M.A., Montreal, Que.\*

On the latest map of the Eastern Townships, issued by the Geological Survey, three areas of Precambrian rocks are indicated. They form nearly parallel belts, which run in a northeast and southwest direction, generally from twenty to thirty miles apart, and are themselves from two to fifteen miles in width. They usually form conspicuous ridges, which are frequently the highest hills of the district. The intervening areas are occupied by later sediments. The extent and relative position of a part of these belts is shown by the accompanying sketch map (vide *American Journal of Science*, Vol. XIV, p. 43).

The western and central belts have long been known to be copper-bearing. They have yielded all the copper yet produced in the Eastern Townships, with the exception of that from the Acton and the Huntington mines, and the minor properties in the vicinity of each of these widely different deposits.

In a communication to this Institute in 1902, the writer pointed out that the greater part of these two belts are of volcanic, not sedimentary, origin, as had been previously believed. The view was then also advanced that all of the copper locations of the district of any known, or probable importance, would be found to occur in the igneous portions of these belts, and that those reported

from the sedimentary parts of the Precambrian, were likely to be of insignificant value. This view has been fully sustained by the results of two seasons' field work in this region, which have since been carried on for the Geological Survey.

Of the third Precambrian area, that around Lake Megantic, little is yet known. The wooded condition of the country along the boundary of the State of Maine, at the time that the southeastern quarter sheet of the Eastern Townships map was prepared (1885-6), prevented a detailed examination of the area. Yet the rocks were correctly correlated with the others in the Townships already referred to the Precambrian systems (Report of the Geological Survey, 1886, J, Dr. R. W. Ells).

In the summer of 1902 the writer spent a few days in an examination of the rocks in the vicinity of Lake Megantic. Outcrops were examined and specimens taken for forty miles along the western edge of the Precambrian area, and in a southerly course across it from Lake Megantic to the Arnold River, near the Maine boundary. The greater part of the rocks thus seen were found to be of volcanic character, like those of the Sutton and Stoke belts. In a cutting twenty rods in length on the Canadian Pacific Railway, near Boundary Siding, the rock, which is quite similar to the copper-bearing rock of Ascot, is everywhere rusted by the oxidation of pyrites. In the central part of this cutting, copper and iron pyrites, comprise from five to ten per cent. of the rock, through a band upwards of ten yards in width. Copper is reported to occur in the bank of the Arnold River, south of the village of Chaumay, between Lake Megantic and the boundary line of the State of Maine. Owing to high water at the time of my visit I did not go to the locality.

Topographically considered this area seems to be a northern extension of the copper-bearing range of the vicinity of Berlin Falls and Copperville in New Hampshire.

Dr. Chalmers reports the rocks of Ditton in the southern part of the eastern Precambrian area to be similar to those of Stoke Mountain. The latter are volcanics. The two areas, Ditton and Dudswell, (which latter is in the southern part of Stoke Mountain) are further alike in that the gravels of both carry considerable amounts of placer gold. In Dudswell the volcanic rock is evidently the source of the gold, while in Ditton, Dr. Chalmers also considers the gold to have been derived from the rock of the adjacent hills. Hence the occurrence of gold in the rocks farther to the eastward, along the tributaries of the Chaudiere, which has been reported by Logan, Michel, Selwyn and Chalmers, is a probable indication of the continuance of the volcanic rocks in that vicinity.

Further to the eastward, in the highlands of Gaspé, several observers, notably Logan, Ells and Low, have reported the occurrence of rocks characterized by chlorite and epidote, but no detailed microscopic study of them has yet been made. They are presumably a continuation, or recurrence, of this class of copper-bearing traps. Hence it seems probable that the watershed which determines the boundary between the Province of Quebec and the State of Maine, will, as the country becomes accessible for detailed examination, be found to be a continuous ridge, or succession of ridges, of copper-bearing volcanic rocks which may ultimately be connected with the cupriferous Precambrian of New Brunswick.

In view of the prospective opening of this wide extent of country by the projected Grand Trunk Pacific Railway, the actual extent of these rocks is likely to be soon known, and the value of the deposits they may contain becomes a problem of early importance.

\*Paper to be read before the March meeting of the Canadian Mining Institute.

### Notes on the Construction of Mine Bulkheads.

By WILLIAM THOMPSON, Rossland, B.C.\*

The writer was recently called upon to design and erect a number of mine bulkheads which required to be absolutely free from danger of collapse and fracture and possibilities of leakage. After consideration of the many classes of material available for this purpose, and various designs of construction, the following general design was decided upon and followed:—

#### Materials:—

Materials chosen for the erection of the bulkheads were hard burned, repressed brick, manufactured from clay found at Clayton, in the State of Washington, U.S.A., Portland cement imported directly through Vancouver agents from White Brothers, of London, England, and clean river sand found locally. Before being used samples of all materials were tested in the laboratories of Dr. J. T. Donald and McGill University, Montreal, Quebec.

#### Design of Bulkheads:—

In each case the pressure exerted from the head of water to be retained was in one direction. Bulkheads were, therefore, erected in the form of an arch set against footings cut into the solid rock, footings also being cut into the roof and floor of the workings to remove loose or fractured material and make perfect seal against leakage at point of contact between brick work and walls of drift. The first arch was re-inforced by a second arch of similar design and the space between the intrados and extrados of the two arches filled with strong cement concrete. The extrados of the final arch was also sealed by strong cement concrete faced with two-inch cedar plank. The strongest and most perfectly shaped brick were chosen for the construction of the main arches and the mortar used consisted of two parts sand to one cement, freshly mixed as required.

#### Strength of Materials:—

##### Brick:—Transverse test:—

Distance between centres of support in each case, 6 in.

##### Specimens tested on flat.

Breaking load at centre in lbs., arch brick 6,500 lbs.  
 “ “ “ face brick 3,900 lbs.

##### Compression Test.—

Load in lbs. per sq. in. at initial failure, arch brick, 6,600 lbs.  
 “ “ “ “ face “ 2,117 “  
 Maximum load in lbs. per sq. in., arch “ 8,320 “  
 “ “ “ “ face “ 3,242 “

##### Cement:—

Tensile strength in lbs. per square inch.

Neat cement 20 per cent. water, at end of 60 days, 699 lbs.

One cement and one standard quartz sand, same period, 540 lbs.

One cement and one sand used, same period, 498 lbs.

#### Plan of Bulkheads:—

Diagram No. 1 shows vertical section, and Diagram No. 2 plan of bulkhead erected to withstand pressure due to 475 feet of water.

A three-inch wrought iron pipe was laid through each bulkhead to carry off water accumulating during construction, this pipe being sealed when water was allowed to accumulate against the face. Bulkheads were maintained free from pressure until material had become thoroughly set.

#### Results:—

Results obtained proved eminently satisfactory, bulkheads proving watertight, and owing to large factor of safety are free from any danger of collapse or fracture.

\*Paper to be presented at the Annual Meetings of the Mining Institute, March 2nd, 3rd and 4th, 1904.

## COMPANY NOTES

**B. C. Copper Company.**—At the British Columbia Copper Company's annual meeting at Charleston, W. Va., important changes were made in the directorate, Messrs. Laidlaw, Thomas and Ropes retiring. F. G. Renner of the stock exchange firm of Woerischer & Co., J. C. Reiff, a well known local capitalist, and W. W. Trimpf, president of the Newark River Works, succeeded them. Other directors were re-elected. The consolidation with the Snowshoe is being worked out. Considerably more than the required British Columbia stock has been deposited.

**Lightning Creek Gold Gravels Co.** The Annual meeting of the Lightning Creek Gold Gravels and Drainage Company of which Senator James Reid is president will be held in Ashcroft, B.C., on Thursday the 10th of March, when it is expected arrangements will be made for continuing work on this property.

**Klondyke Consols, Ltd.**—The report issued by Klondyke Consols, Ltd., shows that the mining operations during the past year resulted in a loss, and, to obviate further losses, the company has let out its ground on the lay system. Owing to the low gold values in the ground which has been recently worked, the board are not inclined to run the risk of further losses, they have therefore decided to dispose of their claims to the best advantage, and wind up the company.

**Vancouver Oil and Petroleum Synd.**—The Vancouver Oil and Petroleum Syndicate has received word from Alberta that a very large pocket of gas has been struck at oil well No. 1 in Alberta. The last news received by the company from the oil fields, reports two wells as being bored. In No. 1 they are in limestone and the indications are that gas has been generated from the oil reservoir beneath this strata. The well is down 1,350 feet.

**Cariboo McKinney Mining and Milling Co.**—The Greenwood (B.C.) *Times* has the following in a recent issue, respecting the above company: "The Cariboo mine of Camp McKinney is likely to remain closed indefinitely. At the annual meeting recently held in Toronto, a dividend of 4 per cent. was ordered paid, leaving only \$5,000 in the treasury, and it was decided to not open the mine. Some time ago the Cariboo was closed and pumps taken out, the local management announcing that there was no further ore in sight. Shareholders in the company were opposed to this action, believing that some of the money in the treasury should be used in development work, and it was confidently believed that further ore bodies could be opened up. It was hoped that this view would prevail at the annual meeting but evidently the majority of shareholders didn't believe in expending any money in development work."

**Dominion Coal Co.**—The Dominion Coal Co. expects to produce 3,500,000 tons of coal during the present year; and, their being no demoralization in the Canadian coal trade as in the United States, the company had succeeded in selling for 1904 up to November on the basis of 3,500,000 tons at practically unchanged prices. With respect to the operations of the company Mr. James Ross, president is reported as saying:—"At the annual meeting to be held next month, the company will show very satisfactory earnings for the year. For the year ended February, 1903, the earnings were about \$1,717,000 or almost nine per cent. on the common stock outstanding, after payment of fixed charges and preferred stock dividends. This year, notwithstanding the severe loss at Dominion No. 1, by reason of fire, earnings should be as large as a year ago when all the mines of the company were in operation."

**Diamond Vale Iron and Coal Co. (B.C.)**—Preliminary arrangements have been completed for the building of a railroad from Spence's Bridge, on the Canadian Pacific Ry., to Nicola Lake, where the Diamond Vale Iron & Coal Co. owns large areas of coal land which it is planning to develop on an extensive scale. This district, which is yet undeveloped, is about equal in mineral resources to the Crow's Nest field.

**Payne Consolidated Mining Co.**—The Sandon (B.C.) *Standard* is authority for the following item: The Payne has closed a contract with the Aaron Hirsh & Sohn company, of Halderstadt, Germany, for about 2,500 tons of zinc. The deal was closed last Saturday by S. Hirsh, representing L. Vogelstein, a Wall street broker. The ore will be shipped in bulk and will comprise the most of the year's output of the Payne. With a market for silver, lead, zinc and iron, the Payne should be on velvet before long.

**Calumet and B. C. Gold Mine, Ltd.**—The fourth cleanup of the stamp mill of the Calumet and B. C. Gold Mines took place last week at Camborne and gave values of \$5,000, according to the Camborne Miner. The value of the gold in the brick was \$7,640 and the concentrates are valued at \$360, making the total \$8,000. The quantity of rock treated was 900 tons and the total time of the mill run was 690 hours. Although the cleanup was \$3,400 less than that of December still it is very satisfactory. The falling off is due to the fluctuating nature of the quartz.

**Crow's Nest Pass Coal Co.**—The output of Crow's Nest Pass Collieries for the week ending February 12 was 17,956 tons. Coal Creek, 7,233 tons; Michel, 6,864 tons; Morrissey, 3,859 tons. Total output for week, 17,956 tons. Average daily output, 2,992 tons. Total output corresponding week last year, 10,472 tons; average daily output for corresponding week last year, 1,745 tons.

**Slocan-Cariboo Mining and Development Co.**—At the annual meeting of the Slocan-Cariboo Mining & Development Co. in Toronto, on February 12, it was decided to issue bonds to the amount of \$10,000 to enable work to be continued at the company's gold mines on Canadian Creek, near Cariboo, B.C. The money will be partly expended in running a tunnel into the old channel. The report of H. McMaster was to the effect that the claim had been proved to carry gold in paying quantities in two places half a mile apart and that there was good reason to believe that the intervening ground was as rich. It could be economically worked by reason of the limited extent of waste ground having to be worked through to strike the old stream bed. Alfred Ansley was elected president and Charles T. Lyon, secretary-treasurer. George H. Weatherhead and W. J. Chick were added to the directorate.



Le Roi No. 2, Limited.—At the meeting of Le Roi No. 2, further information was given to the shareholders than appeared in the report. Although the chairman was unwilling to state definitely that the concentration process was a proved commercial success in regard to the ores of this company, it seems impossible to doubt that this is the case. It was stated that no ore of a higher value than \$5 had been treated, and the ratio of concentration had been entirely satisfactory, in addition to which the cost of oil and oil losses has been very much reduced under skilled management, judging from the statements made by Mr. Elmore. There is every reason, therefore, to anticipate that when ore of the value of seven or eight dollars a ton is concentrated there will be a substantial margin of profit. The action of the auditors in writing off a substantial amount of depreciation was referred to, and although it has the sanction of the board, it is pointed out that with a reduced capital such a course would not have been necessary. The recent discovery at depth in the Le Roi is naturally of considerable importance to this company, as it would appear to prove that they also will find high grade bodies at depth. The board has undoubtedly made a wise choice in their consulting engineer.

## NEW COMPANIES.

### ONTARIO.

Orion Mining Company, Limited.—Incorporated under the Statutes of Ontario, 13th January, 1904. Authorized capital, \$1,500,000 in 1,500,000 shares of one dollar (\$1) each. Directors: M. Stewart, L. K. Hyde, I. L. Shank, T. B. Westgate, F. Tacky, S. Grumbine, T. Canan. Head Office: Niagara Falls, Ont. Formed to acquire the properties known as the "Orion Mining Company, Limited."

The People's Natural Gas Company, Limited.—Incorporated under the Statutes of Ontario, 9th December, 1903. Authorized capital, \$100,000 in 4,000 shares of twenty-five dollars (\$25) each. Directors: J. Brown, F. J. Ramsay, R. A. Harrison, F. R. Lalor, H. Cockshutt, W. J. Aikens, H. Eagle. Head Office: Dunnville, Ont. Formed to acquire the properties known as "The People's Natural Gas Company, Limited."

Mayo Mining and Development Company, Limited.—Incorporated under the Statutes of Ontario, 8th January, 1904. Authorized capital \$250,000 in 5,000 shares of fifty dollars (\$50) each. Directors: R. Harcourt, J. L. Harcourt G. Campbell, O. E. Fleming, H. O. Fleming. Head Office: Windsor, Ont. Formed to acquire the properties known as the "Mayo Mining and Development Company, Limited."

The Deep Oil and Gas Company, Limited.—Incorporated under the Statutes of Ontario, 29th January, 1904. Authorized capital, \$100,000 in 10,000 shares of ten dollars (\$10) each. Directors: L. Teskey, C. E. J. Smith, M. Elliott, L. E. Smith, E. A. Teskey, A. Elliott, A. T. McMahan. Head Office: London, Ont. Formed to acquire the properties known as "The Deep Oil and Gas Company, Limited."

### BRITISH COLUMBIA.

Amalgamated McKee Creek Mining Company, Limited.—Incorporated under the Statutes of British Columbia, 19th January, 1904. Authorized capital, \$20,000 in 20,000 shares of one dollar (\$1) each. Formed to acquire the properties known as the "Amalgamated McKee Creek Mining Company Limited."

Keystone Mines, Limited.—Incorporated under the Statutes of British Columbia, 20th January, 1904. Authorized capital, \$50,000 in 5,000 shares of ten dollars (\$10) each. Formed to acquire the properties known as the "Keystone Mines, Limited."

British Columbia Mica Company, Limited.—Authorized and licensed under the Statutes of British Columbia, 12th January, 1904, as an Extra-Provincial Company to carry on business. Authorized capital, \$1,000,000 in 10,000 shares of one hundred dollars (\$100) each. Head Office: Lewisville, N.B. Head Office in this Province: Kamloops, B. C., F. J. Fulton, Kamloops, B. C., Attorney. Formed to acquire the properties known as the "British Columbia Mica Company, Limited."

The International Gold Company.—Registered under the Statutes of British Columbia, 12th January, 1904, as an Extra-Provincial Company. Authorized capital, \$15,000 in 1,500,000 shares of one cent (1c.) each. Head Office: Whatcom, State of Washington. Head Office in this Province: Vancouver, B. C. J. Martin, Vancouver, B. C., Attorney. Formed to acquire the properties known as "The International Gold Company."

The Pacific Mineral Extraction Co., Limited.—Incorporated under the Statutes of British Columbia, 29th January, 1904. Authorized capital \$100,000 in 100,000 shares of one dollar (\$1) each. Formed to acquire the properties known as "The Pacific Mineral Extraction Co., Limited."

Camp Creek Hydraulic Placer Mines, Limited.—Incorporated under the Statutes of British Columbia, 8th February, 1904. Authorized capital \$125,000 in 125,000 shares of one dollar (\$1) each. Formed to acquire the properties known as the "Camp Creek Hydraulic Placer Mines, Limited."

"The Kamloops Coal Development Company, Limited." "Non-Personal Liability."—Incorporated under the Statutes of British Columbia, 4th February, 1904. Authorized capital, \$5,000 in 100 shares of fifty dollars (\$50) each. Formed to acquire the properties known as "The Kamloops Coal Development Company, Limited." "Non-Personal Liability."

The Handy Gold Mines Development Co.—Registered under the Statutes of British Columbia, 8th February, 1904, as an Extra-Provincial Company. Authorized capital, \$1,500,000 in 1,500,000 shares of one dollar (\$1) each. Head Office: Spokane, Washington. Head Office in this Province: Kalso, B. C., A. J. Curle, Kalso, B. C., Attorney. Formed to acquire the properties known as "The Handy Gold Mines Development Company."

## CONCENTRATES.

Mr. James C. McNally, U.S. Consul at Liege, Belgium, reports that a representative of the Canadian Pacific Ry. is shipping Belgian coal miners to British Columbia, offering as an inducement wages much in excess of those prevailing in Belgium, and as a result a large number of men have been secured.

A member of the Dominion parliament is drafting regulations for the development of coal property on Indian reserves in the Northwest Territories. It is provided that all persons acquiring mining rights on Dominion lands or upon Indian reserves shall be required to sell direct to consumers, at not more than \$1.75 per ton.

The efficiency of compressed air in operating pumps underground in mines is greatly increased by reheating the air at a point near the pumps. This is usually possible where the ventilation is sufficiently good. A compound direct-acting pump, heated sufficiently to prevent freezing, will pump double the amount of water with the use of a given amount of air that a single-acting pump will. Freezing of a mine pump may often be prevented by arranging a drip from a pipe so that a small stream of mine water will fall upon the exhaust opening. This usually keeps the temperature at a point somewhat above freezing. A large exhaust opening is also necessary, and may be kept from clogging with ice much easier than a small one.

An Order in Council has been passed at Ottawa providing that no mining regulations or other regulations for the sale or disposal of Government lands shall apply to the 50,000 acres of coal lands in the Crow's Nest Pass district selected by the Dominion Government. These lands are only to be disposed of as specially authorized by Order in Council.

RUSSIAN ORE SHIPMENTS.—For the week ending January 30 shipments aggregated 8,750 tons, as follows: Le Roi, 4,890; Centre Star, 1,320; War Eagle, 1,230; Kootenay, 240; Jumbo, 320; Le Roi, No. 2, 420; same (milled), 30; total for year to date, 40,568 tons.

Prof. Rutherford, of McGill University, to whom a specimen of uranium mineral found in an old mica mine near Murray Bay, Charlevoix county, Que., was submitted for analysis by Mr. J. Obalski, M.E. of Quebec, reports that the mineral contains uranium in workable quantity and compares with the best pitch blende used for that purpose in Europe.

PHOENIX, B. C., FEB. 13.—The Boundary ore shipments for the week bring the total for 1904 over the 100,000 ton mark. Severe snowstorms nearly all this week have kept the C.P.R. officials busy endeavoring to keep traffic open, and they have been generally successful, although the tonnage is somewhat smaller for the current week. The Athelstan this week, made the largest ore shipments since that property resumed sending out ore last summer, being able to secure all the cars needed. Following are the figures for the week's tonnage from the several Boundary mines:

|                                                       |        |
|-------------------------------------------------------|--------|
| Granby, to Granby smelter.....                        | 10,590 |
| Mother Lode to Greenwood.....                         | 3,040  |
| Emma, to Granby smelter.....                          | 495    |
| Senator, to Granby smelter.....                       | 264    |
| Oro Denoro, to Granby smelter.....                    | 870    |
| Athelstan-Jackpot, to Granby and Greenwood smelters.. | 625    |

Total for the week.....15,884

The total for the year to date is 100,480 tons. This week the Granby smelter treated 13,540 tons of ore, making a total of 77,088 tons this year.

The 1903 output of gold from the Alaskan Territory, U.S. will probably show a larger total than any other previous year. Last year's product has been placed by the United States mint at \$8,233,408. The increase in the Nome output last year was not as great as many persons believed it would be. This year the estimate is placed at \$6,000,000. The quartz mines of Southeastern Alaska made the best showing during the past twelve months. People are beginning to realize that the quartz fields around the Juneau district are certain to produce an increased amount of gold every year for an indefinite period. The increase in the 1902 product of gold and silver in Alaska amounted to \$1,400,254 over the year 1901. The gold product in 1901 was \$6,932,226. The increase in gold over the year before was \$1,351,181. The 1902 Nome output of gold was \$4,542,188, this being an increase of \$430,182 as compared with the product of the year before.

COAL CONSUMED BY THE SIBERIAN RAILROAD.—About 300,000 tons of coal are consumed yearly by the Siberian Railroad. The bulk of the coal comes from the mines in the Tomsk and Irkutsk districts of Siberia but the Urals supply most of that consumed on the western section of the line.

The minerals of Korea are of considerable value. Copper, iron and coal are reported as abundant, and gold and silver mines are being successfully operated, an American company having charge of and operating a gold mine at the treaty port of Wunsan under a concession granted in 1895.

SWEDISH IRON ORE EXPORTS.—The exports of magnetic iron ore from northern and Central Sweden in 1903 were 2,537,214 metric tons. Of the total exports, 1,949,477 tons were forwarded to Germany and the remainder to Great Britain, Belgium and other countries.

Osmiridium and platinum have been found in the alluvial gravels of the Horsefly and Bullion districts, in British Columbia. Special appliances are being installed to extract these rare metals.

The Broken Hill Proprietary mine, in New South Wales, is about to manufacture its own sulphuric acid for use in the Delprat process. This will obviate heavy first cost and subsequent freight on this chemical. Broken Hill has become a notable stimulant to metallurgical research.



### The Gold Run Co.

The following letter which is addressed to the editor of the B.C. *Miners Record* published in London, England will be read with interest, by many people in Canada where the "Count" is so well known. Mr. Carbonneau is a native of Ottawa, but is perhaps better known in Montreal, in which city he found more scope for his remarkable financial abilities.

Sir,—Some twelve months ago you took occasion to comment on the formation of a Klondike mining company, formed to operate an extensive territory on Gold Run Creek. In your role of critic and adviser on Canadian mining matters, you characterised these claims worthless, and made many libellous and untrue statements against myself. A vindictive newspaper article seems to lose much of its importance at a distance, more especially when the person attacked is in his own country and among those who actually know the true facts of the case. You may remember, if you follow the remarks of the local press, that every paper took strong exception to your remarks, as being absolutely unjustifiable. As I have lived and worked in Klondike for five years, this fact speaks for itself.

Your attack on me was as bitter as it was unjustified, and had I at that time been in London, I should have taken immediate action.

The company I had formed, being the most important, both in size and proved value of the properties, which has yet been brought out, required my entire time and energies, and to speak frankly, your criticism has in no way affected my own or the company's welfare.

My object in writing to you is to enclose a copy of the first balance sheet of the company, which has just been passed by the auditors, a London firm of the highest standing.

You will see that from March to October last year, gold to the value of £100,526 was washed from the company's claims, and we have been able to distribute dividends amounting to £79,566, a proof of the richness of the claims and the economy of the management which has, I think you will admit, never been equalled by any other Klondike company.

As your remarks as to the value of this company's properties have proved so entirely at variance with facts, you may, possibly now do justice both to the company and its originator.

Yours truly,

C. E. CARBONNEAU.

15, Avenue D'Autin,  
Paris.

3rd February.

### Pig Iron Production in Canada.

The American Iron & Steel Association has received direct from the manufacturers the statistics of the production of all kinds of pig iron in Canada in the Calendar year 1903. They show a decrease of 54,139 gross tons, or nearly 17 per cent, as compared with 1902, but an increase of 20,442 tons as compared with 1901.

The total production in 1903 amounted to 265,418 gross tons, against 319,557 tons in 1902. In the first half of 1903 the production was 132,930 tons and in the second half it was 132,488 tons, a falling off of only 442 tons. Of the total production in 1903, 247,995 tons were made with coke and 17,513 tons with charcoal. Nearly one-half of the total production was basic pig iron, namely, 126,842 tons. Less than 1,000 tons of bessemer iron were made. Spiegeleisen and ferro-manganese have not been made since 1899.

The following table gives the total production of all kinds of pig iron (including spiegeleisen and ferro-manganese) in Canada from 1894 to 1903. Prior to 1894 the statistics of pig iron production in Canada were not collected by the Association.

| Year.     | Tons   | Year.     | Tons.   |
|-----------|--------|-----------|---------|
| 1894..... | 44,791 | 1899..... | 94,077  |
| 1895..... | 37,829 | 1900..... | 86,090  |
| 1896..... | 60,030 | 1901..... | 244,976 |
| 1897..... | 53,796 | 1902..... | 319,557 |
| 1898..... | 68,755 | 1903..... | 265,418 |

The unsold stocks of pig iron in Canada on December 31, amounted to 19,168 tons.

On December 31, 1903, Canada had 15 completed blast-furnaces, of which 9 were in blast and 6 were idle. Of this total, 11 were equipped to use coke for fuel and 4 to use charcoal. In addition, 3 coke furnaces and 1 charcoal furnace, were being built or were partly erected on December 31, but work on at least two of the furnaces had been suspended some time ago.

The Dominion Iron & Steel Company, of Sydney, N. S., had all four of

its furnaces running during 1903, although two only were in operation on December 31. No date has been set for the blowing in of the idle furnaces.

The Londonderry Iron & Mine Company, of Londonderry, N. S., did not operate either of its furnaces in 1903. During the year it rebuilt furnace A and expected to have it in blast about the middle of January. This stack is now 75 by 17 ft., and has an annual capacity of about 45,000 gross tons of foundry pig iron. The Company is uncertain whether it will rebuild furnace B, which has been long idle.

The Nova Scotia Steel & Coal Company operated Ferrona furnace, at Ferrona, N. S., for 48 weeks in 1903 and was running it on December 31. The new furnace which the company is erecting at Sydney mines, in Cape Breton county, will probably be completed in June, 1904. It will have a daily capacity of 200 tons.

The Canada Iron Furnace Company was re-lining its furnace at Radnor Forges, Quebec, on December 31, but expected to have it ready for blast about the middle of January. The furnace ran for 41 weeks last year. The Midland furnace of the company, at Midland, Ont., ran for 45 weeks last year and was active on December 31.

John McDougall & Co. had one of their two furnaces at Drummondville, Que., in blast on December 31. The idle furnace may resume work during the coming summer.

The Algoma Steel Company, Limited, of Sault Ste. Marie, Ont., had two furnaces completed and ready for blast on December 31. The date when they may be blown in is uncertain.

The Deseronto Iron Company of Deseronto, Ont., operated its charcoal furnace for 46 weeks in 1903, and was running it on December 31.

The Hamilton Steel & Iron Company, Limited, of Hamilton, Ont., was operating its furnace on December 31. It ran for 43½ weeks last year.

### General De Wet as a Promoter.

SYNDICATE NOW BEING FLOATED BY LATE BOER LEADERS.

War time wounds are being healed rapidly. Convincing evidence of this is forthcoming in the presence of Christian R. de Wet, Judge Hertzog, and Mr. J. G. Celliers, upon the directorate of an enterprise imposingly designated "The National Options Syndicate, Limited." With three ex-Boer Commandant-Generals, this Syndicate is somewhat out of the ordinary, and for this reason the prospectus deserves consideration. Of the capital of £100,000, the vendors, who are presumably included in the directorate, are to receive 45,000 shares and £5,000. Working capital is to be £25,000, and 25,000 shares constitute the reserve. Besides the gentlemen designated, the other Directors are Messrs. H. Jasper Smith, W. H. Poultney, and James Hosking.

A few features of the prospectus rather indicate that Boers make better terms with Boers than do Britishers negotiating options. The assets consist of the right to prospect and the option to acquire *at one pound per morgen, in cash or shares, all metals, minerals, precious stones, coal, mineral oils, etc., and all mining rights, absolutely.* The vendors are to continue to negotiate options. For what they have already obtained they are to be paid £20 per farm, actual expenses.

The present area over which options have been acquired is about 500,000 acres, and it is expected that the options in the hands of the Syndicate will soon be increased to over one million acres. Of the 500,000 acres already secured, the rights of the Syndicate over about 40,000 acres, consist of *perpetual* options to purchase the mineral rights absolutely at £1 per morgen in cash or shares *without further payment* for option money. The rights over the remaining 460,000 acres consist of a five years option *without further payment*, to purchase absolutely the whole of the mineral rights at £1 per morgen in cash or shares. The option on any farm can be continued *indefinitely* after the expiration of five years by payments of £50 per annum.

The claim is made that the Syndicate has been, and will be, enabled to secure many valuable options (which would otherwise have been unobtainable) owing to the *unique terms* of their options and the influential agents acting for them. "The terms of the options are such that, while the Syndicate obtains all mineral rights, the farmers retain the surface rights (beyond what is necessary for mining purposes) in all circumstances, and the Syndicate has the benefit of the services of many of the leading officials in the late Transvaal and Orange Free State Republics. The value of these two considerations is evident to all having experience of the Boer people. The farms are said to have been selected because of indications thereon of diamonds, mineral oils, gold, copper, lead, zinc, coal, iron, etc." Several

of the farms are in the Boshof District, and are reported to carry diamondiferous formations similar to that of the Kimberly District. "One of these farms, on the Vaal River, is bounded on the east and on the west by farms on which diamonds are being found. Several others in the Orange River Colony have oil shales, natural gas, and coal, besides both precious and base metals. Gold, copper, lead, coal and iron, as well as asbestos, nitrates, etc., are found on the Transvaal farms."

The farms are arranged in amalgamated areas of from 40,000 to 50,000 acres, and, for the purposes of prospecting or purchasing, each such area will be treated as a unit, and any options exercised by the Syndicate to purchase will extend to the whole of each amalgamated area. In conclusion this optimistic document states. "Prospecting must be commenced before the end of November next. Most of the farms are highly mineralized, and in all probability will require little money spent prospecting them before the developments will amply justify the formation of subsidiary companies. It is believed the profit accruing therefrom will provide sufficient funds for carrying on the business of the Syndicate without resorting to further issue of share."—*South African Mines*, Johannesburg, S.A.

### Coal in War Time.

As the fat is now in the fire and the navies of Japan and Russia, are at it "hammer and tongs," the following excellent editorial from one of the leading authorities on the British coal trade, will no doubt prove of timely interest to the readers of the REVIEW:

"In a recent leading article we discussed at some length the position of coal in time of war; but in view of the importance of the subject, especially at the present time, some further consideration of it may not be unprofitable, for when there is any possibility of naval war between two Powers whose respective Governments are on good terms with England, British coal merchants cannot help feeling anxious with regard to the safety of cargoes which are on their way to foreign ports. The doctrines of international law are not always capable of precise interpretation, nor, when clearly appreciated, are they rigidly observed by all Great Powers. Every modern war witnesses the advent of new weapons and machinery for which existing rules of international law on questions of contraband, etc., do not provide. Further, though all nations readily attach their signature to conventions and treaties in "piping times of peace," some of them are only too ready to disregard their obligations during hostilities when they realize that by doing so they may gain an important advantage. To the coalowner and merchant, however, the question of greatest interest is whether coal is to be treated as contraband of war. Unlike the muniments of war themselves, coal is an article which is not only of the first importance in naval warfare, but which serves the needs of peaceful citizens in belligerent states. It would, therefore, be unjust in the highest degree if the law of nations were to place an absolute embargo upon the delivery of coal at belligerent ports for any purpose during the progress of hostilities. It may be of interest to consider the present state of international law with regard to the transport of coal and then to make some reference to the effect of a war upon policies of insurance which may have been taken out for the protection of coals sent, or about to be sent, from this country to one or other of the belligerent Powers.

The rule to be deduced from treaties and international conventions upon the question whether coal is contraband of war appears to be, as we recently pointed out, that coal is *conditionally* contraband—that is to say, the question must be answered in relation to each particular cargo. To take an illustration. The coal on board a ship which was under charter to deliver it to one of the belligerent fleets at sea could be declared contraband and confiscated by the other belligerent. This is a statement of international law which would probably be accepted by every civilized country. The question whether coal on board a ship which is bound for the port of a belligerent is open to more difficulty, and is not answered in the same way by the Great Powers. For instance, in 1870 Germany protested against the delivery of any English coal at French ports during the war, but British Ministers, although they restrained the delivery of coal to French warships at sea, permitted merchantmen flying the British flag to deliver coal at French ports. In view of this German protest, it would seem that Germany's attitude is to make coal contraband of war in all cases. The position of Russia is very different. At the West African Conference, as we have before noted, she gave a complete denial to the right of any country to declare coal to be contraband, and pronounced her determination never to sign any treaty or convention which contained any stipulation of the kind. How far she will

consistently abide by this decision when she is next involved in a naval war remains to be seen. For instance, in the case of a war with Japan, would a Russian cruiser not interfere if an English collier were delivering coal to a Japanese warship? English merchants will surely act on the safe side if they assume that coal consigned, directly or indirectly, to belligerent States is liable to capture.

It is most important to consider the effect of war on policies of insurance. Such policies usually contain what is known as the "neutral clause," which provides in effect that if the law of nations with regard to neutrality shall not be observed, the underwriters are absolved from the consequences. By the law of nations, as interpreted in this country, the following rule has been firmly established as a principle of our laws of war:—If, during war, neutral property be engaged in any branch of the Colonial or coasting trade of the enemy, which is not open to foreigners in time of peace, such property loses its character of neutrality, and becomes liable to hostile capture. This rule



# Canadian Mining Institute

INCORPORATED BY ACT OF PARLIAMENT 1898

### AIMS AND OBJECTS.

- (A) To promote the Arts and Sciences connected with the economical production of valuable minerals and metals, by means of meetings for the reading and discussion of technical papers, and the subsequent distribution of such information as may be gained through the medium of publications.
- (B) The establishment of a central reference library and a headquarters for the purpose of this organization.
- (C) To take concerted action upon such matters as effect the mining and metallurgical industries of the Dominion of Canada.
- (D) To encourage and promote these industries by all lawful and honourable means.

### MEMBERSHIP.

MEMBERS shall be persons engaged in the direction and operation of mines and metallurgical works, mining engineers, geologists, metallurgists, or chemists, and such other persons as the Council may see fit to elect.

STUDENT MEMBERS shall include persons who are qualifying themselves for the profession of mining or metallurgical engineering, students in pure and applied science in any technical school in the Dominion, and such other persons, up to the age of 25 years, who shall be engaged as apprentices or assistants in mining, metallurgical or geological work, or who may desire to participate in the benefits of the meetings, library and publications of the Institute. Student Members shall be eligible for election as Members after the age of 25 years.

### SUBSCRIPTION.

|                                  |         |
|----------------------------------|---------|
| Members yearly subscription..... | \$10 00 |
| Student Members do .....         | 2 00    |

### PUBLICATIONS.

|                                          |
|------------------------------------------|
| Vol. I, 1898, 66 pp., out of print.      |
| Vol. II, 1899, 285 pp., bound red cloth. |
| Vol. III, 1900, 270 pp., " "             |
| Vol. IV, 1901, 333 pp., " "              |
| Vol. V, 1902, 700 pp., " "               |
| Vol. VI, 1903, 600 pp., now in press.    |

Membership in the Canadian Mining Institute is open to everyone interested in promoting the profession and industry of mining without qualification or restrictions.

Forms of application for membership, and copies of the Journal of the Institute, etc., may be obtained upon application to

B. T. A. BELL, Secretary,  
Orme's Hall, Ottawa

stands on two grounds:—(1) That the neutral, by thus acting, interposes to relieve the enemy from the condition to which the other belligerent has reduced him, and to that extent deprives that belligerent of the advantage he had gained. (2) That the neutral employed in a trade, reserved by the enemy to his own subjects, identifies himself with that enemy and assumes his character. In the words of Lord Mansfield:—"If a neutral ship trades to a French colony with all the privileges of a French ship, and is thus adopted and naturalized, it must be looked on as a French ship, and is liable to be taken." Carrying simulated papers is a ground of capture and condemnation, and, if without leave expressly given in the policy, it is a breach of the warranty of neutrality; and, in the United States, carrying suspicious papers has been held to be a breach of warranty. It has also been held in the United States, and apparently, on sound principles, that an attempt to disguise belligerent goods as neutral, and carrying them as such with neutral cargo, is a breach of the warranty of neutrality, and will void a policy of insurance as to the neutral cargo, though if the same goods had been taken on board as enemy's goods, and so documented, the only effect would have been to expose them to confiscation. We shall discuss this subject with sufficient clearness if we deal with the "warranty of neutrality" which appears in a policy of marine insurance. The meaning of a warranty of neutrality is not only that the ship or goods are neutral owned at the time the policy is effected, but that, so far as depends on the conduct of the assured or his agents, they shall be neutral for the purpose of being protected on the voyage; and therefore that the ship shall be navigated according to the law of nations, and also be furnished with all the documents and papers which are the evidence of neutrality, and her observance of the regulations of those international treaties to which she is bound to conform. If the coal which is the subject of the insurance be *in transitu*, or in the course of consignment from a vendor to a vendee, it is not enough, in order to satisfy a warrant of neutrality, that the property be neutral-owned at the commencement of the transit, for if it be consigned by neutral owners to a hostile destination in pursuance of a contract made during war, it is liable to hostile capture while in transit. The English rule is that neutral property going to be delivered in the belligerent country, and under a contract to become the property of the belligerent immediately on arrival, is to be considered as belligerent property unless the contract was made in time of peace, and without any contemplation of war. It is to be observed that if a

neutral coal vessel were to carry despatches for either belligerent she might become liable, with the whole cargo, to confiscation. In view of the foregoing circumstances, exporters will be well advised to carefully consider the terms of every charter party and policy of insurance when sending coal to the Far East, should war come about between Russia and Japan."—*Iron and Coal Trades Journal*, London, Eng.

### Largest Breaker in the World.

Says the Wilkes-Barre *Record*:—Ground was broken last June for the foundation of what will be the highest, largest and most modern coal breaker on earth, that of the new Nottingham of the Lehigh & Wilkes-Barre Coal Co., at Plymouth. The foundation, which was finished about 10 weeks later, is of solid concrete and is a massive piece of work. The first stick of timber was erected on September 19 of last year and the frame work is now about finished. All that remains to be done is to erect the headhouse, which is under way. There will be 1,750,000 feet of timber in the breaker.

The contractors are Lamoureux & Smith, and these men have pushed the work vigorously, and were it not for the rigors of the present winter they would have had the siding in place and most of the machinery, also. The building will be 172 feet in height and will have a capacity of 3,000 tons daily.

There will be four tracks underneath and four sets of chutes, from which all sizes of coal, from steamboat to birdseye, will be loaded.

It is the intention of the Lehigh & Wilkes-Barre Coal Co. to run all the coal from the Reynolds mine through this breaker and with that object in view a track from the Reynolds along the D. L. & W. R. R. tracks up to the Nottingham will be laid and thence hoisted into the breaker.

## SALE OF VALUABLE MICA MINE IN CANADA

PURSUANT to the Order of the High Court of Justice, for the winding up of the Wakefield Mica Company, there will be offered for sale by public auction at the Local Master's Office, in the Court House, in the City of Ottawa, in the Dominion of Canada, on the

17th DAY OF MAY, 1904, at 2.30 P.M.

1. All the mines, minerals and mining rights in and upon Lot No. 16 in the 2nd Range of the Township of Wakefield in the County of Wright in the Province of Quebec, containing 200 acres, with the buildings erected thereon for mining purposes.

2. Water power and mill privilege on Blackburn's Creek on said Lot, containing one acre in fee simple, with saw-mill thereon erected, and electric dynamo and other machinery therein, including auxiliary steam plant.

3. All wood and timber on Lot No. 16 B in the 3rd Range of said Township, with free right to cut and remove same up to the 29th day of October, 1916.

4. A large quantity of mining plant and machinery, consisting of electric pump, motors belting, shafting, derricks, drills, blacksmith's tools, rope, piping, telephones, stoves, cutlery &c.

The property is situate about six miles from Wakefield Station on the O.N. & W.Ry. and about 20 miles from the City of Hull. A shaft has been sunk to a depth of 170 feet and a considerable amount of mica has been extracted therefrom. Specimens of the mica and a detailed inventory of the chattels, a report of an independent Mining Engineer, and other information may be obtained from the Liquidator.

The entire property will be sold in one block, subject to a reserved bid fixed by the Master.

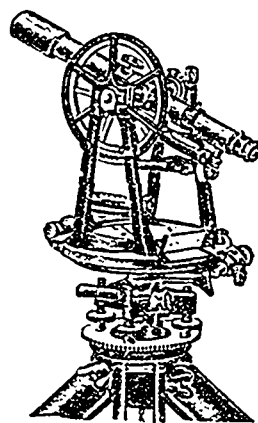
Ten per cent of the purchase money must be paid at the time of sale, and the balance within 30 days.

Dated the 21st day of January 1904.

ERNEST A. LARMONTH,  
Liquidator,

48 Elgin Street, Ottawa, Canada.

W. L. SCOTT,  
Local Master at Ottawa.



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# CANADIAN MINING INSTITUTE



## ANNUAL MEETINGS

The Annual General Meetings of the members of the Canadian Mining Institute for the transaction of business, the discussion of papers, etc., will be held in the

**KING EDWARD HOTEL, TORONTO**

ON

**WEDNESDAY, THURSDAY and FRIDAY**  
..... 2nd, 3rd and 4th MARCH, 1904 .....

### SINGLE FARE ON RAILWAYS.

**B**Y special arrangement members will be carried to Toronto and returned for a SINGLE FARE on the Canadian Pacific, Grand Trunk, Intercolonial, Quebec Central, and Canada Atlantic Railways. In order to secure this rate members and mining men who purpose being present at the meetings must obtain from their Ticket Agent the ordinary form of Convention Certificate provided by railways. They will purchase a one-way trip ticket to Toronto and on presentation of Certificate duly vized by the undersigned will be returned free of charge.

### INSTITUTE GOLD MEDAL.

The Council of the Institute will award a Gold Medal for the best paper contributed by members to the Transactions of the Institute during the year 1904.

### STUDENTS' PRIZES.

In addition to the President's Gold Medal the Council offers three prizes of a cash value of twenty-five dollars each for the best papers contributed by Canadian mining students on the following subjects:—

GROUP I.—ORE DEPOSITS AND MINING GEOLOGY.—The subject may be treated generally, or some particular district or single deposit may be discussed or described.

GROUP II.—MINING PRACTICE.—Any and every branch of mining may be treated such as pumping, hoisting, ventilation, timbering, ore extraction, development, etc., etc., or some particular method of mining, or some individual mine or group of mines, may be described or discussed.

GROUP III.—ORE DRESSING AND METALLURGY.—Any branch of ore dressing or metallurgy may be treated as for example—crushing, jigging, milling, concentrating, smelting, roasting, cyaniding, etc., or some particular plant may be described or discussed.

Competitors must advise the titles of their subjects to the Secretary of the Institute not later than the 18th February next and MSS. must be sent to him on or before the opening session of the meeting on 2nd March.

### SYLLABUS OF PAPERS.

Syllabus, embracing over forty papers, and detailed programme of arrangements for these meetings will be mailed to members in due course.

**EUGENE COSTE,**  
PRESIDENT.

**B. T. A. BELL,**  
SECRETARY.

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 Present Capacity of Mines 1,000,000 tons of coal per annum.  
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We would call attention to the superior quality of our Michel Blacksmith Coal, suitable for large forgings. Can be shipped at reasonable prices to all parts of British Columbia, the Northwest Territories and Manitoba.

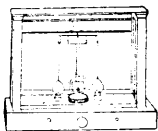
This Company also owns the Fernie and Morrissey Mines townsites, which offer investments in town lots that cannot fail to prove productive.

Having a large amount of development under way, there is always work for coal miners at good wages, and it may be said that there are few places in the world where labor of all kinds can earn more net money under agreeable conditions.

**G. G. S. LINDSEY,**  
 Third Vice-President,  
 Toronto.

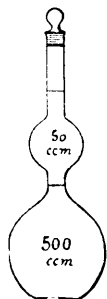
**THOS. R. STOCKETT, Jr.,**  
 General Superintendent,  
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# ANNUAL CONVENTION

OF

## Canadian Mining Engineers and Mine Managers

TO BE HELD UNDER THE AUSPICES OF

# THE CANADIAN MINING INSTITUTE

will be held in the King Edward Hotel,  
 City of Toronto, on

WEDNESDAY, THURSDAY and FRIDAY,  
 2nd, 3rd and 4th MARCH, 1904.

Special Excursion on 6th March to Niagara Falls, visiting Power  
 Plants and Electro-Metallurgical Works.

**SINGLE FARE TO ALL MINING MEN ON CANADIAN RAILWAYS.**

Among the contributors of papers are the following:—

Dr. Eugene Haanel, Dominion Superintendent of Mines; Prof.  
 Miller, Mr. James McEvoy, Mr. Eugene Coste, E.M., Mr. A. J.  
 Beaudette, Mr. J. N. S. Williams, Mr. C. A. Meisner, Mr. W. M.  
 Brewer, Dr. Ami, Mr. Wm. Thompson, Mr. F. T. Snyder, Mr. D. G.  
 Kerr, Mr. W. E. H. Carter, Mr. E. D. Ingall, Mr. L. J. Robe, Mr.  
 E. B. Kirby, Mr. F. Keffer, and others.

**OFFICIAL PROGRAMME LATER.**

EUGENE COSTE,  
 PRESIDENT.

B. T. A. BELL,  
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# DOMINION OF CANADA

## SYNOPSIS OF REGULATIONS

### For Disposal of Minerals on Dominion Lands in Manitoba, the North-West Territories, and the Yukon Territory.

#### COAL.

Coal lands may be purchased at \$10.00 per acre for soft coal, and \$20.00 for anthracite. Not more than 320 acres can be acquired by one individual or company. Royalty at such rate as may from time to time be specified by Order-in-Council shall be collected on the gross output.

#### QUARTZ.

Persons of eighteen years and over and joint stock companies holding Free Miner's certificates may obtain entry for a mining location.

A Free Miner's Certificate is granted for one or more years, not exceeding five, upon payment in advance of \$10.00 per annum for an individual, and from \$50.00 to \$100.00 per annum for a company, according to capital.

A Free Miner having discovered mineral in place may locate a claim 1500 x 1500 feet by marking out the same with two legal posts, bearing location notices, one at each end of the line of the lode or vein.

The claim shall be recorded within fifteen days if located within ten miles of a Mining Recorder's Office, one additional day allowed for every additional ten miles or fraction. The fee for recording a claim is \$5.00.

At least \$100.00 must be expended on the claim each year or paid to the Mining Recorder in lieu thereof. When \$500.00 has been expended or paid the locator may, upon having a survey made and upon complying with other requirements, purchase the land at \$1.00 per acre.

Permission may be granted by the Minister of the Interior to locate claims containing iron and mica, also copper in the Yukon Territory, of an area not exceeding 160 acres.

The patent for a mining location shall provide for the payment of royalty on the sales not exceeding five per cent.

#### PLACER MINING, MANITOBA AND THE N.W.T., EXCEPTING THE YUKON TERRITORY.

Placer mining claims generally are 100 feet square; entry fee, \$5.00, renewable yearly. On the North Saskatchewan River claims are either bar or bench, the former being 100 feet long and extending between high and low water mark. The latter includes bar diggings, but extends back to the base of the hill or bank, but not exceeding 1,000 feet. Where steam power is used, claims 200 feet wide may be obtained.

#### DREDGING IN THE RIVERS OF MANITOBA AND THE N.W.T., EXCEPTING THE YUKON TERRITORY.

A Free Miner may obtain only two leases of five miles each for a term of twenty years, renewable in the discretion of the Minister of the Interior.

The lessee's right is confined to the submerged bed or bars of the river below low water mark, and subject to the rights of all persons who have, or who may receive entries for bar diggings or bench claims, except on the Saskatchewan River, where the lessee may dredge to high water mark on each alternate leasehold.

The lessee shall have a dredge in operation within one season from the date of the lease for each five miles, but where a person or company has obtained more than one lease one dredge for each fifteen miles or fraction is sufficient. Rental \$10.00 per annum for each mile of river leased. Royalty at the rate of two and a half per cent., collected on the output after it exceeds \$10,000.00.

#### DREDGING IN THE YUKON TERRITORY.

Six leases of five miles each may be granted to a free miner for a term of twenty years, also renewable.

The lessee's right is confined to the submerged bed or bars in the rivers below low water mark, that boundary to be fixed by its position on the 1st day of August in the year of the date of the lease.

The lessee shall have one dredge in operation within two years from the date of the lease, and one dredge for each five miles within six years from such date. Rental, \$100.00 per mile for first year, and \$10.00 per mile for each subsequent year. Royalty ten per cent on the output in excess of \$15,000.00.

#### PLACER MINING IN THE YUKON TERRITORY.

Creek, Gulch, River, and Hill claims shall not exceed 250 feet in length, measured on the base line or general direction of the creek or gulch, the width being from 1,000 to 2,000 feet. All other Placer claims shall be 250 feet square.

Claims are marked by two legal posts, one at each end bearing notices. Entry must be obtained within ten days if the claim is within ten miles of Mining Recorder's office. One extra day allowed for each additional ten miles or fraction.

The person or company staking a claim must hold a Free Miner's certificate.

The discoverer of a new mine is entitled to a claim 1,000 feet in length, and if the party consists of two, 1,500 feet altogether, on the output of which no royalty shall be charged, the rest of the party ordinary claims only.

Entry fee \$15.00. Royalty at the rate of 2½ per cent. on the value of the gold shipped from the Territory to be paid to the Comptroller.

No Free Miner shall receive a grant of more than one mining claim on each separate river, creek, or gulch, but the same miner may hold any number of claims by purchase, and Free Miners may work their claims in partnership, by filing notice and paying fee of \$2.00. A claim may be abandoned and another obtained on the same creek, gulch, or river, by giving notice, and paying a fee.

Work must be done on a claim each year to the value of at least \$200.00, or in lieu of work payment may be made to the Mining Recorder each year for the first three years of \$200.00, and after that \$400.00 for each year.

A certificate that work has been done or fee paid must be obtained each year; if not, the claim shall be deemed to be abandoned, and open to occupation and entry by a Free Miner.

The boundaries of a claim may be defined absolutely by having a survey made, and publishing notices in the *Yukon Official Gazette*.

#### HYDRAULIC MINING, YUKON TERRITORY.

Locations suitable for hydraulic mining, having a frontage of from one to five miles, and a depth of one mile or more, may be leased for twenty years, provided the ground has been prospected by the applicant or his agent; is found to be unsuitable for placer mining; and does not include within its boundaries any mining claims already granted. A rental of \$150.00 for each mile of frontage, at the rate of 2½ per cent. on the value of the gold shipped from the Territory. Operations must be commenced within one year from the date of the lease, and not less than \$5,000.00 must be expended annually. The lease excludes all base metals, quartz, and coal, and provides for the withdrawal of unoperated land for agricultural or building purposes.

#### PETROLEUM.

All unappropriated Dominion Lands shall, after the first of July, 1901, be open to prospecting for petroleum. Should the prospector discover oil in paying quantities he may acquire 640 acres of available land, including and surrounding his discovery, at the rate of \$1.00 an acre, subject to royalty at such rate as may be specified by Order in Council.

**JAMES A. SMART,**  
Deputy of the Minister of the Interior.

OTTAWA, 9th Dec., 1901.



# PROVINCE of QUEBEC

The attention of Miners and Capitalists in the United States  
and in Europe is invited to the

## GREAT MINERAL TERRITORY

Open for investment in the Province of Quebec.

Gold, Silver, Copper, Iron, Asbestos, Mica, Plumbago,  
Phosphate, Chromic Iron, Galena, Etc.

ORNAMENTAL AND STRUCTURAL MATERIALS IN ABUNDANT VARIETY.

The Mining Law gives absolute security to Title, and has been  
specially framed for the encouragement of Mining.

Mining concessions are divided into three classes:—

1. In unsurveyed territory (a) the first class contains 400 acres, (b) the second, 200 acres, and (c) the third, 100 acres.
2. In surveyed townships the three classes respectively comprise one, two and four lots.

All lands supposed to contain mines or ores belonging to the Crown may be acquired from the Commissioner of Colonization and Mines (a) as a mining concession by purchase, or (b) be occupied and worked under a mining license.

No sale of mining concessions containing more than 400 acres in superficies can be made by the Commissioner to the same person. The Governor-in-Council may, however, grant a larger extent of territory up to 1,000 acres under special circumstances.

The rates charged and to be paid in full at the time of the purchase are \$5 and \$10 per acre for mining lands containing the superior metals\*; the first named price being for lands situated more than 12 miles and the last named for lands situated less than 12 miles from the railway.

If containing the inferior metal, \$2 and \$4 according to distance from railway.

Unless stipulated to the contrary in the letters patent in concessions for the mining of superior metals, the purchaser has the right to mine for all metals found therein; in concessions for the mining of the inferior metals, those only may be mined for.

\*The superior metals include the ores of gold, silver, lead, copper, nickel, graphite, asbestos, mica, and phosphate of lime. The words inferior metals include all other minerals and ores.

Mining lands are sold on the express condition that the purchaser shall commence *bona fide* to mine within two years from the date of purchase, and shall not spend less than \$500 if mining for the superior metals; and not less than \$200 if for inferior metals. In default, cancellation of sale of mining lands.

(b) Licenses may be obtained from the Commissioner on the following terms:—Application for an exploration and prospecting license, if the mine is on private land, \$2 for every 100 acres or fraction or 100; if the mine is on Crown lands (1) in unsurveyed territory, \$5 for every 100 acres, and (2) in unsurveyed territory, \$5 for each square mile, the license to be valid for three months and renewable. The holder of such license may afterwards purchase the mine, paying the prices mentioned.

Licenses for mining are of two kinds: Private lands licenses where the mining rights belong to the Crown, and public lands licenses. These licenses are granted on payment of a fee of \$5 and an annual rental of \$1 per acre. Each license is granted for 200 acres or less, but not for more; is valid for one year, and is renewable on the same terms as those on which it was originally granted. The Governor-in-Council may at any time require the payment of the royalty in lieu of fees for a mining license and the annual rental—such royalties, unless otherwise determined by letters patent or other title from the Crown, being fixed at a rate not to exceed three per cent. of the value at the mine of the mineral extracted after deducting the cost of mining it.

The fullest information will be cheerfully given on application to

THE MINISTER OF LANDS, MINES AND FISHERIES,  
PARLIAMENT BUILDINGS, QUEBEC, P. Q.



# Ontario's Mining Lands..

THE Crown domain of the Province of Ontario contains an area of over 100,000,000 acres, a large part of which is comprised in geological formations known to carry valuable minerals and extending northward from the great lakes and westward from the Ottawa river to the Manitoba boundary.

Iron in large bodies of magnetite and hematite ; copper in sulphide and native form ; gold, mostly in free milling quartz ; silver, native and sulphides ; zincblende, galena, pyrites, mica, graphite, talc, marl, brick clay, building stones of all kinds and other useful minerals have been found in many places, and are being worked at the present time.

In the famous Sudbury region Ontario possesses one of the two sources of the world's supply of nickel, and the known deposits of this metal are very large. Recent discoveries of corundum in Eastern Ontario are believed to be the most extensive in existence.

The output of iron, copper and nickel in 1900 was much beyond that of any previous year, and large developments in these industries are now going on.

In the older parts of the Province salt, petroleum and natural gas are important products.

The mining laws of Ontario are liberal, and the prices of mineral lands low. Title by freehold or lease, on working conditions for seven years. There are no royalties.

The climate is unsurpassed, wood and water are plentiful, and in the summer season the prospector can go almost anywhere in a canoe. The Canadian Pacific Railway runs through the entire mineral belt.

For reports of the Bureau of Mines, maps, mining laws, etc, apply to

**HONORABLE E. J. DAVIS,**  
Commissioner of Crown Lands,

or

**THOS. W. GIBSON,**  
Director Bureau of Mines,  
Toronto, Ontario.



**PROVINCE OF NOVA SCOTIA.**  
**Leases for Mines of Gold, Silver, Coal, Iron, Copper, Lead, Tin**  
—AND—  
**PRECIOUS STONES.**

**TITLES GIVEN DIRECT FROM THE CROWN, ROYALTIES AND RENTALS MODERATE.**

**GOLD AND SILVER.**

Under the provisions of Chap. 1, Acts of 1892, of Mines and Minerals, Licenses are issued for prospecting Gold and Silver for a term of twelve months. Mines of Gold and Silver are laid off in areas of 150 by 250 feet, any number of which up to one hundred can be included in one License, provided that the length of the block does not exceed twice its width. The cost is 50 cents per area. Leases of any number of areas are granted for a term of 40 years at \$2.00 per area. These leases are forfeitable if not worked, but advantage can be taken of a recent Act by which on payment of 50 cents annually for each area contained in the lease it becomes non-forfeitable if the labor be not performed.

Licenses are issued to owners of quartz crushing mills who are required

to pay Royalty on all the Gold they extract at the rate of two per cent. on smelted Gold valued at \$19 an ounce, and on smelted Gold valued at \$18 an ounce.

Applications for Licenses or Leases are receivable at the office of the Commissioner of Public Works and Mines each week day from 10 a.m. to 4 p.m., except Saturday, when the hours are from 10 to 1. Licenses are issued in the order of application according to priority. If a person discovers Gold in any part of the Province, he may stake out the boundaries of the areas he desires to obtain, and this gives him one week and twenty-four hours for every 15 miles from Halifax in which to make application at the Department for his ground.

**MINES OTHER THAN GOLD AND SILVER.**

Licenses to search for eighteen months are issued, at a cost of thirty dollars, for minerals other than Gold and Silver, out of which areas can be selected for mining under lease. These leases are for four renewable terms of twenty years each. The cost for the first year is fifty dollars, and an annual rental of thirty dollars secures each lease from liability to forfeiture for non-working.

All rentals are refunded if afterwards the areas are worked and pay royalties. All titles, transfers, etc., of minerals are registered by the Mines Department for a nominal fee, and provision is made for lessees and licensees whereby they can acquire promptly either by arrangement with the owner or by arbitration all land required for their mining works.

The Government as a security for the payment of royalties, makes the royalties first lien on the plant and fixtures of the mine.

The unusually generous conditions under which the Government of Nova Scotia grants its minerals have introduced many outside capitalists, who have always stated that the Mining laws of the Province were the best they had had experience of.

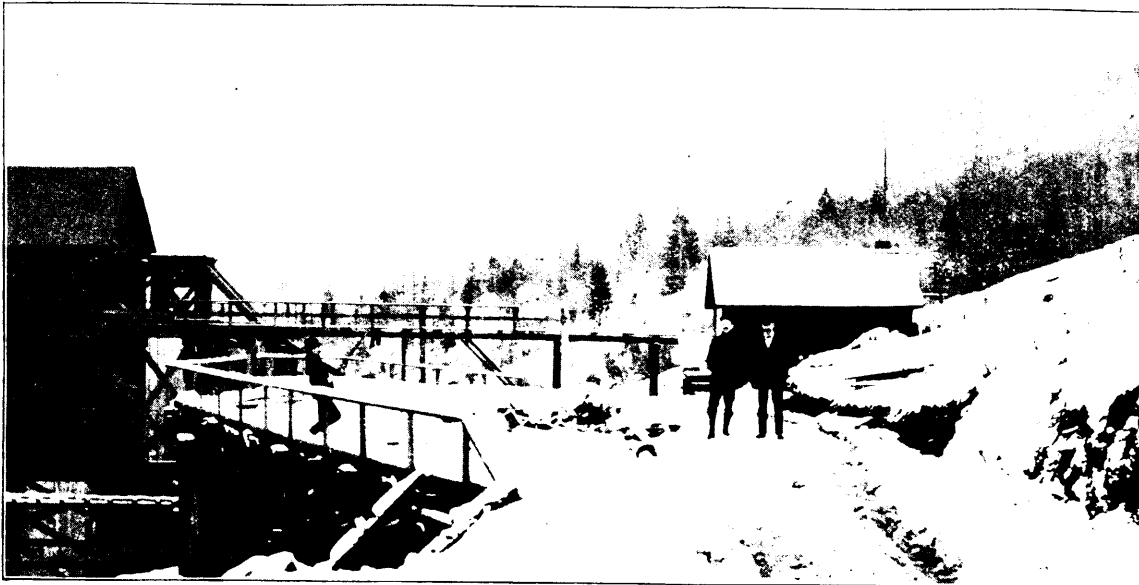
The royalties on the remaining minerals are: Copper, four cents on every unit; Lead, two cents upon every unit; Iron, five cents on every ton; Tin and Precious Stones, five per cent.; Coal, 10 cents on every ton sold.

The Gold district of the Province extends along its entire Atlantic coast, and varies in width from 10 to 40 miles, and embraces an area of over three thousand miles, and is traversed by good roads and accessible at all points by water. Coal is known in the Counties of Cumberland, Colchester, Pictou and Antigonish, and at numerous points in the Island of Cape Breton. The ores of Iron, Copper, etc., are met at numerous points, and are being rapidly secured by miners and investors.

Copies of the Mining Law and any information can be had on application to

**THE HON. A. DRYSDALE,**  
Commissioner Public Works and Mines,  
HALIFAX, NOVA SCOTIA.

# One Man Can handle 1200 TONS per day with a Riblet Patent Automatic Aerial Tramway



YOU CAN FIGURE  
THE COST PER TON

More Riblet Tramways are now being  
installed than of all the other  
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# The Pulsometer

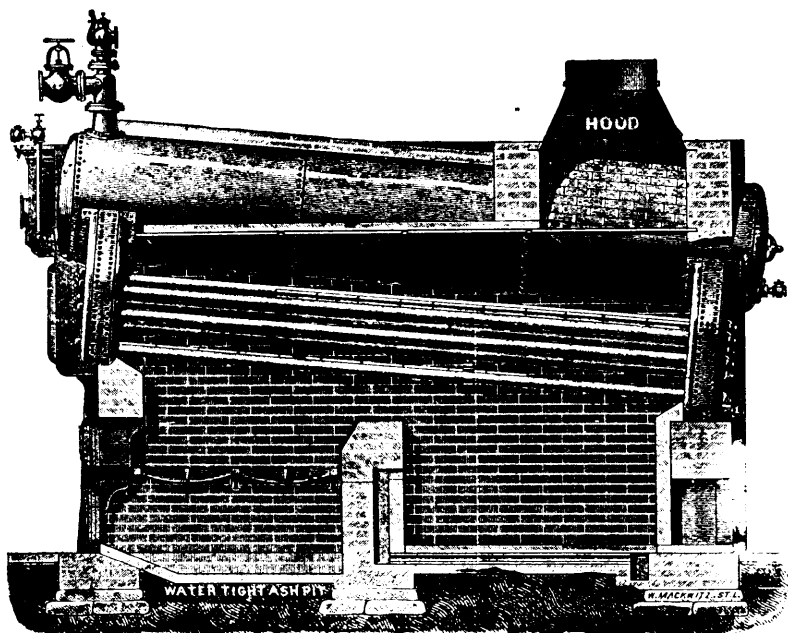
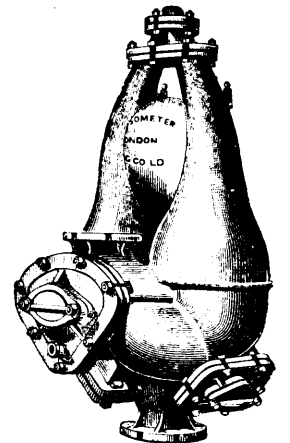
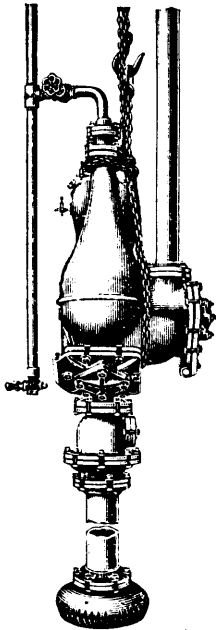
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TELEGRAMS—"Ropery Rutherglen. A B C, A I and Lieber's Codes used.

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