

**PAGES**

**MISSING**

# The Canadian Engineer

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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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TORONTO, CANADA, APRIL 24th, 1908.

A subscriber has for sale bound volumes of the Canadian Engineer for 1893, 1894, and 1895. What are they worth to you?

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### SPECIAL NOTICE.

Mr. Oswald Barratt no longer represents The Canadian Engineer at Vancouver. Subscribers and advertisers in British Columbia will please deal, for the time being, direct with the head office at Toronto.

### BUILD NOW.

During the past winter everyone was hoping that with the approach of spring heavy construction work would commence, and with the opening up of large works business would brighten, money would circulate more freely, and the activity, prosperity and commercial progress of the last few years continue. But spring has not brought the hoped-for change. Private individuals and many corporations cannot secure money and credit necessary for the carrying on of new works.

With the decline in the volume of business and the dropping off in the number and size of orders the price of materials necessary for the carrying on of construction work has perceptibly lowered, and a large number of skilled workmen are without employment.

It is at such a time as this that Governments and large municipal corporations, who can secure money at a favorable rate, even in periods of depression, should commence the construction of necessary public works. For years all these public bodies have been contemplating harbor improvements, the construction of seawalls and wharves, the laying of trunk sewers and larger water mains, and the erection of bridges and the building of new highways. Labor and Material will be cheaper, and thus there will be a great saving to the State, but the State will gain in other ways. Works that will add to the comfort and health of the community will be built, people who, otherwise might be charges on charity, receive employment, and channels of trade would flow more regularly, much to the advantage of our country.

Now is the time to construct those works that a year or so ago people thought of as election schemes and visionary improvements.

### VENTILATION OF SEWERS.

The ventilation of sewers is a subject that has engaged the attention of sanitary engineers for many years, but as yet no very satisfactory method suitable for general use has been devised.

Recently the city of Winnipeg has been conducting experiments with sewer lamps, but the city engineer does not appear to be impressed with the desirability of this system for that city.

Sewer gas is constantly forming in the sewers, and it is necessary that this gas be mixed with large volumes of air and not allowed to penetrate into the houses. This gas gathers in the higher reaches of the sewers, and in districts where the manholes are provided with airtight coverings forces its way through defective plumbing into the houses. In districts where the manhole covers are perforated the gas escapes at the street level, and in the summer season is very objectionable, entering the open doors and windows, and carrying with it disease.

Ventilation in sewers that vary in the volume of discharge, caused either by the inrush of storm water or the uneven flow from factory districts, require ventilation more than do those sewers in which the flow is regular. The sudden reduction of the space occupied by the gas forces it through the traps, and generally interferes with the natural ventilation of the sewer.

High, vertical iron pipes have been used for inducing ventilation, but these have not proved to be altogether satisfactory. The sewer gas soon corrodes and rusts the pipe, and the gas is not always carried clear of the houses. The subject is one that will stand further investigation.

### COST OF THE TRANSCONTINENTAL.

From Moncton to the Rocky Mountains the estimated cost of the National Transcontinental now is some \$85,000,000; the sum total is made up as follows:—

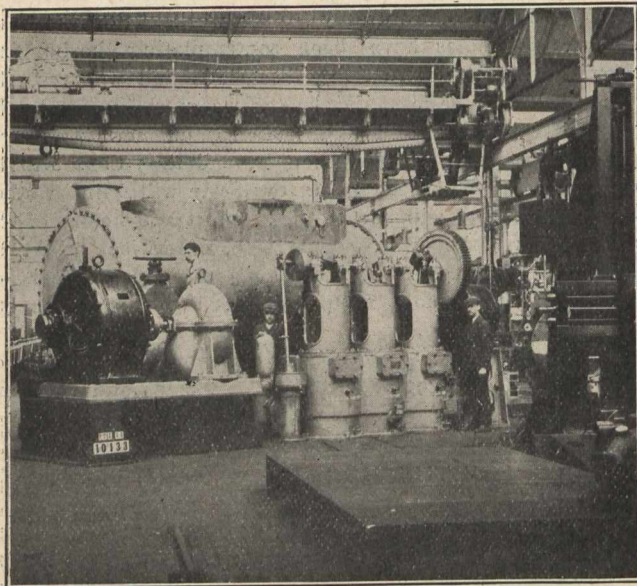
National Transcontinental under contract.....	\$44,389,393
National Transcontinental not under contract....	19,030,173
Grand Trunk Pacific, Prairie section .....	21,872,200
Total .....	\$85,291,766

These figures are the estimates upon which the contracts have been or will be let.

The estimated cost of the 1,227 miles under contract on the Eastern division, or National Transcontinental, is some \$44,000,000; or rather over \$36,000 a mile.

### CONDENSING PLANT.

We published in our current issue a photograph taken in the makers' works of a large condensing equipment, which is one of a set of five complete equipments which have been recently designed and constructed by Messrs. W. H. Allen, Son & Company, Limited, Queen's Engineering Works, Bedford. The five sets are all, constructed exactly to the same drawings, and each is capable of dealing with 66,000 lbs. of exhaust steam per hour, and of maintaining a vacuum within



2 inches of the barometric pressure, when supplied with circulating water at a temperature of 70 degrees Fahrenheit.

A large and almost unequalled experience in this class of apparatus, which extends over a great many years and in all parts of the world, together with the expert knowledge obtained through years of careful experimental work carried out by their own staff at Bedford, places Messrs. Allen in the very fortunate position of being able to decide the correct proportions of the various parts of a condensing equipment with the greatest possible accuracy, so that the transfer of heat from the exhaust steam to the circulating water may be carried out in the most expeditious manner possible, and with a minimum expenditure of power.

As regards the details of the very large plant which we illustrate, in the first place it has been designed to deal with the exhaust from a steam turbine, and this has necessitated the employment of a very large steam opening in the top of the condenser body. The latter is of cylindrical form, and of cast-iron, and of ample stiffness—extra stress being placed in the casing where necessary.

The tube plates are of rolled brass and are carefully stayed. The tubes are of solid-drawn brass, the total surface being 10,000 square feet. The circulating water enters the lower part of the condenser through the water box which is situated at one end and circulates from end to end of the same water box.

The supply of cooling water is effected by one of Messrs. Allen's well-known "Conqueror" centrifugal pumps, having suction and discharge branches 20 inches in diameter, and capable of supplying 66,000 gallons of water per hour against a total head of 20 feet. The pump casing is of cast-iron, and the impeller of gunmetal, the spindle being of forged naval bronze. It is direct-driven by means of a three-phase motor of 67 B.H.P. running at 410 revolutions per minute, and receiving current at 220 volts and 60 periods.

The air pump is of the three-throw "Allen-Edwards" type, and is of Messrs. Allens very latest and improved design. The three barrels are exactly similar, having a diameter of 18 inches, the plunger having a stroke of 14 inches, the crankshaft making 135 revolutions per minute. This is driven by means of a three-phase motor of 19 B.H.P. running at 575 revolutions per minute, and receiving current at 220 volts, 60 periods. The air pump delivers the condensed steam into a surge tank situated in the lower part of the air pump casing, and at the near end of the pump shown in the photograph. This water is withdrawn by means of a single-acting force pump having a plunger 17 inches in diameter, the stroke being 10 inches, and capable of delivering against a head of 10 feet. The arrangement of this pump is well shown in the photograph, the drive being effected from an outside disc crank on the end of the air pump crank-shaft. The crank-shaft and motion work of the air pumps are of the best open-hearth mild steel, the bearings being lined throughout with white metal—with the exception of the cross-head bearings which are of gunmetal. The lubrication, as will be seen in the photograph, is effected by means of "Stauffer" spring grease cups.

The cross-head guides are cylindrical, and bored at one setting with the facing of the trunk in which they are fixed, thus ensuring a perfect alignment. The air pump buckets are of cast-iron, and are fitted with a solid gunmetal ring; the air pump barrel is also of solid gun-metal as well as the valve plates, the valves being of the "Kinghorn" metallic type resting on accurately faced seatings.

The force pump is also fitted with gun-metal plunger and liners; the air pump casing is fitted with the usual accessories in the way of shifting valves, drain cocks, and relief valve, all of which may be seen in the front of the casing in the photograph. A large sluice valve is also provided on the discharge side of the circulating pump in accordance with the specification for the plant. Careful examination of the photograph will convince of the admirable way in which the arrangement of the plant has been carried out so that easy accessibility of all the working parts is ensured.

The water-box covers on the condenser are also easily removable for cleaning the tubes, and are provided with small inspection covers which permit of easy access to the interior of the water boxes for inspection only.

The executive officers of the Westinghouse Electric & Manufacturing Company, now at 111 Broadway, New York, N.Y., and the New York sales offices and export offices, of that company now at 11 Pine Street, will be removed on Monday, April 20th, 1908, to the new City Investing Building, No. 165 Broadway, New York.

In the design of the new jute mill of the Columbian Rope Company, at Auburn, N.Y., the architect, Mr. Charles T. Main, of Boston, has introduced somewhat unusual features in the design of the floors. Because of the large size and excessive weight of the machines in the second and third storeys, as well as on account of vibratory effect of their rotary movement, exceptional strength and stability was required. The columns, spaced on 10-foot bays across the building and on 18 to 24-foot centres lengthwise, are of 16 x 16 Georgia pine. The beams running lengthwise of the mill are of the same size and material, while the flooring is of 6-inch plank, spliced and toe nailed together, and covered with ordinary maple top. The result is a practically solid floor which is absolutely rigid and capable of sustaining the heaviest possible loads.

# 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.]

## PRODUCER GAS IN ACTUAL PRACTICE.

Sir,—Referring to the Hydro-Electric Commissions report on producer gas, the writer does not presume to discuss the general conclusion that this power will probably occupy an intermediary position between steam and electric powers. But as to its individual merits and demerits it is possible too decisive conclusions might be drawn from the Commission's report.

If data has been acquired chiefly from inspections of producer gas practice in Canada, such data might perhaps not be sufficient. To make a complete examination of the matter, it would seem necessary for competent men to visit England and Europe and inspect the different types and systems in operation there, where experience has been much more extensive and the success of the power is reported as marked. The subject being comparatively new, very few works of reference have been published.

It is probable that of the plants examined the majority were of the suction type. Has sufficient examination been made in general plants operating under pressure, and of "ammonia recovery" plants wherein a by-product is obtained, the sale of which reduces fuel cost to a minimum? Have all these been taken into consideration in arriving at estimates of power costs and reliability?

It may be admitted that producer gas had a number of setbacks in Canada. In some cases the matter has been treated as a machinery agent's proposition rather than an engineering problem. Plants have been put in which were unsuitable or flimsy, both in respect to type and installation. As might be expected, results have been unsatisfactory. Another important source of trouble has been the ignorance of erectors and attendants. Leaving out the question of risk, which appears greater with steam than gas, it may be stated that for a person unfamiliar with gas practice to attempt to operate a plant will produce results just as inefficient as for an unskilled person to take charge of a steam plant. The commission, however, emphasizes the importance of avoiding these errors.

As to reliability—given the customary essentials for the successful operation of either steam, gas or electricity, i.e., correct types of plants, substantially constructed and properly installed, and competent attendance, the reliability of the producer gas power is certainly sufficient to admit of comparison at least with that of steam or electricity.

Granted that steam is the most reliable of these, can electricity generated from water power be considered entirely reliable without auxiliaries or reserves? Failure undoubtedly occurs, from ice, frazil, low water, etc.

In a plant with which the writer has had recent experience, difficulties undoubtedly have arisen, but in reviewing the same they can be attributed almost entirely to lack of experience and knowledge of proper practice. In proportion as these latter have been gained, the plant has proved itself quite satisfactory as to ease of operation and reliability.

Aside from mechanical defects or accidents common to any machinery, practically all troubles arising in producer gas operation come under three heads, and failure thereunder rarely occurs without giving ample warning for an experienced man to avoid it. With proper supervision and inexpensive duplication of some few parts, the question of reliability may be reduced to an inconsiderable factor for all ordinary purposes.

Respecting loads, sudden and wide variations affect the gas engine, the former condition being more important than the latter. This is minimized where the engines have an ample margin of power and where the pressure system of generating gas is used. With a fairly uniform load, the steadiness of speed is one of the gas engine's strong points. Regarding the cost of power under load variation, as to the fuel cost, at least, the engine uses only so much gas as the load calls for, and the consumption of fuel is automatically regulated accordingly, within limits.

The opinion of the writer, formed from actual experience, and respectfully submitted, is that the merits of this prime mover are such as to deserve the very careful consideration of all power-users according to their conditions.

Almonte, Ont., April 1908.

H. W. Lundy.

## THE QUEBEC BRIDGE.

Typographical errors, in Mr. Walter P. Chapman's article on the Quebec Bridge in our issue of April 17th, detracted somewhat from the value of the article.

In the sketch showing cross-section of the large members of the Quebec Bridge four not five-inch members should have been shown. The names of the designer, consulting engineer, and assistant engineer, should read Mr. Szlapka, Mr. Cooper, and Mr. McClure.

The date of the article should have been April 3rd, 1908.

## THE QUEBEC BRIDGE.

Sir,—Our attention has been drawn to a letter in the Canadian Engineer by Mr. Chapman which refers to the design of the Quebec Bridge, and regret that Mr. Chapman did not give us more of his time and more of the valuable material and data which he undoubtedly possesses. This interesting material, etc., should be very acceptable to engineers familiar with similar large undertakings. We are more than pleased to notice that his statements, made in his too brief letter, are sustained and supported by the best authorities in the world, who have successfully met and overcome greater difficulties, not only in bridge designing, but in bridge erection—two separate and distinct problems.

All engineers, familiar with the erection of large bridges, will at once recognize the value of Mr. Chapman's design, especially the fact that he places two piers beneath the tower of his proposed cantilever instead of one as in the Szlapka design, and we are astonished that any engineer or body of engineers of eminence should for a moment consider it advisable to have designed a bridge of this magnitude and rest it on one pier. The weakness of construction as displayed in this last mentioned plan is evidenced, even to the casual observer. This astonishment is increased by the fact that a precedent had already been established by the greatest steel bridge engineer the world has ever known, and the work of this eminent British engineer will remain a lasting monument to his ability, integrity, and foresight.

Mr Chapman says: "The tower could vary in length from 175 to 200 feet **to suit conditions at end of bridge.**" The writer would respectfully suggest that the length of the tower is a quantity which can and must be determined mathematically. Therefore, the length of the tower is a calculable quantity. The same rule holds good as to its height. It also applies to the length of the short arms, for the length of the long arm is arbitrary, and all other stresses and dimensions will be governed and determined by its deadload, rolling load, and associated factors.

Mr. Chapman further states: "To carry out this plan the bridge spans of 210 feet must be eliminated. These

bridge spans could be cut out, removed to new sites and erected"—elsewhere. The fact is, the proposed design must not consider any portion or part of the old design, or any other feature of this failure. If the two spans just referred to are in the way, it will be wise to cut them out and consign them with the rest of the original bridge—to the scrap heap. It is not necessary or wise to consider any portion of a bridge which failed when designing a bridge that will not fail, and which will cost approximately five or six million dollars. We thoroughly agree that the features of Mr. Chapman's design for erection "cannot be over-estimated." Any design which does not take into consideration the many and varied stresses to which the bridge will be subjected during erection will result in failure. Stresses during erection must be as carefully provided for as the stresses to which the bridge will be subjected when completed. A bridge which fails during erection cannot be valuable for any purpose.

With every word of this we thoroughly agree, and recognize the importance of the statement Mr. Chapman makes when he says: "The above will upset some mistaken theories (assumptions) on this point." We take exception, however, to our esteemed Mr. Chapman when he states: "Had it been possible to erect the structure on falsework and join the chain of eyebars of the upper chords of cantilever with the members of the suspended span, results would have been entirely different." No matter how strong the chain of eyebars of the **upper** chords might be, the **lower** chord would be obliged to meet the stresses which are due to the length and weight of the long arm. The recent failure should be sufficiently convincing of this.

We further agree with Mr. Chapman's statement that: "The original design is impracticable for the Quebec span, and no engineer or body of engineers would be rash enough to repeat the experiment," especially while we remember the eminent success which attended Sir Benjamin Baker in successfully meeting similar conditions. We frequently hear of this or that engineer or other professionalist being "up to date." With the example of the last noted eminent authority before us we would respectfully suggest to all young engineers and the older portions of the "up-to-date" ones, that it is necessary for them to be more and better acquainted with those indispensable authorities, "the old masters," before they attempt to equal, imitate or surpass them.

An engineering periodical has stated that the art of engineering is not sufficiently advanced at present for engineers to successfully design bridges of the magnitude of the Quebec Bridge, mentioning particularly the uncertainty of engineering knowledge as to the stability of long columns. We believe that eminent periodical spoke from its best knowledge, but with the illustrated example before us, to which Mr. Chapman has been good enough to draw our attention, it will be readily seen that columns nearly twice the length of those required at the Quebec Bridge are an old story with engineers of half a century ago, at which time they had successfully used them, and their structures will remain monuments of their ability.

We also agree with Mr. Chapman when he expresses the hope that the "future Quebec Bridge will stand a monument to the skill and success of Canadian engineers." "The recent failure has emphasized the fact that the bridge when built will be a monument to the skill and success of Canadian engineers, because there seems to be no one else qualified to build so important a structure.

The Yankee has had his opportunity and failed.

Now that the Quebec Bridge is to be nationalized and—including its failure—paid for by Canadians, it is high time that Canadian engineers should design and erect it, for with them the habit of dropping into the river either half erected or completed bridges has not become chronic.

Yours truly,

A. G. Midford.

April 22nd, 1908.

## ORDERS OF THE RAILWAY COMMISSIONERS OF CANADA.

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

4579—March 10—Authorizing the C.P.R. to take additional lands adjoining station for the accommodation of traffic, being a portion of No.'s 22, 23 and 36, according to the registered plan No. 5a, Toronto, Ont.

4580—April 14—Authorizing the Brantford & Hamilton Electric Railway Company to erect, place and maintain its electric power, trolley and feeder wires over the track of the Tillsonburg Branch of the G.T.R. at a point in the city of Brantford, Ont.

4581—March 12—Authorizing the Brantford & Hamilton Electric Railway Company to cross with its tracks the track of the Tillsonburg Branch of the G.T.R. in the city of Brantford, Ont.

4582—April 14—Authorizing the G.T.R. to reconstruct the bridge over the highway known as the "Waterdown Road," 1st Concession of the Township of East Flamboro, County of Wentworth, Ont.

4583—March 31—Authorizing the Vancouver, Victoria & Eastern Railway & Navigation Company to construct and maintain a flume over the property of the Anglo-British Columbia Cannery Company, being Lot No. 23, Group Two, New Westminster, District British Columbia.

4584—March 10—Authorizing the Ingersoll Telephone Company, Limited, to erect, place and maintain its wires over the Canadian Pacific Railway Company at the right of way between lot, the First and Broken Front Concession of the Township of Oxford, Ont.

4585—April 10—Approving location of the Quebec, Montreal, & Southern Railway Company's station at St. Philomene, County of Lotbiniere, P.Q.

4586—April 10—Approving location of the Quebec, Montreal, & Southern Railway Company's station at Lake St. Paul, County of Nicolet, P.Q.

4587—April 10—Approving location of the Quebec, Montreal & Southern Railway Company's station at Becancour, Nicolet County, P.Q.

4588—April 10—Approving location of the Quebec, Montreal & Southern Railway Company's station at St. Charles, County of Nicolet, P.Q.

4589—April 10—Approving location of the Quebec, Montreal & Southern Railway Company's station at Orignaux, County of Nicolet, P.Q.

4590—April 10—Approving location of the Quebec, Montreal & Southern Railway Company's station at Gentilly, County of Nicolet, P.Q.

4591—April 10—Approving location of the Quebec, Montreal & Southern Railway Company's station at Gentilly River, County of Nicolet, P.Q.

4592—April 10—Authorizing the C.P.R. Company to cross with its spur the town of Thessalon, across the Government Road on the southeast quarter of Lot 33, in the Township of Thessalon, and Lorne, at Dymont St., Genelle St., Park St., Mowat St., and new streets, not yet opened, in the easterly limit of the said town of Thessalon.

4593—April 10—Authorizing the C.P.R. to reconstruct bridge No. 100.5 on its Sherbrooke Section.

4594—April 10—Authorizing the C.P.R. to reconstruct bridge No. 51.3 on its Prescott Branch.

4595—April 10—Authorizing the C.P.R. to reconstruct its bridge No. 46.74 on the White River Section of its Lake Superior Division.

4596—April 10—Approving location of the Quebec, Montreal & Southern Railway station, Pierreville, in the County of Yamaska, P.Q.

4597—April 10—Approving location of the Quebec, Montreal & Southern Railway Company's station at St. Gregoire, in the County of Nicolet, P.Q.

4598—April 10—Approving location of the Quebec, Montreal & Southern Railway Company's station at La Baie, in the County of Yamaska, P.Q.

4599—April 10—Authorizing Le Credit Municipal Canadien to construct and thereafter maintain a twelve-inch pipe under the track of the Montreal, Park & Island Railway Company at a point where it is crossed by the Upper Lachine Road at St. Pierre aux Liens, and a six-inch pipe under its racks at a point west of the Simplex Railway Appliance Company's Works at St. Pierre aux Liens.

4600—April 14—Authorizing the C.P.R. to construct a spur to the premises of Messrs. J. B. Smith & Sons, Lot 33, Concession 11, Township of Ferris, District of Nipissing, P.Q.

4601—April 9—Approving deviation in the location of C.P.R. Company's Moose Jaw north-westerly branch, from a point in Section 23, Township 28, Range 5, west of the 3rd Meridian to a point in Section 17, Township 30, Range 15, west of the 3rd Meridian, Province of Saskatchewan.

4602—April 10—Authorizing the Canadian Northern Ontario Railway to construct a bridge over Stanley Street in the town of Hawkesbury, Ontario.

4603—April 14—Recommending to the Governor-in-Council for sanction, amalgamation agreement between the Vancouver, Victoria & Eastern Railway and Navigation Company, and the Victoria Terminal Railway Company.

4604—April 10—Authorizing the C.P.R. to construct a spur to and into the premises of W. C. E. Koch, from a point on the centre line from mile post 9 on the C.P.R. Company's Slovan Branch, a distance of about seven (700) hundred feet.

4605—April 14—Extending until May 14th the time within which the Winnipeg Electric Railway Company may be permitted to erect, place and maintain its wires, for the transmission of electrical energy, across the railway of the Lac du Bonnet Branch of the C.P.R., in Section 35, Township 13, Range 9, east of the 1st Meridian, Manitoba.

4606—April 14—Extending until May 14th, the time within which the Winnipeg Electric Railway Company may be permitted to erect, place and maintain its wires, for the transmission of electrical energy, across the tracks of the C.P.R. in the town of St. Boniface, Manitoba.

4607—April 14—Extending until May 14th, 1908, the time within which the Winnipeg Electric Railway Company may be permitted to erect, place and maintain its wires, across the transmission of electrical energy, across the tracks of the C.P.R., in Section 25, Township 12, Range 8, east of the 1st Meridian, Manitoba.

4608—April 14—Authorizing the Crow's Nest Pass Electric Light & Power Company to carry its telephone wires across the track of the British Columbia Southern Railway at the crossing of the British Columbia Southern Railway, and the Morrissey, Fernie & Michel Railway, near Fernie, B.C.

4609—April 14—Authorizing the Crow's Nest Pass Electric Light & Power Company, to carry its wires across the track of the British Columbia Southern Railway at Elko, B.C.

4610—April 14—Authorizing the Crow's Nest Pass Electric Light & Power Company to carry its wires across the track of the British Columbia Southern Railway at Prior St., in the town of Fernie, B.C.

4611—April 9—Approving revised location of the G.T.P. Railway from Yellowhead Pass to Tete Jaune Cache, mile 0 to mile 50, Cariboo District, B.C.

4612—April 9—Approving location of the G.T.P. Railway from Prince Rupert easterly, mile 50 to mile 100, (Copper River), Coast District, B.C.

4613—April 15—Authorizing the G.T.P. Railway to connect the Lake Superior Branch of its railway with the C.P.R. at Dexter, Ontario.

4614—April 9—Approving deviation and location of the double tracking of the C.P.R. Company's main line between Kenora and Garwood, being from mile 142.6 to mile 145.

4615—April 15—Approving deviation in the location of the main line of the C.P.R. Company's Lauder Extension Branch, from mile 20.04 to mile 32.28.

4616—April 15—Authorizing the C.P.R. to open for carriage of traffic the diversion of the British Columbia Southern Railway Company's main line, at mileage 85.4 east of Spar-

wood, in the Province of British Columbia, on the Crow's Nest Branch, from mile 16.5, Cranbrook Section for a distance of 3,366 feet, or 0.64 of a mile.

4617—April 15—Authorizing the Bell Telephone Company to erect, place and maintain its aerial wires across the tracks of the C.P.R. at Metcalf St., North Bay, Ont.

4618—April 10—Authorizing the C.P.R. Company to construct, maintain and operate a branch line of railway or spur from a point on the centre line of the Smelter Spur, distant about 170 feet south-westerly, along the centre line from the south-westerly limit of 1st street to and into the premises of C. B. Hume & Company, in the town of Revelstoke, B.C.

4619—April 9—Authorizing the Chatham, Wallaceburg & Lake Erie Railway Company to operate its cars over the crossing of the G.T.R. on William Street, in the city of Chatham, Ont., until the 1st day of August, 1908.

#### CANADIAN CEMENT AND CONCRETE ASSOCIATION.

At a representative meeting of cement men held at the King Edward Hotel, Toronto, Monday, April 20th, an association was formed, to be known as the Canadian Cement and Concrete Association. The meeting was representative of all the identified lines of activity, and the unanimity and enthusiasm displayed was most encouraging. The organization, which is modelled along similar lines to the National Association of Cement Users of the United States, embraces the entire Dominion. The outlook in Canada is most encouraging, and a growing field of usefulness and influence is almost assured. Judging by the interest and unanimity displayed at this, the inaugural meeting, there need be little fear as to the eventual outcome. In addition to an annual convention the Association are planning to hold an exhibition, which will go far in bringing the claims



Mr. P. Gillespie, A.M., C.S., C.E., President Canadian Cement and Concrete Association.

of the legitimate use and the possibilities before the public of Canada. All persons connected with cement construction, manufacturers of cement or cement machinery, as well as dealers, suppliers, architects, engineers, or persons connected in any way with the cement industry are eligible for membership. The membership fee has been placed at five dollars. The officers-elect are as follows: President, Peter Gillespie, lecturer in Theory Construction, University of Toronto; vice-president, C. F. Pulfer, Ideal Concrete Machinery Co., London, Ont.; secretary-treasurer, Alfred R. Uren, 62 Church Street, Toronto, Ont. Councillors—Kennedy Stinson, Montreal, Que.; Gustave Kahn, Toronto, Ont.; C. H. Thompson, Toronto, Ont.; F. B. Kilbourn, Montreal, Que.; R. A. Rogers, Toronto, Ont.; T. G. Dates, Owen Sound, Ont.; J. G. Murphy, Toronto, Ont.

## AS SEEN BY OTHERS

### A LESSON IN COURAGE.

Engineering Contracting.—The real lesson to be learned from this Quebec disaster is not so much a "lesson in humility" as a lesson of courage in defending individual judgment in the face of any man's opinion, no matter how eminent he may be. Had certain engineers and employees on the Quebec bridge had the courage to fight for their judgment as to the weakness of the bridge, instead of permitting a great engineering reputation to silence them, there would have been no Quebec disaster.

To our readers who are young, with reputations yet to make, we say: Many a great reputation is founded on little else than a masterly silence and a look of wisdom. Many another reputation has come from the favor of chance rather than the dower of merit. But, in any event, whether the reputation is merited or not, have sufficient courage to stand for your own convictions, unabashed by the fact that many eminent authorities do not agree with you.

### The Nine Hour Law in U.S.

Telephone Journal.—The United States Federal law limiting the hours of service of railroad employees, which became effective on March 4, provides that operators, train dispatchers and all employees concerned directly with the handling of train movements shall not be on consecutive duty more than nine hours in any 24-hour period at towers or offices operated day and night, and not more than 13 hours at offices operated only during the day time. This is modified by the provision that in case of emergency, such employees may be on duty for four additional hours in any 24-hour period on not more than three days in any week.

### The Grief of Railroadng.

The Railway Review.—The strain on a railway official is undoubtedly far greater than is imagined by those looking over the fence from other fields. Responsibility, care, anxiety, contention, blame, harrying by the public and its officials, and employees and their officials, fear of what may be happening on the line at any moment of day or night—these things are not compensated for by money salaries or the dignity of position. The laborer sitting alongside the track, waiting for the train to pass by, thinks the "old man" in the private car has reached the acme of human bliss. The president, possibly, glancing out of the car window, envies the laborer who has no care except to win his daily bread. This is as old as any philosophy in the world.

### A Japanese Power Scheme.

The Toronto Star.—The most significant fact in connection with the awakening of Japan is not found in the marvelous capacity which the people of that country have shown in carrying on warfare. The point of greatest importance is in the rapidity with which this new-old nation is adapting itself to the industrial environment formed by the circle of world-powers into which it has entered. . . . The most recent development is in the organization of a company to develop electric energy from water powers which have heretofore been allowed to waste. This company intends to produce 91 thousand horse-power all told, with works at three different points; and one-third of the undertaking is to be carried out this year. Other enterprises of a like nature will doubtless follow. With cheaper power added to cheap and wonderfully efficient labor, Japan may soon give the world a greater surprise by her achievements in the industrial field than she has already caused by her prowess on the field of battle.

### Hudson's Bay Railway.

Port Arthur Chronicle.—Both parties in Parliament tried to make a hit with the West by expressing sympathy

with a Hudson's Bay railway scheme. This means that the time is near at hand, probably during the coming election campaign, that plans will be outlined and policies adopted by the two parties towards the project. In the meantime the biggest kind of election campaign material for the East is a determination to construct the Georgian Bay Canal. The Government cannot side-step this most important project. They are making good with the G.T.P., and the people will take just as kindly to the Georgian Bay Canal enterprise as they did to that scheme.

### An Opinion of the Report.

Engineering Record.—The report, as a whole, is fair, and judicial in its tone. It recognizes the grave difficulty under which the engineers labored in making the design and in carrying out the erection. It compliments the contractor upon the skill and efficiency of its organization in the office and shop, and in carrying out the erection, and the tortured and twisted condition of much of the wrecked material at the bridge site is a superb tribute to its quality, confirmed also by the commission's report. The commission is unquestionably right in stating that the fall of the bridge could not have been prevented by any action that might have been taken after August 27, 1907. The question of responsibility for the disaster as due to defects of design, they do not attempt to settle; they simply state, what is obviously the fact, that the design was officially approved by the consulting engineer, whose supreme authority was fixed by an "order-in-council."

### Opening Tenders in Public.

The Montreal Star.—It is difficult to understand why the suggestion of Dr. Reid that all Government tenders should be opened in public, could not be accepted by the Ministry. What harm would ensue if the tenderers could be present when their tenders were opened by two or three officials of the department which had advertised for them? The very presence of the tenderers or their agents would prevent any undue influence being exercised by any one of them, in case the group of acting officials were open to that sort of thing. . . . Public business should be transacted more in the public eye than it is. . . . Who imagines, for example, that, if the whole transactions with the Quebec Bridge Company had been carried through in public, the bridge-building experts of the country would have permitted the Government to practically assume the financial responsibility for the enterprise without putting at least a competent Government engineer on the job?

### River Floods.

The Brantford Courier.—The manner in which the Government might well assist would be in connection with reforestation, a matter they have already made a step towards, and in the appointment of a commission who could investigate when asked, with reference to various rivers, and report upon the best methods for relieving the situation.

### Canadian Talent.

The Hamilton Herald.—A commission of Canadian engineers pronounces judgment upon the two eminent American engineers who designed the Quebec Bridge, pronouncing them lacking in the ability and knowledge necessary for such a great work. It is announced that Mr. Douglas, bridge engineer of the Dominion Department of Railways, noticed the structural defects of the ill-fated bridge long before it collapsed, and protested against the high unit stress proposed by the designers. Here we have Canadian engineers who are competent to sit in judgment on the "eminent American engineers" who designed the structure, and a Canadian engineer who appears to have been wiser before the event than these eminent specialists. All of which suggests the query, Why not entrust great public works of this sort to Canadians? It is to be hoped that the Dominion Government, when it proceeds with the reconstruction of the Quebec Bridge, will entrust the task to Canadian engineers. Nor should it be impossible to have the Quebec Bridge a "made-in-Canada" product in every sense.

SOCIETY NOTES.

Engineers' Club, Toronto.

At the regular meeting on April 16th, Mr. W. Almon Hare discussed a proposed Annealing Bed for Steel Rails. Mr. Hare said in part:—

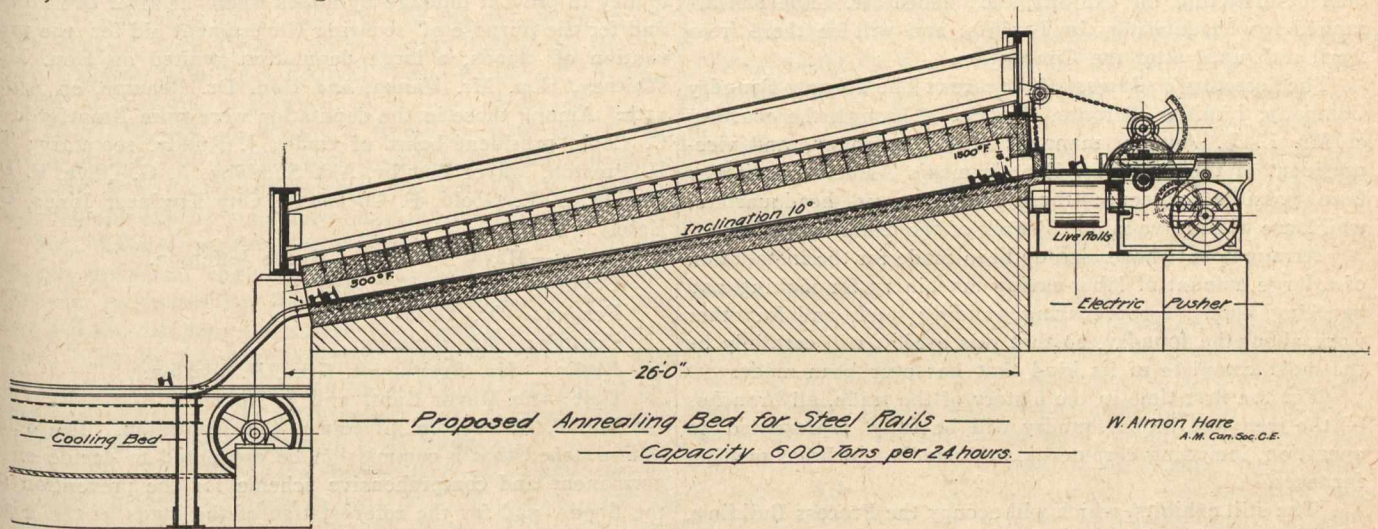
It is a well-known fact that in almost every rail are present certain internal stresses of an indeterminate character. This is easily proved by cutting the rail in two by planing the web to separate the head from flange. As soon as separation occurs the two parts will assume a curved form due to these internal stresses, which have become unbalanced by cutting the rail apart. It is quite possible that a number of the breakages which have occurred have been partly due to the action of these indeterminate stresses, which in the instance of the broken rail exerted their influence in conjunction with the exterior applied forces, which of themselves would not have been sufficient to rupture the rail.

Assuming that such is the case, we are led to investigate as to the cause of these stresses, and to devise means to minimise as much as possible this unknown feature. A great deal of this difficulty is evidently due to the distortion of the steel during its passage through the finishing pass of the rolls, where the rail is brought to its final shape. At the

Annealing is in other words, slow cooling, and in all forgings in which internal stresses have to be eliminated annealing is resorted to. Usually the method in such cases is to subject the forging for some hours to a moderate dull red temperature, thus allowing the molecules of the metal to adjust themselves to the new form into which they have been crushed, making the part homogenous in strength and quality.

It is not supposed that this can be done in the case of rails, as the resulting metal would be too soft, which would be detrimental, especially on the head where the unit stresses in the metal are greatest, due to the action of the wheels in transit. It is assumed, however, that some benefit will result if all rails were subjected to exactly the same treatment in cooling whether made in summer or winter, and that the product would be free from all stresses due to cooling at any rate. Whether it is possible to carry this further and anneal the rail to a greater extent than is here suggested is a matter that cannot be stated off-hand, and very likely this could only be done in conjunction with a change in the chemical properties tending to increase the hardness or tensile strength of the steel.

In the accompanying drawing is shown a suggested annealing bed for a rail mill of about 600 tons per 24 hours. The rails come from the cambering rolls along the live rolls



temperature at which this is done, the distortion cannot show itself, but only after the rail has been partly cooled when these stresses cause the rail to buckle and curve, and when the rail has completely cooled it has a permanent set or curve which must be straightened out in the straightening press before shipment. The mill superintendent will endeavor to reduce this curvature, by adjusting the cambering rolls which give the hot rail a curve in the opposite direction to that which it would assume without cambering and so when the rail had cooled the distortion to be removed by straightening is, of course, minimised.

The manner of cooling the rails to-day is practically the same as was the practise in England when rails were first made. It consists simply of putting the hot rail on elevated skids, or cooling racks, which are in the open, and are left there until cool enough to handle. This method, is, of course, simplicity itself, and in countries having a moderate change of climate between winter and summer, nothing more could be wished for. Throughout the United States the above is the general practise, and for the Southern States is perhaps satisfactory. In the Northern States, however, and in this country, where the winters are so much colder, and the summers almost as hot, it is fair to ask the question if the rails rolled in the winter are subject to the same treatment as those made during the summer. In the summer months, the rails exposed to the weather cool at a much slower rate than those made in the winter, and if statistics were collected it is reasonable to expect more breakages in winter rails than in those made in the summer. It is certain that to expose the hot rail at say 1,400 or 1,500 degrees Fahrenheit to a temperature of 10° or 15° below zero is to cause a much more rapid rate of cooling than if the temperature were only 75° above zero.

shown on the right hand. When the rail reaches a point opposite the opening to the annealing bed, the electric pusher advances and moves the rail laterally into the chamber, the door of which has been automatically opened by the pusher by means of the mechanism shown. On withdrawing the pusher, the door closes, preventing the unnecessary escape of heat.

The rails entering this chamber are at a temperature of about 1,400 to 1,500 degrees Fahrenheit, and in some mills somewhat higher, and will in a short time raise the temperature of the chamber correspondingly. In starting up on Monday morning, it will be necessary to fire the chamber with a few gas jets until the roof has been heated, after which the incoming rails will maintain the temperature required.

The roof of this chamber is firebrick of a usual form suspended by the steelwork shown. These blocks are 9 inches thick, and about the same in length. The roof thus made is perfectly flat, and can be repaired at a very low cost. The bed is also firebrick, built up to within 1 inch of the top of the steel rails forming the skids. The roof has been shown higher at the entering end than at the exit, to assist in confining the heat at the upper end. At the lower end it is only high enough to allow the rail to pass out freely. After the rails have passed through this chamber, which will take about one hour for any one rail, they are dropped down to the cooling bed and skidded to the live rolls for transit to the straightening presses. The floor of this chamber has been shown on an incline of 10°, so as to facilitate the movement of all the rails on the bed without causing too great a stress on the nearest rail to the pusher, which being the hottest would be the most susceptible to injury. The coefficient of friction on this inclination is not more than .027, so that the pusher will



only have to exert a thrust of about 1,350 lbs. to move the rails down the slope. As this is distributed throughout the length of the first rail the unit stresses are negligible.

It is assumed that the rails will cool very slowly during their passage through the chamber and at the exit, the temperature will be about 500° Fahrenheit. In the annealing bed shown, the length of the bed has been made 26 ft., but this is, of course, merely tentative as the final design can only be determined by experiment, once the tonnage has been decided on.

#### The Foundry Exhibit at Toronto.

Plans for the exhibit of foundry supplies and equipment at the Convention of the American Foundrymen's Association, the Brass Founders' Association, and the Associated Foundry Foremen, have been moving on apace. Many members of the Foundry Supply Association, which is the organization making the exhibit, have already taken space in the exhibit buildings; so rapidly is the space being engaged, in fact, that over 75 per cent. of that in Machinery Hall has already been reserved, and a large amount of space in the Process Building.

The extensive arrangements which have been made for this exhibit necessitates the presence of the Secretary on the ground immediately, in order that he may look after the details of installing the exhibits, etc., hence Mr. Lane has arranged for headquarters in Toronto, and will be there from April 18th until after the Convention.

The Secretary's address will be care of The Toronto Foundry Company, Limited, Toronto, Ontario. Through the courtesy of Mr. L. L. Anthes, manager of the company, and vice-president of the American Foundrymen's Association, it has been possible to secure these advantageous headquarters, which are within five minutes' walk of the exhibit building.

Arrangements have already been made for the installation of a large amount of labor-saving machinery for making and handling molds, for preparing molding sand, and for other work about the foundry, so that this exhibit will certainly be the most complete of its kind that has ever been made.

For the first time in the history of the trade, all branches of the iron and brass foundry will be fully represented in operation, including core ovens, and cupola and brass melting furnaces.

The still exhibits, which will occupy the Process Building, will also be unusually attractive, and many of the firms have plans on foot which will prove beyond question that the Process Building is not asleep, even if it does not make so much noise as its neighbor across the way.

### 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 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, P.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. April 30th, the Quebec Bridge Disaster, by Mr. John Galbraith.

**WINNIPEG 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.

**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. April 24th Mr. H. V. Price, B.A.Sc., "The Oscillograph."

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

### CONTROL THE WATERS OF THE GRAND RIVER.

During the past several years the towns and cities situated on the banks of the Grand River have spent large sums of money to prevent damage by floods when the river overflows, and for the purpose of securing Government aid for the prevention of floods, a large deputation waited on Hon. Mr. Whitney, Hon. Mr. Hanna, and Hon. Dr. Reaume, on April 15th. Among those in the deputation were from Brantford:—C. Cook, president board of trade; J. Ruddy, secretary; T. H. Preston, Mayor Bowiby, Ald. Suddaby, A. G. Olive, F. D. Reville, E. L. Goold, F. Cockshutt, City Engineer Jones, G. Hately.

Paris:—Mayor Patterson, Reeve Jefferson.

Cayuga:—Mr. Kohler, M.P.P.

Fergus:—Dr. Groves.

Preston:—Mr. Henning.

Berlin:—Mr. Breithaupt, C.E., H. Watson.

Galt:—Ex-Mayor Cant, and J. Jaffray.

Mr. T. H. Preston introduced the deputation. The delegation asked that a commission be appointed to decide on a permanent and comprehensive scheme for the prevention of the floods, and for the reforestation of the lands at the head of the Grand River. It was pointed out that the city of Brantford has already spent \$150,000 on dykes. It was stated that the floods on the river are more frequent and violent than formerly, which impairs the value of the water-powers on the river. Notwithstanding the expenditures which many municipalities have made, there is still a sense of insecurity. On account of the immense floods the forests which originally held the river in abeyance have been swept away and it is therefore necessary to preserve the forest. It was decided by the Brantford Board of Trade to represent to the Provincial Government the conditions which prevail on the river and petition the Government to investigate and take steps to prevent the floods.

In reply, Mr. Whitney said:—

"I am very much impressed by what I have heard and at any rate, you can rely upon it that we will look into the matter more carefully, and if a commission should be appointed it would have to be chosen with great care in order to get the greatest possible results out of the investigation, and it will be a commission that will require to spend considerable time and care. It must also investigate in detail whatever questions may arise out of the situation. It would have to be a commission other than the Hydro-Electric Commission, although there would be no objection to one member of it being represented.

"I am very much impressed by what you say and you may rely upon it that we will stir it up among ourselves here and endeavor to come to conclusions that will be worthy of our responsibility."

The aggregate production of copper in Canada in 1907 was about 57,381,746 pounds, an increase of 3 per cent. over 1906.

# 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.

### New Brunswick.

ST. JOHN.—The following resolution was adopted at a meeting of the St. John Board of Trade held recently, Resolved that this Board of Trade urge the Dominion Government that during the session of Parliament legislation be enacted for the construction forthwith by the Dominion Government of a branch railroad affording the shortest direct connection between St. John and the National Trans-continental Railway.

### Ontario.

OTTAWA.—The Grand Trunk Pacific Railway has been granted an extension of two years in which to commence, and five years in which to finish branches from its main line to Montreal, to North Bay, and to Fort William, and the last of these is now being built; also lines to connect the main line with Ottawa, with Orillia, with Hudson Bay, with Regina, with Calgary, with Prince Albert, with Battleford, to Vancouver, to Victoria, to Dawson, to St. John, N.B.

GUELPH.—M. A. Pigott & Company have brought an action against the Guelph and Goderich Railway Company, claiming \$523,574.75 and interest for work done, materials supplied and expenses incurred pursuant to a certain contract.

GUELPH.—Superintendent Oberne and M. A. L. Hertzberger, divisional engineer of the C.P.R., were in the city recently in connection with the negotiations between the city and the company for an overhead bridge at the Eramosa road. The bridge as suggested would cost at least fifty thousand dollars. Of this sum the C.P.R. only promised five thousand dollars, and the proposal was at once dropped, the city deciding to erect a new level bridge.

FORT WILLIAM.—In furtherance of plans for increasing its elevator capacity on the Great Lakes, and to facilitate the handling of through grain shipments from the West, the Grand Trunk Pacific is said to have entrusted Mr. John S. Metcalfe, of Chicago, who is widely known as an engineer and designer of this sort of work, with the preparation of plans for a second elevator, to be situated at Fort William. This particular piece of work had only reached the "projected" stage up till now, but work has been in progress on a similar plant at Tiffin (Midland), on the Georgian Bay, since last spring. These two elevators, which will look after the G.T.P.'s lake grain traffic, one at either end of the water journey, are to have a capacity of 2,000,000 bushels each, and the specifications stipulate that they shall be ready to handle the grain crop of 1909. The estimated cost of the work is \$3,000,000.

### Manitoba.

WINNIPEG.—The Winnipeg, Selkirk and Lake Winnipeg Railway line, which was taken over by the Winnipeg Electric Railway Company, has been converted into an electric line, and the first through electric car made the trip to Selkirk recently. The complete electrical equipment is now in position, and an electrical service will be opened in the near future.

GRETNA.—Work is now well under way on the new Great Northern bridge over the Pembina River just south of this town. The pile work has been completed and the excavations have been made for the concrete foundations, which will rest on piles which have been driven to a depth of thirty-five feet, with only a few feet protruding, which will be buried in the concrete. With the exception of these piles, which will not show when the bridge is completed, the structure will be almost entirely of steel and concrete. Engineer Wallace, who has charge of the job, states that the bridge will not be completed for perhaps eight months.

### Alberta.

EDMONTON.—Construction work is finished on the line for 200 miles west of Saskatoon as far as Battle River. The divisional headquarters have been moved to Edmonton, and will be maintained there this summer.

## LIGHT, HEAT, AND POWER.

### Ontario.

HAMILTON.—The Cataract Power Company have appealed against the award of Judge Snider, who as official arbitrator allowed the city a cut of \$15 a lamp per annum for street lighting. The city was entitled to the saving effected, "owing to new discoveries and advances in the electrical art." It was in connection with this clause that much expert evidence was taken.

TORONTO.—The legal representatives of the various municipalities to whom forms of contract with the Hydro-Electric Commission for the supply of power have been submitted met at the Parliament Buildings. They discussed the form of contract from its legal aspect, and it is anticipated that a number of changes in the phraseology will be submitted. Chief Justice Sir William Meredith will consider the amendments, and where thought desirable suggest their incorporation in the contract.

### British Columbia.

LADYSMITH.—A few weeks will decide whether Ladysmith will have a lighting system or not. At a recent meeting of the city council Secretary Wilson, of the Citizens' League, presented a petition asking the council to introduce a by-law for the purpose of borrowing the necessary money for the installation of an electric light plant. It seems that the League had prepared two forms of petitions, the one favoring private ownership and the other municipal ownership. These petitions had been taken round by three members of the League, and over ten per cent. of the ratepayers had signed them. The signatures disclosed the fact that there is an overwhelming feeling for a municipal plant. Only two persons out of the large number who signed the petitions favored private ownership, and the business men without exception declared for a city owned plant.

## CONTRACTS AWARDED.

### New Brunswick.

WOODSTOCK.—Powers & Brewer have been awarded the contract for the concrete work on the Upper Woodstock C.P.R. bridges.

### Quebec.

MONTREAL.—Nine tenders were received for the 1,450 tons of iron pipe wanted for the new 30-inch water main from Atwater Avenue eastward. Canadian, American, English and Scottish firms were represented in the tenders opened. The lowest tender was that sent in by J. T. Farmer, of Montreal, representing D. W. Stuart, a Scottish firm. The price was \$30.90 a ton. The Stanton Iron Works, of Nottingham, England, offered the iron at \$31; the Richards, Johnston, Clapham & Morris Company, of Manchester, England, at \$31.40; the Canadian Iron Foundry Company, of Montreal and Three Rivers, at \$31.80; the United States Cast Iron Pipe and Foundry Company, of Buffalo, at \$34.10; the Robert McLaren Company, of Scotland, at \$32; the W. McNally Company, of Montreal, at \$34; the Watson Jack Company, of Montreal, representing McFarlan & Strachan, of Glasgow, at \$33.50; the Railway

Spring and Supply Company, of Montreal, at \$31.47. It was decided to award the tenders to the Canadian Iron Foundry Company, of Three Rivers and Montreal, at \$31.80 a ton.

#### Ontario.

HARRISTON.—Mr. Wm. C. Chambers, of Harriston, has been awarded the contract of building seventy-five miles of the Grand Trunk Pacific, in the Lake Nepigon district.

#### Manitoba.

WINNIPEG.—The controllers have recommended that the sewer pipe contract be divided among W. F. Lee, Dunn Bros., Dobson & Jackson, and Bissett & Louckes, each to get the order for that portion of the pipe on which they had the lowest offer. The council voted to accept the recommendation.

## TENDERS.

#### Nova Scotia.

HALIFAX.—Tenders for Annapolis Royal ice piers will be received until Friday, April 24th, 1908, inclusively, for the construction of three ice piers in the Annapolis River at Annapolis Royal, Annapolis county, N.S., according to a plan and specification to be seen at the offices of C. E. W. Dodwell, Esq., resident engineer, Halifax, N.S.; E. G. Millidge, resident engineer, Antigonish, N.S.

#### Ontario.

GUELPH.—Tenders will be received until May 18th, 1908, for high duty pumping engine, water tower and foundation and 3,000 feet cast-iron pipe. Davis & Johnson, Berlin, engineers; J. J. Hackney, manager of Waterworks. (Advertised in the Canadian Engineer.)

OTTAWA.—Tenders will be called for until May 1st, 1908, for 3,974 fathoms of chain with shackles and swivels. F. Gourdeau, Deputy-Minister of Marine, Ottawa.

#### Manitoba.

VIRDEN.—Tenders will be received up to 10th day of May 1908, for the building of such telephone lines and the installation of such telephones as will be required in the telephone system in the rural municipality of Wallace. James F. C. Menlove, Secretary-Treasurer.

#### Saskatchewan.

PRINCE ALBERT.—Tenders will be received until May 1st, 1908, for the extension of water and sewerage works. F. A. Creighton, city engineer. (Advertised in the Canadian Engineer.)

#### British Columbia.

MONCTON.—Tenders for spur line, Surrey, will be received up to and including April 30th, 1908, for the construction of a spur line to ballast pit at Surrey, P.E.I. D. Pottinger, general manager. Railway Office, Moncton, N.B.

VICTORIA.—Tenders for new cruiser for British Columbia will be received up to the first day of May for the construction of a twin-screw steel cruiser for fisheries protection service in British Columbia waters, of the following dimensions, namely: Length over all, 250 feet; breadth of beam moulded, 32 feet, and depth from top of keel plate to top of beams at side, 17 feet, and to be delivered at Victoria, B.C.

## SEWERAGE AND WATERWORKS.

#### Ontario.

ORILLIA.—Orillia will not have a sewer system installed at the present, the ratepayers voting down the by-law to provide the required money. Majorities were given against the by-law in three wards, the total negative majority being 77.

FORT WILLIAM.—It will take another year, according to the city engineer's report, to complete the waterworks system at Lock Lomond.

## PERSONAL.

THE HAYWARD COMPANY have removed from 97 Cedar Street to 50 Church Street, Toronto, Ont.

MR. T. R. FLETT, trainmaster at Moose Jaw, has been appointed district superintendent of the Canadian Pacific at Brandon.

MR. C. B. MEHARG, C.P.R. superintendent at Brandon, has been appointed superintendent of the new district of Saskatoon, Alta.

MR. T. B. CODE, B.A.Sc., of Smith's Falls, has been appointed town engineer of Gananoque. Mr. Code will still keep his Smith's Falls office open.

MR. A. L. FORD, B.A.Sc., Eglinton, Ont., who has received an appointment as resident engineer on the National Transcontinental, has left for Ottawa.

MR. C. P. LEONARD, of the Construction Department, C.P.R., Toronto, has returned from a six weeks' trip to New York, Washington, and the Southern States.

MR. G. A. MOUNTAIN, engineer of the Dominion Railway Commission, called last week upon City Engineer Rust, Toronto, to discuss certain phases of the viaduct scheme.

MR. J. R. HEDDLE, assistant city engineer, Hamilton, has returned from Reading, Pa., where he has been examining a sewage disposal plant such as Hamilton expects to install.

MR. R. W. JONES, divisional engineer of the G.T.P. between Edmonton and Saskatoon intends making Edmonton his headquarters until the G.T.P. line is completed as far as that city.

MR. C. A. E. CARR, formerly manager of the Montreal Park and Island Railway, will become the managing director of the Quebec Gas Company. Mr. Carr for some time has been general manager of the Light, Power and Railway Co., of Helena, Montana.

MR. JAS. D. SCHUYLER, of Los Angeles, Cal., the well-known hydraulic engineer, has achieved the distinction of being the first member of the profession to twice receive one of the principal honors bestowed by the American Society of Civil Engineers. This is the "Thomas Fitch Rowland Prize," given annually to the member or any engineer who contributes the most worthy paper describing in detail accomplished work of construction. Mr. Schuyler, who is the author of a standard work on "Dams," has been advised that he has received the 1907 award for his paper, entitled "Recent Practice in Hydraulic-fill Dam Construction," a contribution to science which has created a stir among engineers throughout the world. He had previously won the prize for his paper, "The Construction of the Sweetwater Dam."

## NEW INCORPORATIONS.

**British Columbia.**—Pacific Motor Works Company, \$50,000; Patterson Eckert Lumber Company, \$20,000; Seymour River Lumber Company, \$500,000; Moyie Telephone and Electric Light Company, \$10,000; Royal City Gas Improvement Company, \$150,000.

**Toronto.**—Canadian Steel Products Company, \$40,000; G. Ruel, G. F. Macdonnell, R. Temple. Granite, Crushed and Dimension, \$40,000; J. H. McKnight, J. Preston, W. E. Douglas. Queen City Motor and Dynamo Company, \$40,000. T. Patterson, Toronto Junction; W. Leslie, H. J. Ingram, Toronto. Big Moose Silver Cobalt Mining Company, \$750,000. F. H. Robinson, C. K. McGregor, W. J. Elliott. Nipissing Reduction Company, \$250,000. J. L. Galloway, J. F. Boland, F. Watts. Big Fissure Mining Company, \$2,000,000. R. W. Eyre, E. E. Wallace, R. J. G. Dow. Pennsylvania Lumber and Mineral Company, \$100,000. J. F. Ancona, T. C. Ancona, C. J. Peters, Reading, Pa.

**Ottawa, Ont.**—Charles Ogilvy, \$150,000. C. Ogilvy, W. McGiffin, J. Anderson. Building Stone and Brick Manu-

facturing Company, \$60,000. A. Tracy, R. A. Nesbitt, M. Tobin.

**St. Catharines, Ont.**—Coniagas Reduction Company, \$250,000. J. J. Mackan, T. Sullivan, H. H. Collier.

**Saskatoon, Sask.**—Burchard Lumber Company, \$100,000. E. E. Heiner, F. H. Stoltze, W. H. Pierce.

**Winnipeg, Man.**—Lighting Systems, \$20,000. D. Lock, A. G. Buckingham, E. M. Levins.

**Quebec Province.**—La Compagnie Hydraulic de Saguenay, \$50,000. D. Maltais, V. N. Tremblay, L. G. Belley, Chicoutimi.

**Midland, Ont.**—Ever-safe Horseshoe Company, \$100,000. D. Broderick, T. A. Richardson, J. Playfair.

**Forest, Ont.**—People's Telephone Company, of Forest, \$20,000. R. F. Scott, W. Lawrie, J. W. Bell.

**Sault Ste. Marie, Ont.**—Strathcona Nickel Mines, \$250,000. B. W. Harris, R. H. Carney, D. I. Millar.

**Parry Sound, Ont.**—E. J. Vincent, Limited, \$30,000. E. J. Vincent, A. N. Fenn, Parry Sound; R. J. Vincent, Forest.

**SETTING A MARKET VALUE ON A WATER-POWER PLANT.**

"The value of such a plant," so says Mr. Charles T. Main, mill engineer of Boston, "varies extremely with different conditions which govern the first cost, and with the character of the work done. The effect of the head, length of dam, length of canal, distance from canal to river, etc., increase or decrease the cost of construction. Very much better work is done in some places than in others, which increases the value and decreases the depreciation, so that no general rule can be given to cover all cases. The plant must be considered not alone, but in connection with the privilege, each being dependent upon the other, and each affecting the value of the other, as described in the earlier part of this paper.

"For the water-wheels themselves, the average life of the wheel is probably about twenty-five years, while the casing might be allowed to outlive two wheels. Iron or steel penstocks, if taken care of, should last probably 100 years, but wooden feeders underground will not last fifty years. Wooden flumes, gates, and racks which are exposed to the weather will last about twenty years. Some wooden dams have lasted a great many years, but they are apt to get washed away in freshets. Stone dams, if properly designed and well built, will last for hundreds of years.

"The market value of the wheels would depend somewhat upon their efficiency, independent of their physical conditions; for it might pay to replace them, if water is expensive, by wheels of higher efficiency. The vertical wheels with bevel gears will not produce as much net horse-power per cubic foot of water as the horizontal wheels; and with the horizontal wheels the extra expense and danger of breakage of gears is avoided."

**MARKET CONDITIONS.**

Toronto, April 23, 1908.

The most that can be said is that enquiries for metals and hardware are more numerous and prices as a rule maintained. As to actual orders, neither in metals nor machinery will they compare with last year at this time, when everybody seemed busy. One firm, however, whose business is confined to Toronto, declare that their orders for structural steel are as numerous as last April. In bricks, cement and lumber the feeling is confident.

Matters in the United States have not "picked up" yet, as expected, and there are reasons, mentioned elsewhere, why they should not. True, the United States Steel Company have managed to maintain their prices for structural steel, but though they can do this they cannot increase demand for their product; and that demand is still undeniably slack.

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.**—Quiet, but inquiries are coming in more freely; we quote 10 to 11 cents.

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

**Beams and Channels.**—Active demand from Toronto builders; prices continue to be \$2.50 to \$2.75, according to size and quantity; angles, 1 1/4 by 3-16 and larger, \$2.55; tees, \$2.80 to \$3 per 100 pounds. Extra for smaller sizes.

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

**Boiler Plates.**—1/4-inch and heavier, \$2.50. Supply probably adequate and quotations still firm.

**Boiler Tubes.**—Lap-welded steel, 1 1/4-in., 10c.; 1 1/2-in., 9c. per foot; 2-in., \$9.10; 2 1/4-in., \$10.85; 2 1/2-in., \$12; 3-in., \$13.50; 3 1/2-in., \$16.75; 4-in., \$21 per 100 ft.

**Building Paper.**—Plain, 32c. per roll; tarred, 40c. per roll. Demand up to average for the season.

**Bricks.**—Common structural, \$9 to \$10 per thousand, wholesale; small lots, \$12; there is a good demand. Red and buff pressed are worth \$18 at works.

**Cement.**—Price of Canadian makes to the dealer in 1,000 barrel lots and up is \$1.75, in cotton bags, on car, Toronto. The dealers' price to the contractor up to car-load lots without package price, are general at \$1.80 per barrel in cotton bags and \$2 in wood, weight in each case 350 pounds. Most builders are booked for year's supply. Prices steady.

**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. In moderate request.

**Fire Bricks.**—English and Scotch, \$32.50 to \$35; American, \$25 to \$35 per 1,000. Demand, moderate.

**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 30, \$4.70 per 100 pounds. Stocks very low.

**Ingot Copper.**—The expected advance did not come; matters are much as before. Local price continues at 14 to 14 1/2c.

**Iron Pipe.**—Black, 1/4-inch, \$2; 3/8-inch, \$2.25; 1/2-inch, \$2.72; 3/4-inch, \$3.68; 1-inch, \$5.28; 1 1/4-inch, \$7.20; 1 1/2-inch, \$8.64; 2-inch, \$11.50; 2 1/2-inch, \$18.40; 3-inch, \$24.15; 3 1/2-inch, \$30.40; 4-inch, \$34.55; 4 1/2-inch, \$38; 5-inch, \$43.50; 6-inch, \$56. Galvanized, 1/4-inch, \$2.85; 3/8-inch, \$3.05; 1/2-inch, \$3.57; 3/4-inch, \$4.83; 1-inch, \$6.93; 1 1/4-inch, \$9.45; 1 1/2-inch, \$11.34; 2-inch, \$15.12.

**Lead.**—Holding its own at \$4.25. Easier in England.

**Lime.**—In plentiful supply no very active 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.**—The following are quotations for lumber suitable for making forms for concrete, per 1,000 feet f.o.b., shipping points; hemlock, 2-inch plank, \$16; 2 x 4 scantling, \$12; spruce, good mill culls, 2-inch, \$14. For dressing one or two sides the prices will be about \$1.25 in advance of quoted prices, and for dressing and matching about \$1.75.

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

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

**Pig Iron.**—More pig is selling; Summerlee quotes: No. 1, \$25.50; No. 3, in car load lots, \$22 to \$23 here; Glengarnock, \$25.50; Clarence, \$20; No. 1 Cleveland, \$20 to \$22; Old Country market firm.

**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; 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 abroad, but higher on the whole; price here 33 to 34c.

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Montreal, April 22nd, 1908.

The pig iron markets of the world have been exceedingly dull during the past few weeks, and the Easter season seemed to put a stop to even the little that was going on. In the United States and in England and Scotland there is a feeling of hesitation which is not any too reassuring to those who are interested in the maintainance of prices. For the most part, however, makers are maintaining prices, although the demand at quoted figures is not very encouraging. It is doubtful, however, if it would be any better were quotations to be reduced, and it is probably this suspicion, as much as anything else, which supports the market. It is considered by a good many that if a buyer were to make an offer for good round lots at something less than prices generally quoted he might succeed in getting the goods.

In the local market, interest is increasing as the opening of navigation approaches. Already a dozen ships have cleared for the port of Montreal, and among the cargoes carried by these is a very considerable quantity of iron. Practically everything included in the early arrivals has been sold for prompt delivery, and will be forwarded as quickly as possible to its destination.

The situation in finished and partly finished material is not particularly encouraging. There has been an increase of demand, lately, but trade is slow as compared with a year ago, and all the elements of confidence are wanting. The market, however, remains very steady, hardly a change having taken place in prices since a week ago.

**Antimony.**—The market holds steady and sales are being made at 9½ to 10c. per lb.

**Bar Iron and Steel.**—Prices continue unchanged and business is not very active. Bar iron, \$1.90 per 100 lbs.; best refined horseshoe iron, \$2.15; forged iron, \$2.05; mild steel, \$2.00; sleigh shoe steel, \$2.05 for 1 x ¾-base; tire steel, \$2.05 for 1 x ¾-base; toe calk steel, \$2.50; machine steel, iron finish, \$2.15.

**Boiler Tubes.**—The market holds steady, demand being fair, prices are as follows:—2-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, \$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.

**Iron.**—Prices for delivery after the opening of St. Lawrence navigation are approximately as follows: No. 1 Sum-

merlee, on cars, Montreal, \$20.50 to \$21 per ton; No. 2 selected Summerlee, \$20 to \$20.50; No. 3, soft, \$19.50 to \$20; Cleveland, \$18.50, and No. 3 Clarence, \$18; No. 1 Carron, \$22 to \$22.50; Carron special, \$20.25 to \$20.75; Carron, soft, \$20 to \$20.50. Stocks on spot are light. Clarence No. 1 is quoted at \$20.50 to \$21; Clarence No. 3 at \$19 to \$19.50; Carron No. 1 at \$24.50 to \$25, and Carron, soft, at \$22.50 to \$23, cars, Montreal.

**Lead.**—Trail lead is unchanged, at \$3.90 to \$4.00 per 100 lbs., ex-store.

**Nails.**—Demand for nails is moderate, but prices are steady at \$2.30 per keg for cut, and \$2.25 for wire, base prices.

**Pipe—Cast Iron.**—Trade dull and prices 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 dull. 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 in fair 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.**—Prices are steady at the list, less 25 per cent. Demand is on the dull side.

**Steel Plates.**—Demand is good, and the market steady. Quotations are: \$2.55 for 3-16, \$2.40 for ¼, and \$2.30 for ⅜ and thicker, in smaller 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 is steady at 33½ to 34c. 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.**—The market is unchanged, at 5¼ to 5½c. per pound.

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Winnipeg, April 21, 1908.

The opening up of spring, and the general bright appearance on the outlook for building, has caused a considerable activity in contractors' supplies. Building material is in good demand, as also heavy hardware for railroad camps, and cement agents report an excellent demand for their goods. The lumber companies throughout the country are experiencing some difficulty in filling orders, as they expected little or no business until the summer. Bricks and cement blocks are being enquired for from many headquarters. Pig-iron is in active demand, and owing to a large amount of

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