

PAGES

MISSING

The Canadian Engineer

WEEKLY

ESTABLISHED 1893

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The Canadian Engineer

ESTABLISHED 1893

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CIVIL, MECHANICAL STRUCTURAL, ELECTRICAL, MARINE AND MINING ENGINEER, THE SURVEYOR, THE MANUFACTURER AND THE CONTRACTOR.

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A reader is anxious to secure copies of the Canadian Engineer for May 3rd, 1907, and is willing to pay 25 cents a piece for these. Perhaps some of our subscribers can accommodate him.

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SUGGESTED REFORMS.

Elsewhere will be found an extended report of one feature of the recent annual meeting of the Canadian Society of Civil Engineers. Believing that this feature of the meeting is one many members are deeply interested in, and that this interest should not be allowed to fag, we give this matter special attention. We would be very pleased to receive communications from engineers expressing their views on this matter.

SPECIFICATIONS.

This is the time of year when engineers are preparing for the spring rush and this is a good time to revise specifications.

Many engineers have prepared specifications on the principle that the specifications should bind the contractor and protect the engineer without binding him. Is this fair?

The engineer is, in common with all men, fallible, and it would be too much to hope, that in the preparation of specifications, he should make them perfect; to cover every detail of construction; to escape from some ambiguity or indefiniteness. Most will admit, however, that within these limitations much improvement can be made.

If the plans and specifications are full, specific and clear the contractor will know exactly what will be required of him and will name a price that will compensate him for work of that class. If, however, the specifications are loose, indefinite, or call for almost impracticable requirements the contractor will make a reckless bid, hoping that good luck, an easy engineer and clever planning on his own part will lift him out. This is where trouble commences and the engineer who prepares his own specifications has none to blame but himself.

But what of the engineer who does not prepare his own specifications but works to those prepared by another? His position is, indeed, unenviable, yet it frequently occurs that many re-readings make clear and explicit that which was obscure. Discussion with the chief will explain away ambiguity. Difficulties with specifications are often through misconceptions. Let the engineer who prepares specifications make them clear, let the engineer who works by them endeavor to understand them—before he condemns them.

ENGINEERING SOCIETIES.

CANADIAN RAILWAY CLUB.—President, W. D. Robb, G.T.R.; secretary, James Powell, P.O. Box 7, St. Lambert, near Montreal, P.Q.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—413 Dorchester Street West, Montreal. President, W. Galbraith; secretary, Prof. C. H. McLeod. Meetings will be held at Society Rooms each Thursday until May 1st, 1908.

TORONTO BRANCH OF THE CANADIAN SOCIETY OF CIVIL ENGINEERS.—96 King Street West, Toronto. President, C. H. Mitchell, C.E.; secretary, T. C. Irving, Jr., Traders Bank Building.

ENGINEERS' CLUB OF TORONTO.—96 King Street West. President, J. G. Sing; secretary, R. B. Wolsey. Meeting every Thursday evening during the fall and winter months. February 20th, paper by Prof. R. Angus on "Gas Producers for Power."

SOCIETY NOTES.

Ontario Land Surveyors.

This week the Board of Provincial Land Surveyors are holding the annual examination at the Parliament Buildings, Toronto. On the 25th inst. the annual meeting will be opened. We hope next week to publish a full programme of the meeting.

Dominion Association of Land Surveyors.

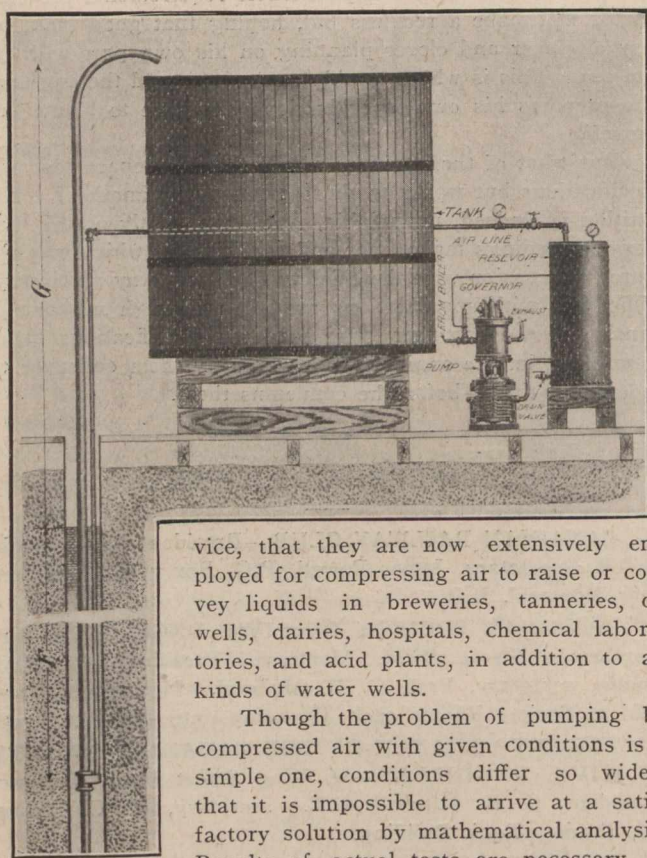
A year ago a Dominion Association of Surveyors was formed, with head offices at Ottawa. This year their annual convention will open on February the 25th at Ottawa. T. Nash, of the Surveys Branch of Department of Interior, secretary.

WESTINGHOUSE AIR COMPRESSORS FOR PUMPING AND CONVEYING LIQUIDS.

The advantages of employing compressed air for pumping water, oil and other liquids from wells, vats and tanks, are so pronounced that within the last few years this system has come into general use in a great variety of industries. Its simplicity and ease of maintenance make it far superior to any other means of conveying liquids. In deep wells particularly, great economy is found in the use of air as compared with the old time deep-well pump. No valves, no reciprocating rods and plungers, and no wasteful steam cylinders at the well to operate them are needed. The air system requires nothing but pipes properly proportioned as to the size, length and connections, which when once placed in position, remain indefinitely without need of attention and repairs.

The air may be compressed in an existing power house, or at any convenient point, regardless of the distance from the well. Several separate wells, if desirable, can be pumped from one central station.

Westinghouse compressors, both steam and motor driven, have been found so well adapted to this class of ser-



vice, that they are now extensively employed for compressing air to raise or convey liquids in breweries, tanneries, oil wells, dairies, hospitals, chemical laboratories, and acid plants, in addition to all kinds of water wells.

Though the problem of pumping by compressed air with given conditions is a simple one, conditions differ so widely that it is impossible to arrive at a satisfactory solution by mathematical analysis.

Results of actual tests are necessary to form a correct basis of figuring. Realizing this and desirous of assisting their patrons in every possible way to obtain the best results, the Westinghouse Air Brake Company has lately completed a series of nearly 2,000 tests covering a range of from 350 to 400 different conditions of deep-well pumping, to obtain data concerning water delivered, air consumed and the best proportion and arrangement of piping and apparatus.

Heretofore tests have been made on wells having fixed conditions, and the results, covering a number of isolated cases, have been the only guide in considering the requirements for all other installations. In this case, however, the tests were made with a well driven on the premises of the Westinghouse Air Brake Company specially fitted up for experimental work.

So far as is known, no such wide range of tests have ever before been made upon a single well. The results place the manufacturers in a position to be of great assistance to those desiring to install compressors for direct air pressure pumping.

The accompanying illustration shows the simple arrangement of piping used when the inside diameter of the well casing permits a discharge pipe and an air pipe, both of suitable size, to be placed side by side in the casing.

PROTECTION FOR ENGINEERS.

We, last week, reported the proceedings of the general meeting of the above, but reserved for a separate article the impressions left on our mind by the speeches of the members.

It is impossible to avoid the conclusion that the members who do not live in Montreal derive but little material benefit from the Society. The Transactions are "put on a shelf for our son to read," as one member expressed it.

The dissatisfaction at this state of affairs is at present inarticulate, partly on account of the innate shyness of some members, partly because of the difficulty involved in reducing to definite propositions the many germinating ideas, and, correlatively, procedure precludes the expression thereof.

First, dealing with the last difficulty. It is inevitable that the routine work, such as presenting reports and financial statements, the elections, etc., must take priority. Consequently, discussion of grievances or suggestions is relegated to the fag end of the annual meeting. By that time the enthusiasm of reformers has been effectually "damped down" by the laudatory torrent emitted by the selected orators at the previous night's banquet. The classical advice to "feed the brute" is applicable to other besides marital relationships, and has a stultifying effect on the discussions of the following day.

There is little doubt that members have in past years given utterance to valuable suggestions at this last day's meeting, but, owing, no doubt, to lack of recording arrangements, they have been lost sight of, especially those suggested by drastic reformers.

The thin edge of the wedge of reformation has at last been inserted by Messrs. W. J. Camp and William McNab in a far-reaching resolution. Notwithstanding the whittling efforts of some members, the meeting decided that all the resolutions, amendments, comments and discussions, suggestions, etc., made during the annual meeting should be recorded by a stenographer, and copies thereof should be sent within a given date to each member.

Unfortunately, a resolution of this nature cannot bear fruit until next year's meeting, as only a few desultory notes were made of this year's discussions. We, therefore, desire to give publicity to this reform and to other recommendations and suggestions made this year.

It is the opinion of many that but little good is derived by individual members from Parliamentary and such like artificial support. A charter of incorporation is, of course, necessary, but to seek powers from Parliament, whereby civil and other engineers would be forced to join the Society, involves injustice and bigotry, and creates a monopoly of the rankest character.

The Society of Civil Engineers should, of its own accord and from its great financial resources offer such material benefits to its members that its attitude to non-members could be one of "repulsion" rather than being one of "compulsion."

On these grounds we desire to call attention to the remarks made by Mr. Hilder Daw, of Montreal. Speaking under the heading of "For the Good of the Order," he drew the attention of the members present to the foregoing aspect of the case. Pointing to the Institution of Civil Engineers of Great Britain, he gave the following reasons for the dominating position which that Society holds:—

Firstly, the Institution of Great Britain upholds its members in times of tribulation.

A small committee of investigation is entrusted with powers to investigate and remove pecuniary difficulties. No record of such assistance is kept, such being the trust reposed in this committee, so no stigma rests upon that member who receives their timely aid.

It follows that to prevent such aid being necessary, every effort is made to secure suitable positions for members.

Secondly, the Institution will, if requested, educate one son of a deceased member as a Civil Engineer, and article him with a responsible firm.

Thirdly, and Mr. Hilder Daw laid strong emphasis on this feature, the Institution defends its members, under counsel's opinion, against aggressions or wrongings from corporations or individuals. "If a member feels aggrieved, he is compelled by the ethics of the Institution to lay all the particulars and original documents connected with his case before the council, who, after taking counsel's opinion, if necessary, take active steps to right the wrong. As a consequence of these powers, always ready to be actively exercised, corporations and individuals think twice before attacking or injuring a member of the Institution." Since I spoke on this matter last Tuesday, when I was ruled out of order, the following has appeared in the Montreal "Star":—

DISMISSED CITY ENGINEER.

"Calgary, Alta., Jan. 29th.—Though seven different petitions were presented, asking for investigation, the city council dismissed the City Engineer on a vote of seven to four. The Engineer will enter suit against Alderman Watson on the ground of slander. The offence is said to have been committed at the last municipal elections."

"Now, gentlemen, such a state of affairs as that could never be reached by a member of the British Institution. (A member: "Is the Calgary City Engineer a member of this Society?") I do not know who the Calgary City Engineer is, or whether he belongs to this Society, but I am sure that if this gentleman was a member, and this Society exercised the protective powers I have described, such a case could never have occurred.

"Many instances of injustice to engineers will, no doubt, recall themselves to your mind, especially cases where a combine of contractors, desirous of ousting an upright engineer, has succeeded in removing the obstacle, enabling bad or inferior workmanship or material to pass unchallenged. It is very difficult for an Engineer to fight such a combine singlehanded, and it is to his Society that he should look for support."

The above remarks met with the warm approbation of the assembled members, many rising and quoting instances that had come to their knowledge of engineers who had received injustice under similar circumstances. It is to be hoped that the new council will endeavor to give effect to these and other suggestions.

We cordially invite correspondence on these subjects, feeling that they would convert the Society from a "Society for the Propagation of Professional Papers," as one member described it, to a virile and invaluable force, controlling Government appointments, rectifying abuses, investigation of disasters, and becoming the Oriflamme of a noble profession.

ENGINEERS' CLUB OF TORONTO ANNUAL BANQUET.

The annual banquet of the Engineers' Club, held on the sixth inst., at the Club rooms, King Street West, was a most successful affair. The number of members present was unusually large, taxing to the utmost the accommodation that could be provided in the present rooms. Mr. C. B. Smith, the retiring president, occupied the chair. The vice-chair was occupied by Mr. J. G. Sing, president elect.

To the right of Mr. Smith sat Dr. Ellis, acting Dean of the Faculty of Applied Science; Dr. Stupart, president of the Canadian Institute, and Capt. K. Gamble, representing the Ontario Land Surveyors. To the left of the chairman sat Mr. R. C. Steel, representing the Board of Trade; Mr. J. B. Tyrrell, representing the Mining Institute; Mr. T. Hogg, president of the Engineering Society, Toronto University. After Royalty had been honored, Dr. Ellis responded to the

toast of "Our Country." He referred to Canada as a country of great natural wealth, yet a country where great differences in size of private fortunes did not exist. This was a condition of things to be desired as it did much to prevent the growth of that class hatred so detrimental to the growth of any country. He liked to think of Canada as a country peopled by men not set above the ordinary laws of public opinion, a nation in morality at least not behind the other nations of the earth.

Mr. Steel in responding to "Our City" referred to Toronto as a prince among cities, yet not jealous of the success of sister cities, as city of power in practical affairs, giving tone and direction to discussions and movements along commercial, political and educational lines. But withal a city at the mercy of the engineer, whether harbor improvement, cheap power, trunk sewer, viaduct or transportation the future of the city, was in the keeping of the engineers.

Mr. Smith in proposing "Sister Institutions" suggested that the Toronto Branch of the American Institute of Electrical Engineers consider the advisability of becoming the



G. B. Smith,

Retiring President of the Engineers' Club.

Toronto Branch of the Electrical Section of the Canadian Society of Civil Engineers.

Capt. K. Gamble brought words of good cheer from the Ontario Land Surveyors. Mr. A. J. Van Nostrand in replying for the same Society was pleased to know the membership of the Engineers' Club was so large as to tax the capacity of the present quarters and anticipated that shortly larger and commodious Club rooms would have to be secured.

Mr. T. C. Irving, Jr., responding for the Toronto Branch of the Canadian Society of Civil Engineers referred to the harmonious manner in which two organizations with the same aim and object worked together.

Dr. Stupart, representing the Canadian Institute, referred to the Institute as the oldest Canadian Engineering Society. He outlined the progress in engineering since the Institutes organization in 1849, and paid a tribute to engineers for the work they had done in the development of Canada.

Mr. J. B. Tyrrell, of the Mining Institute, did not agree with the definition of an engineer as "a silent man who does things, such a man," said he, "was but half developed." The engineer should be willing to tell his fellow workers something of what he had accomplished. The engineer should be a speaker as well as a listener.

Mr. W. A. Bucke, of the American Institute of Electrical Engineers, could not now fall in with the suggestion that the Institute become in name Canadian. It, however, was a matter worthy of discussion.

Mr. T. Hogg, of the Engineering Society, dwelt upon the unsuitable accommodation and insufficient course provided for those wishing to secure technical education.

The toast to "The Press" was responded to by E. A. James of The Canadian Engineer.

During the evening several songs were given by W. Paris and R. A. L. Gray, with J. F. B. Vandeleur at the piano. The banqueting-room was beautifully decorated with bunting and electrical effects under the direction of R. A. L. Gray, while the whole affair was superintended by W. J. Fuller, chairman of the rooms committee.

CANADIAN SOCIETY OF CIVIL ENGINEERS.

Herewith we give the result of the December ballot for the election of new members and the transfer of members in the Canadian Society of Civil Engineers. It is not likely that the results of the next ballot will be announced before March:—

Honorary Member.—John Kennedy, Harbor Commissioner, Montreal.

Members.—T. S. Armstrong, Nepigon, Ont.; F. H. Balfour, St. John's, Newfoundland; T. J. Brown, Sydney Mines, N.S.; W. Lyon Browne, New Carlisle, P.Q.; A. R. Goldie, Galt, Ont.; H. U. Hart, Canadian Westinghouse Co., Hamilton, Ont.; H. B. Muckleston, Box 530, Calgary, Alta.; G. R. Smith, Thetford Mines, P.Q.

Associate Members.—K. L. Aitken, 1003 Traders Bank Building, Toronto; J. J. Aldred, Box 394, Deseronto, Ont.; J. A. Beatty, 80 St. Francois Xavier Street, Montreal; G. L. Brown, Morrisburg, Ont.; W. R. Chisholm, Hervey Junction, P.Q.; E. P. Clarkson, 609 Jarvis Street, Toronto; G. B. Dodge, Department of the Interior, Ottawa; W. E. Douglas, 575 Huron Street, Toronto; G. E. Evans, Confederation Life Building, Toronto; J. A. Ewart, 193 Sparks Street, Ottawa; F. A. Gaby, Hydro-Electric Power Co., Toronto; J. C. Galway, New Canadian Co., Port Daniel Centre, P.Q.; J. Garrett, G.T.P. Railway, Saskatoon, Sask.; N. R. Gibson, care C. B. Smith, Esq., Winnipeg; R. J. Gordon, Lethbridge, Alta.; C. Holden, Carnegie Library Building, Winnipeg; H. A. Icke, C.P.R. Irrigation Department, Strathmore, Alta.; S. B. Johnson, Britannia Bay, Ont.; M. Kimpe, Edmonton, Alta.; R. J. Lecky, care of Peter Lyall & Sons, Montreal; A. J. Macdonald, T.C. Railway, St. John, N.B.; J. R. MacKenzie, St. Stanislas, P.Q.; J. R. C. Macredie, Box 63, Kenora, Ont.; B. T. McCormick, Allis-Chalmers-Bullock Co., Montreal; E. L. Miles, Bala, Muskoka; D. C. Raymond, Concrete Engineering and Construction Co., Toronto; B. Ripley, C.P.R. Viaduct, Lethbridge, Alta.; F. N. Rutherford, Box 762, St. Catharines, Ont.; R. Simpson, Haileybury, Ont.; F. E. Sterns, care of Isthmian Canal Commission, Mills Building, Washington, D.C.; H. A. Terrault, Sorel, P.Q.; J. R. Todd, care of MacKenzie, Mann & Co., St. Stanislas de Champlain, P.Q.; A. F. Wells, 158 Madison Avenue, Toronto.

Associates.—W. C. Bate, Fairview, B.C.; F. D. Gillies, 160 McCord Street, Montreal.

Transferred to the Class of Member.—W. I. Bishop, Room 30, 107 St. James Street, Montreal; A. R. Decary, Department Public Works, Quebec; J. Ewing, Engineering Department C.P.R., Montreal; J. B. Goodwin, McCall Ferry Power Co., Bonview, Pa.; J. F. Guay, Morin Building, Quebec; F. C. Laberge, 71 St. James Street, Montreal; C. S. Leech, Assistant Engineer C.P.R., Montreal; D. O. Lewis, 186 Cottingham Street, Toronto; J. W. Orrock, C.P.R., Montreal; P. E. Parent, Department of Marine, Quebec; F. H. Pitcher, 62 Imperial Building, Montreal; A. V. Roy, 425 St. James Street, Montreal; W. G. Skaife, 70 Sherbrooke Street West, Montreal.

Transferred to the Class of Associate Member.—A. A. Belanger, 127 Beaudry Street, Montreal; R. W. Bishop, C.P.R., Ottawa; H. V. Brayley, Hamilton Powder Co., Belœil Station, P.Q.; C. E. Cooper, 645 Burrard Street, Vancouver; A. Ferguson, T.C. Railway, La Tuque, P.Q.; J. Handley, 128 Slater Street, Ottawa; H. F. J. Lambert, Vine Lynn, New Edinburgh, Ottawa; A. C. Mackenzie,

Merrickville, Ont.; F. H. Peters, P.O. Box 560, Georgian Bay Ship Canal, Ottawa; F. M. Rutter, Woodstock, N.B.; D. Sinclair, Stratford Station, Ont.; A. Surveyer, Box 1069, Department Public Works, Ottawa; G. L. Watson, Engineers' Club, Philadelphia, Pa.

ORDERS OF THE RAILWAY COMMISSIONERS OF CANADA.*

C.P.R. and C.N.R. connect at Sudbury.

C.T.R. and C.P.R. order to make better connections at Brockville.

4277—Jan. 30—Authorizing the chairmen of the Official, Western, and Southern Classifications to file with the Board copies of each of the said classifications and supplements on behalf of the railway companies, which file with the Board International Freight Tariffs, subject to these classifications. Such authority to be by power of attorney.

4278—Jan. 29—Authorizing Bell Telephone crossing Grand Trunk Railway near Lachine Station, P.Q.

4279—Jan. 31—Authorizing Bell Telephone crossing Grand Trunk Railway at private road three-quarters of a mile west of Weston Station.

4280—Jan. 28—Authorizing branch of the Brandon, Saskatchewan and Hudson's Bay Railway Company to open for carriage of traffic its transfer track connecting the C.P.R.'s main line between Eighteenth and Twenty-sixth Streets, Brandon, Man.

4281—Jan. 28—Authorizing the C.P.R. to construct its railway across the highway on its Hudson's Bay Mining Company's spur at Bienfait, in the Province of Saskatchewan.

4282—Jan. 29—Approving revised location of G.T.P.R. Pheasant Hills branch between old mileage, 528 to mile 543.3.

4283—Jan. 29—Approving revised location of C.P.R. main line, at mileage 85.4 east of Sparwood.

4284—Jan. 31—Authorizing C.P.R. to construct spur to premises of the Alexander Black Lumber Company, Winnipeg, Man.

4285—Jan. 31—Authorizing the C.P.R. to construct spur to the premises of the Keewatin Lumber Company, Winnipeg, Man.

4286—Jan. 29—Authorizing the C.N.R. to construct spur in the town of Virden, Man., to a point, Lot Eight, to the intersection of the boundary line between lots Eight and Nine, Block 76, being more generally known as the spur along Princess Street.

4287—Jan. 31—Authorizing C.N.R. to take part of Lot Five, Concession Four, in the Township of McKim and District of Nipissing, for the purpose of constructing a transfer track to connect its track with the track of the C.P.R. in the town of Sudbury, Ont., at the intersection of Albion and Murray Streets.

4288—Jan. 31—Authorizing the C.P.R. to construct a spur to the premises of Page Hersey Iron and Tube Company, in the city of Guelph, Ont.

4289—Jan. 31—Authorizing the C.P.R. to construct a spur to the premises of R. H. Hill, on the west half of Lot Twenty-nine, Concession One, west of Township of Caledon, County of Peel, Ont.

4290—Jan. 31—Authorizing the C.P.R. to construct spur to the premises of Messrs. R. & H. Shortreed, Township of Medonte, County of Simcoe, Ont.

4291—Jan. 31—Authorizing the C.P.R. to construct branch line or spur to the premises of the Wabasso Cotton Company, Limited, in the city of Three Rivers, Que.

4292—Jan. 31—Granting certificate to the Vancouver, Victoria and Eastern Railway and Navigation Company to

(Continued on Page 115.)

*Full text of these orders may be secured from the Canadian Engineer for a small fee.

CORRESPONDENCE

[This department is a meeting-place for ideas. If you have any suggestions as to new methods or successful methods, let us hear from you. You may not be accustomed to write for publication, but do not hesitate. It is ideas we want. Your suggestion will help another.—Ed.]

A TRIP FROM G. T. P. TO CIVILIZATION.

Sir,—We completed our final location on the 31st of September, and then had to lay up until the 5th of October, waiting for the tug to take us down Lake Nepigon. We got pretty restless and impatient waiting, and you can hardly blame us.

Let me assure you there were no laggards in the crowd that loaded the steamer with dunnage and grub that day. We got away about twelve o'clock, noon, and laid up that night at Nepigon House, a Hudson Bay post half way down the lake. Here we had a feast on canned pears, peaches and lobster. Early the next morning we got a good start and by noon reached Virgin Falls, the foot of the lake, where we disembarked and had lunch.

To start with we had about a half mile portage, then we loaded our five canoes and were off down the Nepigon River for Nepigon. There were four in our canoe, with blankets, dunnage, etc., some of the canoes had five. Two of us carried all the dunnage and the other two the canoe, so that we had to make only one trip. You see we worked some. We got well down the river that afternoon and camped in the open that night with the result that our blankets were covered with a white hoar-frost the next morning. We had a beautiful day for our trip, the sun came out cloudless in a sharp crisp air, so that every thing sparkled. The scenery along the Nepigon River is magnificent at any time, but on this beautiful morning, to us with the thoughts of home and friends before us, it seemed doubly so. At noon we lunched on our last portage (two miles long) just twelve miles from Nepigon. Our canoe was the first off at just one o'clock, we were now on the home stretch as it were, with only twelve miles of straight paddling ahead of us, so we dug in. At three exactly our canoe shot into a little ripple that runs under the C.P.R. bridge at Nepigon. It had just taken us two hours with a loaded canoe against a head wind to make the last twelve miles. When we had all landed each man shouldered his pack and started for the hotel. We were a motley looking outfit I can tell you.

We straightened out our business at the office that afternoon, and that evening the chief, transitman, draftsman, topographer, and myself took the one o'clock train for Port Arthur in order to procure the necessities to make our bodies fit subjects for a trip East.

In order to pick up the thread of civilization where it was broken it seemed to us we should resort to the dining car, so we marshalled ourselves in order and entered with a lowly mien as befitted our apparel. It was no use, however, a white-shirted dignitary kindly but firmly pressed us out into the vestibule to wait a more seasonable appearing. Here we waited in darkness and coldness, the pangs of hunger reminding us of the good lunch we had out of our abundance left on that lone portage, now miles away, until driven to despair we entered in a body, seized upon two empty tables and figuratively speaking demanded to be fed. The head waiter came with the dispatch that would flatter the most exacting, but lo! when he arrived it was ourselves he would dispatch. The chief, however, in a few fitting, well chosen, phrases pointed out to him the error of his way, and after a little desultory firing from both sides we remained in possession. Say, talk about eating, well, we were making up for a sixteen months' fast.

I am very sincerely yours.

RAILWAY CROSSOVER.

Sir,—The following is the solution of the above:—

Given the angle of divergence, N, the initial P.C. at G, the distance GH, and the radii R, r, to find the central angles A and B:—

$$GK = GH \times \tan N.$$

$$KC = GC - GK = R - GK.$$

LC or EF = KC × cos N, the line CF being drawn parallel to LE.

$$\cos B = DF \div CD = (r + EF) \div (R + r).$$

$$\text{Angle A manifestly} = B + N.$$

In "Rodman's" problem:—

N = 20° 10', GH = 450 ft., and both R and r = 573.68.

$$GK = GH \times \tan N$$

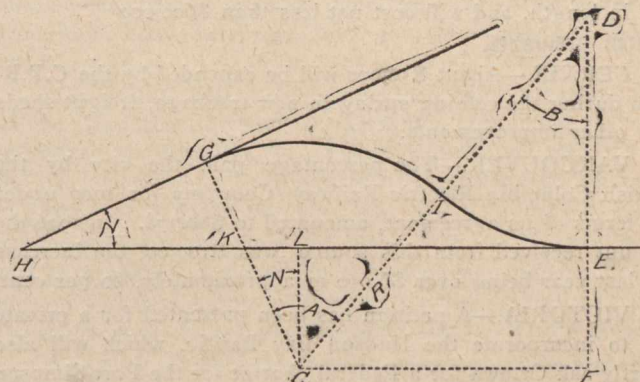
$$GH = 450 \text{ ft.} \dots\dots\dots \log 2.653213$$

$$N = 20^\circ 10' \dots\dots\dots L \tan 9.564983$$

$$GK = 165.27 \text{ ft.} \dots\dots\dots 2.218196$$

$$KC = R - GK = 573.68 - 165.27.$$

$$KC = 408.41.$$



$$LC \text{ or } EF = KC \times \cos N$$

$$KC = 408.41 \dots\dots\dots \log 2.611096$$

$$N = 20^\circ 10' \dots\dots\dots L \cos 9.972524$$

$$EF = 383.37 \dots\dots\dots 2.583620$$

$$\cos B = (r + EF) \div (R + r)$$

$$r + EF = 957.05 \dots\dots\dots \log 2.980934$$

$$R + r = 1147.36 \dots\dots\dots \log 3.059714$$

$$B = 33^\circ 29' \dots\dots\dots L \cos 9.921220$$

$$B = 33^\circ 29', A = B + N = 33^\circ 29' + 20^\circ 10' = 53^\circ 39'.$$

Yours truly,

Transit.

Footes Bay, Ont.

(Continued from Page 114.)

correct error made in plan, profile and book of reference covering located line of railway between Brownsville and Oliver's, B.C.

4293—Feb. 1—Approving Standard Passenger Tariff, C.R.C. No. 86, of the Kingston and Pembroke Railway, making rate of three cents per mile.

4294—Jan. 30—Amending order dated December 10th, 1907, in connection with the transfer of passengers and mails between trains of the C.P.R. and G.T.R. at Brockville, Ont., so as to require the two railways to fully provide for this connection on or before March 1st, 1908.

4295—Feb. 3—Authorizing the Dominion Car and Foundry Company, Limited, at Montreal, to lay water pipe under the track of the Lachine Canal Bank Branch of the G.T.R.

CONSTRUCTION NEWS SECTION

Readers will confer a great favor by sending in news items from time to time. We are particularly eager to get notes regarding engineering work in hand and projected, contracts awarded, changes in staffs, etc. Printed forms for the purpose will be furnished upon application.

RAILWAYS—STEAM AND ELECTRIC.

Ontario.

OWEN SOUND.—The G.T.R. is extending its yards and making extensive additions to its freight-sheds here.

HAMILTON.—The T., H. & B. is going to build a new bridge at Cainsville, on the Brantford and Hamilton road. The bridge will be a steel one with heavy concrete abutments.

New Brunswick.

ST. JOHN.—Quietly but with most satisfactory progress there is being carried on in Northern New Brunswick and Eastern Quebec railroad work which will open up an enormously wealthy though hitherto undeveloped district. That whole country surrounding Bay Chaleur and the Restigouche River will, by the end of next year, if present plans are carried out, become as easily accessible as any portion of Eastern Canada. It is intended to make Campbellton the ultimate terminus of the A. Q. & W., and in order to do this it will be necessary to construct a great bridge over the Restigouche. This has already been designed, and the contract awarded to the International Bridge Company. The bridge will be 3,300 feet in length, and will cost not less than \$600,000

British Columbia.

FERNIE.—About \$50,000 will be expended by the C.P.R. here during the coming spring in new trackage, freight sheds and other improvements.

VANCOUVER.—The percentage paid the city by the British Columbia Electric Railway Company for 1907 under the terms of its agreement, amounted to \$16,378. In 1906 the amount received from this source was \$10,300, the increase for last year being over \$6,000 or approximately, 60 per cent.

VICTORIA.—A petition has been presented for a private bill to incorporate the Hudson Bay Pacific, which will also shortly ask Ottawa for a Federal charter for the Port Simpson to Fort Churchill road to be completed in five years.

VANCOUVER.—A seventy-mile extension of road will be built by the Spokane International Railway from Eastport to Fernie, where it will connect with the C.P.R.

Alberta.

EDMONTON.—Fletcher Bredin, Athabasca, in the Legislature, has moved the second reading of an Act to amend the charter of the Alberta and Northwestern Railway, which aims to open up the Peace River district. The company are making financial arrangements in the Old Country by which operations will be soon commenced. By amendment the route of the railway will be from Medicine Hat to Rocky Mountain House, then to Edmonton and thence to Lesser Slave and Peace River.

MISCELLANEOUS.

British Columbia.

MICHEL.—Plans are now being prepared and construction will be started within the next few months of a new tippie for the Crow's Nest Pass Coal Company. The structure when completed will represent an expenditure of \$200,000.

Ontario.

BELLEVILLE.—It looks as though the city would have the benefit of another large cement industry, thus making three here. It is now said that Messrs. H. Corby, ex-M.P., and Fred. R. Tingham, with others, have purchased vast rock and clay properties along the Bay of Quinte shore, and the big cement works and limekilns will be started at an estimated cost of nearly \$7,000,000.

LIGHT, HEAT, AND POWER.

Ontario.

BELLEVILLE.—The City of Belleville are anxious to secure a city engineer; one familiar with the installation of waterworks preferred.

ST. CATHARINES.—With the temperature six below zero, many hundreds of people in this city and in Thorold suffered from the cold last night and to-day, due to the scarcity of natural gas, the only heating that a majority of the houses in this city have. The gas in hundreds of stoves and furnaces went out entirely last week, leaving the houses absolutely without heat. "I am going to wire to the Minister of the Interior about the export of natural gas across to Buffalo, thus sending out of the country a natural asset that our own people are actually suffering for," said Mayor Campbell. The Natural Gas Company, which supplies St. Catharines and Thorold with natural gas, claims that the great strain on the gas wells occasioned by sending the gas to Buffalo, prevents them from getting anything like an adequate supply. Something will have to be done at once or people here will be actually freezing to death in their homes.

Manitoba.

(From Our Own Correspondent.)

WINNIPEG.—The power question is beginning to get acute. Business men who placed reliance on the good judgment of Mayor Ashdown, and his promises, that the scheme would be gone on with whenever the financial situation was sufficiently clear to issue debentures covering the cost of expenditures contracted for, are now disappointed that the Mayor has changed his view by asking for the dismissal of Chief Engineer Smith, which practically means the killing of the power scheme for the city. The Board of Control, every member of which pledged himself to the rapid construction of the scheme on the recovery of the money market, are to all intents and purposes unanimous with the Mayor. The citizens are becoming tired of the Mayor's manoeuvring, and the latest step is in the direction of the formation of a power league, which will endeavor to bring pressure to bear on the City Council and force the completion of the scheme. There has already been expended a sum in the vicinity of \$300,000 on tramway and other works, and the majority of citizens place absolute reliance in the estimates and advice given by Engineer Smith. The completion of the power scheme means the building of Winnipeg as a manufacturing centre; the greatest obstacle hitherto to the establishment of manufacturing concerns being the high price of power, light and taxes. A number of Eastern and States companies are negotiating for the erection of plants in Winnipeg provided the power is put on a satisfactory footing, and should Mayor Ashdown and the present council fail to carry out the citizen's wishes it is generally expected that there will be trouble ahead, the popular vote being for the immediate construction of the plant now that the money market has eased off.

Alberta.

EDMONTON.—A new power plant, consisting of a gas producer engine of 1,000 horse-power, and a 2,300 volt generator will be installed here on the site of the present power plant.

British Columbia.

VICTORIA.—According to the annual report of Mr. Matthew Hutchinson, superintendent of the city lighting department, several additions and changes will be found necessary for the city electric plant. He recommends the replacing of the older types of lamps and machinery before making further extensions.

TENDERS.

Ontario.

BROCKVILLE.—Tenders will be received until February 20th for the construction of a bridge over the mouth of Jones' Creek. M. J. Connolly, Mallorytown, Ont., is clerk.

LONDON.—Tenders will be received until February the 18th, 1908, for the erection of Hygienic Institute Building. H. F. McNaughten, Secretary of Public Works Department, Toronto.

NEWBURG.—Tenders will be received until February the 20th, 1908, for plans, specifications and tenders for the erection of a steel bridge, with stone or cement abutments or an arch stone or cement (reinforced with steel) bridge-span about 60 feet. B. G. Hamm, chairman of roads and bridges, Odessa, Ont.

OTTAWA.—Tenders will be received until March 12th, 1908, for the construction of Section No. 3 of the Trent Canal. J. B. Brophy, division engineer, Trenton; L. K. Jones, Secretary Department of Railway and Canals. (Advertised in Canadian Engineer.)

OTTAWA.—Tenders will be received until March the 2nd, 1908, for the construction of three steel tugs. Plans and specifications may be seen at Government Engineer's Offices, Halifax, Ottawa, Toronto and Montreal. Fred. Gelinas, Secretary Department of Public Works. (Advertised in the Canadian Engineer.)

TORONTO.—Tenders will be received until March 2nd, 1908, for the construction of a new entrance to Toronto harbor. J. G. Sing, resident engineer; Fred. Gelinas, Secretary of the Department of Public Works. (Advertised in the Canadian Engineer.)

TORONTO.—Tenders will be received by the Board of Control until February the 18th, 1908, for the following construction:

Asphalt Pavement.—Sherbourne Street, King to Wilton Avenue; Carling Avenue, from Bloor Street to north end; Eadean Avenue, from Jones Avenue to Leslie Street.

Vitrified Block Pavement.—Lane first south of Queen Street, from Church Street to east end.

Bitulithic Pavement.—Trafalgar Avenue, from Gladstone Avenue to Dufferin Street. Joseph Oliver, mayor; C. H. Rust, city engineer.

New Brunswick.

MONCTON.—Tenders will be received until February 18th, 1908, by the Intercolonial Railway for the construction of a hard pine trestle bridge at Sydney, N.S. D. Pottinger, general manager, Moncton, N.B.

Manitoba.

BRANDON.—Tenders will be received until February the 20th, 1908, for (1) a reinforced concrete bridge with approaches, (2) a steel bridge with approaches. H. Brown, city clerk; W. H. Shillinglaw, city engineer. (Advertised in the Canadian Engineer.)

British Columbia.

VICTORIA.—Tenders are being invited for a freighter for the Skeena River. This vessel is being built by the G.T.P. and is to be ready early in the spring. The order for machinery has been placed with the Polson Iron Works, Toronto. G. A. McNicholl is purchasing agent for G.T.P.

Saskatchewan.

REGINA.—Tenders will be received until February the 24th, 1908, for the construction of a re-inforced concrete bridge and dam on the Wascana Creek, Albert Street, Regina. F. J. Robinson, deputy commissioner, Regina. (Advertised in the Canadian Engineer.)

CONTRACTS AWARDED.

MITCHELL.—Messrs. A. Hill & Company, bridge builders, have received the contract for a steel bridge at Wingham. The contract price was about \$7,000.

Manitoba.

WINNIPEG.—The City Council has recommended the acceptance of the tender of the Canada Iron and Foundry Company, Fort William, for the supplying of water pipes and specials to the city, on the condition that the pipe be delivered only in such quantities as may be required from time to time and payments made accordingly. The amount of pipe to be purchased is 1,634 tons and 70 tons of specials. The amount of tender is \$66,994 for the pipe and \$4,060 for the specials, making a total of \$71,054. The tender has also been recommended of the Canadian Fairbanks Company, for the supplying of six and eight inch hydrants, the amount of tender being \$8,437.50.

WINNIPEG.—Messrs. Foley Bros. & Larson, of this city, have been awarded by the G.T.P. the contract for the construction of one hundred and twenty-six miles of line east of Edmonton.

WINNIPEG.—The S. C. Hill Company, sub-contractors for bridge work on the G.T.P., have secured the contract for bridges at Cross Lake and Green Lake, Man.

PERSONAL.

MR. WALTER J. FRANCIS, C.E. (Tor.), has opened offices as a consulting engineer in the Sovereign Bank Building, Montreal.

MR. C. HOLDEN, of Winnipeg, was appointed superintendent of the city power plant and light system, of Moose Jaw, succeeding A. C. Read, who resigned.

MR. T. S. NASH, D.L.S., of Ottawa, has been appointed special examiner to examine candidates for commissions as Dominion Land Surveyors and for admission as articulated pupils.

MR. JOHN ERICKSON, who has been superintendent of the Cranbrook division of the C.P.R. for many years, is to retire. J. Brownlee, at present superintendent of the Moose Jaw division, is to succeed Superintendent Erickson.

MR. C. DRINKWATER has been appointed senior assistant to the president of the C.P.R. Mr. Drinkwater will have charge of all matters affecting the company in connection with legislation at Toronto, Quebec and Ottawa, and the business of the company with the Railway Commission.

MR. A. A. BOWMAN, Toronto manager of the Canadian Rand Company, passed through Montreal, this week, on his way to the Maritime Provinces, on a trip of inspection for the company, after having spent several weeks on a similar errand, in Manitoba and the North-West. While in the West he visited the principal mining and manufacturing centres and found the outlook for business for the company quite promising. This is attested in the fact that the company has since decided to open an office at 406 Traveller's Building Winnipeg, where will be kept a full line of Rand mining machinery for the benefit of purchasers in the West.

MARKET CONDITIONS.

Toronto, February 13th, 1908.

The following are wholesale prices for Toronto, where not otherwise explained, although for broken quantities higher prices are quoted:

American Bessemer.—Fourteen-gauge, \$2.45; 17, 18, and 20-gauge, \$2.60; 22 and 24-gauge, \$2.65; 26-gauge, \$2.80; 28-gauge, \$3.

Antimony.—Quiet, but inquiries are coming in more freely; we quote 11½ to 13c.

Bar Iron.—\$2.20 base, from stock to the wholesale dealer. Unaffected by last week's action in the United States which advanced prices \$2 per ton.

Beams and channels, \$2.75 to \$3, according to size and quantity; angles, 1¼ by 3-16 and larger, \$2.65; tees, \$2.90 to \$3 per 100 pounds. Extras for smaller sizes.

Boiler Heads.—25c. per 100 pounds advance on boiler plate.

Boiler Plates.—¼-inch and heavier, \$2.50. Supply probably adequate and quotations still firm.

Boiler Tubes.—Lap-welded steel, 1¼-in., 10c.; 1½-in., 9c. per foot; 2-in., \$9.10; 2¼-in., \$10.85; 2½-in., \$12; 3-in., \$13.50; 3½-in., \$16.75; 4-in., \$21 per 100 ft.

Building Paper.—Plain, 32c. per roll; tarred, 40c. per roll, and the market decidedly strong at these prices.

Bricks.—Common structural \$10 per thousand, wholesale; small lots \$12 to \$13, and the demand fairly brisk. Red and buff pressed are worth \$18 at Don Valley Works.

Cement.—Star brand, Toronto, 1,000 barrel lots, \$2.25 per barrel, 350 pounds net, including bags, or \$1.85 ex-package, small lots cost \$2.10 warehouse, \$2.15 delivered. National and Lakefield prices are identical; English, Anchor, \$3 per barrel in wood. Demand continues moderate.

Detonator Caps, 75c. to \$1 per 100; case lots, 75c. per 100; broken quantities, \$1.

Dynamite, per pound, 21 to 25c., as to quantity.

Felt Paper—Roofing Tarred.—Market steady at \$2 per 100 pounds. Orders are fairly regular, and the spring prospects good.

Fire Bricks.—In steady request; English, \$32 to \$35; Scotch, \$30 to \$35; American, \$25 to \$35 per 1,000.

Fuses—Electric Blasting.—Double strength, per 100, 4 feet, \$4.50; 6 feet, \$5; 8 feet, \$5.50; 10 feet, \$6. Single strength, 4 feet, \$3.50; 6 feet, \$4; 8 feet, \$4.50; 10 feet, \$5. Bennett's double tape fuse, \$6 per 1,000 feet.

Galvanized Sheets—Apollo Gauge.—Sheets 6 or 8 feet long, 30 or 36 inches wide; 10-gauge, \$3.25; 12-14-gauge, \$3.35; 16, 18, 20, \$3.50; 22-24, \$3.70; 26, \$3.95; 28, \$4.40; 29 or 10¾, \$4.70 per 100 pounds. Stocks very low.

Ingot Copper.—Market still irregular and inclined to weaken. We now quote 14½ to 16c., as to quantity.

Lead.—Holding its own at 4½c.

Nails.—Wire, \$2.55 base; cut, \$2.70; spikes, \$3.15. Supply moderate.

Pitch.—Quiet at 75c. per 100 lbs.

Pig Iron.—Summerlee No. 1, always in demand, generally for small lots, quotes now, nominally, \$27; Gleggarnock, \$26.50; No. 2, \$26; Cleveland, No. 1, \$23.50, \$24; Clarence, No. 3, procurable in Montreal, price here \$23 to \$24.00. But a small business doing; buyers cautious.

Steel Rails.—80-lb., \$35 to \$38 per ton.

Sheet Steel.—In moderate supply; 10-gauge, \$2.65; 12-gauge, \$2.70.

Tar.—Market unsettled, \$3.50 per barrel the ruling price.

Tank Plate.—3-16-in., \$2.65.

Tin.—Irregular, but active, fluctuating in Singapore and London. Quotation in Toronto, 31½ to 32½c.

Tool Steel.—Jowitt's special pink label, or octagon drill steel, 10½c. per pound; Capital, 12c.; Conqueror, highspeed, 70c. base.

* * * *

Montreal, February 20th, 1908.

Antimony.—The market has weakened during the past few days and prices are now 1c. lower than a week ago, at 11½ to 12c. per pound.

Bar Iron and Steel.—The market is steady at last week's decline, prices being as follows: Bar iron, \$2 per 100 pounds; best refined horseshoe iron, \$2.25, and forged iron, \$2.15; mild steel, \$2.10; sleigh shoe steel, \$2.10 for 1 x ¾-base; tire steel, \$2.10 for 1 x ¾-base; toe calk steel, \$2.60; machine steel, iron finish, \$2.15.

Boiler Tubes.—The market holds steady, demand being fair. Prices are as follows: Two-inch tubes, 8 to 8¼c.; 2½-inch, 11c.; 3-inch, 12 to 12¼c.; 3½-inch, 15 to 15¼c.; 4-inch, 19¼ to 19½c.

Building Paper.—Tar paper, 7, 10, or 16 ounce, \$2 per 100 pounds; felt paper, \$2.75 per 100 pounds; tar sheathing, No. 1, 60c. per roll of 400 square feet No. 2, 40c.; dry sheathing, No. 1, 50c. per roll of 400 square feet, No. 2, 32c.

Cement—Canadian and American.—Canadian cement is generally quoted at \$1.80 to \$1.90 per barrel, in cotton bags, and \$2.10 to \$2.20 in wood, weights in both cases 350 pounds. There are four bags of 87½ pounds each, net, to a barrel, and 10 cents must be added to the above prices for each bag. Bags in good condition are purchased at 10 cents each. Where paper bags are wanted instead of cotton, the charge is 2½ cents for each, or 10 cents per barrel weight. American cement is steady at \$1.15 per 350 pounds, basis Glens Falls, cotton or paper bags. When the cotton bags are returned in good condition, only 7½ cents is allowed for them. American cement sold at \$2 on track.

Cement—English and European.—English cement is unchanged at \$1.90 to \$2.20 per barrel in jute sacks of 82½ pounds each (including price of sacks) and \$2.10 to \$2.20 in wood, per 350 pounds, gross. Belgian cement is quoted at \$1.90 to \$2.10 per barrel, in wood. German is \$2.52 to \$2.55 per barrel of 400 pounds for Dyckerhoff.

Copper.—The market for copper shows increased strength, this week, being ½c. higher in price. Prices are 15½ to 16c. per pound.

Lead.—The market is steady and unchanged, this week, at \$4 to \$4.10 per 100 pounds. Demand is fair.

Nails.—Demand for nails is very dull this week, but prices show no further change, being \$2.50 per keg for cut, and \$2.40 for wire, base prices.

Pipe—Cast Iron.—The market is next thing to dead, as nothing is used during the winter. Prices are steady at \$36 for 8-inch pipe and larger; \$37 for 6-inch pipe, \$38 for 5-inch, and \$39 for 4-inch at the foundry. Gas pipe is quoted at about \$1 more than the above.

Pipe, Wrought.—The market is firm but duller. Quotations and discounts for small lots, screwed and coupled, are as follows: ¼-inch to ¾-inch, \$5.50, with 54 per cent. off for black and 38 per cent. off for galvanized. The discount on the following is 66 per cent. off for black and 56 per cent. off for galvanized: ½-inch, \$8.50; 1-inch, \$16.50; 1¼-inch, \$22.50; 1½-inch, \$27; 2-inch, \$36; and 3-inch, \$75.50; 3½-inch, \$95; 4-inch, \$108.

Spikes.—Railway spikes are not in very good demand; \$2.60 per 100 pounds, base of 5½ x 9-16. Ship spikes are steady at \$3.15 per 100 pounds, base of 5½ x 10 inch and 5½ x 12 inch.

Steel Shafting.—At the present time prices are steady at the list, less 25 per cent. Demand is very dull and lower figures would hardly be refused.

Steel Plates.—Demand is quite dull and a firm bid at lower figures than quotations would be considered. Quotations are: \$2.75 for 3-16, and \$2.50 for ¼ and thicker, in small lots.

Tar and Pitch.—Coal tar, \$4 per barrel of 40 gallons, weighing 575 to 600 pounds; coal tar pitch, No. 1, 75c. per 100 pounds, No. 2, 65c. per 100 pounds; pine tar, \$4.35 to \$4.50 per barrel of about 280 pounds; pine pitch, \$4.25 per barrel of 180 to 200 pounds.

Tin.—The market for tin shows a slight advance, this week, at 31½ to 32c. per pound.

Tool Steel.—Demand is light but the market is firm. Base prices are as follows: Jessop's best unannealed, 14½c. per pound, annealed being 15½c.; second grade, 8½c., and high-speed, "Ark," 60c., and "Novo," 65c.; "Conqueror," 55 to 60c.; Sanderson Bros. and Newbould's "Sabon," high-speed, 60c.; extra cast tool steel, 14c., and "Colorado" cast tool steel, 8c., base prices. Sanderson's "Rex A" is quoted at 75c. and upward; Self-Hardening, 45c.; Extra, 15c.; Superior, 12c.; and Crucible, 8c.; "Edgar Allan's Air-Hardening," 55 to 65c. per pound.

Zinc.—Demand is on the dull side and prices show a slight advance as compared with a week ago, being \$5.25 to \$5.50 per 100 pounds.

SECOND HAND EQUIPMENT
FOR
**CONTRACTORS, MINES, STONE-
WORKERS.**
If you wish to buy or sell write us.
THE HARTLAND COMPANY
32B Board of Trade Building, MONTREAL.

TENDERS CALLED FOR



SEALED TENDERS addressed to the undersigned, and endorsed "Tender for New Entrance to Toronto Harbour, Ont.," will be received at this office until Monday, March 2, 1908, inclusively, for the construction of a New Western Entrance to the Harbour of Toronto, in the County of York, Ontario, according to plans and specification to be seen at the office of J. G. Sing, Esq., Resident Engineer, Confederation Life Building, Toronto, at the office of H. J. Lamb, Esq., Resident Engineer, London, Ont., at the office of J. L. Michaud, Esq., Resident Engineer, Merchants' Bank Building, St. James St., Montreal, P.Q., and the Department of Public Works, Ottawa.

Tenders will not be considered unless made on the printed form supplied, and signed with the actual signatures of tenderers.

An accepted cheque on a chartered bank, payable to the order of the Honourable the Minister of Public Works, for forty-eight thousand dollars (\$48,000.00), must accompany each tender. The cheque will be forfeited if the person tendering decline the contract or fail to complete the work contracted for, and will be returned in case of non-acceptance of tender.

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

By order,

FRED. GELINAS,

Secretary.

Department of Public Works,
Ottawa, January 31, 1908.

Newspapers will not be paid for this advertisement if they insert it without authority from the Department.



DEPARTMENT OF RAILWAYS AND CANALS, CANADA.
TRENT CANAL.
ONTARIO-RICE LAKE DIVISION.
SECTION NO. 3.
NOTICE TO CONTRACTORS.

SEALED TENDERS addressed to the undersigned and endorsed "Tender for Trent Canal," will be received until 10 o'clock on Thursday, 12th March, 1908, for the works connected with construction of Section No. 3, Ontario, Rice Lake Division of the Canal.

Plans, specifications, and the form of the contract to be entered into, can be seen on and after the 5th February, 1908, at the office of the Chief Engineer of the Department of Railways and Canals, Ottawa, at the office of the Superintending Engineer, Trent Canal, Peterboro', Ont., and at the office of Mr. J. B. Brophy, Division Engineer, Trenton, Ont., at which places forms of tender may be obtained.

Parties tendering will be required to accept the fair wages Schedule prepared or to be prepared by the Department of Labor, which Schedule will form part of the contract.

Contractors are requested to bear in mind that tenders will not be considered, unless made strictly in accordance with the printed forms, and in the case of firms, unless there are attached the actual signatures, the nature of the occupation, and place of residence of each member of the firm.

An accepted bank cheque for the sum of \$10,000 must accompany each tender, which sum will be forfeited, if the party tendering declines entering into contract for the work, at the rates stated in the offer submitted.

The cheque thus sent in will be returned to the respective contractors whose tenders are not accepted.

The advertisement dated the 16th January, 1908, is hereby cancelled.

The lowest or any tender not necessarily accepted.

By order,

L. K. JONES,

Secretary.

Department of Railways and Canals,
Ottawa, February 3rd, 1908.

Newspapers inserting this advertisement without authority from the Department will not be paid for it.

CITY OF BRANDON

Tenders for Bridge.

SEALED TENDERS addressed to the undersigned will be received up to 12 o'clock, noon, of Thursday, February 20, 1908, for the construction of a bridge over the Assiniboine River at First Street in the City of Brandon.

Tenders are required as follows:

(a) Reinforced concrete bridge with approaches.

(b) Steel bridge with approaches.

Full information as to conditions of tendering and copies of plans and specifications may be obtained on application to the undersigned.

A marked cheque or cash deposit of 5 per cent. of tender will be required with each tender.

The lowest or any tender not necessarily accepted.

HARRY BROWN,
City Clerk.

Brandon, Manitoba, Canada,
January 28, 1908.



DEPARTMENT OF

PUBLIC WORKS.

Tenders for the Construction of a Reinforced Concrete Bridge and Dam over Wascana Creek, Albert Street, Regina.

Tenders addressed to the Deputy Commissioner of Public Works, Regina, Saskatchewan, and endorsed, "Tenders for the Construction of Bridge and Dam, Albert Street, Regina," will be received up to 4.30 p.m., **Monday, February, 24th, 1908**, for the construction of a reinforced concrete bridge and dam over the Wascana Creek on Albert Street, Regina. A certified cheque for the sum of \$2,000 must accompany each tender. Cheque will be retained until the contract and bonds for the work have been executed and the work commenced. Cheques of unsuccessful bidders will be returned after the contract is signed. The right to reject any or all bids or waive any defects is reserved. Plans, specifications and all information may be obtained on application to the undersigned.

F. J. ROBINSON,

Deputy Commissioner of Public Works.

Dated at Regina, Sask.,
February 8th, 1908.



SEALED TENDERS addressed to the undersigned, and endorsed "Tender for Steel Tugs," will be received at this office until **Monday, March 2, 1908**, inclusively, for the construction of Three Steel Tugs, according to a plan and specification to be seen at the offices of E. T. P. Shewen, Esq., Resident Engineer, St. John, N.B.; C. E. W. Dodwell, Esq., Resident Engineer, Halifax, N.S.; J. G. Sing, Esq., Resident Engineer, Confederation Life Building, Toronto, Ont.; Chas. Desjardins, Esq., Clerk of Works, Post Office Building, Montreal, and at the Department of Public Works, Ottawa.

Tenders will not be considered unless made on the printed form supplied, and signed with the actual signatures of tenderers.

Accepted cheques on a chartered bank, payable to the order of the Honorable the Minister of Public Works, for three thousand five hundred dollars (\$3,500.00), for one Steel Tug; six thousand dollars (\$6,000.00), for two Steel Tugs, and eight thousand dollars (\$8,000.00), for three Steel Tugs, must accompany each tender. The cheques will be forfeited if the person tendering decline the contract or fail to complete the work contracted for, and will be returned in case of non-acceptance of tender.

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

By order,

FRED. GELINAS,

Secretary.

Department of Public Works,
Ottawa, February 1, 1908.

Newspapers will not be paid for this advertisement if they insert it without authority from the Department.

PROFESSIONAL PAGE

CHARLES H. MITCHELL, C.E.

Member Canadian Society Civil Engineers.
Member American Society Civil Engineers.
Assoc. Mem. Institution Civil Engineers (Lon.)
Assoc. American Institute Electrical Engineers
Rooms 1004-5 Traders Bank Bldg.
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BUDDEN, HANBURY A.

F. M. Chart, I. P. A., Barrister, Solicitor,
and Patent Attorney

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CANADA SALES CO.

Correspondence solicited from Manufacturers
and others desiring representation in the
Dominion of Canada.

Address all communications to

Canada Sales Co.
86 King St. East.
Toronto.

QUEBEC BRIDGE COMPANY.

Inquiry in the Senate.

Hon. Mr. Landry inquired:

1. Has the Government at any time paid the Quebec Bridge Company, or the Quebec Bridge and Railway Company, any sums of money to aid it in the construction of its undertaking?
2. At what date, for what amount, and under authority of what statute, was each of such payments made?
3. Besides the sums hereinabove mentioned, has the Government, directly or indirectly, come to the aid of the said company?
4. In what manner, when, up to what point, and under what authority?

WALTER J. FRANCIS, C. E.

CONSULTING ENGINEER
SOVEREIGN BANK BUILDING
MONTREAL

MEMBER CANADIAN SOCIETY CIVIL ENGINEERS.
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Hon. Mr. Scott—The answers are:

1. Yes.
2. Date: Between December 28th, 1900, and December 16th, 1902.
Amount: \$374,353.33. Authority:
Chapter 7, Section 3, 62-63 Vic (1899),
"An Act to authorize the granting of
subsidies in aid of the construction of

(Continued on Page 18.)



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