

PAGES

MISSING

The Canadian Engineer

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The Canadian Engineer

ESTABLISHED 1893

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TORONTO, CANADA, JUNE 26th, 1908.

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INSPECTING.

No one will question the necessity of good design. Safe and reliable construction is expected. But design and construction are both apt to receive severe tests unless the inspection be careful, thorough and sane. Good design will suffer unless there be good construction, but too often good construction fails because of indifferent and careless inspection.

We do not mean to infer that all contractors and manufacturers try to scrimp their work, that they all require watching—we know different. But we also know that you cannot trust "all the people all the time"; hence the necessity for inspectors. Some inspectors help the work, some hinder, and the engineer who has the

appointment of such officials should be just as careful in the selection of these men as in his choice of assistant engineers.

An inspector should be a man of experience, not some youth who knows neither what is to be done nor how to do it. Far too many engineers send out young inspectors, who interfere where interference does harm, antagonize the contractor, and tempt him to resort to sharp practices. An inexperienced man will require of the builder refinements of work and material that are not necessary, and because not necessary, not wise. A good inspector will help, not hinder the contractor. He will be an inspector, not a detective—a man with knowledge of the matter in hand, so that he can tell right from wrong, good from bad; a man with the courage and the ability to enforce good workmanship and secure good material; a man who will never act as though he expected to be placed on two pay rolls.

There are two systems of inspection now in vogue: one, the appointment of an official paid by the purchaser or constructor, responsible to his superior for employment and advancement. Naturally, he grows to look upon the contractor or manufacturer as his great enemy. In the other case the inspection is carried on by inspection companies, who secure future business because of satisfactory service rendered in the past. This should be the more satisfactory system. The inspector is not the employee of either parties to the contract. He should feel free to give a "square deal." More than that, he should be an experienced man. Inspection companies pose as a body of experts, and experts they should be. But as in many other things it is not a matter of systems, but of men. A good man working under a poor system may bring good results. and a good system of inspection will come to grief the moment it attempts to serve two masters.

And while on this subject allow us to say that we believe a few engineers are making a serious mistake in not being more careful of inspection. They design well, and then turn the plans over to the contractor or owner. The work is completed. In a short time failure is in evidence, and the design is condemned when the disaster should have been laid at the door of the erector. Engineers will show great wisdom by insisting on thorough and competent inspection.

EDITORIAL NOTES.

It is stated that the Canadian Government is about to enforce the Dumping Clause on steel sheets of a less thickness than 14 gauge, the mill company at Morrisburg having informed the authorities that they are now making these thinner sheets. But we are told that the Morrisburg mill is making only small sheets, and cannot produce the larger ones which form so great a proportion of the requirements of commerce and still have to be imported. A very natural question comes up, whether for the sake of protecting the producer of a comparatively small article it is equitable to impose a heavy duty upon goods not made in Canada. And the larger sizes of steel sheets thinner than 1 gauge are not produced here, as we are informed. There is room for both importer and consumer to complain if the Dumping Clause is set in motion on inadequate grounds.

THE QUESTION OF BOND.

By H. F. Porter, C.E.

There are examples almost without number, in all parts of the globe, of the successful and satisfactory adaptation of plain steel bars to the problems of the reinforced concrete constructor. In Europe, where this construction has reached its highest development, fully 90 per cent. of the installations have been with plain bars, and mostly plain round bars. These facts speak for themselves.

There are likewise many examples of the use of the so-called deformed bars, or bars of special section, designed to enhance the effectiveness of the mechanical bond or interlock between the concrete and the steel. Especially in the United States has this type of reinforcing met with extensive use. Wide and systematic advertising undoubtedly has played a large part in this popularity.

Plain bars, used scientifically, are a positive success—this fact stands on rock.

Deformed bars, used scientifically, are equally a success. There is certainly no disadvantage in having the unevennesses in the steel exaggerated in order to make a greater mechanical bond.

Plain bars are generally easiest to obtain, the simplest and cheapest to handle, and can be bought in open market anywhere for the lowest price per pound. They amount to a staple commodity.

Deformed bars are "legion," and each one is supposedly superior to all the rest. The prospective user, provided he decides to employ a patent section, is confronted at the outset with the problem, "Well, which one?" Besides, no matter the type selected, the market is a closed one and more or less limited, entailing added trouble, delayed deliveries and more expense. Being of special section, and patented, the initial cost always exceeds that of plain bars, from \$5 to \$25 a ton, and in the field because of the unevennesses the bars are more awkward to handle, thus further increasing the cost. Patented bars are a "fancy" commodity.

Plain bars are never advertised, or rather their merits set forth in the advertising columns of the trade journals—no more than flour.

Patented bars are widely advertised, and peculiar emphasis laid upon their salient supposed points of advantage. This is legitimate, but to hold up any one type as the only one and imply that to use any other is "risky," and to use a plain bar "fatal," is illegitimate. No one patented bar is a "cure-all," and all others dangerous. Engineers may be fooled once, but they will not be fooled the second time. Let the honest facts stand forth.

This much is obvious—the use of deformed bars will continue to increase, whether merited or otherwise, and will gradually undermine the popularity of plain bars unless plain-bar advocates stand firmly by and the mills loosen up and advertise as well. Certainly, engineering journals, as reflectors of human opinions, cannot be expected to forever continue to give space to the exposition of the merits of plain bars when their advertising columns abound with copy relative to patented bars and nary a line relative to plain bars.

Both kinds of bars have their province, no doubt, for everything has its own peculiar field. In the writer's experience in reinforced concrete, as applied to building construction, the best results and cheapest have followed the use of plain round bars. As to the reputed inefficiency of the bond of plain steel, which is the bone of contention always, if the reinforcing is done scientifically, with proper regard for the stresses that ensue due to the monolithic nature of the construction, the reliance on mere bond becomes a minor consideration. Let the steel be placed in the moulds so as to approximate the catenary curve as closely as practicable; then it is at all

times in position to assume all tensile strains; and further, let an absolute tie be provided across the support by lapping, splicing, or anchoring one span against another; then the matter of bond becomes a minor issue, for the concrete is relieved of all differential strains, acting only in compression, compelling the otherwise loose and flexible steel to definite lines of action, lending general stiffness to the construction, and furnishing a rigid, durable, indestructible floor. Engineers are coming to see that this is the natural way to treat the mechanics of reinforced concrete.

If deformed bars are employed, they should be held to the same requirements as plain bars, and no preference given or concession made in manner of placing. Too often have designers fallen into the error of assigning unwarranted value to the efficiency or application of a nicked section, to the extent of eliminating all, or nearly all, vertical stringers and neglecting to truss up the bars near the supports where the shear attains a maximum, and develop them over the supports. No amount of exaggeration of the surface of the bars can compensate for these omissions, and this fact is attested by the statistics of failures, that by far the larger number have been patented-bar installations. Experience has taught many that little or no real reliance should be placed on concrete in tension; hence all tensile stresses, horizontal, diagonal and vertical, should be provided for with steel. The catenary curve, or a modification thereof, seems best to fulfil the conditions. And plain bars are as effective this way as deformed.

Vertical stirrups should never be dispensed with in beams or girders. In a sense they do amount to deformations on the plain bars, preventing slippage, but they do far more. They serve the triple purpose of (1) tying support and flange of beams together, offsetting horizontal separation at the junction of slot and soffit, and aiding to develop Tee-action; (2) they take vertical tension, and by resolving the internal action into a sort of Howe-truss arrangement, heighten the efficiency of the horizontal steel; (3) they afford a convenient and economical means if bent over to rest on the slab centres, thus forming a true stirrup, of supporting the steel, both in the soffit below and in the slot above, in proper relative position during the operation of concreting. Besides, in deep beams especially it would seem wise practice to use stirrups liberally on the principle that concrete should be well tied together in every direction. Many designers make it a practice to space stirrups continuously throughout the beam at a maximum spacing not to exceed the distance centre of compression to centre of tension, and closer progressively towards the supports—and some building codes, notably the new Philadelphia code, expressly requires this.

The deformed bar is, perhaps, better adapted where the embedment is short compared with the diameter of the bar, as in small footings or stubby beams. Many experienced engineers prefer deformed bars for hydraulic work, on the ground that infiltration of water would in time destroy the bond. While the writer has never personally witnessed a failure of bond due to this cause, he has heard of instances of failure of bond where this was assigned as the cause; however, it would seem that if sufficient moisture could penetrate to destroy the bond, it would also in time destroy the steel by oxidation, in which case bars, not only effectively anchored by mechanical deformations, but protected from corrosion by suitable paint, would seem to be called for. More facts on this point would be of great value to the engineering world.

The Victor Preservative Co. have opened a Toronto office in the Peterkin Building, Bay Street. Their product is a metal preservative, water purifier and a scale remover. The "Victor" is a liquid, and easy to handle, and the manufacturers are willing to submit to a sixty-day test.

AS SEEN BY OTHERS

A National Board of Health.

Municipal Engineer.—The necessity for broader and more comprehensive views of sanitation is being realized more strongly and generally each year. It is now realized that no villages are so small or cities so large as to be independent the one of the other in sanitary matters. . . . The general government, through a competent health department, should collect such data, disseminate such educational information as is needed, and advise the necessary legislation. The formation of such a health department or bureau is urged more and more strongly upon successive Congresses, and will in all probability become a reality ere long. A "Committee of One Hundred" eminent citizens of the United States, which has now far outgrown that number, is striving intelligently and persistently toward this end, and deserves the support of all who realize the urgent desirability of a national health board.

The Stranger Within Our Gate.

The Monetary Times.—Canada has been labelled a country wherein a man may be given a fresh start in life; which is good so far as it goes. But there are thousands of men, largely of the class handled by the charitable agencies, who would never do well in whatever land they were placed, with whatever opportunities blessed. Ambitionless, they are irreparably divorced from labour. Their heads may be raised above the waters of careless indifference by the hand of philanthropy, but they sink again. . . . It is unfair to shift the social problems of an old country upon the shoulders of a new. Canada welcomes any flesh that is adaptable. No lady can witness with equanimity her house sheltering the undesirable. Neither can the Lady of Sunshine and Snows. The Dominion Government must force its wise policy of selection whatever storms of protest be raised by a handful of idealists. These protestations are sentimental; they last a day. The harm wrought by a lax supervision of immigration is real; it multiplies with the years.

Industrial Education.

The Toronto Star.—The time is ripe for the Dominion Government to appoint a commission to inquire into the matter of industrial education. The country has entered upon an era of industrial development. It has magnificent industrial resources, including mines, forests, and water powers. In industrial education it lags behind the rest of the world. This is disadvantageous in many ways. It hinders the industrial progress of the country. It is a source of anxiety and discouragement to manufacturers. It tends to keep the mechanics of Canada in subordinate positions and to prevent them and their sons from rising in their callings. Two-thirds of the best positions in Canadian factories to-day are held by men who have been trained outside of Canada. The urgent need for industrial training is further shown by the fact that in Montreal and its vicinity the sum of \$100,000 is sent to Pittsburgh for correspondence courses of industrial education.

The Far North.

Victoria Colonist.—We will all shortly be writing "Churchill, Manitoba" as a result of that important harbor on Hudson Bay becoming a part of the province mentioned, as provided for in the measure for the extension of the boundaries of Manitoba, which will soon be presented to Parliament. And it imposes no strain on the imagination to understand that the possession of Churchill will ultimately add materially to the prestige of one of the chief provinces of the Dominion, already famed as "The Granary of the Empire."

Preserve the Forest.

The Montreal Star.—Our forest, in a word, should be regarded as a permanent storehouse of wealth, to be replaced

as rapidly as it is drawn upon. We should treat it as a bank account, and not as a spendthrift's heritage. It should be conserved; and, if this forces up the price of wood products on the Continent, so much the better for the nation which possesses a practical monopoly of the supply. The forest reserves of Quebec ought to pay our provincial taxes for us without drawing a cent of capital. That is, the revenue from the annual rental of our limits should do this. We have been permitting ourselves to be plundered in the past; and it is high time to call a halt.

Engineering a Profession.

Power.—If the engineer really believes that he is more than a manual worker, it is up to him to make good his claim when he is given an opportunity. If his means of livelihood require the exercise of brains rather than manual skill, he is entitled to be styled a professional to the same extent that any other brain worker is. But if it is shown that in the vast majority of instances he is simply a skilled manual worker, or a good foreman in charge of other workers and mechanical appliances, his claim to professional titles falls with the usual dull thud. Just what an engineer makes of himself he will be. He can by his attainments elevate his vocation to the dignity of a profession, if he will; or he can sink it below the level it occupied in the beginning, when an engineer was regarded as one of the necessary and attendant expenses of a steam plant, which must be kept as low as possible. Men are honored by other men for what they are rather than for what they do.

Obstruction.

The Canadian Mining Journal.—It is a sad fact that the only lethal weapon in the possession of His Majesty's loyal Opposition at Ottawa is that double-bladed axe obstruction. By the exercise of certain prerogatives all votes of supplies can be blocked. And at present they are being blocked.

Whether this is "good" politics, "bad" politics, heroism, or original sin, we stay not to inquire. But we linger to notice that the work of the Geological Survey has suffered delay already and may be altogether hindered if the deadlock is continued.

Hence we most respectfully (but insistently) submit that the interests of the mining industry (an industry peculiarly susceptible to chills, fevers, and vapours) must not be sacrificed even for the good of a fighting Opposition.

All of which emphasizes strongly the fact that important branches of the public service, especially the two branches of the Department of Mines, should be removed entirely from the zone of political disturbance.

Independence in Journalism.

The Railway Review.—Because journals devoted to railway interests have always advocated what they believe to be the rights of railway companies, and have withstood the attacks of demagogues and the unjust complaints of shippers, many readers have come to look upon these papers as standing by and upholding all practices of all railway men. That this opinion is unjust would clearly appear from an examination of the editorial pages of the Review for the past twenty-five years or more. A "lick-spittle" is beneath contempt. So is any periodical which professes to be devoted to expression of opinion, but allows its opinions to be warped by their effect on advertising or subscription patronage. There is nothing more certain than that a newspaper, technical or otherwise, which has no independence in thought and action cannot command the respect of others, nor any real self-respect. It should speak the right as it sees it, and should take good care what kind of spectacles it looks through, so that its vision be not warped or dimmed. Men may feel hurt and may protest; but they will read it and respect it and gradually come around to its point of view.

Government Railways.

Hamilton Herald.—What is being done by almost all the governments of Europe should not be beyond the ability of a Canadian government. In almost all European countries the railways, the telegraphs and the telephones are owned by the state and operated solely with regard to the public welfare.

In Britain the telegraph system has long been a state institution operated (sometimes at a loss) for the convenience of the public. In three years the telephone system will also be owned as well as operated by the Government. And now a movement has been started in England for the nationalization of the railways. This will be a gigantic undertaking, but it is sure to be carried into effect, for the practical wisdom of the British people will make them realize the advantages of it.

ORDER OF THE RAILWAY COMMISSIONERS OF CANADA.

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

- 4823—June 9—Authorizing the W. E. & Lake Shore Rapid Railway Company to operate its trains across the tracks of the M.C.R.R. at Erie Avenue, Leamington, Ont., without being brought to a stop, provided always that the said trains shall be under full control and prepared to come to a stop.
- 4824—June 9—Authorizing the Malahide & Bayham Tel. Co-operative Association, Limited, to erect, place and maintain its wires across the track of the C.P.R. about one mile north of Eden, Township of Bayham, County of Elgin, Ont.
- 4825—June 9—Authorizing the Saraguay Electric Light & Power Company to erect, place and maintain its wires across the track and roadbed of the C.P.R. at Prud'homme Avenue and Cote St. Luc Road, in municipality of Notre Dame de Grace, County of Hochelaga, P.Q.
- 4826—June 9—Authorizing the Falkirk Telephone Association to erect, place and maintain its aerial wires across the track of the G.T.R. at the 2nd and 4th Concession Roads, Township of McGillivray, County of Middlesex, Ontario.
- 4827—June 3—Dismissing application of the C.N.R. for Order amending Order of the Board No. 558, dated July 18th, 1905, approving and sanctioning location of the C.P.R. Company's Wolseley-Reston branch.
- 4828—May 14—Authorizing the town of Notre Dame de Grace to construct a concrete arched culvert or sewer under the track of the G.T.R. near the village of Turcot, P.Q.
- 4829—May 26—Authorizing the C.P.R. to cross the road allowance between Lots 10 and 11, Concession 8, Township of Vaughan, County of York, Ont., by means of a subway.
- 4830—May 19—Dismissing complaint of Messrs. McColl Bros. & Company, Toronto, against the form of release of responsibility No. 258, which the C.P.R. required them to sign with respect to shipment from Toronto to Mohawk.
- 4831—May 13—Approving memorandum of agreement entered into by the Bell Telephone Company with the Windsor Hotel Company, Montreal, P.Q.
- 4832—June 3—Extending until the 15th of June, 1908, the time within which the C.N.Q. Ry. is to complete interlocking plant directed to be provided in Order of Board of 8th February, 1907, which was extended for a period of sixty days from November 30th, 1907, and further extended until 1st of May, 1908; also to use, for construction purposes only, the crossing of its track with the track of the C.P.R. in parish of Deschambault, County of Portneuf, P.Q.
- 4833—June 3—Authorizing the G.T.P. Ry. to operate its trains over the crossing where its line crosses the line of the C.P.R. Company's main line, Parish Lot 58, Portage la Prairie, district of Portage la Prairie, Man., without being brought to a stop.
- 4834—June 3—Authorizing the C.N.R. to operate its trains over the crossing where its line crosses the track of the C.P.R. at Headingly, Man., without being brought to a stop.
- 4835—June 3—Authorizing the C.P.R. Company to construct spur to and into the premises of the Dominion Car & Foundry Company, parish of Montreal, county of Hochelaga, P. Q.
- 4836—June 3—Authorizing the Alberta Railway & Irrigation Company to construct a branch line of railway in Section 6, Township 9, R. 21, west of 4th meridian and running in a north-eastern direction to a point in Section 19, Township 9, R. 21, west of 4th meridian a distance of 13,700 feet, in Province of Alberta.
- 4837—May 14—Authorizing the G.T.P.R. to cross the track of the C.P.R. (Pheasant Hill's branch) in Section 27, Township 29, R. 22, west of 2nd meridian, Province of Saskatchewan.
- 4838—June 3—Dismissing application of municipality of town of Bowmanville for Order directing the G.T.R. to provide better protection where its line of railway crosses highway directly east of G.T.R. station.
- 4839—June 2—Amending Section 7 of Order of the Board of June 16th, 1904, in re derails at crossing of the Peterboro' Radial Railway and G.T.R. at Lock Street, Peterboro', Ont., by striking out the words "one hundred" in line three and substituting in lieu thereof the words "seventy-five" as the distance of the derails at the crossing.
- 4840—June 9—Authorizing the corporation of the city of Guelph, Ontario, to lay and maintain a twelve-inch water main under the track of the G.T.R. where the same crosses Metcalfe Street.
- 4841—June 16—Authorizing the C.P.R. to construct a spur to the premises of the Patrick Lumber Company, West Kootenay, B.C.
- 4842—June 3—Authorizing the G.T.P.R. to operate its trains over the crossing where its line of railway crosses the C.N.R. (Arizona branch), Parish Lot 58, Portage la Prairie, district of Portage la Prairie, Man.
- 4843—May 19—Amending Orders of the Railway Committee of the Privy Council, dated November 22nd, 1892, and 10th May, 1893, in re protection at crossing of Toronto Suburban Ry, G.T.R. and C.P.R., near St. Clair Avenue, Toronto Junction, and directing parties thereto to contribute towards maintenance and protection of the crossings.
- 4844—April 24—Authorizing the G.T.R. to construct spur to and into the premises of the Berlin Machine Works, Limited, Hamilton, Ont.
- 4845—June 11—Granting leave to the town of Niagara, Ont., to erect, place and maintain its electric light wires across the track of the M.C.R.R. at a point near the town where a sidetrack leaves the main line and runs into Paradise Grove.
- 4846—June 11—Authorizing the Vancouver, Victoria & Eastern Railway and Navigation Company to construct its railway across public highways through Huntingdon Township, B.C.
- 4847—June 2—Authorizing the C.P.R. to construct certain branch lines of spurs to the Consumers' Cordage Company. Messrs. Shearer, Brown & Wills, the Sherwin-William Paint Company in the city of Montreal, P.Q.
- 4848—June 2—Authorizing the C.P.R. to construct spurs to and into the premises of the Canada Sugar Refining Company, Montreal, P.Q.
- 4849—June 2—Authorizing the C.P.R. to construct spurs across certain streets in the city of Montreal, P.Q., to the premises of the Canada Sugar Refining Company.

For violating the eight-hour law the Chicago, Milwaukee and St. Paul Railroad Co. must pay to the State a fine of \$1,000 and \$50 additional costs, according to the judgment entered by Judge Warren on motion of Attorney-General Gilbert. The action, which is made a test case by the railroad, involves the working overtime of a telegrapher at a way station. The case will now be appealed to the State Supreme Court.

Some five years ago there were in Canada 169 irrigation ditches, having a total length of 469 miles and capable of irrigating some 614,000 acres. At the present time there are 272 irrigation schemes, with a total length of 922.92 miles, and capable of irrigating 3,033,009 acres. Of this number Alberta has 167 ditches, with a total length of 748.58 miles, capable of irrigating 2,998,321 acres; Saskatchewan has 105 ditches, with a total length of 174.34 miles, capable of irrigating 34,688 acres.

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.]

"MODERN HIGH BUILDINGS."

Sir,—My attention has been called to an interesting article, under the above title, in your issue of April 3rd. As it embodies and tends to perpetuate a common misconception as to the origin of the "skeleton construction", I trust you will allow me to correct it in the interest of historical accuracy.

My charming old friend, the late W. L. B. Jenney, of Chicago, lived and died in the belief that he was the author of the construction, which, from having been employed by him in the building of the Home Fire Insurance Company in that city, came commonly to be known as the "Chicago construction." I have heard him tell the circumstances which led his clients to believe that their building investment would prove unprofitable or at least unsatisfactory, if the whole weight of the building and its contents were to be imposed on the walls and these made as thick as that function required. Necessity, the mother of invention, called upon him to provide some device by which the walls could be relieved of some part of their burden, and accordingly attenuated. And this he did by introduction of a "cage" of metal within the outer walls of a metallic framework, which should leave the outer walls nothing but themselves to bear. This was a novelty, although it said that a device essentially similar had already been employed in the interior construction of the Produce Exchange in New York. Another novelty which Mr. Jenney claimed for this building was that it offered the first instance of the employment of structural steel in architectural work. This was by no means extensive or systematic enough to make the building an example of "steel construction," but was confined, if I mistake not, to one or two specimen members, contributed by the Carnegie works as a trophy of the success of the Bessemer process in cheapening the material and an indication that it would soon be commercially available for building.

However, this may be, the Chicago building is not an example of the "skeleton construction" but only of the "cage construction." The skeleton construction was also the offspring of "necessity." April 17th, 1888, Mr. Bradford Lee Gilbert, of New York, filed plans in the building department of that city, for a building at No. 50 Broadway, of eleven storeys, or 129 feet high, on a plot at the Broadway end, of 108 feet by 21 feet 6 inches. If the walls had been made self-supporting in brick-work of the thickness required by the building law, the front building on Broadway would have been reduced to a mere passageway to the wider building in the rear. Accordingly the architect devised a framework of metal, to carry not only the floors and their loads, as in the "cage" construction, but to supersede the side walls, which became mere panels in metallic frames, according to the system with which everybody is now familiar. The scheme rather horrified the board of examiners to which it was submitted, and it was only after much dubitation and discussion that it was approved, and the building erected with the habitable offices on every floor, which under the system of construction before prevailing would have been impossible.

The unprecedented structure, known from the first as the "Tower Building," was, of course, much more than a nine days' wonder to architects and engineers in New York, and it did not long remain unique. But it still stands as the pioneer, and bears on its narrow front a bronze tablet

with this inscription, which is believed to be unimpeachably accurate, and which seems to tell the whole story:—

"This tablet, placed in 1899 by the Society of Architectural Iron Manufacturers of New York, commemorates the erection during 1888-9 in this, the Tower Building, of the earliest example of the Skeleton Construction in which the entire weight of the walls and floors is borne and transmitted to the foundations by a framework of metallic posts and beams. Originated and designed by Bradford Lee Gilbert, architect, Jackson Architectural Iron Works, contractors for the steel and iron work." Very respectfully

(Signed) Montgomery Schuyler.

New York, June 2, 1908.

ADJUSTMENT OF TRANSIT.

Sir,—On examining a new transit I find that the "Line of Collimation" is not in the centre of the telescope field, and that the cross hairs do not seem to be on the object when the telescope is out of focus. Is this fault of any real consequence? Yours truly,

N. D. O.

Footes Bay, June 12th, 1908.

GOOD SHOP PRACTICE.

Sir,—Being interested in the manufacture and use of small boilers, we are desirous of obtaining some information from other manufacturers, users, and interested parties, as to whether it is considered good shop practice to punch the tube holes in the boiler heads. Is the punched hole considered satisfactory in small vertical boilers, up to say 50 horse-power?

Any information on this subject will be gratefully received by

Enquirer.

Montreal, June 16th, 1908.

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, 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.

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. Meet-

ing every Thursday evening during the fall and winter months.

CANADIAN ELECTRICAL ASSOCIATION.—President, N. W. Ryerson, Niagara Falls; 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, J. H. Winfield; 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.

CANADIAN ELECTRICAL ASSOCIATION.

The Eighteenth Annual Convention of the Canadian Electrical Association was held in the Chemistry and Mining Building of Toronto University on June 17th, 18th and 19th.

Delegates from all parts of Canada were present and papers of interest to electrical engineers read and discussed. In connection with the Convention there was an exhibition of new and unusual electrical equipment and fixtures.

The Secretary-Treasurer, Mr. T. S. Young, in his annual report referred to matters of legislation. A deputation had waited on the Dominion Government on February 12th, 1908,



Mr. W. N. Ryerson.

and in consequence the registration fee for inspecting gas and electric meters had been abolished, effecting a saving of \$6,000 to the lighting companies.

It was also pointed out in his report that no carbons had been manufactured in Canada for a number of years, and suggested that the Association make an effort to have the present duty of 35 per cent. either abolished or greatly reduced.

The imports of carbons into Canada being about \$40,000, this claims, constitutes an unnecessary and unjust tax of \$14,000 on the lighting companies.

The officers for the ensuing year are: President, W. N. Ryerson, general superintendent Ontario Power Company, Niagara Falls, Ont.; First Vice-President, R. M. Wilson, Montreal; Second Vice-President, P. S. Coate, Chatham; Secretary-Treasurer, Mr. T. S. Young, Toronto. Managing Committee—Messrs. R. G. Black, Toronto; A. A. Dion, Ottawa; B. F. Reesor, Lindsay; Charles B. Hunt, London; J. J. Wright, Toronto; W. Williams, Sarnia; H. O. Fisk, Peter-

boro'; J. W. Purcell, Walkerville; W. A. Pearson, Niagara Falls; R. S. Kelsch, Montreal.

Mr. W. N. Ryerson, the president-elect, is a native of New York City, being born there in 1874. He received his education as an engineer in the School of Mines of the Columbia University, graduating with the degree of Electrical Engineer in 1896. Mr. Ryerson was connected for short periods with the Sprague Electric Elevator Company; the Western Electric Company; and was then appointed assistant to the chief engineer of the Waldorf-Astoria Hotel, during the erection of the isolated plant. He was then for three years employed by the Metropolitan Street Railway Company, New York, in the construction and operating department and left that company to accept the position of chief operator to the Manhattan Railway Company, New York City, and was for three years superintendent of the sub-stations for this company and later for the Interborough Rapid Transit Company, having the entire supervision of all of the designing, the construction and operating of the 16 sub-stations throughout New York City for the operation of both the Manhattan elevated system and the New York subway. Since April 1st, 1905, he has held the position of superintendent of the Ontario Power Company of Niagara Falls, in charge of construction, operating and local business management. Mr. Ryerson is an Associate Member of the American Institute of Electrical Engineers; a Member of the American Society of Mechanical Engineers, and a Member of the Canadian Society of Civil Engineers.

One of the most interesting demonstrations was that in charge of Mr. Saul Dushman, of Toronto University. This exhibit consisted of an electric furnace in full operation. Several times during the Convention the furnace was tapped and a small pig of iron secured.

Although great interest has been aroused in hydro-electric matters there has been practically no data, hitherto, as to the most economical design and construction of such plants. Water-wheel builders have described their water-wheels and electrical manufacturers their electrical apparatus, but of the conditions necessary for their successful operation as one unit little or no information has been available. Allis-Chalmers-Bullock, Limited, however, are now in a position to supply this want. They are the only company in Canada who build both turbines and electrical machinery and distributed among the members of the Canadian Electrical Association a bulletin illustrating, among their plants either in operation or under construction those of the New Liskeard Light, Heat and Power Company, at Chester Falls, Ont.; the Mond Nickel Company at Wabageschik Chute, Vermillion River, Ont.; the Montreal Light, Heat and Power Company at Soulanges, Que.; and the Quebec Railway Light and Power Company on the Montmorency River, Que.

Mr. J. F. B. Vandeleur, of Dineen Building, Toronto, had an extensive exhibit of English-made meggers, volt and ammeters, switch-gear and motor starting panels, insulated wires and cables, air compressors, etc. Mr. Vandeleur has just returned from Great Britain, where he has made arrangements for handling the Canadian business of several large British firms.

Another agency that had a large exhibit was the Joyner-Greene Company, of the Stair Building, Toronto, who had an exhibit of transformers, sign fashers, controllers, time switches, etc.

The Canadian General Electric Company had an extensive exhibit, demonstrating the different heating and lighting devices that use electricity. One purpose of this exhibit appeared to be to illustrate how the sale of electric energy might be developed at those hours when the general load was least.

The Canadian Westinghouse Company had an interesting exhibit of motors and metallic flame and A.C. arc lamps.

SOCIETY NOTES.

Society of Chemical Industry, London, Eng.

At the last meeting of the Society Mr. O. Guttman read two papers, the first being on some modern chemical plant in which he discussed certain recent developments in the

chamber process for sulphuric acid necessitated by the invention of the contact process. He showed that the yield of acid per chamber was augmented by increasing the height in proportion to the length, or, in other ways, by turning the old chamber through an angle of 90 deg. Chambers are now built 48 feet square and 80 feet high, giving a capacity of 178,000 cubic feet. A novel method of hanging these chambers from the roof by means of vertical rods and straps was suggested. Glover towers in volcanic lava, built up in sections, and held together by lead-covered iron hooks, were shown, and mention was made of the feeding arrangements for Gay-Lussac towers.

A nitric acid still, holding five tons of nitrate of soda, was described, and a reference made to even larger ones capable of receiving at once ten tons of this salt, or fifty times as much material as that dealt with twenty years ago in one distillation.

The Building of Explosives Works.

In his second paper, Mr. Guttman dealt with some of the arrangements made to minimize the distinctive effect of explosions in explosives factories. The author proposed that buildings in explosives works should be constructed in ferro-concrete with fine river gravel. Such a structure being practically a solid mass would not be liable to collapse, it would be fire and lightning proof, and, should an explosion take place, would be so pulverized that particles could not be projected to any considerable distance. In order to resist the fall of heavy pieces of machinery or other ponderous materials, the roof is made with a double ferro-concrete skin, a layer of sand about one foot thick being interposed. The use of wire-glass is recommended to avoid the dangerous splintering of ordinary window-panes.

Nova Scotia Society of Engineers.

The second annual meeting of the Nova Scotia Society of Engineers was held June 10th, 1908, in the Chamber of the House of Assembly, Halifax, N.S. The attendance of members was large. The chair was occupied by Rod. McColl, president of the society. The annual report was an interesting review of the year's work. It alluded to the fact that two members, R. McColl, of Halifax, and C. M. Odell, of Glace Bay, have been honoured by election to the council of the Canadian Society of Engineers. Two other members, A. McColl, of New Glasgow, and A. W. Robb, of Amherst, have been honoured by the election to the mayoralty of the towns in which they reside. The report concludes: "We think it a good and proper thing that men such as these should be selected for civic rulers. A good thing, because with their professional qualifications and business experience, they must be a valuable addition to any municipal governing body; and a proper thing, that men leading the business lives which these gentlemen must necessarily do, should be prepared to sacrifice some of their time in working for the benefit of those amongst whom they reside, and for the good of the State generally. We believe good civic government is the keystone to good provincial and national government, and, as professional men and good citizens, we should do all we can to further it."

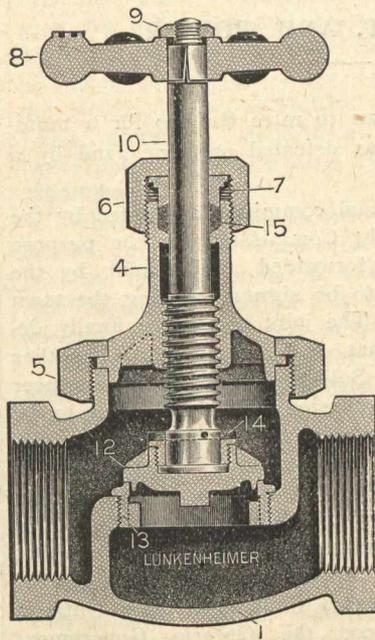
The following papers were read:—"Harbours," by J. J. Taylor, C.E.; "Mechanical Engineering," by J. A. Stairs, Nova Scotia Steel and Coal Company; "Some Common Mistakes in the Construction and Maintenance of Water Systems," by W. G. Yorston, C.E.; "Mechanical Strains in Pole Line," by F. A. Bowman, District Superintendent Eastern Telephone Company; "The Use of Electricity in Coal Mining," by E. G. Archibald, who has returned from abroad.

The new officers are as follows:—President, J. H. Winfield, Halifax; vice-presidents, P. A. Freeman, Halifax; J. Fellows, New Glasgow. Council: J. W. McKenzie and F. H. Sexton, Halifax; F. A. Bowman, Sydney; J. G. W. Campbell, Sydney Mines; J. A. Stairs, New Glasgow; E. H. Morley, Westville; L. H. Wheaton, Bridgewater; L. C. Gelling, Bridgewater; secretary, S. Fenn, Halifax; treasurer, J. L. Allen, Halifax.

The next annual meeting will be held in New Glasgow.

A NEW VALVE.

The Lukenheimer Company, Cincinnati, Ohio, have designed the valve shown in sectional view herewith for the benefit of the trade preferring a renewable seat regrinding valve. This valve differs from the Lukenheimer Regrinding Valve only in the construction of the disc and seat. The disc 12 is provided with a projecting ring which enters the



valve seat ring 13. Its principal function is the preservation of the seat, which is accomplished in a two-fold manner. First, as it enters the cylindrical part of the seat it deflects the current of steam from the seat ring face, thus preventing the wire-drawing which would otherwise occur. This feature is especially important should the valve be left partly open for any length of time. Secondly, the seating surface is kept free from scale and grit by the action of the thin current of steam discharged over it as the disc is brought home. Another function of his ring is the prevention of

waterhammer which is caused by the sudden admission of steam, for it will readily be seen that no matter how quickly the hand wheel may be operated, the flange will only permit the steam to enter gradually. The seat 13 is renewable, and can be removed from the valve body by using a flat bar to engage the lugs of the inside of the ring. Particular attention is called to the fact that the seat may be reground a number of times before it is necessary to renew it. Not only is the seat renewable, but all of the other wearing parts, including the disc, can be renewed if necessary. The hub is securely held to the body by means of a union ring, owing to which it is impossible for the hub and the body to become corroded together, as the thread which holds the union to the body is protected at all times from the action of the steam, the joint being made between the flange on the hub and the neck of the body. This connection also acts as a tie or binder in screwing over the body, and tends to strengthen the valve. The stuffing-box can be repacked under pressure when the valve is wide open, as a shoulder on the stem, directly above the threads forms a seat beneath the stuffing box. All valves above the ½-inch size have a gland follower in the stuffing box.

These valves are guaranteed to stand 200 pounds working pressure, and are made in both screw and flange ends. Up to 1½ inches inclusive, valves are furnished with hexagon bonnet rings; above 1½ inches, round slotted rings are sent. Either style of ring can be had for any size valve without extra charge. English instead of American standard pipe threads and flanges are furnished when so ordered. The valves are also made with navy standard flanges, and brass hand wheels.

With the exception of the seat rings, Lukenheimer "Renewo" valves are made entirely of only the highest grade of bronze, according to the formula specified by the United States Navy. The seat rings are made of hard, close-grained nickel, and will permit of regrinding many times over. It is very noticeable that Lukenheimer valves are heavier than imitations.

To regrind, unscrew the union ring 5, take the trimmings from the body, and place a little powdered sand or glass and soap or oil on the disc, inserting a wire or pin through the slot in the disc locknut and hole in the stem. Then replace the trimmings in the valve body and regrind, leaving the ring unscrewed, so that the hub rotates in the body and acts as a guide for the stem while regrinding.

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.

LIGHT, HEAT, AND POWER.

Ontario.

LISTOWEL.—The by-law to raise \$18,000 for a municipal electric light plant was defeated on June 22nd by a majority of two.

WATERLOO.—The special committee appointed by the Berlin council met the Light Commission for the purpose of discussing the contract forwarded the council by the Hydro-Electric Commission to be signed, binding the town to take 1,000 horse-power. The joint committee finally decided not to recommend that it be signed until another conference is held, at which Solicitor Robb and an engineer of the Hydro-Electric Commission will be invited to be present to explain certain provisions of the contract. By signing the contract, which was authorized by the vote of the ratepayers in January, 1907, the town binds itself to take 1,000 horse-power, defray the cost of distributing it in the town, which, it is estimated, would amount to about \$30,000, and also be responsible for its share of the cost of transmitting power from Niagara Falls to Western Ontario, amounting to about \$138,000, the Ontario Government agreeing to guarantee this expenditure. During the discussion Superintendent Philip of the local plant said that the town can buy more machinery for the plant and beat the feet off Niagara power, as it will affect Berlin, for a period of from five to eight years. After that, it is a question whether it would not be better to buy Niagara power. He said the Hydro-Electric Commission's engineers have said that the town's present price for power is less than can be fixed for Niagara power.

Manitoba.

PORTAGE LA PRAIRIE.—At a special meeting of the council held recently the report of W. E. Skinner, electrician, of Winnipeg, was heard. Mr. Skinner was called in to make a valuation of the Central Electrical Company's plant, with a view to the purchase of the same by the city. The report estimated the plant as worth \$42,391.43. The additional cost of making the plant up-to-date and of raising it to a capacity of 400 amperes was estimated at \$40,486.40. The report was discussed and a motion forming a basis of contract with the Company was passed. A by-law is before the city to be voted on July 14th for the granting of \$100,000 towards the contemplated purchase.

SEWERAGE AND WATERWORKS.

Ontario.

LISTOWEL.—The by-law submitted on June 22nd to raise \$6,000 to complete the waterworks system carried.

LONDON.—The by-law submitted to the ratepayers of London for the extension of the present waterworks system, with a view of retaining spring water for the city as long as possible, was defeated by 43 votes. The scheme which has just been turned down was an extension of the present system, with filtration as the ultimate end. The only solution left now is filtration in its entirety or Lake Huron, and he enormous expense of the latter proposition precludes its adoption for years to come. The water supply for the last three years has been painfully short, and the time has come when immediate action must be taken.

WATERLOO.—The Board of Health of Waterloo township and the town of Waterloo in conjunction with the Waterloo Sewer Commission, held a meeting to investigate

the complaint of Mr. Peter Shirk that the impurities from the Waterloo sewer farm flow into his dam at Bridgeport and contaminated the water. The sewer farm was visited, and Mayor Fischer assured the representatives that when the work was completed, which would occupy about two weeks' more time, and the new sewer farm was in working order, the matter would be remedied, and there would be no further cause for complaint. The township representatives, after viewing the sewer farm, were satisfied that following the completion of the work there that this would afford a solution of the difficulty.

Saskatchewan.

PRINCE ALBERT.—The Dominion Government are calling for tenders for the installation of a waterworks plant at the new Prince Albert penitentiary, which is to be erected a mile and a half west of the town.

CONTRACTS AWARDED.

Nova Scotia.

WOLFVILLE.—The governors of Acadia College awarded the contract for the Carnegie science building to Rhodes, Curry & Co., of Amherst. Construction work has commenced.

Ontario.

PRESTON.—The Concrete Engineering and Construction Co., Limited, of Toronto, have been awarded the contract for Section C of the Preston sewers.

Manitoba.

WINNIPEG.—The Dominion Bridge Co. have secured the contract for all the structural steel work on the new Fort Garry Station at Winnipeg. This contract will amount to somewhere in the neighborhood of \$200,000, and will be one of the largest structural steel contracts ever let in Western Canada. The Winnipeg works of the Company will shop considerable of the steel. The same Company have also secured the contract for the structural steel work on Davon Court Apartments on Broadway, John D. Aitchison being the architect. All the steel work on this job will be shopped in the Winnipeg works.

WINNIPEG.—This city has a contract with Mr. Sprague, under which he is to supply 2,000,000 to 5,000,000 feet of lumber. The city can terminate the contract after 2,000,000 feet have been used, and at the present time over 3,000,000 feet have been used. Lumber prices are now considerably below the prices in the contract, and the question is whether the city shall terminate the contract and call for new lumber tenders, or whether it shall continue to buy from Mr. Sprague at the higher prices.

Alberta.

CALGARY.—At a recent meeting of the General Hospital Board the contract for the new hospital was awarded to Woodward Bros., of this city, whose tender called for \$103,370, exclusive of installing the electric wiring, etc. The contract for the latter was awarded to the North-West Electric Co. for \$5,500. The amount does not include the installation of the heating apparatus, electric elevators, dumb waiters, laundry machinery, etc. Tenders will be called for these shortly.

British Columbia.

VICTORIA.—The V. Stanton Iron Co., of London, England, has received an order for 300,000 tons of iron piping for water, gas, and other public works from the council of Victoria.

RAILWAYS—STEAM AND ELECTRIC.

New Brunswick.

WOODSTOCK.—One of the contractors on the G.T.P. construction work laid before Chief of Police Foster information against Baptiste Theriault, of Salmon River, Victoria county, charging him with selling liquor to the Italian workmen. A hearing was held last week at Perth before G. T. Police Commissioner Hon. L. P. Ferris. Theriault was proven guilty of seven offences. Commissioner Ferris fined him \$50 or three months for each offence. The liquor was seized and ordered to be destroyed. The chief work of the new G.T.P. police is to prevent the sale of liquor in the construction camps, and it is hoped that the firm manner in which Commissioner Ferris has handled this the first case of the kind, will have a wholesome effect.

Quebec.

MONTREAL.—The Montreal and Southern Counties (electric) Railway Co. have opened offices at 605 and 606 Canadian Express Building, McGill Street, Montreal. W. B. Powell, manager; J. A. Burnett, superintendent and electrical engineer. Work is now proceeding on the Montreal-St. Lambert section of this road, and entry into the city of Montreal has been arranged for.

Ontario.

HAMILTON.—The prospects of work being started on the Hamilton, Waterloo and Guelph Railway are bright. Although not very successful with Old Country financiers, John Patterson and his associates think they now have a good chance of getting the money at once for the construction of the line.

LONDON.—The C.P.R. are replacing the present rails of their line between London and Detroit with heavy 80-pound steel, the heavy traffic over the line making this compulsory. The work will be extended over two or three seasons, and each year a certain portion of the present line will be thus improved. This year the section between Hyde Park and Caradoc is being relaid, and the work will be completed during the coming week. Construction gangs have been busily employed thereon for some time past under the resident engineer, Mr. Thornton.

Manitoba.

PORTAGE LA PRAIRIE.—Mr. H. A. K. Drewry, assistant engineer of the Railway Commission, came most of the way down from Saskatoon on a special yesterday. Mr. Drewry inspected the road for the Commission from Asquith to Saskatoon and from Saskatoon to Lanigan. The Asquith stretch of track is in good condition, and the roadbed from Saskatoon to Lanigan will be first-class as soon as the ballasting is completed. It is expected that this will be finished in about three weeks, as only about twenty-two miles remains to be done.

Saskatchewan.

PRINCE ALBERT.—Dalmeny to Carlton branch of the C.N.R. is just about completed and the grading outfit has been ordered to start work on the C.N.R. extension to Battleford through the Shellbrook district. This line will be continued through to Calgary.

British Columbia.

VICTORIA.—The C.N.R. shops have been temporarily closed and official notice given to the employees to the effect that they would not open again until July 2nd. The shops have been closed upon other occasions, but only for about a week at a time. It is not yet known whether the closing down affects all the mechanics, boilermakers, machinists and blacksmiths, but if so over 400 men will be out of employment.

TENDERS.

Ontario.

HAMILTON.—Tenders for Heating Apparatus, Armory, Hamilton, Ont., will be received until Friday, June 26, 1908. Fred. Gelinax, secretary. Department of Public Works, Ottawa.

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.

OTTAWA.—Tenders for Trent Canal will be received at this office until 16 o'clock on Wednesday, the 15th July, 1908, for deepening and improving of a channel way from a point in Cook's Bay, Lake Simcoe, Ontario, to the mouth of and up the Holland River, and the east branch thereof to the Bradford road at Holland Landing. By order. L. K. Jones, secretary. Department of Railways and Canals. (Advertised in the Canadian Engineer.)

Manitoba.

WINNIPEG.—The Board of Control, Winnipeg, have decided to call for tenders for water metres. There are to be 6,300 metres purchased, and the total cost will probably reach \$70,000 or \$75,000. It is proposed to provide in the specifications for delivery at the rate of 500 per month.

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. Gelinax, Secretary Department of Public Works, Ottawa.

Alberta.

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

British Columbia.

VICTORIA.—Tenders will be received up to Monday, the 20th July, 1908, for the supplying and erecting of one horizontal cross-compound pumping engine, one steel tank and tower, one concrete and steel water tower. The lowest or any tender not necessarily accepted. W. H. Northcott, purchasing agent, city hall.

MISCELLANEOUS.

Ontario.

CORNWALL.—The 200-foot swing bridge of the Ontario and New York Railway, crossing the Cornwall Canal, is a mass of twisted iron, lying on top of its demolished pier. The bank of the canal has a gap in it 150 or 175 feet wide and 25 feet deep. Navigation of the canal is tied up, and will be for several weeks, and international traffic on the railway will be interrupted for a long period. Besides this several local industries that were using water power are closed down. This was caused by a break in the bank of the canal. When first noticed by the lockman of Lock 18 the leak was about two or three feet in diameter, some 50 feet west of the railway bridge. The canal bank is over 100 feet thick at the bottom at this point, about 40 feet at the top, and faced with heavy stone riprapping on both sides. Once the water got a start, however, the hole grew rapidly, and in half an hour the canal was pouring down into the river, which is 25 or 30 feet lower. The current, which swept huge blocks of stone out into the river like so many chips, soon undermined the pier on which the railway bridge swung, and at 6 a.m. it slipped out at the bottom and came down in a pile. The shock seemed to break the back of the bridge, which fell in a tangled mass on top of the remnants of the pier.

MACHINERY WANTED.

No. 15.—Wanted, a pile-driver with a 2,000-pound hammer.

No. 16.—Wanted, to rent, a dredge. Must be in a good state of repair.

No. 17.—A subscriber requests the names of individuals or firms that can supply cedar or live tamarac piling.

RECENT FIRES.

Quebec.

THREE RIVERS.—Fire which broke out on June 22nd destroyed one hundred buildings, including the post-office, telegraph offices, Bell Telephone office, all the banks, all the drug stores, all the principal groceries, all the dry goods stores, the old parish church, several private residences, and all the principal hotels. The loss will probably be about \$1,500,000.

Ontario.

BRANTFORD.—Severe electric storms passed over the city on the 19th inst. Lightning struck in a couple of places, doing most damage at the Brantford Cordage Works, where it completely demolished the brick chimney, which was one of the tallest in the city, and wrecked the roof of the boiler-house.

ST. CATHARINES.—This city suffered another serious loss by fire, when at an early hour this morning one of the mills of the Lincoln Paper Co., situated on the Welland Canal at the city limits, was totally destroyed at a loss which will reach probably \$85,000, with insurance of \$60,000. The cause is a complete mystery, though it may be laid at the door of friction. The expensive machinery used in making paper is ruined, officials of the Company declare.

PERSONAL.

MR. H. P. TIMMERMAN, general superintendent of the eastern division of the C.P.R., has been appointed to the position of industrial commissioner for lines east of Montreal.

MR. F. S. LAZIER has resigned from the staff of the Trent Valley Canal, Trenton, Ont., to accept a position on the Transcontinental Railway near Hervey Junction, Quebec.

MR. WILLIAM DOWNIE, superintendent of the Atlantic division of the Canadian Pacific Railway, was in Montreal recently and discussed with other officials of the road the advisability of securing certain coal areas in Queen's county, N.S., to ensure a supply for this section of the railway. Mr. Downie is on his way to British Columbia.

MR. GEORGE HODGE, superintendent of Canadian Pacific terminals in Montreal has been appointed superintendent of the Montreal-Quebec division of the road, and will enter upon his new duties on July 1st, succeeding Mr. W. J. Singleton.

MR. JOHN D. MATHESON, the civil engineer representing Warren & Wetmore, of New York, the architects who have charge of the construction of Fort Garry station and the great union railway yards, has taken up his residence in Winnipeg, Man.

MARKET CONDITIONS.

Toronto, June 25th, 1908.

It cannot be said that business is generally active, though a considerable number of small orders are passing. Buyers in Ontario seem timid and for the most part not sanguine; Western buyers are, after their fashion, more optimistic. The lack of large orders is quite noticeable. Not a few dealers and contractors in heavy goods are likely to be troubled for weeks by the disastrous break in the canal at Cornwall.

In the United States there is much dullness in industrial circles; in fact business of all kinds is suffering from the delay of new railway construction and backwardness of other forms of enterprise on a large scale. Prices of copper, lead, and spelter are pretty well maintained; iron and steel are subject to downward variations in the home market, as has been shown. Glasgow advices say that warrant iron is moving briskly to Germany and the Baltic, and the stock at 13th June was 22,000 tons lower than on 13th May. Scotch iron is well maintained. It is worthy of notice that the Canadian Government has extended the time of the bounties on lead.

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.—Business very quiet, price for Cookson's, 9c.

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

Boiler Plates.— $\frac{3}{4}$ -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, $\frac{1}{4}$ -inch, 10c.; $\frac{1}{2}$ -inch, 9c. per foot; 2-inch, \$8.50; $2\frac{1}{4}$ -inch, \$10; $2\frac{1}{2}$ -inch, \$10.60; 3-inch, \$12.10; $3\frac{1}{2}$ -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.—Not much doing here, the general market rather irregular; price, $13\frac{3}{4}$ c. for large purchases, and $14\frac{1}{4}$ c. 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.

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 10 $\frac{3}{4}$, \$4.70 per 100 pounds. Demand very active.

Iron Pipe.—Black, $\frac{3}{4}$ -inch, \$2.03; $\frac{1}{2}$ -inch, \$2.25; $\frac{3}{8}$ -inch, \$2.63; $\frac{1}{4}$ -inch, \$3.56; 1-inch, \$5.11; $1\frac{1}{4}$ -inch, \$6.97; $1\frac{1}{2}$ -inch, \$8.37; 2-inch, \$11.16; $2\frac{1}{2}$ -inch, \$17.82; 3-inch, \$23.40; $3\frac{1}{2}$ -inch, \$29.45; 4-inch, \$33.48; $4\frac{1}{2}$ -inch, \$38, 5-inch, \$43.50; 6-inch, \$56. Galvanized, $\frac{3}{4}$ -inch, \$2.85; $\frac{1}{2}$ -inch, \$3.08; $\frac{1}{4}$ -inch, \$3.48; $\frac{3}{8}$ -inch, \$4.71; 1-inch, \$6.76; $1\frac{1}{4}$ -inch, \$9.22; $1\frac{1}{2}$ -inch, \$11.07; 2-inch, \$14.76. These downward changes indicate the decline spoken of last week.

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; Gleggarnock, \$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.

Septic Process Patent Sustained

BY RECENT ACTION OF THE
United States Supreme Court

After five years of litigation, unlicensed use of the Septic Process has been declared illegal.

Municipalities and others contemplating the installation of Sewage Disposal Plants are invited to avail themselves of our facilities for and experience in treating sewage.

We offer three propositions:

- 1.—To design Sewage Disposal Plants and take contracts for their construction.
- 2.—To furnish plans and specifications and license the use of plants.
- 3.—To license the construction and use of plants designed by other engineers.

Hereafter infringements will no longer be tolerated, and owners of unlicensed plants are invited to write us for the purpose of effecting settlements.

**Liberal Terms will be offered where
useless litigation is avoided**

CAMERON SEPTIC TANK CO.
352-6 Monadnock Block, CHICAGO, ILL.

BRANCHES:

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Mr. A. C. Hepp, C.E., Resident Engineer
SAN FRANCISCO: Mr. W. C. Fee, Resident Engineer