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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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TORONTO, CANADA, JUNE 19th, 1908.

CONTENTS OF THIS ISSUE.

ACCIDENTS DURING APRIL.

Statement of accidents in Canada during April, 1908, in the following industries and trades:—

Trade or Industry	Killed	Injured	Total
Lumbering	10	5	15
Mining	7	11	18
Building trades	5	12	17
Woodworking trades	1	11	12
Railway service	32	45	77
Navigation	2	9	11
General transport	2	11	13
Miscellaneous	1	18	19
Unskilled labor	7	11	18

LETTING BY TENDER.

Competition may or may not be the life of trade. Certain it is we require some competition to ensure fair prices. Various methods of securing competition have been used. In many districts contracts are auctioned off. That such a method should still be in vogue is a marvel. The effect of such a system must be most pernicious. Men anxious to secure work bid down until they reach a figure so low that only by using poor labor and poorer material can they complete, without great personal loss, the undertaking. In the end this system is unsatisfactory and injurious to both parties. To overcome the evils of such unreasonable competition the letting of contract by tender was originated. But this newer system seems to have fallen in these evil days. One would imagine that forces were combined against it, so many are the inventions now attached to specifications, which defeat the good purposes of letting contracts by tender.

In many cases an unreasonably large deposit is required—a deposit so large that the number of firms or individuals who may compete is very limited—so limited that competition is eliminated. And coupled with this is the holding of deposits. A firm puts up a large deposit, and for weeks, and sometimes months, it is held while plans and contract are being perfected with the successful tenderer. This should not be necessary. Complete plans and contract should be prepared before the opening of tenders. A few days should be long enough to close the bargain and free all the deposits.

Abuse number two is that some men, not able to estimate on their own design, call for tenders for no other purpose than that they may secure prices—a most unfair and unprofessional practice. A legal method of stealing, taking of a man's time and knowledge without ever intending to give returns.

Our municipal councils are doing more than anyone else to discourage the submitting of fair tenders. Work is advertised, firms from a distance submit prices in competition with local men, but when the tenders are opened the local firms secure the work, even if they are a few thousand dollars higher than their competitors. Result: After a few experiences local men set their own price and the ratepayer pays twice for work completed.

It is not often that the contractor is at fault, but we noticed a most remarkable tender during the last week. One firm put in a tender, which, without mentioning any amount, said: "We will do the work for one hundred dollars less than the price of any other firm." Such a method of securing work cannot be too strongly discouraged. It leads to poor workmanship, defective material, and dishonest methods.

Fair specifications, contract to the lowest tenderer, and a fair contract will secure good results. Any other method will lead to trouble.

Independent United States steel producers have thought fit, though reluctantly, to lower prices of steel in spite of the stubborn refusal of the United States Steel Company. A London despatch of Monday last says: "The cut in your steel market had long been regarded as inevitable. It will not affect our market, because prices here had already fallen considerably. All manufacturing centres agree that there is still an absence of buying orders, but the further decline in coal prices encourages hope of a better selling market.

DISCUSSION OF METAL AND WOODEN FORMS IN CONCRETE CONSTRUCTION.

By L. C. Wason,
President of the Aberthaw Construction Co., Boston.

There is a great field for research and inventive genius in the production of cheap, durable forms, sufficiently flexible for many different uses, as the cost of this part of the work is at present one of the greatest handicaps to the reduction of the cost and the more general use of concrete construction. The writer has used metal forms to some extent, and has observed their use by other contractors. If sheet metal is placed on a wooden back or on a metal stiffening frame there is danger of its becoming dented, bent, or otherwise defaced so as to give an imperfect surface to the concrete, and if the metal covering is sufficiently thick and strong to resist damage it is too heavy and expensive for general use. Moreover, such forms are not flexible, so that they can be used for various purposes. The use of heavy cast-iron moulds, as proposed by Mr. Edison, is far more expensive still. Therefore, up to date wood has proved to be the most economical and flexible in the way of being changed from one use to another of anything which the writer has yet seen, and his study has been concentrated on the most effective and economical use of lumber. When a sheet metal form becomes dented it is usually cheaper to throw the covering away and start anew than to straighten and re-use that which is bent. With the rough, careless class of mechanics called carpenters, which is the only possible kind to get for concrete forms, there is great danger of a rapid deterioration in the value of the material. Thoroughly good mechanics, those who are capable of doing a nice job of carpentry, cannot be induced to work on this class of construction. The quality of these rough carpenters is also becoming poorer, usually on account of the trade unions' restriction to the employment of apprentices. Any man who can buy a few tools and use a saw and hammer can hire out as a carpenter. He is so poor that he is constantly discharged, and after a considerable time of practising on one job after another may show a little intelligence, but he is a very inferior workman at best.

In considering the cost of construction as a whole it is as likely to be governed by the cost of the forms as the cost of the concrete. For illustration, in the cost of columns, although they are made so as to be reduced in size as easily as possible this is somewhat expensive in labor, and after they are reduced the girders and beams which meet at a column are too short, and have to be spliced out, which adds to the cost, and these costs are likely to exceed that which can be saved in concrete. It is, therefore, more economical to run the columns one size through the full height of a low building, or to reduce the size only twice or at most three times in the height of a high building. For instance, the actual cost of labor (without regard to wastage of lumber) in reducing columns from 16-inch to 12-inch on a certain job amounted to $5.70, whereas the cost of the concrete saved by the reduction was $2.30. In the writer's office a set of plans in pamphlet form has been compiled for standard forms for all kinds of work, and where special framing is required plans are made for these special cases, and in spite of this care and study the above figures represent actual experience. Therefore, in designing and handling form work the cost of labor is the principal item to be considered. The opinion was expressed by Mr. Larned that the forms could be cheapened by the use of common and rough lumber instead of a fairly good grade of dressed lumber. The fact that it is almost universal to use a good grade of dressed stock would seem to disprove the above statement. The cost of dressing varies according to the mill from $1.50 to $4 per thousand feet for planing four sides. The price of second grade hemlock and spruce differs but little from that which has small sound knots and is free from wind shakes or large season cracks, and such lumber works so much easier as to cut down the labor cost more than the equivalent of the difference in cost of material. Some builders use ⅞-inch stock, others 1½-inch, and some 2 inches thick. The thicker lumber will stand the wear and tear longer than the light, and can, therefore, be used so many more times than the thin that it is more economical in the long run if the work in hand is large enough, so that the forms can be used several times without delaying the rapid progress of the work. With planed stock tighter joints can be obtained between boards, which prevents leakage of the fine materials and weakening and roughening the surface, and the boards are of even thickness, so that a fairly good surface is obtained, which needs little treatment after the forms are removed except where an ornamental appearance is especially desired. If rough lumber is used, in order to get even a passable surface finish considerable labor must be spent upon dressing the concrete after the forms are removed, and this must be done by mechanics. If a cement finisher, who is in no sense a plasterer, is used, and his wages are 45 or 50 cents an hour, only a fair job can be obtained. If plasterers are used, their pay is 60 cents per hour, and the job is properly finished, but in either case the cost is greater than the cost of planing lumber and of using a good quality. Rough lumber can only be used economically in work which is never exposed to view, or where appearance is no object whatever.

ENGINEERING SOCIETIES.

CANADIAN RAILWAY CLUB.—President, L. R. Johnson; Secretary, James Powell, P.O. Box 7, St. Lambert, near Montreal, P.Q.

CANADIAN STREET RAILWAY ASSOCIATION.—President, E. A. Evans, Quebec; secretary, Acton Burrows, 157 Bay Street, Toronto.

CANADIAN INDEPENDENT TELEPHONE ASSOCIATION.—President, J. F. Demers, M.D., Levis, Que.; secretary, F. Page Wilson, Toronto.

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

QUEBEC BRANCH OF THE CANADIAN SOCIETY OF CIVIL ENGINEERS.—Chairman, E. A. Hoare; Secretary, P. E Parent, Po. O. Box 115, Quebec. Meetings held twice a month at Room 40, City Hall.

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

MANITOBA BRANCH OF THE CANADIAN SOCIETY OF CIVIL ENGINEERS.—Chairman, H. N. Ruttan; Secretary, E. Brydone Jack. Meets first and third Friday of each month, October to April, in University of Manitoba.

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.

CANADIAN ELECTRICAL ASSOCIATION.—President, R. S. Kelsch, Montreal; secretary, T. S. Young, Canadian Electrical News, Toronto. The Eighteenth Annual Convention will be held in Toronto, June 17th to 19th, 1908.

CANADIAN MINING INSTITUTE.—413 Dorchester Street West, Montreal. President, W. G. Miller, Toronto; secretary, H. Mortimer-Lamb, Montreal.

NOVA SCOTIA SOCIETY OF ENGINEERS, HALIFAX.—President, R. McColl; Secretary, S. Fenn, Bedford Row, Halifax, N.S.

AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS, TORONTO BRANCH.—W. G. Chace, Secretary, Confederation Life Building, Toronto.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—29 West 39th Street, New York. President, H. L. Holman; secretary, Calvin W. Rice.

On page 406 of our issue of June 5th there appeared an interesting and valuable article on "The Rental Value of a Power Plant." Credit for this article should have been given to Mr. Charles T. Main.

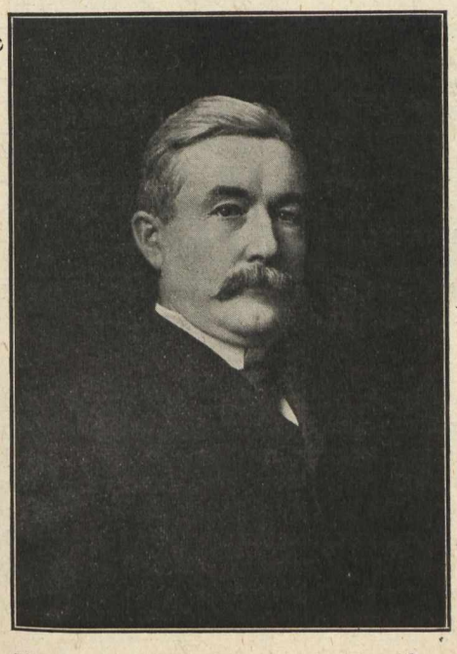
TORONTO-SUDBURY BRANCH C.P.R.

This week saw the opening of 260 miles of new roadway in the Canadian Pacific Railway system, and the completion of one of the most perfect pieces of Canadian railway.

For many years the C.P.R. had contemplated a Toronto-Sudbury line, but it was not until 1903 that they actively commenced construction. In 1898 Mr. H. D. Lumsden, now chief engineer of the National Transcontinental Railway, located for the C.P.R. a line from Sudbury to Kleinburg on the Owen Sound branch, but when the C.P.R. were ready to build in 1903 the requirements as to grades and curvature were so much in advance of those of fifteen years before that new location parties were sent out. The reconnaissance survey was made by H. M. Killey, and the final location was made by parties under the following locating engineers, Messrs. Killey S. Keemley, H. Carry, and J. K. Macdonald.

The line was located with a maximum curvature of four degrees and a limiting gradient of 0.3 per cent. In construction these limitations were not perceptibly departed from.

In 1903 the contract for the section from Rumford to Byng Inlet, sixty miles, was given to Foley Bros. & Larcen. This section was the heaviest work on the line. Eighty per cent. of the excavation was granite rock, and some of the cuttings were one hundred feet deep. This section was practically completed in the spring of 1905.



Mr. J. W. Leonard, Manager of Construction, 1903-7.*

In the spring of 1905 a second section was let. This section extended from Bolton, on the Owen Sound branch, to Parry Sound, a distance of about one hundred and twenty eight miles. The work was let to George S. Deeks & Company, and constructed by the Toronto Construction Company. By November, 1907, this section was completed.

The section from Parry Sound to Byng Inlet, forty miles, was let in the fall of 1906 to Ross-Harris, of Montreal, and this section together with the diversions between Bolton and Toronto, built by John Begg, of St. Catharines, has just been completed.

The difficult engineering work on this line arose because of the necessity of light curves and grades and a direct line, which made necessary the crossing of the large waterways at right angles, thus precluding the use of valleys as an easy path for construction.

The most important bridges and trestles are the Willow Creek trestle, 1,300 feet long, 110 feet high and containing some 750,000 f.b.m., the Severn River Bridge, composed of a riveted truss 20 feet and two 60 foot deck plate girders; the Parry Sound Viaduct; the Byng Inlet trestle, 2,600 feet long, and the French River Bridge, 530 feet long, made up of a warren truss of 415 feet feet, and two 60 foot deck plate girders.

The French River Bridge was fully described in the Engineer of June 5th.

The Parry Sound Viaduct spans the Sequin River, and is over a portion of the town of Parry Sound.

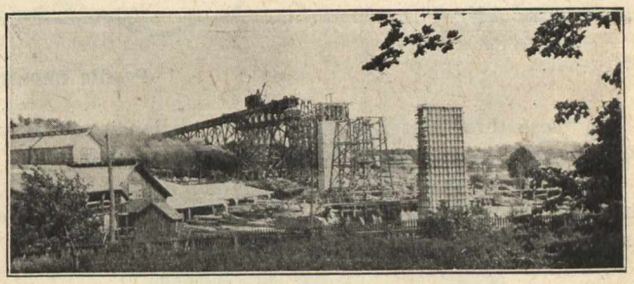
The structure consists of twenty-six spans of various lengths, consisting of twenty-two deck plate girder spans, two 125 feet deck lattice spans, and two 165 feet deck lattice spans, all resting on ten steel towers of varying heights from 35 feet to 90 feet, and the whole steel superstructure is supported on forty-seven concrete piers, consisting of two abutments, one at each end of the bridge, five large piers for supporting the heavy spans, and forty pedestal piers, one under each of the legs of the towers.

Three of the big concrete piers are 90 feet in height. The total length of the steel in this bridge is 1,700 feet, and the total distance of the viaduct from bank to bank is 2,800 feet.

The height of the bridge from the top of the rail to the level of the water in the bay is about 125 feet.

The total weight of the steel in the various spans and towers of the bridge is 3,500,000 pounds.

The erection of this bridge was undertaken by the Hamilton Bridge Works Company, of Hamilton, and completed with plant, appliances, and tools of the very latest engineering practice, and it is interesting to note that twenty spans out of the twenty-six were placed in position with the steel erection car, or derrick, and without falsework or scaffolding of any kind. The two 125 feet deck lattice spans and one of the 165 feet deck lattice spans were erected from falsework, or scaffolds, in the usual way, the material being delivered to the spans with the steel derrick car referred to.



Parry Sound Viaduct, in Course of Construction.

The other 165 feet deck lattice span over the River Sequin was erected as a cantilever without the use of falsework.

As it crosses over the yards and tramways of the Parry Sound Lumber Company, the Railway Commission ordered that a large portion of the bridge shall have a solid deck or floor with steel railing six or eight feet high, so as to prevent the falling of sparks and cinders on the lumber piles.

The main line is laid with 80-pound steel C.P.R. standard, the sidings with 56 and 72-pound steel. The sidings are 3,000 feet long and are placed approximately every five miles. With but few exceptions station houses are built and operators installed at each siding.

The only division point on this section is at Muskoka, 130 miles from Toronto. Here an eight stall concrete round house has been erected, also a concrete engine house and machine shop. A central heating and lighting plant has been installed, oil house and sand house erected and also a coal chute equipped with machinery electric driven. The water supply is secured from Stewart Lake, a body of water some 800 acres in extent, and stored in a 50,000 gallon tank, 35 feet above rail level.

Besides the mail line the division yard contains eight siding, two repair and two storage tracks, together with leads to engine house and the 70-foot turntable.

The C.P.R. do not make a practice of making known contract prices, but it is understood that the prices for work on this line would average about as follows:—

Clearing, per acre.....	$48.00
Grubbing per station of 100 feet and on borrow pits per 2,800 square feet.....	20.00

* See Can. Eng., page 147.

Common excavation, per cubic yard	24 cents
Loose rock, per cubic yard	55 cents
Crosswaying, per square	3.75
Concrete, per cubic yard	8.00
Dry masonry, per cubic yard,	4.00
Rubble masonry, per cubic yard	8.00
Timber for erection, per M	35.00
Labor on erection, per M	11.50
Sheet piling, per M	39.00
Wrought iron, per pound	6 cents
Cast iron, per pound	5 cents
Piles driven, per lineal foot	47 cents
Solid rock, per cubic yard	1.50

The solid rock was all granite and usually free from seams.

Hauling material per ton mile, free haul to four miles	50 cents
Ballasting and trimming, per cubic yard	30 cents
Train fill, per cubic yard	21 cents
Track laying per mile	325.00

In these three last items the railway company were to supply cars, engines, locomotives and crews.

The engine house cost approximately $3,000 per stall, while the concrete work and track for the 70-foot turntable cost $3,500.

An interesting feature in connection with this work was the fluctuation in the labor market.

The main contracts were let with wages for laborers at from 13 to 15 cents per hour. The demand for railway laborers so increased that many sub-contractors had to pay 20 to 25 cents per hour to get men for the completion of their work. For the last few months the price of labor has dropped back to 14 and 15 cents per hour.

Foot-drilling cost 30 cents per foot by the piece and about 40 cents by day labor. One of the interesting features of construction was the use of depressed grades.

A profile of a short section of the road is here given. When the grade line was struck it was drawn so high that the cuts would not make the fills even after allowing for the expansion of the rock, which in most cases was between sixty and seventy per cent. Instead of borrowing rock which cost $1.50 per cubic yard, a temporary grade was struck. Sometimes this grade was as steep as 3 per cent., often not so steep, the dump was kept narrow and a grade was made sufficiently safe for the skeleton track, then sand and gravel was brought in by the train load and the track raised to the established grade line.

One can only estimate the probable saving this method made.

With solid rock at $1.50 per yard the loose rock in the dump, allowing for 66 per cent. expansion, stood the railway at 3-5 of $1.50 = 90 cents per cubic yard.

The sand or gravel cost 20 cents per cubic yard plus the cost to the C.P.R. for hauling. The cost for hauling varied so much that an average is diffcult to secure, but on a seven mile haul a fair price would be 25 cents per cubic yard. This gives a saving in favor of depressed grades of 45 cents per cubic yard. Against this saving there must be placed the loss of material that sifted away in the rock fills. As far as we are able to learn no effort has been made to secure reliable data as to what this would amount to.

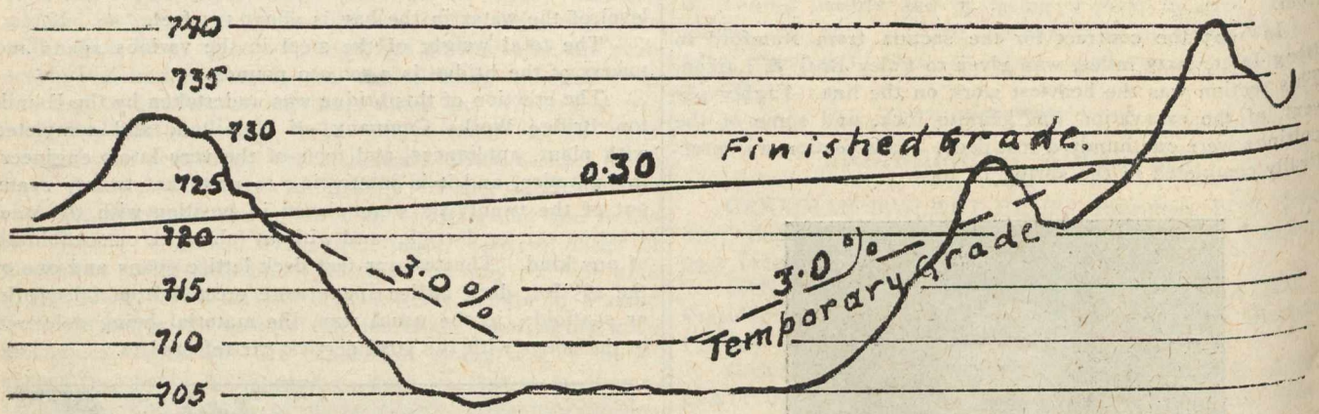
Aside from this unknown loss depressed grades must have saved the railway from $2,500 to $3,000 per mile through the rock country.

In connection with train haul two things are worth of note.

First, that the C.P.R. consolidated engine 2-6-4 and 2-6-0 class were able to haul up 3 and 3.5 grades ten Hart convertable cars holding 30 cubic yards of gravel; and second, that the same engines could haul the same load around 12 degree curves on 0.5 grades coming out of ballast pits.

Including grading, track stations and bridges the line about $45,000 per mile.

In April, 1907, Mr. Leonard found his duties as Assistant General Manager required all his time, and Mr. J. G. Sullivan was appointed manager of construction. Mr. F. S. Darling, who was division engineer during location and construction has as assistants on the grading, Messrs. F. Padget, F. G. Mackie, E. T. Agate, and A. Fronhoefer and E. L. Miles, and as assistants on tracks and buildings Messrs. A. J. Isbester and J. W. Porter.



Profile Showing Depressed Grades.

A much larger proportion in number of buildings for a much smaller amount of estimated value is the record of five months in Toronto's building this year. The buildings erected for that period numbered 2,010 as compared with 2,437 in 1907, the value to $3,957,840, as compared with $7,574,665; the proportion being more buildings last year by 82 to 28, while the value of this year's was only 52 per cent. of last year's. This indicates the erection of a lower-priced class of houses.

The Cutler Hammer Company of Milwaukee have issued a pamphlet descriptive of their Wirt type dynamo brush. The construction of the brush is fully described and illustrated in the pamphlet in question, which states that in designing a dynamo two conditions must be met in order to insure satisfactory operation. One of these is that the brush must be elastic so that it will make good contact with the commutator under slight pressure, disregard of this condition resulting in undue heating and rapid deterioration of both brush and commutator, due to friction. The second requisite is that the brush must be so designed as to oppose a high resistance to the wasteful and destructive current that is generated when adjoining commutator bars are short circuited by the brush. The claim is made that the construction of the Wirt type dynamo brush is such that these two necessary conditions are fully met. Elasticity is secured by constructing the brush of laminated strips of metal, while the desirable feature of high resistance is obtained by combining with the copper laminations, strips of a high resistance metal through which the wasteful current referred to is compelled to pass in completing the circuit from one commutator bar to another. In addition to the purely descriptive matter and price list, the pamphlet contains useful information on the care of commutators and brushes, the importance of correct lap, etc.

THE DIVISION ENGINEER OF CONSTRUCTION.

During the building of the Toronto-Sudbury line of the C.P.R. the man who has been least in the public eye but who has had most to do with the detail and responsibility of its construction is Frederick S. Darling.

Mr. Darling was born in Burlville, Rhode Island, October 8, 1863. He received his educational training in the schools of his native State, and after graduating in 1881 spent four years in preparing himself for a life in the industrial world.

In 1886 the Great Northern lines were being extended in South Dakota, and in that year Mr. Darling joined their engineering staff as chainman. After two years as chainman

Mr. F. S. Darling.

and rodman he left this company and joined the Northern Pacific as instrument man.

In the services of this company he acted as assistant engineer and afterwards as division engineer, both on construction and maintenance, and for a number of years had full charge of both construction and maintenance-of-way for the N.P.

In December, 1902, Mr. Darling entered the services of the Canadian Pacific Railway as Division Engineer of construction on Eastern lines. In this position he has had charge of the most difficult and extensive work that this company have carried on in Eastern Canada—grade revision work from Fort William to Winnipeg and North Bay to Sudbury, construction of the Labelle extension, grade revision from Montreal to Farnham, reconnaissance, survey and construction of the Walkerton and Lucknow Railway.

He was also chief engineer of the subsidiary C.P.R. companies, the Georgian Bay and seaboard and the Tilsonburg and Lake Erie and Pacific railways.

His largest and most important work, however, has been in connection with the Toronto-Sudbury branch of the C.P.R. From the first reconnaissance survey, followed by preliminary and final location and construction, the responsibility, the planning, the working out of petty details and larger schemes have all been his. He has designed and shaped the road as best pleased his purpose. Others may have had much to do with this large work. Others may have been more in the public eye than he, the fact remains that F. S. Darling was the engineer in charge and has now successfully completed the most perfect piece of Canadian railway.

His experience and training on maintenance-of-way made him familiar with what kind of roadway the operating department require for economical work; his wide knowledge of construction work under many varying conditions made the successful handling of difficult problems possible; his capacity for hard work and his great knowledge of details, nothing ever escapes him, nothing ever forgotten, made the handling of a large body of men, for him, easy.

The opening of a new railway to such a man is but an incident, yet in this case a pleasant incident, the more pleasant when he remembers the loyal support he has always received from his assistant division engineers, Messrs. E. L. Miles, J. W. Porter, and J. Isbester.

MANAGER OF CONSTRUCTION.

Mr. J. G. Sullivan, manager of construction for the Canadian Pacific Railway Eastern lines, and who for more than a year has directed the work of construction on the Sudbury-Toronto divisions, is a naturalized Canadian, born near Rochester, N.Y. Having in 1905 become assistant chief engineer of the Panama Canal, Mr. Sullivan is one of the most distinguished engineers in America. It is singular that he took his oath of allegiance in Winnipeg only two weeks before he was appointed to the high position as John F. Stevens' assistant on Uncle Sam's big ditch.

Mr. Sullivan is a graduate of Cornell University in engineering. He is a resident of Toronto. On graduation in 1888 he saw service on construction for the Great Northern and the Spokane and Northern. He came to Canada in 1893 as engineer in broadening the gauge between Dunmore and Lethbridge.

Things went flat in the railroad line and for three months Mr. Sullivan was a section foreman. On other roads later he served as locating and divisional engineer, and in 1898 was associated with Heinze on the Columbia and Western. In 1898, when that road was taken over, he joined the C.P.R. From September 1905, to December 1906, Mr. Sullivan did wonderful preparatory work on the Panama Canal as assistant chief engineer under John F. Stevens. When Mr.

Mr. J. G. Sullivan.

Stevens left the canal Mr. Sullivan resigned with his chief and returned to Canada and to railroading.

In April of 1907 he was appointed manager of construction for C.P.R. Eastern lines. In that capacity he has shown himself as energetic, resourceful and as politic as in previous responsible positions.

The Buffalo Foundry and Machine Company, Buffalo, N.Y., who, besides making exceptionally large castings, are builders of vacuum drying and impregnating machinery, vacuum drum, shelf and rotary dryers, compressors, pumps, condensers, and the Bell steam hammer, recently established a New York office at 143 Liberty Street, having engaged Mr. H. E. Jacoby as resident engineer and manager of New York office.

LEGAL NOTES.

[This department will appear in the third issue of every month. Should there be any particular case you wish reported we would be pleased to give it special attention, providing it is a case that will be of special interest to engineers or contractors.—Ed.]

NAVIGABLE STREAM—OWNERSHIP OF RIVER BED—RIGHT TO FLOAT LOGS.

Canadian Electric Light Company vs. N. P. Tanguay.—The plaintiffs were owners of certain lots on both banks of the River Chaudiere, in Quebec, and had erected dams and other works for generation of power when the defendant Tanguay, who owned timber limits further up stream undertook to erect piers and wharves within that area for the purpose of his lumbering operations. These piers and wharves interfered with the plant of the Electric Light Company and with the working of same, and they brought action to restrain defendant and **for removal of the wharves.**

The case turned materially on the point as to where the river was at that point "navigable." If the stream is navigable then the plaintiffs could not monopolize the river bed but same was free for use of the public, the right of navigation could not be interfered with, and defendant was acting properly in constructing piers and wharves.

The courts have held that the tests of navigability is the possibility of use for **transport in some practical and profitable manner.**

Now at the point in question the Chaudiere is neither wide nor deep, it is not passable for vessels or rafts but for loose logs only, and while some use can be made of the stream for floating loose timbers down stream it is quite impracticable to ascend. The court holds that this is not a navigable stream, consequently the soil adjoining their lots is vested in the plaintiffs who can maintain an action for interference with same. They were within their rights in building dams for water power, and by so doing had taken a very practical possession of the river bed. The defendants must not interfere with the said works and must remove their wharves and piers. 40 Can. S.C.R., 43.

This is French law as administered in Quebec, but on this point practically the same as under English law in the remainder of Canada, and so laid down in the recent Ontario decision of Keewatin vs. Kenora.

Township of Grenville vs. Ward.—The river Range in the Province of Quebec was flowable for logs but not navigable, and was used by the defendant and other lumbermen to bring down saw-logs which were then penned in booms at the mouth of the river. Near the mouth of the river was a railway bridge and also an ordinary traffic bridge, erected by the township. The defendant in driving logs neglected to take any extra precaution at this point with the result that the logs jammed upon the buttresses and did very considerable damage. Now there is no question as to the right of the township to bridge the stream nor yet as to the right of lumbermen to float logs but query as to who must make good the damage.

Held that the right of lumbermen to float timber is not a paramount right but an easement which must be exercised with such care and skill as to prevent injury or interference with the contemporaneous rights of riparian owners and public corporations who are entitled to bridge or otherwise make use of such watercourses. The defendant has a right in the watercourse, but he must not enjoy his right in such manner as will interfere with others who have concurrent rights. Judgment for plaintiff. 32 Can. S.C.R., 510.

SEIZURE OF A SHIP—"LAST VOYAGE."

Inverness Coal Company vs. Elder, Dempster & Company.—Under the law as in force in Quebec a vessel is liable to attachment for supplies furnished her for her "last voyage." The plaintiffs leased to one P. for six months a ship lying at the port of Liverpool, the same to ply between Rotterdam and Canada. The ship came to Montreal with her first cargo, unloaded and reloaded: she then purchased coal from the plaintiffs agent in Montreal; the coal, of course, being supplied to the order of the lessees of the vessel and without any knowledge or consent of the owners. She then sailed to Amsterdam, and about one month later reached Montreal a second time. At this stage the lessees became insolvent and the plaintiffs arrested the ship, claiming a lien for coal supplied on her "last voyage" and still unpaid. Held that the voyage out from Montreal and that returning from Rotterdam did not constitute one voyage, but were separate and complete voyages, and that consequently under the code of Quebec as worded there was no privilege against the ship for the supply of coal furnished for her voyage to Rotterdam: also that the ship was not liable for personal debts of the lessees and could not be seized for same. 40 Can. S.C.R., 45.

CONFIDENTIAL RELATIONSHIP—SECRET PROFIT.

Fleming vs. Hutchinson.—The defendant was a real estate broker in the city of Vancouver, B.C., and as such had a great many lots listed for sale at various prices. The plaintiff applied to him for information, and as a result of the conference agreed to take two lots at prices quoted. The list price of one lot was $220 per acre: this the defendant purchased at $180 per acre but received the full price from plaintiff and retained the balance. The second lot could not be bought cheaper than listed: thereupon the defendant told plaintiff the price asked was higher: he thus induced the plaintiff to hand him over a somewhat higher sum while he paid only the list price and retained the difference, unknown to the purchaser.

On discovering the deception practiced the plaintiff brought action for the balance retained by the agent and the latter claimed in defence that as it had been agreed he should not charge the purchaser any commission he was merely a broker and could buy in and sell at a higher price to any purchaser he could find.

The court held that the relationship of principal and agent existed: such being the case it was the duty of the agent to buy as cheaply as possible for his master and turn the properties over to him at that price. It is repugnant to the principles of English law that an agent should make any profit unknown to his master; for thus his duty and his personal interests come into conflict: he must be content with the pay agreed upon and will not be allowed to supplement the same by any secret profit. Held therefore that the agent must refund the sums he had retained and held further that as he had not stipulated for any commission but had agreed that no commission should be charged to the purchaser: therefore he has no claim for commission against his principal, the plaintiff. 40 Can. S.C.R., 134.

ELECTRIC LIGHT WIRES ON HIGHWAY—NEGLIGENCE.

Closter et al vs. Toronto Electric Light Company.—Several years prior to this action a land corporation were the owners of a tract of land in the Rosedale district of the Township of York, and separated from the city of Toronto

by a very deep ravine. To bring their land into the market, and to make it accessible from the city they built a high level bridge across the ravine and filed a plan dividing their property into building lots and showing a highway where the bridge crossed the ravine. In 1894 the population having increased defendant Electric Light Company placed wires across the ravine and about ten feet west of the bridge. In 1904 the bridge was reconstructed and made wider, being brought to within twenty inches of the wires which in the meantime had become worn and ceased to be insulated. The bridge was reopened for traffic and had been in use some months when the plaintiff, Francis Gloster, a boy about nine years of age put his arm through the railing, touched the wire, and was seriously burned.

The Supreme Court of Canada take the view that the defendant company transmitting such a dangerous element as electricity through wires strung along a public highway are bound to exercise the greatest possible care and use every possible precaution for the protection of the public. Now it ought to have been present to the minds of the company that if not grown-up people at any rate children crossing the bridge or playing upon it would be exceedingly likely to touch the wires. There was evidence to show that the defendant's inspector crossed the bridge almost daily and should certainly have known in what state the wires were at that point. Held that the wires in the condition in which they were at the time and place complained of constituted a danger to those using the highway and were in fact a nuisance: they had become worn and defective and ceased to afford any protection to any person who touched them: the Electric Light Company are liable for the injury to the boy Francis Gloster. 38 Can. S.C.R., 27

ORDER OF THE RAILWAY COMMISSIONERS OF CANADA.

Copies of these orders may be secured from the Canadian Engineer for a small fee.

4810—June 1—Authorizing the Wheately Telephone Company to cross with its wires the track of the Pere Marquette Railway at Lot 12, 3rd Concession, Township of Romney, Province of Ontario.

4811—May 29—Approving location of the C.P.R. Virden-McAuley branch, mile 0 to mile 5, being from a point on main line, in N.W. ¼ of Section 22, Township 10, Range 26 W. Principal Meridian.

4812—May 27—Approving by-law of the Orford Mountain Railway, authorizing A. C. Lytle, to prepare and issue tariffs of tolls to be charged on traffic carried on its railway.

4813—June 3—Approving location of the G.T.P.R. from Prince Rupert, mile 0 to mile 50, Coast District, Province of British Columbia.

4814—June 1—Authorizing the Walkerton & Lucknow Railway to take additional lands adjoining its railway in the village of Priceville, Township of Artemesia, Ont.

SOCIETY NOTES.

American Foundrymen.

At the closing of the American Foundrymen's Convention, held in Toronto, June 9th to 12th, the following officers were elected: President, Mr. Lawrence L. Anthes, superintendent of the Toronto Foundry Company; vice-president, F. B. Farnsworth, McLogan Foundry Company, New Haven; W. H. Parry, National Meter Company, Brooklyn; J. W. Jeffery, Ohio Malleable Company; Samuel T. Johnston, Cleveland; T. W. Sheriff, Sheriff Manufacturing Company, Milwaukee; J. A. Kisserle, Columbus Iron Company, Columbus, Ohio; and R. J. Cluff, King Radiator Company, Toronto. Dr. Richard Moldenke, of Watchung, N.J., was re-elected secretary. The next session of the association will be held at Cincinnati.

The Toronto Convention was a most successful gathering. The attendance was good, the exhibits large in number and extensive in the departments and trades they represented, and the interest taken both in the papers read and machinery and supplies exhibited was all that could be desired.

Each exhibit appealed to some particular class. To some because it was new and strange, to others because they were themselves connected with that particular line of work.

The Arthur Koppel Company, of New York, had a model industrial and portable railway equipped with cars, switches and turntables.

The flexibility and adaptability of the Koppel system bring it in use in almost every large manufacturing establishment and in all lines of work where transportation of either materials or products is an essential feature. The system is simply a complete narrow gauge railway that can be installed in any plant, to reach any individual department, thus doing away with the necessity for wheelbarrows, hand-trucks and other out-of-date equipment of that character. The equipment consists of curves, switches, turntables, crossings—in any weight of rail—any gauge and with specially designed cars to fit any particular requirement.

One of the most interesting exhibits was that of the Goldschmidt Thermit Company, of New York, who have a Toronto office at 103 Richmond West. The process of welding was exemplified and the method of welding and the reactions explained.

The Thermit engineering staff will be at the disposal of interested parties, to advise on, or execute, all work suitable for the process, such as welding locomotive frames and drivers and electric motor cases. It will undertake by contract: (1) The welding of tram rails in paved streets. (2) The welding of heavy sections, such as stern posts of steamships, crank shafts and other steel sections for the repair and reinforcement of which the Thermit process is the only possible method. At the shops, repairs on small castings, not exceeding 1,000 pounds in weight, will be undertaken.

Carborundum does not grind, it cuts. The effect of this in practice is that as compared with an emery wheel, a carborundum wheel, being harder, does more work; being sharper, does much faster work; cutting instead of grinding, does smoother and better finished work; producing less friction, does not affect the temper of, or discolor the work; and requiring much less pressure, calls for the expenditure of much less physical energy on the part of the workman operating it.

The Carborundum Company, of Niagara Falls, N.Y., has an interesting exhibit showing the carborundum in all its stages. The raw material which, by the application of the electric current, becomes carborundum, the product in the rough and the finished cutting wheels, and carborundum paper and cloth.

The Joseph Dixon Crucible Company, of Jersey City, N.J., had an exhibit, a study of which must have been of great value to workers in crucible steel. Not only did they attempt to give object lessons in what happens to crucibles, but their representatives were always ready with suggestions and directions how to handle the crucible so that they would stand the greatest use. They explained the effect of rapid heating and moisture, they described the best tongs and how to use them. Messrs. Smith, Coane, Hoasis and Condit were among the best entertainers at the exhibition.

Compressed air is now the great labor saver in the foundry. As a force to assist in removing moulds there were many devices shown which used compressed air as a motive force.

The J. W. Paxson Company, Philadelphia, Pa., had among their exhibits a sand-blast machine. The sand-blast process is the best and most economical method of cleaning castings and metals which are to be machined, electroplated, enameled, japanned, bronzed or painted. For removing paint and scale from all kinds of metals it is invaluable. On brazed work it is a great labor saver for cleaning off the spelter. It is specially adapted to frosting builders' hardware, gas fixtures, etc. Railroads make use of the sand-blast to clean paint and rust from steel bridges preparatory to repainting. For removing discolorations from stone and masonry work it is of great service.

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.

Quebec.

MONTREAL.—Final action was taken by the City Council in passing the by-law giving the Southern Counties Railway the privilege of entering the city by the construction of an electric railway from Victoria Bridge along Mill Street to Black's bridge, and thence by a couple of short streets to the corner of McGill and Common Streets, making a junction there with the lines of the Montreal Street Railway. By the agreement with the city, the company has one year from next November to complete its line within the city limits.

MONTREAL.—The Level Crossings Committee of the City Council met recently and instructed Mr. Stuart Howard, deputy chief engineer in the Road Department, to proceed with the preparation of plans, in conjunction with the engineer of the G.T.R., for the abolition of the level crossings on the Grand Trunk Railway system in the city. The city's proposal is that the passenger tracks shall be elevated from Bonaventure Station to the Victoria Bridge, but in view of the submitted impracticability of elevating the freight sheds, the freight tracks will remain on the level west as far as Mountain Street, whence they will proceed on an incline to Guy Street, where they will attain the elevation of the passenger tracks. The freight traffic will be limited to certain hours.

Ontario.

HAMILTON.—The street railway negotiations almost came to an abrupt ending. The Cataract magnates, who volunteered from the start to provide fifty new modern cars, wanted to back down. They said fifty was too many, as they were running only thirty-two now. The city's representatives said the company must either consent to provide fifty cars or the negotiations would be called off. The company agreed. The specifications for the roadbed, as already described, providing for 80 and 94-pound rails were agreed upon. The whole rough draft of the agreement was gone over, and a second draft, embodying the changes agreed upon, will be drawn up.

KENORA.—The names of the nine men killed in the explosion on the G.T.P., on June 13th, are: G. Roberts, F. Trimbuli, Luigi Biribi, C. Wayetem, D. Jehemai, H. Bradley, George Munser, Tom Burgess, Robert Hay. The victims included three Italians, two Galicians, one Scotchman, two Canadians, and one Englishman. Foreman Simons, who had a sub-contract, with two assistants, was charging two fresh holes, and had placed seventy-five pounds of dynamite therein, when without warning the explosion occurred, with such awful results. Most of the victims were muckers and were engaged in the bottom of the rock cut at the time, and were buried under tons of stone.

STRATFORD.—The excavations have been started for the new power house for the big shops, which will cost some $125,000, and in which the boilers are to be equipped with the Green travelling link grate stoker, which practically eliminates the smoke. The mistake of under-calculating the size of the future locomotive which was made in building the old shops about twenty years ago, is thoroughly guarded against in these new shops. In the locomotive pits in the new erecting department the accommodation is sufficient for, in many cases, two locomotives, placed tandem fashion, whereas in the old pits it had become a squeeze to get a single locomotive in place, and then to work satisfactorily about it. So that locomotives can grow to twice the length of the giants of the present day, before the Grand Trunk in these Stratford shops will need to worry about the matter of accommodation. Indeed, there is practically no limit set in these shops to the size that the modern locomotive may attain to. There are to be 28 erecting pits, which means that more than that number of engines can be handled at one and the same time.

Alberta.

LETHBRIDGE.—The work of erecting the steel for the great C.P.R. bridge here, which it is said will be the fourth largest in the world, has been commenced by the Canadian Bridge Company of Walkerville, to which firm the contract was awarded. The structure is almost 300 feet in height, and its construction will entail many engineering difficulties.

SEWERAGE AND WATERWORKS.

Ontario.

PORT STANLEY.—The time is drawing near when the final decision will be given by the property-owners of Port Stanley as to their sincerity in requesting the members of the council to submit a by-law for the purpose of installing a waterworks system. Like all other questions of vital importance relative to progressive improvement of any municipality, this one question has received a large share of attention for some years back, and is receiving particular attention at present.

PORT STANLEY.—The waterworks by-law was defeated on June 15th by a vote of 81 against to 42 for. The chief reason given for the adverse vote was that the cost was too great, and that the ratepayers had in mind other expenditures which will have to be made shortly. Chief among these is to be a sum for either the repairing of the present school house or the building of a new school.

TORONTO.—A new sewerage system to cost $7,500 has been recommended for the Mimico Industrial School. The improvement is required this year.

Alberta.

CALGARY.—Extensive improvements are planned for the city water supply. A pipe line and reservoir will be built. The proposed pipe line is to be 10½ miles long and 30 inches internal diameter, reducing to 24 inches at the outlet. The intake is at an elevation of 300 feet above the general city level, and a reservoir to contain about 25 million gallons will be placed a little below the outlet, the water level in same is at an elevation of 220 feet above the city. The reservoir is located just on the outskirts of the city, every portion of which can be supplied from same under good pressure.

EDMONTON.—The Twin City Coal Company, of Edmonton, Alta., have recently purchased an 80 horse-power Robb-Mumford water tube boiler.

LIGHT, HEAT, AND POWER.

Ontario.

INGERSOLL.—This town will contract for 500 horse-power with the Hydro-Electric Power Commission. At a meeting of the Council, held on the 15th inst., the mayor and clerk were instructed to sign the contract.

LONDON.—Within a very few months London will be supplied with natural gas from the Port Dover fields. There are 50,000,000 feet of gas available in sight in the Port Dover fields, and London will require 500,000 feet daily, it is estimated. The gas fields down there and east seem to be inexhaustible. The Welland fields have been in operation

for twenty-five years, and are flowing as strong to-day as ever. The Dunnville fields supply Hamilton and Brantford, where gas is supplied at 30 cents a thousand feet, and where the indications are that it will hold out for many years to come. The introduction of natural gas will have a serious effect on Niagara power, particularly for lighting.

SARNIA.—The work of installing electric power, and, incidentally, electric light, in the St. Clair tunnel has now been completed. The powerful electric locomotives now in use handle 30 per cent. more in tonnage each trip and handle it at 30 per cent. greater speed.

TENDERS.

New Brunswick.

FREDERICTON.—Tenders for Fredericton bridge superstructure will be received at the Department of Public Works, Fredericton, until Monday, 20th day of July, 1908, for constructing three metal superstructure spans of the Fredericton highway bridge, between the city and the south end of the already revised work. John Morrissy, Chief Commissioner. Department of Public Works, Fredericton, N.B.

Quebec.

MONTREAL.—Tenders for the construction of No. 13 Police Station will be received at the office of the City Clerk, City Hall, until the 25th June, inst.

MONTREAL.—Tenders will be received at the office of the City Clerk until 23rd of June, 1908, for the construction of sewers in the undermentioned streets or sections of streets with the necessary connections according to the sections and specifications. Valois Street: from Ontario Street to St. Catherine Street, and on Stadacona Street, from Nicolet Street to the eastern limits of the city. Sherbrooke Street: Between Beaudry and St. Denis Streets, being the first section. John R. Barlow, city surveyor.

ST. JOSEPH.—Tenders will be received until the 27th June for the construction of an iron and concrete bridge of 406 feet length, to be constructed on the Chaudiere River, at St. Joseph of Beauce.

Ontario.

COBOURG.—Tenders for Cobourg Harbour Breakwaters will be received at this office until 4.30 p.m. on Monday, June 29, 1908, for the construction of two breakwaters at Cobourg, Northumberland County, Ont. Fred. Gelinas, secretary, Department of Public Works.

HAMILTON.—Tender will be received until Friday, June 26, 1908, for the construction of a steam heating apparatus at the armoury, Hamilton, Ont. Fred Gelinas, secretary, Department of Public Works, Ottawa.

SHELBURNE.—Tenders for a Rock Crusher; capacity not less than fifty yards per ten hours. Also a Horse Roller, to weigh not less than four tons. Tenders received up to June 29th, 1908. W. A. Hillhouse, town clerk, Shelburne, Ont.

OAKVILLE.—Tenders will be received until June 23rd, 1908, for laying 20,000 feet water pipe and supply and build power-house, water tower, etc., for town of Oakville. A. S. Chisholm, chairman of Board; Willis Chipman, chief engineer. (Advertised in "Canadian Engineer.")

OTTAWA.—Tenders for fog alarm machinery will be received up to noon of the first day of July, 1908, for supplying the machinery required by the Department of Marine and Fisheries for fog alarm purposes during a period of one or three years, at the option of the Minister of Marine and Fisheries. G. J. Desbarats, Acting Deputy Minister of Marine and Fisheries.

Manitoba.

MINNEDOSA.—Tenders addressed to the Chairman of the Minnedosa School Board will be received up to June 25th, 1908, for the erection of a six-room school building in the town of Minnedosa, Manitoba. William Wallace Blair, architect, Winnipeg.

WINNIPEG.—Tender for St. Andrew's Rapids Works will be received until Wednesday, July 8, 1908, for the construction of movable dam, steel service and highway bridge, repair shop, etc., at St. Andrew's Rapids, Red River, Province of Manitoba. Fred. Gelinas, Secretary Department of Public Works, Ottawa.

WINNIPEG.—Tenders addressed to the Chairman of the Board of Control for supply of one hundred enclosed arc lamps and cut outs, and two station regulators required for the Electrical Department, will be received up to June 22nd, 1908. M. Peterson, secretary, Board of Control; H. N. Ruttan, city engineer.

Alberta.

CALGARY.—Tenders will be received until July 3rd for a continuous wooden stave pipe for the supply and conctruction of same. J. G. Watson, chairman, Waterwork Committee; J. T. Child, chief engineer, Calgary. (Advertised in The Canadian Engineer.)

MEDICINE HAT.—Tenders will be received until July 18th, 1908, for drilling a six-inch and an eight-inch gas well. W. B. Morrison, city engineer. (Advertised in The Canadian Engineer.)

VERMILION.—Tenders will be received up to Saturday, the 30th of June, 1908, for the instalation of a steam heating plant in the Vermilion Centre School. H. A. Fieldhouse, secretary-treasurer, Vermilion, Alta.

Saskatchewan.

REGINA—Tenders will be received until June 22nd, 1908, for construction of concrete abutments and retaining walls for a bridge over Wascana Creek, Regina. F. J. Robinson, Commissioner. (Advertised in the "Canadian Engineer.")

REGINA.—Tenders will be called for until June 22nd, 1908, for the erection of Legislative and Executive buildings for the Province of Saskatchewan. F. J. Robinson, Deputy Commissioner of Public Works. (Advertised in the Canadian Engineer.)

British Columbia.

NEW WESTMINSTER.—The Government of British Columbia invite the architects of British Columbia to submit competitive designs of a Public Hospital for the Insane, which it is proposed to erect at Coquitlam, situated near New Westminster, B.C. F. C. Gamble, Public Works Engineer, Lands and Works Department, Victoria, B.C.

VICTORIA.—Tenders will be received up to Monday, the 20th July, 1908, for the supplying and erecting of 1 Horizontal Cross-Compound Pumping Engine; 1 Steel Tank and Tower; 1 Concrete and Steel Water Tower. The lowest or any tender not necessarily accepted. W. H. Northcott, purchasing agent, City Hall.

MISCELLANEOUS.

Ontario.

KENORA.—The outline of an immense pulp and paper industry, which is proposed for Kenora, has been submitted to the Council. Providing certain encouragement is given by the town in the shape of exemption from taxation for a period of ten years and a fixed assessment of $3,000 for a further period of fifteen years. The company proposes to acquire the water power and lands of the Keewatin Power Company, to erect an immense paper and pulp mill with a capacity of 300 tons per day. The plant will cost in the neighbourhood of $3,800,000 and operations will commence on or about the 1st of October next. About $1,000,000 is to be expended the first year.

OTTAWA.—The Forestry branch of the Department of the Interior is ready to continue its work in the forest reserves in the west. The forest survey of the Riding Mountain forest reserve will be in charge of J. R. Dickson. His headquarters for the present will be at Ochre River. A party will be sent to make the survey of the reserve near Prince Albert, known as the "Pines." The staff of the branch is being increased by the appointment of two young

Canadians who have recently graduated from the forestry schools, Messrs. J. R. Dickson, and R. H. McMillan. Both are graduates of the Ontario Agricultural College. Mr. Dickson is also a graduate of the University of Michigan in forestry, while Mr. McMillan holds the diploma of the Yale Forestry School. Mr. Knechtel, inspector of forest reserves, will spend the entire summer in the west, where he has been for some months past.

PORT ARTHUR.—Two steamers of the Montreal Transportation Company are expected to load rails at Port Arthur. One will carry rails for the McKenzie & Mann system and the other for the C.P.R., which has now decided to have the balance of its contract shipped via Port Arthur by water instead of by rail as originally proposed. These steamers and others have been chartered to carry altogether about twelve cargoes to the head of the lake this season.

THOROLD.—Parties are out making preliminary surveys for a new Welland Canal. The present canal has twenty-five locks, each with a lift of about sixteen feet. It is proposed that plans be prepared for a canal of nine locks, with lifts of about thirty feet. The new survey is west of the old canal. Commencing at Lake Ontario, it follows Twenty-Mile Creek for some distance and joins the present canal near Welland.

Manitoba.

BRANDON.—George Harper, chief engineer of the International Heating and Lighting Company, of Cleveland, Ohio, which has a franchise for installing a gas plant here, was in the city to-day making arrangements for receiving the new plant, which, he states, will arrive in two weeks' time. The contract for the machinery has been let to a Toronto firm, who, in all probability, will also have the contract for the erection of the buildings. The work of laying the mains will be started at once. Fifteen miles of mains will be laid in all.

CARNDUFF.—At a meeting of townspeople held recently it was decided to form a joint stock company to install a telephone system in the town. The new company will be known as the Carnduff Telephone and Lighting Co., Limited. The capital of the company was placed at $10,000.

Alberta.

EDMONTON.—The report of the Public Works Investigation Committee, charging the city commissioners and the city engineer with gross mismanagement and incompetence, was unanimously approved by the city council. The resignation of Commissioner Kinnaird was accepted, and Commissioner Pace and City Engineer Keely were dismissed. This is the climax to the action council instituted three months ago, in consequence of a statement made by Ald. Manson, in the heat of the telephone debate, to the effect that bungling by commissioners cost the city a loss of thousands of dollars last year.

British Columbia.

NANAIMO.—The Western Fuel Company, of Nanaimo, B.C., have recently purchased a 90-inch double inlet half housed Sirocco mine ventilating fan having a capacity of 200,000 cubic feet of air per minute at 275 R.P.M., or 300,000 cubic feet of air per minute at 405 R.P.M. This fan will be built by the Robb Engineering Company, of Amherst, N.S., who have made arrangements with the Sirocco Engineering Company, of New York to manufacture their fans in Canada.

VICTORIA.—The Government recently met a delegation from the Boards of Trade of Revelstoke, Vancouver, and Victoria, who urged the construction of a trail from near Revelstoke to the Canoe River. The trail will cost about $100,000, and its construction would mean, it is alleged, that all supplies for the construction of the Yellowhead Pass section of the G.T.P. would be sent in by that route. It is claimed that would mean the purchase of supplies approximately $10,000,000 in value in British Columbia instead of in Calgary. If the road is not constructed the supplies will be sent in via Edmonton.

Cape Breton.

SYDNEY.—The Dominion Iron and Steel Company's plant is running full capacity, and the output for 1908 is expected to double that of any previous year. Three steamers are expected to load rails for lake points for the Canadian Pacific and Northern and National Transcontinental Railways

PERSONAL.

MR. HARRY E. SUCKLING will after July 1st be the treasurer of the C.P.R. Mr. W. Sutherland Taylor, who for twenty-five years held that position, is retiring.

MR. J. H. JACKSON, C.E., who has charge of the engineering work at Victoria Park, has been appointed temporary superintendent.

MR. DE GASPE BEAUBIEN has recently opened an office in the Liverpool & London & Globe Building, Montreal, as consulting electrical engineer, and is prepared to make estimates, reports and plans, draw up specifications, and supervise power, lighting and railway installations. He is making a specialty of electrical work of all kinds. Mr. Beaubien holds the degree of B.Sc., of McGill, where he was demonstrator, and is also Ass. M.C.S.C.E., Ass. M.A.I.E.E. He has had practical experience with the Montreal Light, Heat and Power Company, the Shawinigan Water and Power Company, and the Westinghouse Electric and Manufacturing Company, at their works at Pittsburg, Pa., etc.

The influence of a great conflagration on the material of construction of new buildings in its vicinity is shown by recent contracts let for work in and about Chelsea, Mass. Announcement is made that a group of Everett business men are to build a large reinforced concrete store and apartment house at Everett, Mass., in a district adjacent to the destroyed city. The contract has been awarded to the Aberthaw Construction Company, of Boston, Mass., who already have other reinforced concrete buildings under construction in the burned district. The building is to cover an area of about 15,000 square feet upon a lot in the centre of the city.

The new observatory built on the top of Blue Hill, Hilton, Mass., for the well-known meteorologist, A. Lawrence Rotch, is practically completed. The work is a fine example of the adaptability of reinforced concrete construction. The observatory is circular in section, with relatively thin double walls separated by an air space. This construction makes a very dry structure under the frequently adverse conditions of high wind velocities and heavy rain. The double wall prevents beating through, which frequently occurred with the old granite structure. The Aberthaw Construction Company, of Boston, Mass., were the contractors for the new observatory.

The annual meeting of the stockholders of the Joseph Dixon Crucible Company, of Jersey City, N.J., was held Monday, April 20th, 1908. The old-time officers, Edward F. C. Young, president; George T. Smith, vice-president; George E. Long, treasurer; and Harry Dailey, secretary, were unanimously re-elected.

MARKET CONDITIONS.

Toronto, June 18th, 1908.

The quietude in business circles of the United States continues. At industrial centres the shrinkage of output and the number of unemployed hands are very noticeable. It is only reasonable to look for a comparatively dull summer in that country. All metals there appear to be quiet and weak; nevertheless, C. S. Trench & Company, in their June circular say:—"We see no reason to retreat from our optimistic opinion of the future in metals; and with the exception of perhaps pig tin, the prospect of improving values appears to us more reasonable than any serious declines."

A fair business is reported in most parts of Ontario; but there is nothing in the general conditions, not even in the chorus of hope as to the crop from the Prairie Provinces, to have stimulated any special commercial activity. Toronto builders are moderately well employed; and

values of materials have not varied much of late. The alterations made in Pittsburg markets for steel and iron have not affected prices in Canada at all.

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

American Bessemer Sheet Steel.—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.—Not a great deal doing, 9½ to 10c. is present price. Crude material advancing.

Bar Iron.—$2 base, from stock to the wholesale dealer.

Boiler Plates.—¼-inch and heavier, $2.40. Fair supply, prices steady. Boiler heads 25c. per 100 pounds advance on plate.

Boiler Tubes.—Demand limited. Lap-welded, steel, 1¼-inch, 10c.; 1½-inch, 9c. per foot; 2-inch, $8.50; 2¼-inch, $10; 2½-inch, $10.60; 3-inch, $12.10; 3½-inch, $15.30; 4-inch, $19.45 per 100 feet.

Building Paper.—Plain, 32c. per roll; tarred, 40c. per roll. Orders are of a limited character.

Bricks.—Common structural, $9 to $10 per thousand, wholesale, and the demand is still active. Red and buff pressed are worth, delivered, $18; at works, $17.

Cement.—Price of Canadian makes to the dealer in 1,000 barrel lots and up is $1.80, in cotton bags, on car, Toronto. Retail price is $2 per barrel, 350 pounds. The quantity delivered from mills is much larger than in 1907.

Copper, Ingot.—No advance probable in the United States until consumption increases; price, 13¾c. for large purchases, and 14¼c. for small.

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. A good many small orders.

Fire Bricks.—English and Scotch, $32.50 to $35; American, $25 to $35 per 1,000. Demand continues fair.

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.

Explosives and Accessories.—Dynamite, 50-lb cases, 40 per cent. proof, 18c. in single case lots, Montreal. Blasting powder, 25-lb kegs, $2.25 per keg. Special quotations on large lots of dynamite and powder. Detonator caps, 75c. to $1 per 100; case lots, 75c. per 100; broken lots, $1. Electric blasting apparatus:—Batteries, 1 to 10 holes, $15; 1 to 20 holes, $25; 1 to 30 holes, $35; 1 to 40 holes, $50. Wire, leading, 1c. per foot; connecting, 50c. per lb. Fuses, platinum, single strength, per 100 fuses:—4-ft. wires, $3.50; 6-ft. wires, $4; 8-ft. wires, $4.50; 10-ft. wires, $5. Double strength fuses, $1 extra, per 100 fuses. Fuses, time, double-tape, $6 per 1,000 feet.

Galvanized Sheets—Apollo Brand.—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. Not a great deal doing.

Iron Pipe.—Black, ¼-inch, $2; ⅜-inch, $2.25; ½-inch, $2.72; ¾-inch, $3.68; 1-inch, $5.28; 1¼-inch, $7.20; 1½-inch, $8.64; 2-inch, $11.50; 2½-inch, $18.40; 3-inch, $24.15; 3½-inch, $30.40; 4-inch, $34.55; 4½-inch, $38, 5-inch, $43.50; 6-inch, $56. Galvanized, ¼-inch, $2.85; ⅜-inch, $3.05; ½-inch, $3.57; ¾-inch, $4.83; 1-inch, $6.93; 1¼-inch, $9.45; 1½-inch, $11.34; 2-inch, $15.12. There are rumors of a coming slight decline.

Lead.—The market is weaker, price now down to $3.75.

Lime.—In plentiful supply and moderate movement. Price for large lots at kilns outside city 21c. per 100 lbs. f.o.b. cars; Toronto retail price 35c. per 100 lbs. f.o.b. car

Lumber.—Pine is in moderate supply, and the demand limited. Price of culls lower, as noted below. Dressing, we quote, $32 to $35 per thousand for usual lengths (12, 14, and 16 ft.) and stock sizes of boards, and $38 to $40 for special lengths, common stock boards, as to grade, $24 to $28; culls, $20. Southern pine and Norway pine are somewhat easier. Hemlock moves more freely and quotes at $19 to $21.50, according to size. Much spruce comes from the East and is in better demand; the price asked for flooring is $25 wholesale and $28 retail. Shingles, B.C., in more active demand, retailing at $3.75 per thousand. Laths are quiet, No. 1 quote at $4 on track, No. 2 at $3.50.

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

Pitch.—Fair demand at 75c. per 100 lbs.

Pig Iron.—Business here is quiet and of small volume, price same. Summerlee quotes:—No. 1, $25.50; No. 3, in car load lots, $22 to $23 here; Glengarnock, $25.50; Clarence, No. 3, $19.25 to $19.50; No. 1 Cleveland, $20 to $22.

Steel Beams and Channels.—The cut in American prices does not affect this market, at least not so far. We quote:—$2.50 to $2.75, according to size and quantity; if cut, $2.75 to $3; angles, 1¼ by 3-16 and larger, $2.55; tees, $2.80 to $3 per 100 pounds. Extra for smaller sizes of angles and tees

Steel Rails.—80-lb., $35 to $38 per ton. The following are prices per gross ton; Montreal, 12-lb. $45, 16-lb. $44, 25 and 30-lb. $43.

Sheet Steel.—In moderate supply at rather uncertain prices because of reduction wired from Pittsburg; 10-gauge, $2.65; 12-gauge, $2.70.

Tool Steel.—Jessop's special pink label, 10½c.

Tar.—There is some activity but no large orders; $3.50 per barrel the ruling price.

Tank Plate.—3-16-inch, $2.50.

Tin.—Active but irregular, price here continues at 33 to 34c.

Zinc.—Steady at 5¼ to 5½c.

* * * *

Montreal, June 18th, 1908.

The pig-iron situation is the same as a week ago on both sides of the Atlantic. A number of articles have appeared in the public press during the past week, of a more or less alarming nature, regarding declines in the metal market of the United States, but these have reference only to the action of the united steel manufacturers in New York, at the beginning of last week, in reducing prices of finished steel products. Whether this will eventually affect the local markets or not is a question, but it is said that the said reductions really only brought quotations to figures which were being accepted in a quiet way for some time past. A cut of 50c. per ton in ore prices will not, it is thought, make any change in the price of pig-iron, as producers of pig have already anticipated such action. So far as can be learned, there is no truth in the reports published regarding large orders for steel rails having been placed with United States mills by the Russian and Canadian Governments and the C.P.R. The Canadian Government order was said to amount to 500,000 tons and that of the C.P.R. to 110,000, and it may be regarded as a certainty that these stories are a pure fabrication. It may be that negotiations are going on with

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CONTRACTORS' MACHINERY.

1 refitted 10" x 12" double cylinder, single drum, hoisting engine.
1 new 7" x 12" double cylinder, double drum, steam hoist.
6 new 7" x 10" double cylinder, double drum, steam hoists.
1 refitted 7" x 8" single cylinder, single drum, hoisting engine.
1 refitted 6" x 10" double cylinder, double drum, hoisting engine.
1 refitted 5" x 7" double cylinder, single drum, hoisting engine.
1 refitted No. 2 McCully rotary stone crusher.
1 nearly new Ideal automatic portable concrete mixer with gasoline engine.
1 new Acme portable concrete mixer with gasoline engine.
1 new No. 4 Waterloo concrete mixer complete.
2 new cement block machines with side and corner plates.
1 nearly new 3⅛" x 6" Dominion rock drill complete.
1 new 8" x 8" double cylinder, belt-driven air compressor.
1 new one-ton, single purchase crab winch.
2 new two-ton, single purchase crab winches.
2 new three-ton, single purchase crab winches.
3 new four-ton, single purchase crab winches.
8 new five-ton, single purchase crab winches.
2 new five-ton, double purchase crab winches.
2 new six-ton, single purchase crab winches.
1 new six-ton, double purchase crab winch.
2 new seven-ton, single purchase crab winches.
1 new 900-gallon, Northey, vertical centrifugal pump.
1 new 600-gallon, Morris, vertical centrifugal pump.
1 nearly new 400-gallon, standard horizontal centrifugal pump.
1 refitted 260-gallon, Morris, vertical centrifugal pump.
1 nearly new 70-gallon, Morris, horizontal centrifugal pump.
1 new patent diaphragm hand pump.
1 new 9½" x 11" White, portable engine and boiler.
1 refitted 9" x 10" Abell, semi-portable engine and boiler.
1 refitted 7" x 10" Waterloo, portable engine and boiler.
1 refitted 7" x 10" Victor, portable engine and boiler.
1 refitted 8" x 12" semi-portable engine and boiler.
New modern sand-lime brick plant complete, a bargain, immediate delivery.

A copy of our supply catalogue or monthly stock list for the asking.

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GENERATORS.

1, 35 K.W. "Thompson & Houston" Alternator.
2, D. C 150 Light with Pulleys.
4, 150 Light Arc Machines.
1, 100 Light Arc Machine.
1, 80 K.W. Alternator and Switch Board.
1, 50 110 Volts D.C. Machine.
1, 60 K.W. Alternator and Switch Board.

MOTORS.

2, 250 H.P. A.C.
4, 5 H.P. 220 volts, C.G.E.
1, 50 H.P. D.C. with Pulley.
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4, 40 K.W. Oil Cooled. New.
4, 50 Light Western Arc Regulators.
12, "Bed Spring" Choke Coils.

WATER WHEELS.

54-inch "New American" Vertical Turbine.
33-inch "Little Giant" Vertical Turbine.
2, 30 "New American" Turbine.

STEAM PLANTS.

14-inch x 28-inch "Meyers Valve" Engine. Fly Wheel Governor complete with Boiler, Feed Pump, Heater, etc. Used three months.
20 H.P. Portable Engine and Boiler.
75 H.P. Locomotive Boiler.
10-inch x 24-inch Horizontal Engine.

DRY KILN.

New, 40,000 ft. Moist Air, Dry Kiln with 36 steel trucks and "Moorehead" steam trap.

Second Hand Machinery Bought and Sold

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St. Catharines, Ontario

CONTRACTS AWARDED.

Ontario.

TORONTO.—The Government has let contracts for the clearing of eighty miles of the trunk road from Sudbury to Sault Ste. Marie, in the Blind River and Sudbury section. The successful tenderers are: William Farrar, J. J. Dewhurst, Woodsley; John McPhee, Webbwood; E. G. Chant & Co., Webbwood; James A. Ritchie, Sault Ste. Marie; M. J. Lavallee, Blind River. An appropriation of $40,000 was made for this purpose at the last session of the Legislature.

HUNTSVILLE. — The contract for sidewalks and pavements has been let to the Maple Leaf Paving Company, of Simcoe, Ont., at the following prices: Walks, 11 cents per square foot; crossings, 14 cents per square foot; curbing, 25 cents per square foot; earth excavation, 25 cents per cubic yard; earth filling, 40 cents per cubic yard; gravel, $1 per cubic yard. Galt & Smith, of Toronto are the engineers in charge of the work.

British Columbia.

VICTORIA.—The contract for 4,200 feet of cast iron water pipe for the Oak Bay municipality has been awarded to W. G. Winterburn, consulting engineer of that city. The pipes will be made on the Clyde and will be similar in all respects to those recently ordered for the new distribution system for Victoria.

The growing popularity of concrete piles for permanent construction is illustrated in the fact that the specifications for the new Union Station at Winnipeg call for their use. The contract for the concrete piling has been secured by the Raymond Concrete Piling Company, of Montreal, which company, it may be remembered, carried out a large contract for concrete piling for the Montreal Harbour Commissioners last season, and has only recently completed a mile of piling for the C.P.R. bridge at Lethbridge. The Union Station will require some 1,800 piles, and, as the work is being rushed forward in a great hurry, only about six weeks will be allowed for the driving of the piles.

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the Russian Government although, on this point, there is no particular evidence.

The situation in the local market is practically unchanged, trade being dull and the general tendency of the market easy. So far as can be ascertained the changes in the United States have had no effect on local prices.

Antimony.—The market has advanced fractionally, and sales are being made at 10 to 10½c. per lb.

Bar Iron and Steel.—Bar iron, $1.90 per 100 pounds; best refined horseshoe, $2.15; forged iron, $2.05; mild steel, $1.95; sleigh shoe steel, $1.95 for 1 x ⅜-base; tire steel, $2 for 1 x ⅜-base; toe calk steel, $2.45; machine steel, iron finish, $2.20; mild steel, $2.05.

Boiler Tubes.—The market is rather lower, quotations being as follows:—2-inch tubes, 8c.; 2½-inch, 10½c.; 3-inch, 11½c.; 3½-inch, 15c.; 4-inch, 19¼c.

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, $1.70 to $1.75 per barrel, in cotton bags, and $1.95 and $2.05 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, standard brands, f.o.b. mills, 85c. per 350 pounds; bags extra, 10c. each, and returnable in good condition at 7½c. each.

Cement—English and European.—English cement is steady at $1.85 to $1.90 per barrel in jute sacks of 82½ pounds each (including price of sacks) and $2.20 to $2.30 in wood, per 350 pounds, gross. Belgian cement is quoted at $1.75 to $1.85 per barrel in bags, and $2.05 to $2.20 per barrel, in wood.

Copper.—The market is steady at 14 to 14½c. per pound. Demand continues limited.