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MISSING

The Canadian Engineer

WEEKLY

ESTABLISHED 1893

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TORONTO, CANADA, FEBRUARY 11th, 1910.

No. 6

The Canadian Engineer

ESTABLISHED 1893.

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CANADIAN IRON AND STEEL OUTPUT.

The total production of iron ore in Canada to date has not exceeded 5,000,000 tons, but Canada is to-day producing from her seven or eight mines at the rate of 400,000 tons per annum.

The production of pig iron and steel in Canada has become an important industry, though dependent to a very large extent on imported supplies of ore and fuel. The growth of the industry has been greatly stimulated by the payment of bounties on the part of the Dominion Government. Production is as yet confined to the eastern half of Canada, chiefly in the Provinces of Ontario and Nova Scotia. There are sixteen completed blast furnaces, with a total daily capacity of about 2,665 tons.

The general business depression of 1908 resulted in only a slightly decreased production of pig iron in that year, while a rapid recovery is indicated by the greatly increased rate of production being maintained during the early months of 1909. The rapid growth of population, the extensive railway construction being undertaken, the replacement of wooden bridges by steel on old railways, and the increasing use of steel in building construction all mean a great increase in our consumption of iron and steel goods, so that in 1908, although our own furnaces turned out 630,835 tons of pig iron, we imported in addition over a million tons of iron and steel.

For 1907 the steel produced amounted to 706,982 tons, and in 1908 to 588,763 tons. The pig iron output for 1908 was 212,290 tons.

Canada as an iron and steel country is coming rapidly to the front, and with the perfecting of electric smelting the output will be much greater.

THE WEBBWOOD DISASTER.

On January the 21st passenger train No. 7 on the Soo branch of the C.P.R. was derailed near the Spanish River. Over fifty people were killed and more than a score more were injured.

A part of the train was derailed about four hundred feet east of the steel bridge over the river, and one passenger car fell through and was submerged. The dining car was two-thirds submerged and a second class coach broken in two.

The inquest and examinations which followed the wreck were the most thorough that could be conducted. The Crown appointed one of the most experienced lawyers to conduct the case, and he, together with the civil engineer engaged by the Government, did all they could to find the cause of the derailment.

The jury were unable to find any cause for the derailment, and in giving their verdict, instead of making recommendations, propounded a number of questions to the Dominion Railway Board. If juries would follow this course in the future more good would result from their

deliberations. So frequently their recommendations are so wide of the mark that they are held up to ridicule.

The wreck will cost the C.P.R. about a million dollars, so that for purely business reasons the railway will be anxious to ascertain the cause with a view to prevention.

CANADIAN CEMENT ASSOCIATION.

In March, 1909, the Canadian Cement and Concrete Association held their first annual exhibition and convention in the city of Toronto. The number of exhibits was large, their character varied, representing many features of cement manufacture and testing, as well as concrete reinforcing. The exhibit of concrete machinery was good and the attendance large. Altogether, it was a successful exhibition.

In March of this year the exhibition and convention will be held at London, Ont. With the experience of last year as a resource we expect that this year's meeting will be even more successful. London is offering a splendid exhibition and assembly hall, the demand for cement during 1910 appears to be increasing, and it is to be expected that this will encourage many new exhibits.

GUELPH AND HER PUBLIC UTILITIES.

Great interest is taken in Guelph because of the successful operation of their municipal-owned street railway, power and light and waterworks. This year's report shows even better than before. The gas output shows an increase of twelve per cent., and the revenue increased from \$48,779.23 to \$56,556.94 for the year, while the electric light plant shows an increase from \$34,947.45 to \$40,573.47. On the two departments the Light and Heat Commissioners report a gross profit of \$40,319.13, after setting aside \$5,000 for depreciation, interest \$9,241.53, or \$31,077.60 net gain, and a total income of \$98,525.79, including \$4,647 premium on debentures sold.

The Water Commissioners reported gross earnings of \$30,283.28; operating expenses, \$9,108.28, leaving a profit of \$21,175. The total amount expended on the new extension was \$133,132.52, and the capital expenditure for the year \$10,784.70.

EDITORIAL NOTES.

The January output of the Nova Scotia Steel and Coal Company is as follows:—

	Tons.
Coal	58,236
Ingots	6,684
Pig iron	5,740

* * * *

The Engineers' Club, Toronto, are holding their annual dinner on Thursday, February 17th. This is always an enjoyable function, and affords a splendid opportunity for engineers to meet old friends. This year a large attendance is expected.

PRECIPITATION FOR JANUARY.

The amount of precipitation which was recorded during January, exceeded the average in Central and Eastern Ontario, the Lower St. Lawrence Valley, and Eastern parts of the Maritime Provinces; elsewhere in Canada the normal value was not reached, except very locally in the neighbour-

hood of Battleford, Sask., in the Cariboo District, and generally in the lower levels of British Columbia, and also in the extreme southwest counties of Ontario.

Depth of Snow.

At the close of the month the ground was snow-covered from Saskatchewan to the Maritime Provinces. In those portions of the Western Provinces where there was snow on the ground, the depth varied from 1 to 12 inches, the same being also the case in the Maritime Provinces. In Ontario, in the vicinity of the Georgian Bay and the Highlands of Muskoka the depth was from 26 to 36 inches, while other parts of the Province were only covered to a depth of from 3 to 15 inches. In the vicinity of Quebec City there were some 33 inches of snow on the ground, while over the remainder of the Province, the depth generally exceeded 14 inches.

Thickness of Ice.

Thickness of ice is reported as follows:—

Western Provinces.—Edmonton, 25 inches; Battleford, 24 inches; Medicine Hat, 18 inches; Swift Current, 30 inches; Moose Jaw, 30 inches; Minnedosa, 12 inches.

Ontario.—Port Arthur, 7 inches; Bruce Mines, 14 inches; Barrie, 15 inches; Owen Sound, 3 inches; Southampton, 24 inches; Lucknow, 15 inches; Port Stanley, 12 inches; Port Burwell, 18 inches; Georgetown, 15 inches; Toronto, 15 inches; Kingston, 9 inches; Renfrew, 16 inches.

Maritime Provinces.—Chatham, 7 inches; Charlottetown, 3.5 inches.

The table shows for fifteen stations included in the report of the Meteorological Office, Toronto, the total precipitation of these stations for January.

Ten inches of snow is calculated as being the equivalent of one inch of rain.

Station.	Depth in inches.	Departure from the average of twenty years.
Calgary, Alta.	0.20	—0.26
Edmonton, Alta.	0.20	—0.51
Swift Current, Sask.	0.10	—0.56
Winnipeg, Man.	0.20	—0.77
Port Stanley, Ont.	5.10	+1.77
Toronto, Ont.	3.51	+0.71
Parry Sound, Ont.	5.00	+0.54
Ottawa, Ont.	3.30	+0.31
Kingston, Ont.	2.50	—0.37
Montreal, Que.	3.90	+0.15
Quebec, Que.	4.80	+1.60
Chatham, N.B.	4.40	—0.82
Halifax, N.S.	9.10	+3.25
Victoria, B.C.	4.50	—0.04
Kamloops, B.C.	0.20	—0.75

SULPHIDES SEPARATION.

Valuable Discovery.

For many years metallurgical experts have been endeavoring to discover a practical and economical method of separating the sulphide ore into its constituents. The flotation processes have hitherto been confined to the separation of the gangue from the ore, thus obtaining a clear concentrate composed of such sulphides as the ore contained. The difficulty has always been the separation from one another of the sulphides contained in this concentrate. According to advice just received the desired result has been accomplished by Mr. E. J. Horwood, of Broken Hill, New South Wales,

Australia, who has made a most successful demonstration of his invention at the School of Mines of Bendigo, Australia.

His process consists in submitting the mixed sulphide to a preliminary treatment. This preliminary treatment may consist either of roasting at a temperature of 300 to 400° Centigrade with or without a chemical reagent, or of digestion in an aqueous solution of a chemical reagent with or without heat. In either case the ore is prepared by fine grinding.

It is claimed that by either treatment some classes of the constituents are sulphatized, or more or less changed or deadened so as not to float or granulate when later subjected to a flotation or granulation process.

By the Horwood process it is possible to divide a mixed concentrate of lead and zinc into a clean zinc concentrate on one hand and a lead concentrate on the other. The roasting converts, to a large extent, the lead sulphide into a lead sulphate which, owing to a change in the bright metallic surfaces of the lead, is no longer floatable, while the roasting has no appreciable effect on the zinc sulphide, the result being that when the mixed ore is again submitted to a flotation process the zinc alone floats, the lead being left as a separate product.

Mr. Horwood also claims that recent tests have demonstrated that through the preliminary digesting of certain sulphatized ores in a solution of copper salts, such as blue-stone, with or without the addition of common salt, silver becomes unfloatable and accompanies lead in a subsequent flotation process.

CANADIAN SOCIETY OF CIVIL ENGINEERS.

Verbatim Report of the 24th Annual Meeting, Held at Ottawa, January 25th to 27th, 1910.

(Continued From Last Week).

LT.-Col. Anderson: As one of the original council who drew up the rules of the society at its organization, I think that in some way we have drifted from the original intention, which was that the full membership should pay \$10 a year and non-residents at headquarters should have remitted \$2 of that \$10, and as soon as a branch was formed that \$2 should be collected from them to be used for the good of the branch. That was certainly the original intention of the committee, but in practice it has worked out that non-resident members pay \$8 and out that \$2 has been remitted, so that they get off for \$6 to the parent society and \$2 to the branch. There seems to be no hardship in increasing the fees of non-resident members where there are branches to \$10 and the \$2 to be remitted for the use of the branch. That would put them on the same footing as headquarters members and I think it would give, with the branches we have now, an additional income of probably \$1,000. I disagree, to a certain extent, with my old friend, Mr. Kennedy, with regard to the advisability of increasing the fees. Probably part of the success of the society has been due to the fact that we have been able to run it without a very heavy tax on the members. As long as we can keep the fees at \$10 and cover the expense and possibly put by a little nest egg, it is desirable that there should be no change.

Mr. Jamieson: One other point might be considered. It is well to make the fee as light on the actual student as we can, but I think the privilege of remaining a student member is abused. Considerable revenue might be derived by looking after that more closely. In my own office I have had two cases in the past where members remained "students" although they were receiving salaries of \$125 and \$150 a month. They were not contributing really the cost of giving them the transactions. While it may be well to be as lenient as possible for a time after graduation I think that time should be reduced.

The President: The council in the last year has considered that question.

Mr. Coutlee: I had considerable to do, Mr. Chairman, with the formation of the Ottawa branch, and the formation of that branch has prevented a good deal of the trouble that Mr. Jamieson refers to. We drummed up those who were remaining students over time and they have become associates

or members. We might consider the formation of a grade between student and associate member; call them "juniors," or something like that. The question of an increased revenue has become rather pressing because the quarters in Montreal are entirely too small. I remember two important papers read when there was not sitting room in the lecture hall for those who attended. The secretary tells me that the hall holds 230. The incoming council may have to consider the obtaining of new quarters. I submit that in connection with the getting of new quarters, a readjustment of the annual fees might be looked into.

Dr. Galbraith: A few days ago Mr. Thompson, one of our members from New York, handed me a slip showing that the membership of the American Society of Civil Engineers was somewhere over 5,000; ours over 2,000; and the income of the American Society, \$130,000; ours, \$13,000. That is, with nearly one-half the membership we have only one-tenth the income. That is largely due to the fact that Mr. Jamieson has mentioned; we have eleven hundred student members, or members paying as students. The time that a man may remain a student member is, I think, nine years. I think some regulation might be made to divide that class in two. It would hardly do to say graduates and under-graduates, because all our student members do not go to the Engineering schools, but I think if the time were shortened to say four years and another grade created, it would be well and, in fact, necessary, for there are many men who have outlasted their four years and yet would not come up to our definition of associate member, and I am sure we do not wish to lower that.

Mr. Walsh: Is there an age limit for students?

The Secretary: There is only an age limit for members and associate members. There is a time limit in regard to a student remaining in that class.

Mr. Leoford: If I understand well our council of 1909 has studied the question and they came to the conclusion that the fees actually are not sufficient; why then should we hesitate about paying \$2 or \$3 more or less. When our treasurer, no doubt, voicing the opinion of the council, said we should pay more, why should we appoint committees and deliberate on the question for years. There is no necessity for members spending their time considering whether a dollar, more or less, should be given. Money paid to the society is not wasted; it is just as good as if paid into a bank. (Applause.)

The President: It has been moved and seconded then that this matter be referred to the incoming council. (Carried.)

We come now to the reports of the scrutineers. First as to the by-laws.

The Secretary: This is the report of the committee on by-laws. "We hereby certify that there have been 207 votes cast for amendments to by-laws, 169 ayes and 38 nos." That gives more than the necessary two-third majority. The report is signed.

The President: I declare the amendments to by-laws carried.

The Secretary: By-Laws 35 and 36 require a recommendation by the council added to that of the nominating committee. The proposed sub-division of territory is as follows:—

District No. 1, Montreal, number of resident members, 240.

District No. 2, Newfoundland, Nova Scotia, Prince Edward Island, New Brunswick and the United States, 180.

District No. 3, Quebec, outside of headquarters, and including members resident outside Canada, Newfoundland and the United States, the former 121, and the latter 59, in all, 180.

District No. 4, Ottawa and Ontario, east of and including Lindsay; Ottawa Branch, 124; Ontario, 56; total, 180.

District No. 5, Toronto and Ontario, west of Lindsay and south of Georgian Bay and Lake Simcoe, the former portion 100, and the latter 80; total, 180.

District No. 6, Winnipeg, with 72 members, the other parts of Manitoba 14, and Ontario north of Georgian Bay and west of Lindsay 74; total, 160.

District No. 7, west of Manitoba and east of the mountains, 75. The British Columbia Branch, 105; total, 180.

These numbers, of course, are all approximate.

The President: Your council recommend that the members of the nominating committee be as follows:—District No. 1, Mr. E. Marceau; District No. 2, Mr. R. McColl; District No. 3, Mr. St. G. Boswell; District No. 4, Mr. M. Donald-

son; District No. 5, Mr. E. H. Keating; District No. 6, Mr. E. E. Brydone-Jack; District No. 7, Mr. F. F. Busteed. A resolution of the meeting is required for the election of these gentlemen.

Moved by Lt.-Col. Ruttan, seconded by Mr. Dietrich, that the gentlemen selected by the President be elected as the nominating committee. (Carried).

The Secretary: There is a vote under the old by-laws for the nominating committee and a report is in hand of the scrutineers in that regard.

Moved by Lt.-Col. Anderson, seconded by Mr. Coutlee, that the vote for the election of scrutineers under the old by-laws be null and void, and that the ballots be destroyed. (Carried).

The President: The next is the report of the election of officers and members of the council.

The Secretary: 260 votes were cast for the election of officers and members for council, and the following have been elected, in the order named:—President, H. N. Ruttan; vice-presidents, W. F. Tye, C. H. Rust, R. W. Leonard; councillors, C. R. Coutlee, Phelps Johnson, H. J. Cambie, D. MacPherson, A. E. Doucet, L. A. Herdt, J. A. Bell, C. E. W. Dodwell, C. N. Monsarrat, J. G. Sullivan, A. W. Campbell, J. M. R. Fairbairn, J. M. Shanly, H. H. Vaughan, W. J. Francis, J. E. Hardman, H. E. Haultain, H. G. Kelley, R. J. Durley, R. S. Kelsch; that is signed by O. P. Schreiber and the other members of the committee.

The President: I have much pleasure in declaring these gentlemen elected.

Moved by Mr. Lambe, seconded by Mr. Coutlee, that the ballots be destroyed.

Lt.-Col. Ruttan: (on taking the chair) I thank you, Gentlemen, for the highest honor that a member of this society can receive at your hands. I am not vain enough to imagine that the matter is altogether personal. I can quite understand that you have been considering the feelings of the large and growing portion of Canada which is just now being opened up for development—a portion of Canada in which there is now work for many hundreds of engineers, and where we will send many hundreds in the next few years. The water-powers to be developed in that country, the railways to be constructed and the canals and navigation works under consideration and in progress will take within the next ten years, I am confident, more than double the number of engineers that we now have in this society. That may seem a very sanguine view of the progress of the North-West, but having watched it carefully for the last thirty years and seeing the enormous progress of the last ten years, I do not think I shall be very much disappointed in this estimate of the future. As the hour is late I know you will thank me for not extending my remarks at the present time.

Moved by Mr. Leofred, seconded by Mr. Coutlee, that a vote of sincere thanks be tendered to the retiring president and officers for the excellent work accomplished by them during the past year of 1909. (Carried, with applause).

The President: Mr. Mountain, and gentlemen, I have much pleasure in conveying to you the thanks of this association for your services during the past year.

Mr. Mountain: Mr. President, and gentlemen, I heartily thank the society for the manner in which that resolution was carried. I am sure what we have done has been a labor of love, and if we have in any way advanced the interests of the society during the past year our reward is received. I thank you on behalf of the retiring officers.

The President: There is one question which I think is important and which ought to be brought up at this meeting; that is the place of meeting next year. The people of Winnipeg would be delighted to see the Association there for the next annual meeting, and they would do, I am sure, everything in their power to make matters pleasant for you. If this is the proper time to determine upon that I would be glad if someone would offer a resolution to that effect; either that the meeting be held in Winnipeg, or that the matter be referred to the council.

Mr. John Kennedy: The meeting in different places is something not provided for. We would automatically meet at headquarters if there is no resolution and council would consider in any case whether we should meet at some place else.

Mr. Mountain: It is usually dealt with by council. I move that the matter be left to them.

Mr. Jamieson: It is an important question and council should consider carefully whether we are going to move every

year to different points for our annual meeting or whether that should only be occasionally. They might consider holding the annual meeting at headquarters and summer conventions at different points. We were in Toronto last year, this year in Ottawa, and if next year we go to Winnipeg we shall be establishing a precedent that may cause trouble. Therefore the policy of the Society should be fully considered before it is decided upon, in regard to the place of holding the annual meeting.

Mr. Leofred: I would not like to run opposite to the president, and I thank him for the kind invitation to Winnipeg; I will join with the other members if they decide to go there. At the same time I would invite the society to Quebec next year, with the understanding that we will do all we can to make the visit of the members interesting and enjoyable. (Applause).

The President: Then it is understood that the matter will be left with the council. The arrangement for the summer excursion also requires attention.

Mr. Mountain: I move that that be left to the council. Last year we had a delightful summer convention although not largely attended. We visited a most important work, the tunnel under the Detroit River at Windsor, and I think every member who attended, enjoyed the scientific treat afforded us there.

Mr. Jamieson: That is the same question touched upon by myself. The council in considering the one should consider the other and deal with them together.

The President: Then that is the understanding. The council will meet at half-past three.

Mr. McColl: I wish to move (seconded by Mr. Freeland) a vote of thanks on behalf of the visiting members to our hosts, the Ottawa Branch, and to the Electrical Railway Company, the J. R. Booth Company, the E. B. Eddy Company, the city officials of the waterworks, the officers of the Dominion Archives, Royal Mint and Observatory, the Edinburgh Mills, and to the Mayor and City Council of Ottawa. I am sure that every one who has been here feels that no mistake was made in holding the meeting in the city of Ottawa. Nothing could exceed the kindness shown by the members of the Ottawa Branch in their handling of this present meeting. Every one must have fully appreciated the great kindness of Mr. Booth, who personally conducted us through his mill. As the time is so late I will not say more with regard to this matter although I should enjoy recounting the pleasure that we have received during our visit to Ottawa. (Carried).

Mr. Mountain: Mr. President, I wish to move a vote of thanks to the entertainment committee who looked after our comfort here during the last two or three days. I may say that while I am an Ottawa man myself, they let me sit quietly in the chair and they did all the work. I allude particularly to Messrs. Donaldson, MacPherson, Coutlee, Chapleau, and Ker, who worked like Trojans on all the entertainments they gave us. Carried.

Moved by Mr. Leofred, seconded by Mr. Coutlee, that whenever a candidate is chosen by the nominating committee for any office in the Canadian Society of Civil Engineers, the nominating committee shall have to get the sanction of their choice for such candidates by the local branch, that such candidate may belong to. If such candidate does not belong to any local branch then he shall be chosen in the usual way.

The President: Are you ready to discuss this motion? It seems rather important.

Mr. Mountain: We have just passed a new by-law on this subject. Let us wait long enough to let it get going. The former system required so many sanctions that it was very difficult to get a council. Let us go on as we are.

The Secretary: This would virtually be an amendment of the by-laws if it were adopted.

Mr. Leofred: The idea is that we are often called upon to vote for candidates that we do not know anything about and this is to provide a mode of wise selection.

The President: I would suggest that this motion, which is a very important one, be left over for the next meeting. Let it stand as a notice of motion.

Lt.-Col. Anderson: It seems to me to introduce a bad principle. It permits a branch to dictate to the parent society.

Mr. Leofred: I consent that the motion be left over until next year.

(The meeting then adjourned).

THE Sanitary Review

SEWERAGE, SEWAGE DISPOSAL, WATER SUPPLY AND
WATER PURIFICATION

SELECTING A SCHEME FOR SEWAGE TREATMENT.

Local conditions will always be taken into consideration when selecting and designing sewage disposal works. This introductory remark is so self-evident that we were almost afraid to use it, yet we know of engineers reporting on systems and designing schemes who know little or nothing of the local conditions.

It is useless to presuppose ideal conditions in ideal surroundings. They never exist, and schemes based upon such suppositions will not fit in with the physical, mechanical and financial difficulties with which one comes in contact.

To properly design a scheme one must know the number of people, their habits and occupations. Sewage from the homes of the working classes will require different treatment from that of a high-class residential district. The scheme must not only be designed for to-day, but also for the probable growth during the period over which the debentures will be spread.

The quality and quantity of water supply and water consumption should be known; the likely number of baths and lavatories; the amount of laundry work done, and its distributions as to time and place.

It is important to know the minimum, maximum and average dry weather flow, and the hour of the extremes, and, with this, the temperature of the sewage.

The method by which the flow is brought to the tanks should be considered; whether by gravity, through inverted siphons or pumped. Each of these methods affects the physical conditions of the sewage.

The conditions of the sewers and the quantity of subsoil water entering the sewers will form the basis of a calculation as to the desirability of relaying the sewers in preference to designing works large enough to treat the sewage plus the infiltration water.

The manufacturers' waste admitted to the sewers usually complicates the problem. When the manufacturer first treats the discharge he simplifies the problem, for when chemical treatment is necessary the question of tanks, etc., must be considered.

In considering the land treatment of sewage the factors are: the available area, the nature of the soil and subsoil, and the fall. Broad irrigation requires suitable soil with a small fall. The intermittent downward filtration requires fall sufficient to drain the suitable soil and subsoil.

When artificial filters or contact beds are adopted good fall is very necessary. With contact beds the fall need be only a little greater than the total depth of the beds, but when dosing tanks are used it must be greater.

The disposal of the sludge should be carefully considered. If the works are in a farming district, the

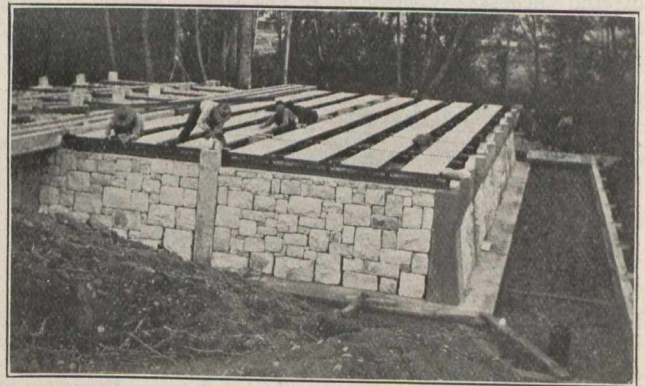
farmer may be induced to take the sludge for his fields. When it cannot be disposed of in this way it may be pressed and shipped out or mixed with refuse and burnt; sometimes though the sludge is of such a jelly nature that these methods fail, then frequently other treatment is required.

SEWAGE PURIFICATION WORKS, CITY OF VERNON, B.C.

The accompanying illustrations show in part the sewage purification works installed and put in operation last season, by the Corporation of the City of Vernon, B.C.

These works are the first complete modern sewage disposal plant as yet built in Canada west of the Great Lakes, and they, therefore, mark a step in advance in Western Canada in that most important question of sewage purification and disposal.

The works which were designed and constructed for the Corporation by Messrs. Galt & Smith, Consulting Sanitary



One-half Distributors Placed.—Sand Filter Completed.

Engineers of Toronto, Ont., consists of a sewage tank with screen and grit chambers, continuous coarse percolating filter, and secondary sand filter.

The plant is estimated to serve from 1,500 to 2,000 of a population, and provision was made in all the details for a future enlargement and duplication of the system when required by the future growth and expansion of the city.

The tank which is built of reinforced concrete is 60 feet long, 20 feet wide, with a sewage depth of 7 feet.

The primary filter 50' x 47' x 6' deep is composed of broken stone graded to various sizes and supported about the outside by a dry stone wall laid up in irregular courses.

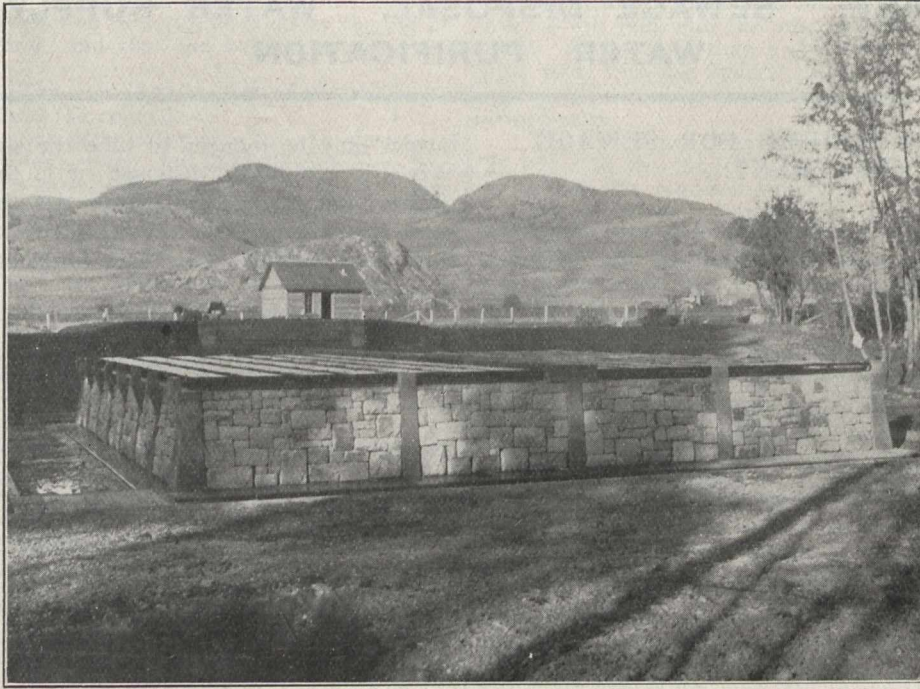
A concrete carrier brings the tank effluent to the filters upon which is distributed by an equipment of Stoddart Sewage Distributors. The sewage after passing through the primary filter, flows to a sand bed which surrounds the first

filter, and the purified effluent is then discharged into the creek.

Sludge beds and drains are also provided for prompt, economical and efficient treatment of the tank sludge.

It was thought at first that in the comparatively mild climate of that territory, the filters would possibly operate un-

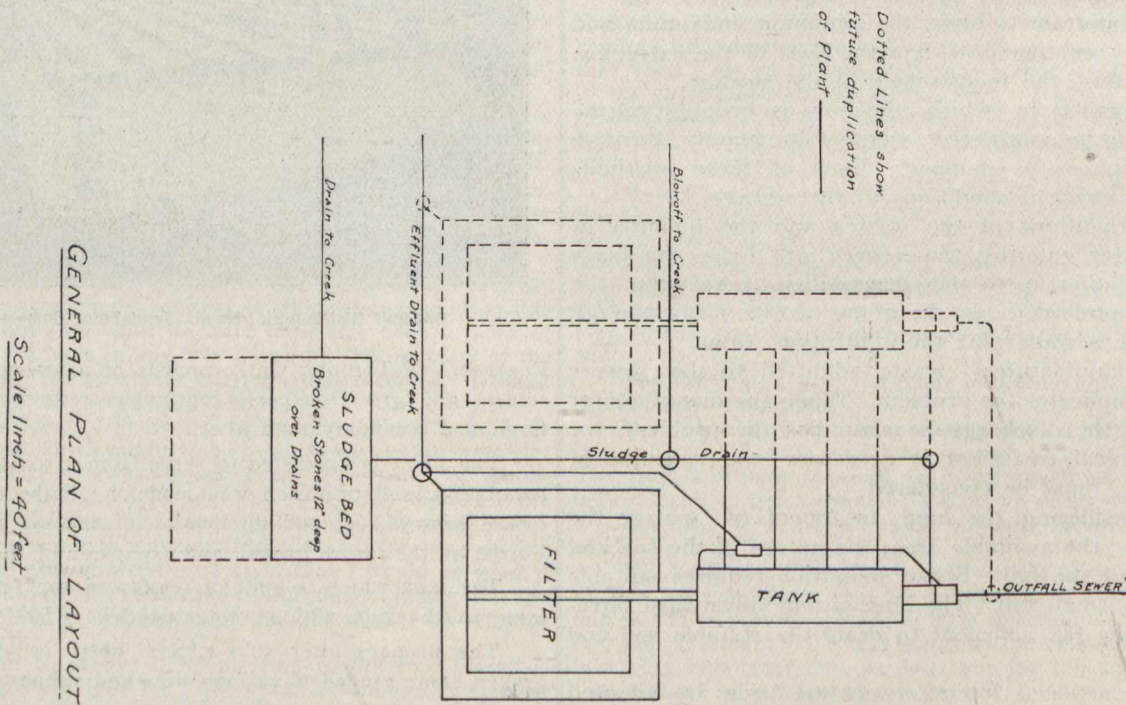
Burning of sludge can only be restored to where refuse destructors are in use, and even then involves the pressing of the sludge before it is mixed with the house refuse. From this it will be gathered that the cost of the process is high, but there is a by-product in the form of clinker, and the sludge is, at any rate, entirely got rid of.



Finished Filter.

protected successfully throughout the winter season. Observation and experience showed, however, that frost conditions were severe enough to demand some protection, and a frost

In addition to these methods there is another, not mentioned by the Royal Commission, of mixing the sludge with house refuse. The mixture dries at a fairly rapid rate.



casing (not shown in the illustrations) was designed and installed about the filters. This casing is so constructed that it admits of easy removal and replacing.

there is very little, if any, nuisance from smell, and the result is a good manure, easily handled, and suitable for sale to farmers.

PROBLEMS IN APPLIED STATICS.

T. R. Loudon, B.A.Sc.

(Registered in Accordance with the Copyright Act.)

This series of problems began in the issue for the week, October 22nd, 1909. It is assumed that the reader either has an elementary knowledge of the subject of Statics, or is in a position to read some text on such theory.

It is seen from the preceding discussion on the construction of the floor beams and stringers that the live load is transferred by these beams, etc., to the joints of the truss. If a Live Load occupies a position between two joints, part of the load goes to one joint and part to the other joint, so that if the stress in any particular

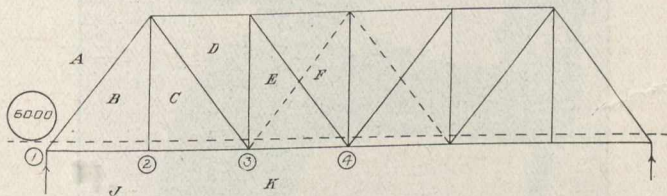


Fig. 141.

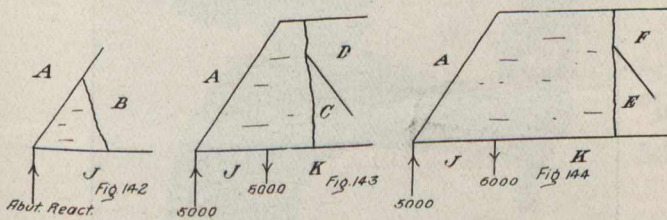
member is desired, the truss must be considered as acted upon by the portions of the load transferred to the respective joints between which the load lies. For instance, if the load were to lie half way between the joints (2) and (3) (Fig. 141), half of the load goes to (2) and half to (3). The truss should then be considered as acted upon by two forces, one at (2) and the other at (3), and, in this case, both equal to half the load.

It is merely necessary, for the time being, to consider the Live Load as it comes directly over each joint, in which case the total load is taken as acting on the particular joint at which it lies.

In Fig. 141 the dotted line represents the level along which the Live Load of 6,000 pounds passes.

Consider the load at joint (2). The left-hand abutment reaction when the load is in this position will be $\frac{5}{6} \cdot 6,000 = 5,000$, since the load is $\frac{1}{6}$ th of the total span from the left abutment.

Take a section through the members AB and BJ. Consider the forces acting on the portion of the truss to



the left of this section. (This portion to the left may be considered as a solid body.) The forces acting on this body are in equilibrium, and act as represented in Fig. 142.

$$\begin{aligned} \sum Y &= Y_{JA} + Y_{AB} + Y_{BJ} = 0. \\ 5,000 + \frac{4}{5} AB + 0 &= 0. \\ AB &= -6,250. \end{aligned}$$

AB is evidently in Compression 6,250 pounds.

Consider the forces acting on the portion of the truss to the left of a section through the members AD, DC, and CK. In this case, and all of the following cases,

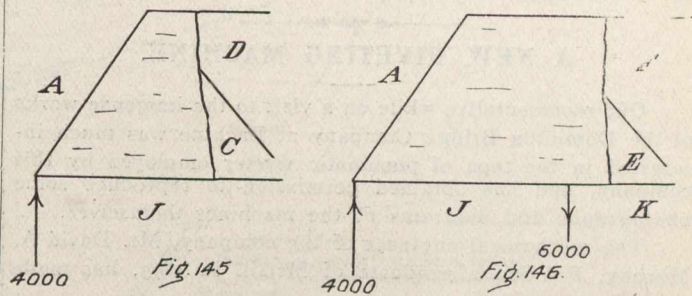
the area underneath the lower chords to the left of the load will be lettered J, and the area to the right of the load lettered K. It is seen that these areas will change whenever the load takes up a new position. (See Fig. 143.)

$$\begin{aligned} \sum Y &= Y_{JA} + Y_{AD} + Y_{DC} + Y_{CK} + Y_{KJ} = 0. \\ 5,000 - 0 + DC \cdot \frac{4}{5} + 0 - 6,000 &= 0. \\ DC &= \frac{5}{4} \cdot 1,000. \\ &= 1,250. \end{aligned}$$

The member DC is in Compression 1,250 pounds. By taking a section through the members AF, FE, and EK and considering the forces acting on the truss to the left of this section (see Fig. 144), the member FE may also be shown to be in Compression 1,250 pounds.

Consider the load at joint (3). The left-hand abutment reaction in this case is $\frac{2}{3} \cdot 6,000 = 4,000$ pounds.

Considering the forces acting on the truss to the left of a section through AB and BJ, it is seen that Fig. 142 will again represent the condition of affairs, provided



4,000 be substituted as the value of the abutment reaction.

$$\begin{aligned} \sum Y &= Y_{JA} + Y_{AB} + Y_{BJ} = 0. \\ 4,000 + AB \cdot \frac{4}{5} + 0 &= 0. \\ AB &= -\frac{5}{4} \cdot 4,000. \\ &= -5,000. \end{aligned}$$

AB in this case is in Compression 5,000 pounds.

Consider the forces acting on the portion of the truss to the left of a section through AD, DC, and CJ. (See Fig. 145.)

$$\begin{aligned} \sum Y &= Y_{JA} + Y_{AD} + Y_{DC} + Y_{CJ} = 0. \\ 4,000 + 0 + DC \cdot \frac{4}{5} + 0 &= 0. \\ DC &= -\frac{5}{4} \cdot 4,000. \\ &= -5,000. \end{aligned}$$

The member DC is in Tension 5,000 pounds.

Fig. 146 represents the forces acting on the portion of the truss to the left of a section through AF, FE, and EK.

Member	Dead Load Stresses	Live Load at			Maximum Stresses
		2	3	4	
AB	-8750	-6250	-5000	-3750	-15000
DC	+5250	-1250	+5000	+3750	+10250
FE	+1750	-1250	-2500	+3750	+5500

Fig. 147.

$$\begin{aligned} \sum Y &= Y_{JA} + Y_{AF} + Y_{FE} + Y_{EK} + Y_{KJ} = 0. \\ 4,000 + 0 + FE \cdot \frac{4}{5} + 0 - 6,000 &= 0. \\ FE &= -\frac{5}{4} \cdot 2,000 = 2,500. \end{aligned}$$

The member FE is in Compression 2,500 pounds.

Consider the load at joint (4). In this case, half

the load will be supported by each abutment; i.e., each reaction will be equal to 3,000 pounds.

The member AB may be shown by the Method of Sections to be in Compression 3,750 pounds and the members DC and FE both in Tension 3,750 pounds.

The results of the preceding discussions are tabulated in Fig. 147.

Influence Lines.

A curve which shows the variation of stress in any particular member of a truss as the Live Load moves over the structure is known as an Influence Line.

The above definition is complete in as far as it goes, but it may be pointed out here that curves which show the variation in Shear and Bending Moment at any particular point or section of a body for a moving load are also known as Influence Lines.

Curves which show the variation of Stress, Shear or Bending Moment for different sections of a body while the load stays in one particular position are not called influence lines, but have names applied to them according to the function they represent.

A NEW RIVETING MACHINE.

Our representative while on a visit to the immense works of the Dominion Bridge Company at Lachine was much interested in the type of pneumatic riveter employed by this company, and has obtained permission to reproduce some photographs and diagrams of the machines themselves.

The mechanical engineer of the company, Mr. David A. Murphy, B.A.Sc., a graduate of McGill in 1893, has made

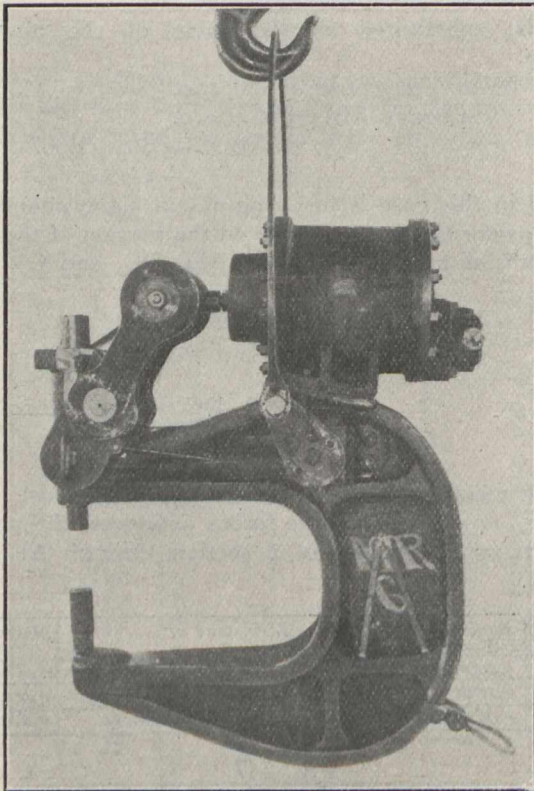


Fig. 1.—At Back Limit of Stroke.

an exhaustive study of the subject of riveting and riveting machines, and has designed and patented a device which gives most excellent results. The management have unhesitatingly reconstructed all their old machines and have added a large number of new ones to their shop equipment.

The three half-tones of the machine show the general

type and construction, while the two diagrams show clearly the peculiar and interesting features of the device.

It will be observed that the Murphy machine may be

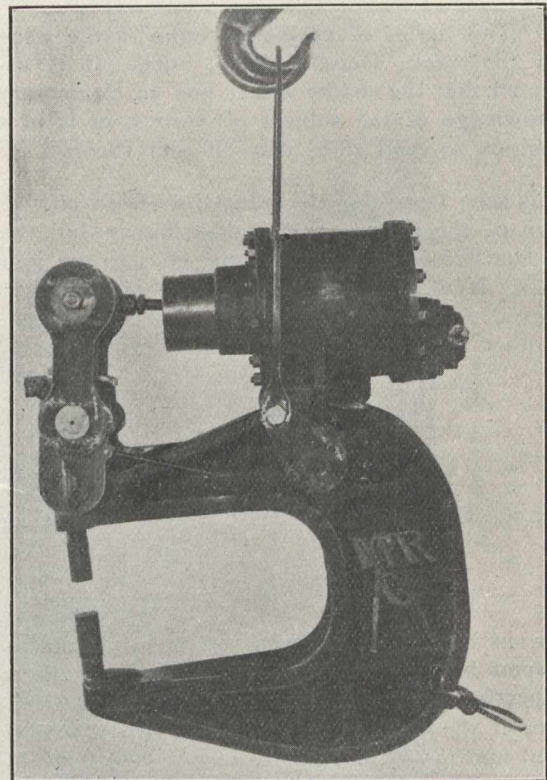


Fig. 2.—Lower Link Engaging the Stop.

considered an improvement on the well-known simple toggle machine, which in a general way it closely resembles. The essential difference lies in the construction of the side or

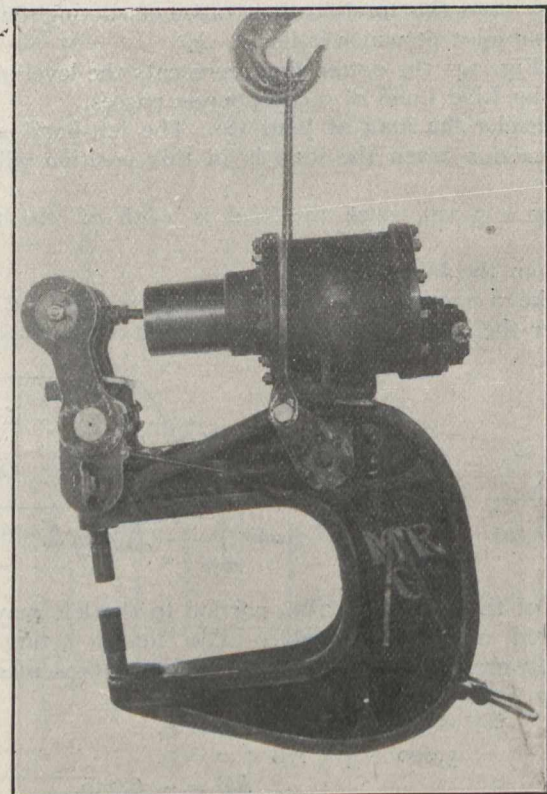


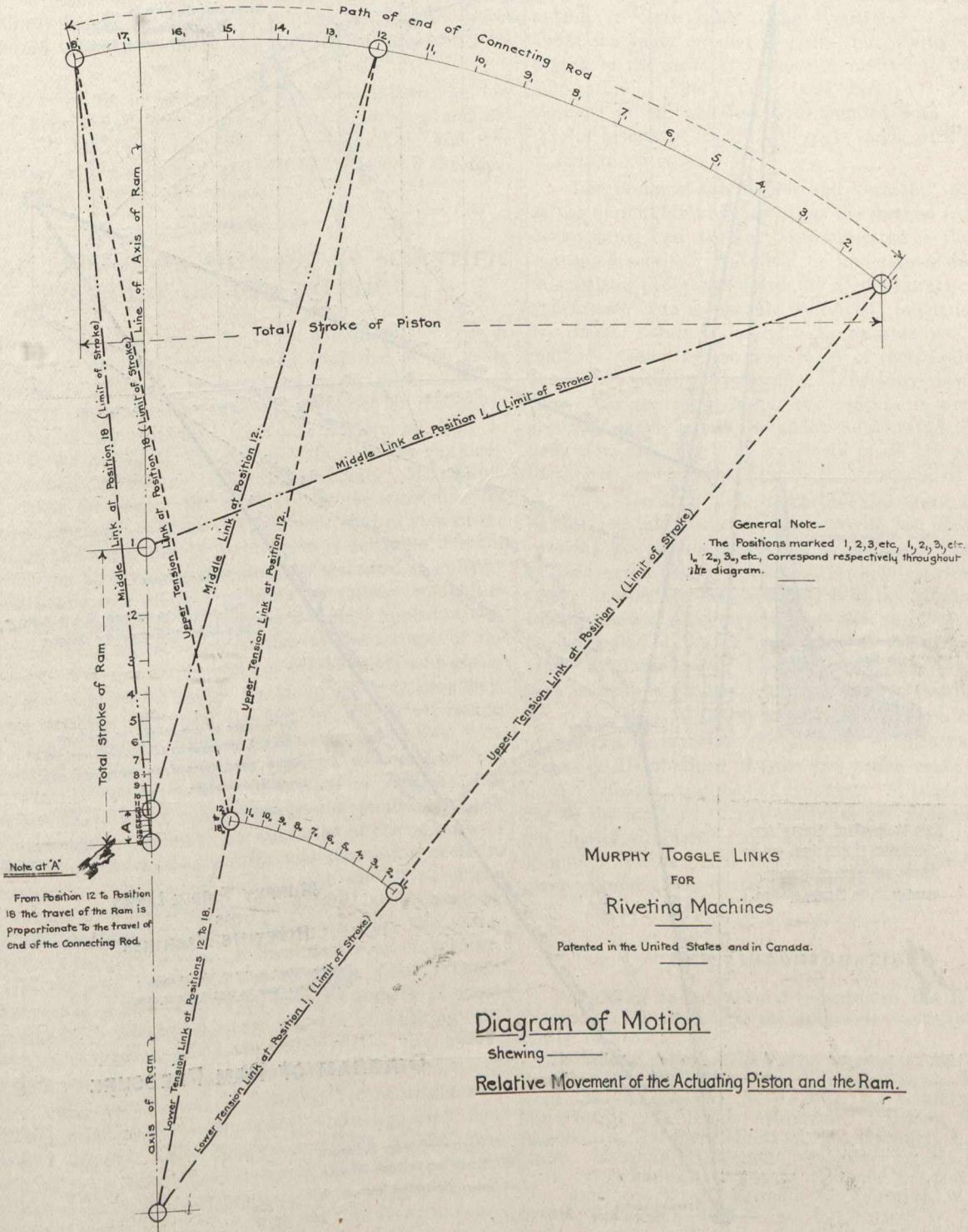
Fig. 3.—Forward Limit of Stroke.

tension links. In the simple toggle type these links are in one piece from end to end. The pressure on the ram, which forms the rivet head, is obtained by the motion of the

actuating piston combined with the tension link, which rotates about its lower centre or trunnion. The result of this combination varies according to the location of the trunnion with respect to the axis of the ram. When the trunnion is placed exactly on the ram axis the load on the ram is a maximum when the top pin is on the line of the ram, and its amount is infinity. This is, of course, speaking theoretically.

wasting much valuable compressed air and treating the rivet very unfairly.

A rivet when being driven should be sufficiently hot to flow into the hole under pressure and completely fill every part of it. The pressure exerted in the driving should be held a few seconds until the rivet has cooled sufficiently to obtain a reasonable amount of its tensile strength when cold.



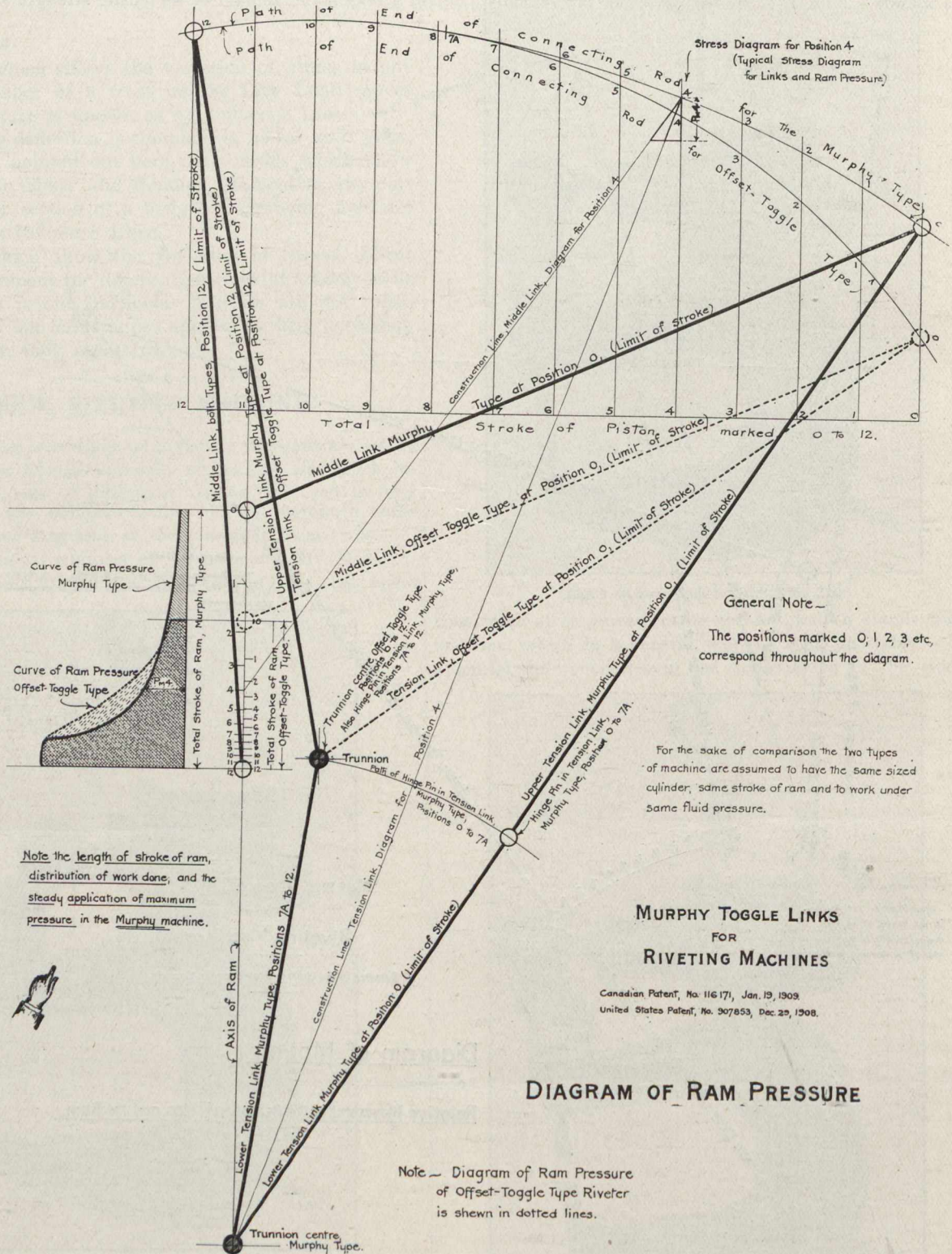
The difficulty, however, is that the maximum load is produced only at the extreme end of the stroke. In practice this means that the dolly screw has to be adjusted very accurately for the grip or thickness of metal through which the rivet is being driven. This adjustment is very difficult, and the result is that the operator, after doing his best, usually strikes the rivet with three or four blows of the ram, thus

If released earlier than this the spring of the metal simply stretches the plastic rivet and sets up a looseness which is often sought to be remedied by repeated applications of the ram.

The infinite load at the theoretical end of the stroke can be modified somewhat by placing the trunnion off the axis of the ram, an expedient adopted many years ago by the

Dominion Bridge Company, and which was, incidentally, suggested by Mr. Murphy at that time. This arrangement gives a definite maximum load for a short distance at the end of the stroke, but it does not lengthen the stroke of the ram, and considerable energy is available at the rivet during a portion of the stroke where it is not needed.

a stop. During the remainder of the stroke the side link rotates about this joint, giving the effect of the offset centre at the end of the stroke. The device accomplishes the following results: It gives a gap, or opening between the dies, of unusual length. It gives a uniform maximum load at the end of the stroke. The travel of the ram is proportional to



Note the length of stroke of ram, distribution of work done, and the steady application of maximum pressure in the Murphy machine.



The Murphy device obviates all these difficulties. It is essentially a combination of the simple toggle machine and the offset centre toggle machine. During the first part of the stroke the side links rotate about the lower centre. After the stroke has proceeded a certain distance, as shown on the diagrams and plates, a joint in the side link is engaged by

the motion of the piston while the maximum load is being applied. The application of the load is of exactly the amount required to drive the rivet from point to point of the stroke. In practice it is very easy to adjust the dolly within the range of the machine, so that repeated applications of the load on the rivet are never required.

The Murphy device is readily adapted to existing machines of the simple toggle type.

We were much interested in observing how the large machines could be varied in power by the introduction of spacers or shims in front of the stop on the side of the machine. By this simple expedient a 100-ton machine with a uniform load for the last half-inch of ram stroke can be made to exert any lesser maximum load with a correspondingly longer application of it. The thicker the spacer introduced between the stop and the link the less the total load.

The economy in compressed air consumption, the low cost of maintenance and repairs, speed of driving and excellence of the rivets appear to be very marked, and the enthusiasm of the workmen and officials regarding the machines seems to know no bounds.

LARGE ECONOMIES POSSIBLE BY SCIENTIFIC METHODS OF CAR PAINTING.

That a saving of twenty to thirty dollars on the cost of painting each car, and an increase of from five to ten years in wearing capacity are attainable by scientific methods of finishing is the important argument presented to the recent convention of the American Chemical Society by Carl F. Woods, of the Arthur D. Little, Inc., laboratory of engineering chemistry, in Boston. "It is probable," Mr. Woods says, "that no one of the methods in use embodies the maximum efficiency possible of attainment, and in view of the very large amount of money involved, it is desirable that the entire subject be given careful study by technical chemists."

The heavy cost of such painting as railway companies have felt to be necessary to appearance—and "appearances"—has long been an excessive burden to the income of the companies. The decorative effect of bright colors and glossy varnish has seemed to be demanded on grounds of policy. A cheap solution has been reached by the Interborough Rapid Transit Company, operating the subways in New York City, where the cars are merely covered with a dark red house paint, guiltless of either decoration or varnish. But for surface cars, which are always in the public eye, and whose appearance is taken as an indication of the company's attitude toward the public, varnish and decoration seem to be a necessity. The cost of painting the same type of car varies on different roads from \$30 to \$60, or even more. Some roads are forced to repaint their cars every two years, while other roads, by means of an annual coat of varnish, make one painting wear from ten to fifteen years. These variations make it clear that much money has been ill-spent through failure to employ the best methods of painting and finishing, especially as the most closely finish has by no means always turned out to be the most durable.

The "color and varnish" is of very recent origin and is a radical departure from the older "lead and oil" and "surfacers" systems. The fundamental idea of the new process is that the fewer the number of coats and the more similar these coats are in composition, the more durable will be the final results obtained. With this in view, a combination of coats is applied which are so composed as to prime the wood, prepare a surface, and obtain the desired color at the same time. This is accomplished by employing heavy silicate paints, containing the proper color ground in the same kind of varnish, each coat possessing suitable drying qualities for its respective demands. The best results are obtained by the use of dark colors such as green or brown, because the principal ingredient may be ochre, umber

or some other natural earth pigment which not only produces the desired shade, but is well adapted for preparing a foundation. The surface so obtained is covered with a coat of the body color ground in varnish followed by one thick coat of finishing varnish.

Each of the processes referred to has its specific faults and virtues. The "lead and oil" process, if properly applied, requires from three to four weeks and the application of ten or more coats. The "surfacers" process requires about the same number of coats, but, owing to the quicker drying of the surfacers, requires but two to three weeks for application. The "color and varnish" process is the simplest of all, and has been applied with apparently successful results in from six to eight days, with an application of four to six coats.

The faults of the "color and varnish" process are not as yet thoroughly understood, as the method is of very recent development and has not been subjected to the test of long continued service. It should be understood that the aim of this shorter process is durability at the lowest cost; and that appearance is in a measure sacrificed; but it is claimed that the finish obtained is fully as durable as by the older methods, that it is free from many of their faults, and that it produces a finished appearance sufficiently good for the purpose. On the other hand, the process is dependent upon specially made paints in which adulteration is difficult of detection, and which if carelessly made are not only short lived, but render more difficult the finishing of the car.

The system is only applicable for dark colors as the lighter and more brilliant pigments do not possess sufficient covering power, but this is not in itself a failing, as the use of dark green and brown colors is rapidly increasing, owing to the greater stability and length of life obtained. In this connection it is of interest to note that the Pullman Company have adopted a brown body color as the most satisfactory shade available, while a large proportion of the railroads, both steam and electric, employ a color of similar nature.

It has been shown by actual results that a saving of \$20 to \$30 can be made on the painting of each car and an increase in life obtained of from five to ten years by the adoption of scientific methods of finishing. It is probable that no one of the methods in use embodies the maximum efficiency possible of attainment, and in view of the very large amount of money involved it is desirable that the entire subject be given careful study by technical chemists.

NEW INCORPORATIONS

According to the several gazettes of the Dominion and Provincial Governments, the following companies were recently incorporated:—

Winnipeg, Man.—Globe Co., \$5,000, F. W. Sparling, H. W. Chislett, P. J. Proctor. Central Canada Portland Cement Co., \$1,000,000; W. A. Fox, V. J. Melsted, both of Minneapolis; C. Blake, Winnipeg. Gardner, Tritt & Co., \$40,000; B. Gardner, Montreal; M. Gardner, L. Tritt, Winnipeg. Hamblin & Brereton, \$40,000. W. H. Hamblin, N. Fritz, N. Schaffer, Winnipeg. Alliance Land & Investment Co., \$100,000; W. K. Bagnall, C. Esbrayal, W. K. Napier.

Orillia, Ont.—J. F. Ball & Co., \$25,000; S. W. Benner, Mrs. F. W. Benner, J. F. Ball.

Hamilton, Ont.—A. Bruce & Co., \$75,000; W. H. Bruce, E. W. Bruce, J. S. Laurie.

Chatham, Ont.—C. H. Gunn & Co., \$20,000; C. H. Gunn, G. A. Witherspoon, T. K. Holmes.

Yellow Grass, Sask.—Cameron, Duncan & Scott.

Yorkton, Sask.—Times Publishing Co.

Estevan, Sask.—Duncan-Moulton Co.

Melville, Sask.—Western Sun Publishing Co.

Bowmanville, Ont.—Durham Glove Company, \$40,000; R. D. Fairbairn, A. H. Parker, M. G. Marks.

Bridgeport, Ont.—Shirk & Snyder, \$50,000; P. Shirk, G. M. Shirk, N. M. Shirk.

ENGINEER'S LIBRARY

AN AMERICAN SPECIAL LIBRARY: A HINT TO ENGINEERS.

There is much more room than has yet been occupied, both in the engineering world, and in specific industrial fields, for the special library for information department organized with a close adaptation to the needs of the particular line of business it is to serve. Not merely technical, or scientific, facts are often required in haste and have to be hunted down more or less laboriously, but commercial questions are so numerous and complicated as to be frequently difficult to keep in mind. The practical value of the special library has been demonstrated in a considerable number of diverse business fields, and it should now be more widely made use of.

A valuable account of a special library that has done exceedingly good service in a technical field is given in a paper lately read before the Convention of the American Chemical Society by Guy E. Marion, in charge of the "Information Department" of the Arthur D. Little, Inc., laboratory of engineering chemistry, in Boston. The plan described gives a clear idea of how a similar library might be devised to give effective service in any industry or special branch of business.

Such a special library requires in the first place a small collection of highly specialized books covering related branches of industry. There must be, next, another small collection of first-rate general works, including the transactions of the chief scientific societies; trade catalogues of other industries with which the library is especially concerned; technical periodicals; general scientific books; dictionaries, encyclopedias, atlases, etc. The materials of the purchaseable sort must be selected with a view both to wide range and exact detail, and they must be at the same time of moderate bulk. Books do not tell the whole story, however, for besides the great number of trade catalogues and technical periodicals there is a further inflow of information through letters, and in the data resulting from the work of the staff itself. If the library is to reach its full theoretical efficiency, all this diverse matter must be so arranged that it can be easily found; further, there must be some one person who is specially acquainted with the resources of the library, and able to find on the instant whatever particular piece of information is asked for. The speed of modern business forces the information department, or special library of the industrial laboratory to play an active part in the correspondence work. The lay client of the industrial scientist asks an infinite variety of questions, and he expects a speedy answer. Members of the firm's own staff are equally in need of specific bits of information, required in the course of their own work. It is the business of the special library to meet these "hurry" calls, besides performing the more deliberate functions associated with the name "library."

Material is chiefly obtained through five channels; the purchase of special books or pamphlets to meet definite requests, through the mailing lists of outside concerns who send their advertising literature from time to time, through the kindness of individual acquaintances at various points who desire to exchange results, from chance notices appearing in the technical periodicals, which prompt us to initiate

ourselves, the getting of the information in question, and from the calls of clients and salesmen who may leave with us at their visits information of one kind or another. These are outside sources. The material produced within our own business of course comes to the library through the regular office routine.

All of this material then on its receipt falls into one of the following six groups: books, pamphlets, trade catalogues, special data, periodicals, and the museum collection.

The books are classified by the Dewey Decimal System, which long ago proved its claims in the public libraries. It serves our purposes very well indeed, and maintains uniformity with the best prevailing library practice in the majority of public libraries. By its use, like books stand together on the shelves, and those related stand closely by. It permits of perfect intercalation of new material upon the shelves in proper order. Supplementing the Dewey subject number, each book has its Cutters' author number. The Klate E. Sanborn arrangement of S. A. Cutters' alphabetic order table is used for assigning these numbers. All books are entered in an accession book on their reception, thus keeping accurate data on each volume.

Pamphlets receive treatment similar to that of the books so far as their numbering goes, but in order to keep this material in a distinct class by itself, the small letter (p) is used before the classification number. The pamphlets are then placed in regular pamphlet boxes on the shelves.

Trade catalogues receive a somewhat different treatment. This is the most objectionable class of material entering the library, owing to its entire lack of uniformity. The best practical treatment has been found to be a shelf arrangement, in which all the small material is enclosed in envelopes ($9\frac{5}{8} \times 11\frac{3}{4}$ inches, without flap, opening on the long side) and standing in one alphabet from (a) to (z). To each company's catalogue is assigned a cutter number; thus the catalogue of the Sturtevant Mill Company is S 936, which places it at one and the same time in a strictly alphabetical and numerical decimal order. This arrangement has the additional advantage of allowing those coming to the library seeking a particular concern's catalogues to go directly to the shelves, without consulting an index.

Special data make up a somewhat miscellaneous class of material composed of an accumulation of newspaper clippings, reviews of articles, results of personal interviews, special investigations, data culled from correspondence, and many other sources. The greater part of it is copied on correspondence size sheets, and placed in a vertical file. A small letter (a) preceding the number keeps this material distinctly in one class. The arrangement here is also by subject with the use of the decimal system.

The class of periodicals is made up of a selected list of about fifty scientific and technical publications, both foreign and domestic. Many of these are purchased directly, while others are received with memberships in the different learned societies. Notable in this class of literature is a new type which is provoking some attention, the industrial publication, such as *Industrial Progress*, *Reactions*, *The Valve World*, and the *General Electric Review*. For convenient reference all the periodicals are given symbols such as E. N. for *Engineering News*, E. R. J. for *Electric Railway Journal*, P. T. J. for *Paper Trade Journal*. Thus with the date of issue known, a certain reference can be easily and briefly made to any article. When the periodicals are later bound, as many of the better ones are, they of course leave this class and become books. As for the others, after clipping, they are thrown away.

The museum collection is made up of a large assortment of samples obtained from various sources, clients, etc., for example, fibrous materials, mineral matter, special papers, artificial silks, standardized steels and irons, papermaking chemicals, electric railway materials, etc., etc. To each individual sample is given a consecutive number, preceded by a small letter (a), which serves to keep this material in one group by itself. The material is filed in glass cabinets, where it is on constant exhibition, and proves, at least to visitors, a source of lively interest.

In the actual handling of this material a color scheme is used. White tags are placed on the books, salmon on the pamphlets, blue on the catalogues, yellow on the special data, green on the periodicals, and cherry on the museum material. This is found to be helpful in the work, always aiding the eye in the rapid classification of material, and preventing often the return of material to the wrong place.

Now as to the processes through which this bulk of material passes. Everything entering for permanent file is first accessioned, then catalogued and filed. The accessioning of the books has already been described; the other classes are accessioned on sheets kept for one week only, from which the information is later transferred to the weekly bulletin which will be described below. This does not apply to the periodicals which are checked upon a special card system as they are received, nor to the museum articles, which are not accessioned.

The classifying takes place next, which is followed as soon as finished by the indexing. Author, title and subject cards. These are all standard 3 x 5-inch library cards, and subject cards. The cards completed, the materials go to their respective files, and the cards to the library index.

This index is one large dictionary catalogue from (a) to (z), and now numbers between thirty and forty thousand cards. These are all standard 3 x 6-inch library cards, and the entire index is liberally supplied with guides for the searcher. After locating the proper material wanted in the index, the nature of the call number on the card will always indicate the group in which the material itself will be found. This has already been explained in earlier paragraphs upon the different groups of material, by the use of the small letters (s) (p) (m), etc., as symbols in the call numbers. A distinctive feature of filling cards with us is the placing of them first in their proper places, without the removal of the rods from the drawers. A second party then goes through the cabinet, verifying them and dropping them into their permanent arrangement.

The charging system carries out the color scheme. We have a small tray with the necessary compartments, in which narrow slips are used for keeping records of the material out of its regular place. White slips receive the book charges, salmon the pamphlet, blue the catalogue, and so on. On each slip is written the call number of the material, the initials of the borrower, and the date on which the loan is made. All material which is returned during the day is kept together in one place, and is returned to the files the first thing the following morning, the charge slips being removed at the same time from the charging tray.

THE CANADIAN ENGINEER'S MONTHLY INDEX OF CIVIL ENGINEERING LITERATURE.

The purpose of this monthly index is: To inform engineers and contractors of the literature published on those subjects in which they are especially interested, the character of the article and the journal in which it appeared. We

do not index in this section articles that appear in *The Canadian Engineer*.

Periodicals containing articles indexed, should be ordered direct from the publishers.

LIST OF PERIODICALS INDEXED.

- Canadian Society of Civil Engineers Proceedings.**—(Can. Soc. C.E. Proc.), Montreal, Can., m., 4 x 7 in., \$1.25.
- Canadian Cement and Concrete Review.**—(Can. Cem. and Con. Rev.), Toronto, Ont., m., 9 x 14, 15 cents.
- Contractor.**—(Contr.), Chicago, Ill., bi-w.; 7 x 10 in., 20 cents.
- Engineering—Contracting.**—(Eng.-Cont.) Chicago, Ill., w.; 9 x 12 in., 10 cents.
- Engineering News.**—(Eng. News), New York, N.Y., w.; 10 x 14 in., 15 cents.
- Engineering Magazine.**—(Eng. Mag.), New York, N.Y., 7 x 10 in., 25 cents.
- Good Roads Magazine.**—(Good Rd. Mag.), New York, U.S.A. 9 x 12 in., M., 10 cents.
- Machinery.**—(Mach.), New York, N.Y., m., 7 x 11 in., 20 cents.
- Municipal Journal and Engineer.**—(Mun. Jl. and Eng.), w., New York, N.Y., 9 x 12, 10 cents.
- Municipal Engineering Magazine.**—(Mun. Eng. Mag.), Indianapolis, Ill., m., 7 x 10 in., 25 cents.
- Power and Engineer.**—(Pow.), New York, N.Y., w.; 9 x 12 in., 5 cents.
- Railway Age Gazette.**—(R. R. Age Gaz.), New York, w.; 8 x 11 in., 15 cents.
- Surveyor, The.**—(Sur.), London, Eng., w.; 6 x 11, 10 cents.
- Engineering.**—(Engr.), London, Eng., w.; 12 x 15 in., 15 cents.

*Illustrated.

SEWAGE AND WATER.

- Sewage Disposal Plant.***—6 pp., Cont., Feb. 1. Method of construction and layout of the sewage disposal works at Baltimore, Md.
- Sewer Construction in Baltimore.***—12 pp., Mun. Jl, Feb. 2. An account of the construction, design and special features of a twenty million dollar plant.
- Depth of Waterpipe.***—3 pp., Mun. Jl, Jan. 5. Data from eighty-seven cities as to the customary depth of water pipe.
- New York Water Supply.***—7 pp., Mun. Jl, Jan. 19; a description of the 90-mile aqueduct and tunnels, and their construction.

RAILWAYS.

- Ditching Machine.***—2 pp., Eng. News, Jan. 20. Design, construction and operation of a ditching machine for small cuts and fills along line of Southern Pacific Railway.
- North River Tunnel.***—5 pp., Eng.-Cont., Feb. 2. By Chas. W. Jacobs, describing design and location of tunnels of the Pennsylvania Railway entering New York City.
- General Shops.***—6 pp., Rail. Age, Jan. 7. The general shops of the Sud. Pacifico de Mexico at Empalme.
- Ties.***—1 p., Cont., Jan. 15; cost of making and laying reinforced concrete ties.
- Transportation.**—4 pp., Rail. Age, Jan. 14; transportation and traffic on railways in Germany.

Engine Tests.*—4 pp., Rail. Age, Jan. 14. A comparison of the tests of the Consolidated and Mallett locos.

CONCRETE.

Reinforced Concrete.*—8 pp., Eng. Mag., February. The industrial applications of reinforced concrete.

Long Span Reinforced Concrete Bridges.*—9 pp., Eng. News, Jan. 27. An article by F. W. Scheidenhelm on Long Span Reinforced Concrete Girder Bridges.

Concrete Lock.—6 pp., Eng.-Cont., Jan. 26. Method and cost of constructing a concrete lock and timber crib dam, employing day labor.

ROADWAYS AND PAVEMENTS.

Crowns of Pavements.*—3 pp., Mun. Eng., February. By Geo. C. Warren, giving formulae for calculation of crown and cross-sections of roadways.

Road Tests.*—3 pp., Mun. Eng., February. An account of tests by Public Roads Branch, United States Department of Agriculture, at Washington.

Brick Pavement.—2/3 p., Eng.-Cont., Feb. 2. Detailed cost of constructing two thousand square yards of brick pavement at Carlisle, Pa.

Pavements.—1/3 p., Eng.-Cont., Jan. 19. Cost of concrete pavements at Boise, Idaho.

Transportation.—3 pp., Good Rd. Mag., January. By Samuel Hill, of the Washington Good Roads' Association, dealing with production, transportation and consumption.

MISCELLANEOUS.

Cast Iron Valves.*—2 pp., Pow., Jan. 11; cast iron valves and fittings for superheated steam.

Piles.—1 p., Eng. News, Jan. 13. Method of Protecting wooden piles against the Tereido, by concrete shells.

Centrifugal Pumps.*—11 pp., Eng. Mag., January. Design, construction and operation of high lift centrifugal pumps.

Construction of Telephone Lines.*—1 p., Eng.-Cont., Feb. 2. Account of cost of construction of a line in Cuba.

Construction of Electric Conduits.*—5 pp., Mun. Jl., Jan. 26. Description of the design and construction of conduits at Baltimore, Md.

Cooling Towers.*—4 pp., Pow., Jan. 18. Types of towers for cooling purposes at steam and gas plants.

Drains.—1/2 p., Eng.-Cont., Jan. 12. Formulae for calculation of capacity of drains.

Drawings.*—1 p., Mach., January; an article describing some economies in making drawings.

BOOK REVIEWS.

Directory of Portland Cement Manufacturers.—Published by the Cement Era, 842 Monadnock Block, Chicago, Ill. Price, \$1.

The directory is issued in a pocket edition, size, 5 x 3 inches, by 1/4-inch thick, 260 pages, is bound in flexible leather cover, contains an alphabetical list of all the cement companies in the United States and Canada, not only those in operation, but those under construction and those being financed. Detailed information is also given in regard to each

company, giving the names and addresses of each of the officers, the capitalization, the name of the brand of cement produced by each company, the daily capacity, the number of kilns, states whether dry or wet process, the kind of fuel used for burning. A new feature this year includes Government statistics on the output of cement, gypsum and lime during the past ten years. The officials of the Association of Cement and Lime Manufacturers is also given.

The Elements of Mechanics of Materials.—By C. E. Houghton, Professor of Mechanical Engineering at New York University. Published by the D. Van Nostrand Company. Price, \$2, net.

As explained in the preface, it is the author's intention that this book be regarded as a text for engineering students rather than a treatise on the subject of Strength of Materials.

It is pleasing to find an author who prefaces his work so modestly as has been above intimated—still more pleasing when the standard of the book is considered.

The first two chapters of the book deal with Stress and Deformation, the theory being first taken up and then made plain by practical examples. The discussion of rivetted joints, while, of course, quite elementary, is very clear.

The next four chapters treat respectively of Torsion; The Elastic Curve in Beams; Long Columns; and Combined Stresses. These subjects are presented in such a manner that the student cannot fail to follow.

The last portion of the book, Chapter VIII., is devoted to Compound Bars and Beams; that is, bars and beams built up of more than one material. Under this heading, the theory of reinforced concrete beams is discussed, a subject upon which very little has been said outside of a few large works on concrete which are unsuitable for students.

The whole work is characterized by the absence of that superfluity of problems of mere mathematical interest which usually take up a great percentage of the pages of most, so-called, engineering text books. This, together with the fact that the steps in the algebraic reasoning of the problems are worked out in full and not left for the student to figure out for himself thereby wasting time, makes the book one which students may well value as a concise statement of the elements of Strength of Materials.

—T. R. L.

"Efficiency as a Basis for Operation and Wages."—By Harrington Emerson. This is an enlarged and revised reprint of a series of articles that appeared in the Engineering Magazine of New York, July, 1908, to March, 1909. Cloth, 5 1/2 x 7 1/2 inches, 171 pages. Amongst the subjects discussed are national inefficiencies, line and staff organization, standard costs, waste, and cost accounting.

The author deals with the modern methods of standardizing shop costs particularly with reference to the human element, the development of the unit workman to his own highest efficiency. The necessity of staff as well as of line organization is clearly shown, the modern German army being perhaps the best example of the high efficiency developed in the ranks by a staff of specialists.

His methods are briefly the attainment of efficiency by working towards standards which are always kept a little ahead of actual results, by accurate accounting and consequent discovery and elimination of waste, and by combining with a minimum standard wage a bonus system which will stimulate the efficient workmen and at the same time render easy of elimination the inefficient one.—A. O.

The Railway Law of Canada.—By Mr. Samuel W. Jacobs, K.C., of the Montreal Bar. The work includes the Statute Revisions of 1906, and contains valuable directions and suggestions as to organization and management which save much time in a busy law office.

At the same time directions and authorities are given with sufficient clearness that organizers or directors can readily understand points which would otherwise require the explanation of a solicitor. The sections as to construction and operation appear to be particularly useful. Those parts dealing with interpretation of the Railway Act and as to the comparatively new practice before the Board of Commissioners save much time and give the practitioner the relief that comes with a sense of certainty.

The work which is fairly exhaustive on Railway Law in Canada, will also recommend itself to many officials handling railway, baggage and passenger traffic, and we think will recommend itself both to the legal profession and the mass of persons connected with railway corporations.—J. E. P.

Practical Engineer Pocket Book.—Published by the Technical Publishing Co., 55 Chancery Lane, London, W.C. Size, 3 x 6; pages, 700. Price, leather, 50 cents; cloth, 35 cents.

This annual publication is of great interest to engineers. In addition to the information it has contained there are added notes on fuel-testing, condensers, friction of air and water in pipes, alloys, suction gas producers, etc.

Practical Engineer "Electrical" Pocket Books.—Published by the Technical Publishing Co., 55 Chancery Lane, London, W. C. Size, 3 x 5; pages, 570. Price, leather, 50 cents; cloth, 35 cents.

The following headings include some of the items of new matter that appear in the current issue: Storage Batteries; Design of Motor Starting Resistances; Water Resistances for Testing Purposes; the International Candle; the Transformation of Currents for Power Purposes; Types of Underground Boxes; Modern Wiring Systems, including the Kalkos and O.S; Metallic Filament Lamps; Arc Lamps; besides numerous other additions and revisions, tables, etc.

Practical Armature and Magnet Winding.—By Henry C. Herstmann and Victor H. Tousley. Published by Frederick J. Drak & Co., Chicago; 251 pages, 128 illustrations; pocket size, full morocco. Price, \$1.50.

As the name implies, it is a treatise for the practical electrician, explaining the fundamental theory of armature and magnet winding in a simple manner, readily understood by the non-technical reader. The more common forms of armature winding and construction are illustrated and described in the text, along with the chapters on the calculation of armature windings, affords information in sufficient detail to an understanding of the principles of the design of the common armature. It will be found of interest to the practical man.—F. A. G.

PUBLICATIONS RECEIVED.

"Tests of Tungsten Lamps," by T. H. Amrine and A. Guell, issued as Bulletin No. 33, of the Engineering Experiment Station of the University of Illinois. It reports a series of tests upon tungsten lamps of the 25-watt size, with filaments made by the paste, colloid and deposition processes. Copies of Bulletin No. 33 may be obtained gratis upon application to W. F. M. Goss, Director of Engineering Experiment Station, University of Illinois, Urbana, Illinois.

"The Occluded Cases in Coal," by S. W. Parr and Perry Barker, issued as Bulletin 32 of the Engineering Experiment

Station of the University of Illinois, is essentially a study of the behavior of coal towards the atmosphere. The avidity of coal for oxygen is made evident, and the results of the entire work bear directly upon the matter of weathering and of spontaneous combustion. Copies of Bulletin No. 32 may be obtained gratis upon application to W. F. M. Goss, Director of the Engineering Experiment Station, University of Illinois, Urbana, Illinois.

Production of Iron and Steel in Canada, 1907-8 by John McLeish, B.A.; 35 pp., 6 x 9, pub. doc. Department of Mines, Mines Branch, Ottawa, Ont.

Tests on the Permeability of Concrete, by Francis Michael McCullough, B.S., Instructor in Mechanics, University of Wisconsin, Madison, Wis. 36 pp., 6 x 9.

Forest Products of the United States, 1908. 137 pp., 6 x 9; pub. doc.; Department of Commerce and Labor, Bureau of the Census; E. Dana Durand, Director, Washington.

Recent Development of the Producer-Gas Power Plant in the United States, by Robt. Heywood Fernald. 82 pp., 6 x 9; pub. doc.; United States Geological Survey, Department of the Interior, Washington; Geo. Otis Smith, Director.

Proceedings of the American Mining Congress, twelfth annual session, at Goldfield, Nev., September 27th, October 2nd, 1909; 460 pp., 6 x 9. Jas. F. Callbreath, Jr., Secretary, Denver, Col.

CATALOGUES AND CIRCULARS.

Cutting and Welding of Metals is the subject dealt with in a recent publication issued by the American Oxhydric Co., Milwaukee, Wis. Tables and illustrations are included, together with much interesting information.

Mine Locomotives.—A seventy-page book has just been issued by the Jeffrey Manufacturing Co., of Columbus, Ohio, and Montreal, Canada, on electric locomotives for mines. The publication contains much information and many interesting illustrations.

Sewage Purification Works.—An interesting report descriptive of the sewage purification works installed in Harwich, England, by the Urban District Council has just been prepared by Mr. J. H. Brocklehurst, Assoc. Mem. R. San. Inst., Harwich. Illustrations and tables are included. Published by Whitehead & Poole, Milltown Engineering Works, Radcliffe, near Manchester, England.

Waterworks Specialities.—Line Drawings and other illustrations and descriptions devoted to tapping engines, machines and waterworks specialities generally are included in a recent catalogue issued by the Waterworks Equipment Co., of 50 Church Street, New York city.

Spiral Rivetted Pipe.—Forged steel pipe flanges, hydraulic and exhaust steam supplies, etc., are illustrated and described by the American Spiral Pipe Works Co., P.O. Box 485, Chicago, Ill., in pamphlet No. 30.

Arc Lamps.—Recent Types of Arc Lamps and Their Operation, by C. E. Stephens, is the title of an interesting paper included in pamphlet 1506, published by the Westinghouse Electric and Manufacturing Co., of Pittsburg, Pa., from whom copies may be secured.

Hassam Granite Block and Compressed Concrete Pavements are dealt with in an interesting publication issued by the Hassam Paving Co., Worcester, Mass, U.S.A.

Pipes and Boilers.—The insulation of pipes and boilers is presented by the H. W. Johns-Manville Company, of New York, in a pocket-size booklet, which contains many fine illustrations.

Conveying Machinery.—General price lists and descriptions of elevating, conveying and power transmitting machinery and chains are published by the Jeffery Manufacturing Co., of Columbus, Ohio, and Montreal, Canada, in a 400-page volume just received. The book teems with valuable tables and references, and will be sent to those interested upon application.

Dumping Tubs and Grab Buckets of many kinds are illustrated and described by the C. W. Hunt Company, of 45 Broadway, New York city.

Specifications for the manufacture of continuous continuous concrete pipe by the Lock Joint Pipe Co., 165 Broadway, New York, have just been issued.

Transformers for lighting and power are well illustrated and described in Bulletin No. 104, issued by the Packard Electric Company, whose head offices and works are at St. Catharines, Ont.

Gas Engines and Producers.—The Goldie & McCulloch Company, of Galt, Ont., are distributing a handsome booklet devoted to gas engines and producers. The descriptions are illustrated, and convey a good idea of the design and improved features of engines built at the above company's works.

Tool Holders.—Machine Shop specialties and tool holders for turning, planing, boring and drilling metals are well described by the Armstrong Bros. Tool Company, 339-357 N. Francisco Avenue, Chicago, Ill., in a new catalogue, in which are new listings, including automatic and plain drill drifts and Armstrong standard reversible ratchet drills. The booklet also contains a good price list.

Electrical Equipment.—Booklet No. 706, issued by Bruce Peebles & Co., Limited, engineers, Edinburgh, Scotland, is partially devoted to an illustrated description of the company's works. Part II. describes electrical equipment, including motors of many kinds, alternators and dynamos.

Feed Water Filters.—A new and greatly enlarged edition of "Feed Water Filtration" is being distributed gratis by James Beggs & Co., 109 Liberty Street, New York. This book explains how oil, dirt, etc., get into feed water, what damage they do within the boilers, and how to remove such impurities before this can occur. It tells how water of condensation and returns from heating systems may safely be used to cut down the coal and water bills, and it explains the advantages and disadvantages of various methods of filtration. Numerous instances are cited where filtration through terry cloth at the last point in the line before water enters the boilers has proven successful after other methods have failed. The Blackburn-Smith feed-water filter and grease extractor is described in detail. Engineers will find this book well worth writing for.

The D. P. Battery Company, of Bakewell, Derbyshire, England, send us their calendar for 1910, which contains a very interesting illustration of Lumford Pack Horse Bridge, built in the 15th century, and it is made more interesting by the fact that the company's works are in the back-ground. The calendar is useful as well as instructive, and is well worth sending for.

ENGINEERING SOCIETIES.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—413 Dorchester Street West, Montreal. President, George A. Mountain; Secretary, Professor C. H. McLeod.

QUEBEC BRANCH.—Chairman, L. A. Vallee; Secretary, Hugh O'Donnell, P.O. Box 115, Quebec. Meetings held twice a month at Room 40, City Hall.

TORONTO BRANCH.—96 King Street West, Toronto. Chairman, J. G. G. Kerry; Secretary, E. A. James, 62 Church Street, Toronto. Meet last Thursday of the month.

MANITOBA BRANCH.—Chairman, H. N. Ruttan; Secretary, E. Brydone Jack. Meets first and third Fridays of each month, October to April, in University of Manitoba, Winnipeg.

VANCOUVER BRANCH.—Chairman, Geo. H. Webster; Secretary, H. K. Dutcher, 40-41 Flack Block, Vancouver. Meets in Engineering Department, University

OTTAWA BRANCH.—Chairman, W. J. Stewart, Ottawa; S. J. Chapleau, Resident Engineer's Office, Department of Public Works.

MUNICIPAL ASSOCIATIONS.
ONTARIO MUNICIPAL ASSOCIATION.—President, Mr. George Geddes, Mayor, St. Thomas, Ont.; Secretary-Treasurer, Mr. K. W. McKay, County Clerk, St. Thomas, Ontario.

UNION OF ALBERTA MUNICIPALITIES.—President, H. H. Gaetz, Red Deer, Alta.; Secretary-Treasurer, John T. Hall, Medicine Hat, Alta.

UNION OF NOVA SCOTIA MUNICIPALITIES.—President, Mr. A. E. McMahon, Warden, King's Co., Kentville, N.S.; Secretary, A. Roberts, Bridgewater, N.S.

UNION OF SASKATCHEWAN MUNICIPALITIES.—President, Mayor Hopkins, Saskatoon; Secretary, Mr. J. Kelso Hunter, City Clerk, Regina, Sask.

CANADIAN TECHNICAL SOCIETIES.

ALBERTA ASSOCIATION OF ARCHITECTS.—President, R. Percy Barnes, Edmonton; Secretary, H. M. Widdington, Strathcona, Alberta.

CANADIAN ASSOCIATION OF STATIONARY ENGINEERS.—President, Charles Kelly, Chatham, Ont.; Secretary, W. A. Crockett, Mount Hamilton, Ont.

CANADIAN CEMENT AND CONCRETE ASSOCIATION.—President, Peter Gillespie, Toronto, Ont.; Vice-President, Gustave Kahn, Toronto; Secretary-Treasurer, Alfred E. Uren, 62 Church Street, Toronto.

CANADIAN ELECTRICAL ASSOCIATION.—President, N. W. Ryerson, Niagara Falls; Secretary, T. S. Young, Canadian Electrical News, Toronto.

CANADIAN FORESTRY ASSOCIATION.—President, Thomas Southworth, Toronto; Secretary, James Lawler, 11 Queen's Park, Toronto.

CANADIAN MINING INSTITUTE.—Windsor Hotel, Montreal. President, W. G. Miller, Toronto; Secretary, H. Mortimer-Lamb, Montreal.

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

CANADIAN STREET RAILWAY ASSOCIATION.—President, D. McDonald, Manager, Montreal Street Railway; Secretary, Acton Burrows, 157 Bay Street, Toronto.

CANADIAN SOCIETY OF FOREST ENGINEERS.—President, Dr. Fernow, Toronto; Secretary, F. W. H. Jacombe, Ottawa.

CENTRAL RAILWAY AND ENGINEERING CLUB.—Toronto, President, C. A. Jefferis; Secretary, C. L. Worth, 409 Union Station. Meets third Tuesday each month except June, July, August.

DOMINION LAND SURVEYORS.—Ottawa, Ont. Secretary, T. Nash.

EDMONTON ENGINEERING SOCIETY.—President, Dr. Martin Murphy; Secretary, B. F. Mitchell, City Engineer's Office, Edmonton, Alberta.

ENGINEER'S CLUB OF TORONTO.—96 King Street West. President, A. B. Barry; Secretary, R. B. Wolsey. Meeting every Thursday evening during the fall and winter months.

INSTITUTION OF MINING AND METALLURGY.—President, Edgar Taylor; Secretary, C. McDermid, London, England. Canadian Members of Council:—Prof. F. D. Adams, J. B. Porter, H. E. T. Haultain, and W. H. Miller, and Messrs. W. H. Trewartha-James and J. B. Tyrrell.

MANITOBA LAND SURVEYORS.—President, George McPhillips; Secretary-Treasurer, C. G. Chataway, Winnipeg, Man.

NOVA SCOTIA SOCIETY OF ENGINEERS, HALIFAX.—President, S. Fenn; Secretary, J. Lorne Allan, 15 Victoria Road, Halifax, N.S.

ONTARIO PROVINCIAL GOOD ROADS ASSOCIATION.—President, W. H. Pugsley, Richmond Hill, Ont.; Secretary, J. E. Farewell, Whitby, Ont.

ONTARIO LAND SURVEYORS' ASSOCIATION.—President, Louis Bolton; Secretary, Killaly Gamble, 703 Temple Building, Toronto.

ROYAL ARCHITECTURAL INSTITUTE OF CANADA.—President, A. F. Dunlop, R.C.A., Montreal, Que.; Hon. Secretary, Alcide Chausse, Beaver Hall Square, Montreal, Que.

WESTERN CANADA RAILWAY CLUB.—President, Grant Hall; Secretary, W. H. Rosevear, 199 Chestnut Street, Winnipeg, Man. Second Monday, except June, July and August, at Winnipeg.

AMERICAN TECHNICAL SOCIETIES.

AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS (TORONTO BRANCH).—W. H. Eisenbeis, Secretary, 1207 Traders' Bank Building.

AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—President, John P. Cauty, Fitchburg, Mass.; Secretary, T. F. Patterson, Boston & Maine Railway, Concord, N.H.

AMERICAN RAILWAY ENGINEERING AND MAINTENANCE OF WAY ASSOCIATION.—President, Wm. McNab, G.T.R., Montreal, Que.; Secretary, E. H. Fritch, 962-3 Monadnock Block, Chicago, Ill.

AMERICAN SOCIETY OF CIVIL ENGINEERS.—Secretary, C. W. Hunt, 220 West 57th Street, New York, N.Y. First and third Wednesday, except July and August, at New York.

AMERICAN SOCIETY OF ENGINEERING-CONTRACTORS.—President, George W. Jackson, contractor, Chicago; Secretary, Daniel J. Hauer, Park Row Building, New York.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—29 West 39th Street, New York. President, Jesse M. Smith; Secretary, Calvin W. Rice.

WESTERN SOCIETY OF ENGINEERS.—1735 Monadnock Block, Chicago, Ill. Andrew Allen, President; J. H. Warder, Secretary.

RAILWAY EARNINGS AND STOCK QUOTATIONS

NAME OF COMPANY	Mileage Operated	Capital in Thousands	Par Value	RAILWAY EARNINGS.				STOCK QUOTATIONS TORONTO						
				Date from	Date to	1910		1909		Price Feb. 4 '09	Price Jan. 27 '10	Price Feb. 3 '10	Sales Week End Feb.	
						Jan. 1	Jan. 31	1910	1909					
Canadian Pacific Railway...	10,048	\$150,000	\$100	Jan. 1	Jan. 31	\$0,007,000	\$4,711,000	173 1/2	180 1/2	178	180			
Canadian Northern Railway.	3,180	.....	100	"	Feb. 7	9,080	647,000	.....	.....	.....	.....
*Grand Trunk Railway....	3,536	226,000	100	"	Jan. 31	3,532,992	2,644,416	*1st. pref.	103 1/2	3rd pref.	50 1/2	ord'y 20 1/2		
T. & N. O.	264.74	(Gov. Road)	100	"	Jan. 21	90,514	46,417	.....	.....	.....	.....
†Montreal Street Railway...	141.79	18,000	100	"	Jan. 28	297,723	279,304	207 1/2	206 1/2	221	220	223	222 1/2	2,631
Toronto Street Railway...	114	8,000	100	"	"	298,612	263,513	120	120	125	123 1/2	121 1/2	95	
†Halifax Electric.....	13.3	1,400	100	"	Jan. 31	15,458	14,073	107	121 1/2	127	123	.....	73

* G.T.R. Stock is not listed on Canadian Exchanges. These prices are quoted on the London Stock Exchange.
 † Quoted on Montreal Exchange.

WINNIPEG STREET RAILWAY.

Earnings for 1909 Show Big Increase—Million Mark Passed.

The gross earnings of the Winnipeg Street Railway for 1909 amounted to \$1,069,782.86. This marks the first time the earnings have gone over the million mark. In 1908 the gross earnings totalled \$899,632.61 so the increase for 1909 over 1908 is \$170,150.25. This is the largest increase on record, save the increase in the earnings for 1906 over 1905, which amounted to \$176,075.40. The receipts by months for 1909 show that through the power breakdown in Nov. the company must have lost over \$15,000 on the drop in street railway receipts alone. Figuring on an average rate of four and a quarter cents in Winnipeg, the street railway carried 25,171,381 passengers in 1909. The company states that this figure will be close to the actual count of fares. In 1908 the company carried 22,019,507 passengers; in 1907 it carried 20,846,317 passengers, and in 1906, 17,229,554 passengers.

About seventy miles of single track have been operated.

Following is a statement which shows the earnings of the street railway by months in 1909:—

	Cash fares	Ticket sales	Total
January	\$14,973.65	\$61,841.30	\$76,814.95
February	13,998.75	59,889.65	73,888.40
March	15,420.55	64,750.55	80,171.10
April	16,140.50	62,567.10	78,707.60
May	18,278.85	68,741.75	87,020.60
June	10,872.00	76,934.20	96,806.20
July	25,790.85	89,872.10	115,662.95
August	21,071.45	77,446.75	98,518.20
September ...	18,609.40	71,852.30	90,461.70
October	18,741.10	75,167.20	93,908.30
November	14,984.35	63,623.25	78,607.60
December	18,918.90	76,713.80	95,632.70

\$216,800.35 \$849,399.95 \$1,066,200.30
 3,582.56

Sundry earnings
 \$1,069,782.86

Percentage due City of Winnipeg; 5 per cent. on \$1,069,782.86..... 53,489.14

These figures show a remarkable falling off in the receipts for November, which was caused by the crippling of the service by the power breakdown.

The following statement shows the increases of the gross earnings from year to year:—

1903 over 1902	\$ 87,550.40
1904 " 1903	120,203.00
1905 " 1904	144,108.40
1906 " 1905	176,075.40
1907 " 1906	134,131.42
1908 " 1907	37,775.19
1909 " 1908	170,150.25

WEEKLY EARNINGS

NAME OF COMPANY	Week Ending	TRAFFIC RETURNS		
		1910	Previous Week	1909
Canadian Pacific Railway.	Jan. 31	*\$1,973,000	\$1,377,000	*\$1,604,000
Canadian Northern Railway..	Feb. 7	168,700	* 246,500	119,800
Grand Trunk Railway	Jan. 31	*1,008,257	764,825	*838,208
T. & N. O.	Jan. 21	30,279	17,855	12,423
Montreal Street Railway...	Jan. 28	74,056	77,942	65,830
Toronto Street Railway....	"	76,141	74,035	65,844
Halifax Electric.....	Jan. 31	4,967	.....	4,237
†London Street Railway....	"	18,063.	.....	17,454

*Ten days—January 22nd to 31st.
 †For month of January—31 days.

ORDERS OF THE RAILWAY COMMISSIONERS OF CANADA.

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

- 9161—January 7—Approving plans and specifications of drain known as Osborne Drain, proposed to be constructed under G.T.R. in Southwold Township, Ontario.
- 9162—January 7—Approving plans and specifications of drain known as Heidt Drain proposed to be constructed under G.T.R. in Southwold Township, Ont.
- 9163—January 8th.—Authorizing the C.P.R. to use and operate bridge No. 31.1, over Noming River, Noming Section, Eastern Division.
- 9164—December 22—Amending Rule No. 4 in connection with the transmission of code messages between points in Canada, contained in the G.N.W. Telegraph Company's Supplement No. 1 to Tariff C.R.C. No. 9; and C. P. Telegraph Company's Supplement No. 2 to Tariff C.R.C. No. 1, and Western Union Telegraph Company's Tariff C.R.C. No. 5.
- 9165—January 7—Authorizing the Saskatchewan Government Telephones to place its wires across track G.T.P. Railway between Secs. 21 and 22, Tp. 20, R. 1 west 2nd Meridian, west of Zeneta, Sask.
- 9166—January 7—Authorizing the Seymour Power & Electric Company to place its electric transmission line across G.T.R. in Lot 12, Con. 6, Seymour Township, Northumberland County, Ont.
- 9167—January 10—Authorizing the town of North Battleford, Sask., to place its wires across C.N.R. at or near Victoria St.
- 9168—January 7—Authorizing the municipality of Pipestone, Man., to place its wires across the C.P.R. at five points, viz.:—1 mile west of Reston, Man., at Ewart Siding, at public crossing at Ebor, Man., at public crossing 1/2 mile east Pipestone, and 2 1/4 miles south-east Ebor siding.
- 9173—January 6—Directing the C.N.R. to provide better facilities and accommodation for traffic offered it on its line between towns of Rainy River and Fort Frances, Ont.
- 9174—January 6—Directing the C.N.R. to provide suitable station and platform facilities at Barwick, Ont.
- 9175—January 10—Authorizing the C.P.R. to construct industrial spurs across Ross Ave. and Xante St., Winnipeg, Man.
- 9176—January 10—Authorizing the Crow's Nest Southern Railway Company to remove interlocking plant where its line of railway crosses C.P.R. about 3/4 mile east of Hosmer, B.C.
- 9261—January 13—Approving proposed highway crossing and road diversion of the G.T.P. Railway in S.E. Sec. 31, Tp. 39, Range 21, west 3rd Meridian, Dist. of West Sask., Saskatchewan.
- 9262—January 13—Approving proposed revised location of the Montreal and Southern Counties Railway Company in the vicinity of Riverside St., Montreal, P.Q.
- 9263—January 13—Approving and sanctioning revised location of the C.N.O. Railway Company's line near Osaca, Hope Township, Ontario.
- 9264—January 13—Authorizing the Montreal and Southern Counties Railway to cross G.T.R. at three points, viz.;—near Victoria Jubilee Bridge, near Windmill Point, and on Common Street, all at Montreal, P.Q.

(Continued on Page 140.)

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.

TENDERS PENDING.

In addition to those in this issue.

Fuller information may be found in the issues of the Canadian Engineer referred to.

Place and Work.	Tenders close.	Issue of.	Page.
Wetaskiwin, Alta., gas well.....	Feb. 15.	Jan. 14.	46
Winnipeg, Man., electric equipment.	Feb. 15.	Jan. 14.	39
Winnipeg, Man., fence, gates.....	Feb. 28.	Jan. 21.	65
London, Ont., electrical apparatus...	Feb. 25.	Jan. 28.	91
Vancouver, tile, line	Feb. 15	Jan. 28.	91
Ottawa, Ont., wooden tank.....	Mar. 1.	Feb. 4.	40
Ottawa, Ont., piers	Feb. 28.	Feb. 4.	111
Toronto, Ont., cast iron pipe.....	Feb. 22.	Feb. 4.	40
Saskatoon, Sask., foundations	Feb. 14.	Feb. 4.	40
Saskatoon, Sask., steel bridge.....	Feb. 21.	Feb. 4.	40
Saskatoon, Sask., Copper wire.....	Feb. 14.	Feb. 4.	40
Moose Jaw, Sask., sprinklers.....	Feb. 21.	Feb. 4.	111

TENDERS.

St. John, N.B.—Tenders will be received for the construction of a wharf 300 feet by 30 feet, for the Eastern Steamship Company, cost not to exceed \$40,000, if the city council adopt the recommendation of the Harbor Board. Wm. Murdoch, city engineer.

St. John, N.B.—Tenders are invited for a new boiler for No. 3 fire engine. (Approximate cost of \$800). Address, Ald. Vanwart, Chairman, Safety Board.

St. John, N.B.—Tenders will be received up to 12 o'clock noon, Wednesday, 9th February, for 1,000 feet of 2½-in. cotton hose, rubber lined, with couplings complete. Adam P. MacIntyre, comptroller.

Montreal, Que.—Tenders will be received up to February 15th, by Murphy & Company, No. 1737 Cornwall Street, for the erection and completion of a convent school for the Notre Dame Ladies of Missions. Separate tenders will also be received for plumbing and heating and electric wiring.

Barrie, Ont.—Tenders will be received until Wednesday, February 16th, for the installation of a heating system in the county jail. A. W. Beardsley, County Clerk's Office, Court House, Barrie, has specifications and plans. Tenders should be addressed to C. J. Picotte, Chairman, County Property Committee, Box 128, Penetanguishene, Ont.

Fort William, Ont.—Tenders will be received up to Thursday, 24th February, for the supply of 7,000 first-class standard railway ties. Minimum face 6 inches. Price to be f.o.b. local tracks. Also 7,100 No. 1 cull standard ties, minimum face 4 inches. Price to be f.o.b. 5 cars G.T.P. Mission, remainder f.o.b., local tracks. Delivery to commence on or before April 1st, 1910, and full quantity to be in before April 15th, 1910. A. L. Farquharson, Construction Superintendent.

Fort William, Ont.—Tenders will be received up to Thursday, February 24th, for the supply of 486 cedar poles as follows:—50, 30 feet long; 416, 35 feet long; 20, 40 feet long. Poles must be sound, straight, free from knots, and have not less than a 7-inch top. Maximum sweep allowable, 1 inch in 5 feet. Price to be f.o.b., Fort William, 2 cars of 35-ft. poles on G.T.P. Mission remainder on C.N.R. local track. Delivery to commence on or before March 15th, and complete delivery before March 31st, 1910. A. L. Farquharson, Construction Superintendent.

Kingston, Ont.—Tenders will be received up to Friday, 11th February, for one steam fire engine, 600 gallons' capacity. W. W. Sands, City Clerk.

Peterboro, Ont.—The Board of Works recently discussed the question of purchasing the year's supply of cement, but took no action. Offers should be addressed to Ald. Hicks.

Toronto, Ont.—Tenders for addition to Ontario Parliament Buildings, will be received until Tuesday, 1st March, for the following works;—Masonry; bricklaying; cut stone; carving; fireproofing, etc.; structural steel; steam heating; plumbing and gasfitting; iron armored conduit and electric wiring; vault doors; roofing, copper and sheet metal; carpenter work; ornamental iron and grille work; elevators; lathing and plastering; painting and glazing; marble and tile; metallic fireproof doors, base and trim; Hardware; iron-founder's work. George W. Gouinlock, architect, 1108 Temple Building. J. O. Reaume, Minister of Public Works, Ontario.

South March, Ont.—Tenders will be received up to 1st March, for dredging work on the Carp River within the townships of March and Huntley, in the County of Carleton, to be done in accordance with the plans of J. H. Moore, C. E. Plans, etc., may be inspected and full particulars and form of tender obtained at the office of Beament & Armstrong, 25 Sparks Street, Ottawa. Thomas Richardson, Clerk, South March, Ont.

Winnipeg, Man.—Tenders for supply of 25,000 barrels of cement, delivered f.o.b., cars, city yards, Winnipeg, will be received up to Monday, February 21st. Col. H. N. Ruttan, City Engineer. M. Peterson, Secretary, Board of Control.

Winnipeg, Man.—Tenders will be received until March 7th, for the construction of the Brant Steel bridge at an estimated cost of \$299,646. M. Peterson, Secretary, Board of Control.

Winnipeg, Man.—Tenders for supply of from 2,500 to 3,500 tons of asphalt for street paving for the city of Winnipeg, will be received up to Friday, February 25th. Col. H. N. Ruttan, City Engineer. M. Peterson, Secretary, Board of Control.

Winnipeg, Man.—Tenders for the supply and installation complete of a cooling tower for the Terminal Station in Winnipeg, in connection with Point du Bois electrical development will be received. M. Peterson, Secretary, Board of Control.

Saskatoon, Sask.—Tenders will shortly be invited for University of Saskatchewan buildings. Brown and Vallance, architects, Canada Life Building, Montreal; President Murray, University of Saskatchewan. (Advertisement in this week's Canadian Engineer).

Calgary, Alta.—Tenders will be received until February 25th, for Cast Iron Pipe, Valves, Hydrants, Specials, etc., for the proposed Waterworks Extension. H. E. Gillis, City Clerk. (Advertisement in the Canadian Engineer).

Edmonton, Alta.—Tenders will be received up to March 12th, for the manufacture of all-steel highway bridges required for the year 1910. Specifications, forms of tender and general instructions may be had from the Structural Engineer's Office, Department of Public Works, Edmonton. John Stokes, Deputy Minister of Public Works.

Vancouver, B.C.—Tenders will be received up to Wednesday, February 23rd, 4 p.m., for the supply of galvanized iron pipe and brass for Waterworks Department. S. Maddison, Supt. Waterworks Department. Wm. McQueen, City Clerk.

Vancouver, B.C.—Tenders will be received up to Thursday, February 24th, at 4.30 p.m., for one automobile ambulance, of not less than 50 horse power. Parties tendering to furnish plans, specifications and detailed drawings of machine and to state price f.o.b., Vancouver. Wm. McQueen, City Clerk.

Victoria, B.C.—Tenders will be called for one 8-inch, one 6-inch, ten 2-inch, ten 1½-inch, twenty 1-inch, twenty

¾-inch, and 350 ⅝-inch water meters for the waterworks department.

Victoria, B.C.—Tenders will be received for an automobile for Fire Chief Carlisle, to cost from \$3,500 to \$4,000. Ald. Whitehead is chairman of the fire committee.

CONTRACTS AWARDED.

Montreal, Que.—It was announced this week that the Canada Cement Company had been awarded the contract for supplying all cement required for the construction of the Quebec Bridge.

Galt, Ont.—The Canadian General Electric Company will probably receive the contract for the equipment required at the Hydro-electric transformer station here.

Berlin Ont.—Jacob Baetz will probably receive the contract for erection of a new school here, at \$57,353, which does not include heating.

Hamilton, Ont.—Contracts have been awarded as follows, for annual supplies:—

Cement—Canadian Portland Cement Company, \$1.50 a barrel, 26 cents more than last year.

Lumber—M. Brennen & Sons Co., \$27.75 a thousand feet.

Sewer brick—Ollman Bros. an average of \$8.25 a thousand.

Lime—E. J. Guest, 16 cents a bushel.
Sewer pipe—Toronto & Hamilton Sewer Pipe Co.

Hydrants—Canada Foundry Company, 150 hydrants at \$43.12 each.

Castings—Gartshore-Thomson Co., \$2.05 a hundred.
Iron pipe—Gartshore-Thomson Co., \$34 a ton.

Gate valves—Kerr Engine Co., of Walkerville, \$9 each for 6-inch valves and \$36 each for 12-inch valves.

Pig lead—Adam Hope & Co., \$3.53 a hundred pounds.
Lead pipe—Canada Metal Co., \$4.35 a hundred pounds.

Toronto, Ont.—R. J. McGarr has been awarded the contract by the Temiskaming & Northern Railway Commission for the double tracking of the line from Cobalt to North Cobalt. When this is completed the Ontario Government railway will be double tracked from Cobalt to Haileybury.

Weston, Ont.—The Canada Foundry Company have been awarded a contract, by this municipality, for hydrants, steam nozzles, street sprinklers, cranes and gate valves, for the new waterworks.

Vancouver, B.C.—Evans, Coleman & Evans, of Vancouver, were awarded the contract for the following waterworks supplies for 1910:—250 tons 4-inch cast iron pipe; 3½ miles 6-inch, 1 mile 8-inch, 2½ miles 12-inch steel pipe. Here is a tabulated list of the tenders:—

Nelson, B.C.—The Nelson Street Railway Company has awarded contracts for equipment. The Allis-Chalmers-Bullock Company, Montreal, received an order for a motor generator set of 250 k.w. capacity, while the Ottawa Car Company will build two cars to seat 40 passengers, and to be equipped with four 40 h.p. Allis-Chalmers motors.

Vancouver, B.C.—Large contracts have been awarded to the Canadian General Electric Company, of Toronto, for electrical machinery for the Jordan River plant of the B. C. Electric Railway Company, and also for the plant of the Western Canada Power Company on Stave River. In the first instance, the approximate value of the contract will be \$30,000, while in the latter it will reach \$150,000. For the Jordan River plant the machinery will include step-up and step-down transformers, switchboards, lightning arresters, etc., including two-thirds of the electrical portion of the machinery. On Stave River the Company will install two generators of 16,000 kilowatt normal capacity, and a 36,000 kilowatt transformer, and under full operation 30,000 horsepower will be produced. The Escher-Wyss Company of Switzerland will supply the water wheels for the Stave River plant, and the high tension insulators by the Thomas Insulator Company. The contracts for the switchboards and the steel towers and poles have not yet been awarded.

Victoria, B. C.—The Victoria Machinery Depot Company have been awarded a contract for castings for 1910.

Victoria, B. C.—J. L. Skene, of Gribble, Skene & Company, who had the contract for the C.P.R. hotel, has been awarded a contract for the erection of the new wing of the Empress Hotel.

RAILWAYS.

Fredericton, N.B.—A company, to be known as the Fredericton Street Railway Company, will make application to the Legislature, at its coming session, for a charter to build a line. The solicitor for the applicants, whose names have not been revealed, is R. B. Hanson, of Slipt and Hanson. An advertisement containing notice of the company's intention, appears in a local paper.

Montreal, Que.—Plans have been prepared for the entrance and terminals, in this city, of the Canadian Northern Railway.

St. Thomas, Ont.—It is announced that the Michigan Central Railway will enlarge their yards and build a round-house here.

Toronto, Ont.—The Board of Control have decided to ask the Legislature for power to prepare plans for a complete system of underground railways and to construct such a system if approved by the ratepayers.

Tenderer.	Total Price 4" Cast Iron Pipe.	Price for 6" Steel.	Inside Diameter.	Thickness of Shell.	Price for 8" Steel.	Inside Diameter.	Thickness of Shell.	Price for 12" Steel.	Inside Diameter.	Thickness of Shell.	Total Steel Pipe.
Can. Gen. Electric, Vancouver	\$11,760.00										
A. J. Forsyth & Co. Vancouver	10,497.50	\$ 9,424.80	6"	3/16	\$3,669.60	8"	3/16	\$17,820.00	12"	3/16	\$30,914.40
Roberton, Godson Co., Vancouver	Apr 8,477.50 May 8,445.	10,334.016	6"	3/16	3,807.072	8"	3/16	14,502.84	12"	3/16	28,703.928
F. Hankin, Montreal	9,587.50 8,562.50	(2240 lbs.) (2000 lbs.)									
C. F. Jackson & Co., Vancouver	9,912.50										
Gartshore - Thomson Pipe Co., Hamilton	12,000.00										
C. Gardiner Johnson & Co., Vancouver		9,424.80 9,794.40	6"	3/16	3,643.20 4,435.20	8"	3/16	17,688.00 24,024.00	12"	3/16	30,756.00 38,253.60
F. Darling & Co.			6"	3/16	3,009.60	8"	3/16	14,652.00	12"	3/16	24,499.20
Evans, Coleman & Evans	9,600.00	6,837.60	6 1/2" outside.	3/16	8 1/2" outside.	3/16	12 1/2" outside.	14,520.00	12 3/8"	3/16	28,727.424
Crane Co.		10,315.536	6 1/2"	3/16	3,891.888	8 1/2"	3/16	13,841.52	11 3/8"	3/16	27,054.00
"		9,563.40	5 1/2"	3/16	3,649.08	7 3/8"	3/16	16,552.80	12"	3/16	29,243.904
"		9,085.92	6"	3/16	3,605.184	8"	3/16				

S. MADDISON,
Supt. Waterworks,
Vancouver, B. C.

Niagara Falls, Ont.—The extension of the electric railway line from Queenston to Niagara-on-the-Lake will probably be the result of a conference held here between Supt. Martin Sheehan, of the Intercolonial Railway, and Mayor James Aikens, and the Council of Niagara-on-the-Lake.

Winnipeg, Man.—According to a recent announcement of General Manager Bury, of the C. P. R. western lines, that company will spend thirty millions this year on construction work and extensions in the West.

Winnipeg, Man.—The Canadian Pacific is preparing to expend thirty million dollars upon construction and betterment work in the West this season. The double-tracking from Winnipeg to Brandon and the completion of 225 miles of track-laying connecting Moose Jaw with Castor, giving direct communication with Edmonton over the new line, will probably take place, and the Weyburn-Lethbridge line will also be completed.

Regina, Sask.—The C.P.R. are said to have prepared plans for a \$500,000 station here.

Nelson, B.C.—On Friday, February 11th, a meeting of the shareholders of the Nelson Street Railway will be held for the purpose of authorizing the issue of \$25,000 debentures guaranteed by the city.

Vancouver, B.C.—P. Welch, of Foley, Welch & Stewart, expects that sub-contracts for the construction of the V. V. & E. Railway, from Abbotsford to Hope, will shortly be awarded.

SEWERS, SEWAGE AND WATERWORKS.

New Glasgow, N.S.—The city council is again considering plans for increased water supply at an estimated cost of \$175,000.

Guelph, Ont.—The reforestation of 168 acres of land forming the watershed of the springs giving Guelph her water supply is the plan of the Water Commissioners here.

Calgary, Alta.—City Engineer Childs is preparing plans for a trunk sewer and septic tanks to cost \$800,000.

LIGHT, HEAT AND POWER.

Blind River, Ont.—The Blind River Light, Heat & Power Company contemplate extensive additions to their plant. Plans recently outlined include a new concrete power house and the installation of a 300 horse-power turbine. Thomas H. Pindell, Superintendent.

Toronto, Ont.—The arbitrators decided against the Corporation of Kenora in the recent arbitrations proceedings. The awards were in favor of the Hudson Bay Company for \$45,000 and the Keewatin Power Company for \$35,000, or a total of \$80,000 to be paid by the municipality of Kenora. The arbitrators were unanimous.

Toronto, Ont.—Asked to confirm a newspaper report which stated that \$250,000 would be spent on extensions to their plant, the Canadian General Electric Company said no definite decision had been arrived at.

Victoria, B.C.—City Electrician McCrossan has recommended the appointment of another inspector in his department, at \$90 a month.

FINANCING PUBLIC WORKS.

Halifax, N.S.—The city council has voted \$20,000 for the construction of sewers.

Shelburne, N.S.—M. S. Robertson, town clerk, invited tenders for \$20,000 electric light debentures.

Como, Que.—The ratepayers will vote on a by-law to issue \$30,000 road and bridge debentures.

Quebec, Que.—A civic committee has recommended the issue of \$235,000 debentures:—\$200,000 for permanent walks and \$20,000 for waterworks extensions.

Exeter, Ont., has sold \$8,365 local improvement debentures.

Walkerton, Ont.—The County of Bruce have sold \$20,000 bridge debentures.

Killarney, Man.—Until February 14th, G. B. Monteith, Secretary of the Municipality, offers for sale \$3,000 town hall debentures.

Yorkton, Sask.—R. H. Lock, secretary-treasurer, offers for sale \$40,000 school debentures.

Calgary, Alta.—Ratepayers will vote on a \$242,000 by-law for waterworks extensions and a \$20,000 subway by-law.

North Vancouver, B.C.—Until February 28th, tenders will be received for the following debentures:—Waterworks, \$65,000; sewer, \$40,000; school, \$16,000; road machinery, \$10,000; parks, \$5,000; fire equipment, \$3,000. Interest, 5 per cent. half yearly. Thos. Shepherd, city clerk.

Victoria, B.C.—Ratepayers have passed a \$184,000 school by-law.

MISCELLANEOUS.

Tillsonburg, Ont.—The Town of Tillsonburg (population 3,000) is anxious to get in touch with an engineer, who is also an Ontario Land Surveyor. The municipality requires only a portion of his time. A. E. Raynes, Town Clerk.

Toronto, Ont.—The following is included in the estimate of new plant required by the fire department:—7,000 feet 2½-inch hose, \$7,700; automobile, \$2,500; 12 fire alarm boxes, \$1,500.

Welland, Ont.—It is expected a lighthouse will be built off Point Abino east of Port Colborne for the protection of shipping at that point at a cost of \$75,000. The Michigan Central expect to build a new bridge across the Welland Canal in the spring.

Winnipeg, Man.—A local company has been formed for the purpose of constructing asphalt and other forms of permanent pavements throughout the West. This company is known as the National Paving and Contracting Company, Limited, and the active management will be under the direction of A. R. McNeill, formerly secretary-treasurer of the Bitulithic and Contracting Company, Limited. It is the intention to operate with railroad portable paving plants.

SOCIETY NOTES.

Dominion Land Surveyors.—The Dominion Land Surveyors Association will hold their annual meeting in Ottawa, March 1st and 2nd.

Union of New Brunswick Municipalities.—The programme of the fourth annual convention of the Union of New Brunswick Municipalities, to be held at Campbellton, N.B., on February 16-17, is being distributed.

Central Railway and Engineering Club of Canada.—The next meeting of the above club will be held at the Prince George Hotel, Toronto, on Tuesday, February 15th, at 8 p.m., when a paper on "The Principles of Melting Iron in a Cupola" will be read by E. B. Gilmour, Superintendent of the Moulding Department, Canada Foundry.

On Friday evening, February 25th, at 8.15 o'clock, a social evening will be tendered to members and prospective members, at the St. Charles Hotel.

Ontario Good Roads' Association.—The annual convention of the Ontario Good Roads' Association is to be held in Toronto, March 2nd, 3rd and 4th next. The President, Mr. W. H. Pugsley; the Secretary, Col. J. E. Farewell, K.C., County Clerk of Ontario, with the Executive of the Association, are putting forth special efforts to provide a thoroughly good programme, and to procure an increased attendance. All municipal councillors are urged to attend, either as representatives of their municipality, or because of their personal interest in the question of roads. The public generally are invited. Addresses will be delivered by a number of Canadian road builders on the details of road construction, and matters relating to township and county road systems will be discussed. It is also anticipated that some prominent American "good roads" authorities will be added to the programme. Subjects to be introduced will be:—"Agriculture and Good Roads;" "County Road Systems;" "Benefits from Road Improvement in Perth County;" "Economic Benefits of Good Roads;" "Cost of Farm Haulage;" "Relation of Cities to Good Roads;" "Cost of Roads per \$1,000 Assessment;" "Benefit of a Steam Roller;" "Turnpiking and Drainage;" "Methods in Lennox and Addington;" "Improvement of Old Gravel Roads;" "Cost Data of Road Building;" "Mainten-

ance of Roads;" "Preparation and Use of Road Metal;" "Road Dimensions,—Crown, Width and Gradient;" "Road Management in Hastings;" "Duties of a Road Superintendent;" "Selection of Road Foreman;" "Raising Funds for Road Construction;" "Concrete Highway Bridges;" "Steel Highway Bridges;" "Township Road Systems;" "Road-making Machinery;" "Road Laws in the United States;" "Principles of Road Management."

Engineers' Club of Toronto.—The use of high carbon steel for concrete reinforcement" was the subject discussed at the Engineers' Club last Thursday evening. The following gentlemen, led by Mr. Peter Gillespie, took part:—Messrs. C. R. Young, R. A. Baldwin, W. J. Fuller, L. J. Street, T. T. Black. Mr. C. M. Canniff presided.

Canadian Mining Institute.—The twelfth annual meeting of the above society will be held in Toronto, at the King Edward Hotel, on Wednesday, Thursday and Friday, March 2nd, 3rd and 4th. H. Mortimer Lamb, secretary, Windsor Hotel, Montreal, Que.

Association of Ontario Land Surveyors.—The next annual meeting is announced for 8th, 9th and 10th of March. The annual examination will commence on 14th February in the east hall of the University of Toronto. There are thirty candidates for final examination and six for preliminary.

McGill Applied Science Undergraduates.—A regular meeting of the Applied Science Undergraduates' Society of McGill University was held in the lecture theatre of the Chemistry and Mining Building, on Monday evening, January 31st, the speaker being Mr. J. K. L. Ross, of the Dominion Coal Company.

Mr. Ross, who graduated from the Science of Faculty of McGill in 1897, was introduced by Dr. Barnes, and spoke on "Life Saving Apparatus in use at the Dominion Coal Company's plant at Sydney, C.B." The apparatus was known as the Draeger, which, in general, consisted of a helmet and two cylinders. The cylinders were strapped over the shoulder and were air-filled with oxygen, each one being capable of allowing a man to live in the presence of poisonous gases for one hour. The helmet was air-tight around the face.

The address was supplemented by a practical demonstration of the working of the apparatus.

While essentially a life-saving apparatus, its advantages to the company from an economic standpoint were very great, as in the case of a fire in the mine the men could go down and fight it directly.

Dr. J. M. Elder also spoke on "Artificial Respiration."

Both addresses were very instructive, and were highly appreciated by the large body of undergraduates present.

Dean Adams, Dr. Barnes, Dr. Porter and Professor Evans contributed to the discussion.

OBITUARY.

Joseph Doupe, Civil Engineer and Dominion Land Surveyor, died at 169 Edmonton Street, Winnipeg, on Thursday. The deceased was one of the best known engineers in Western Canada. He went West with Dominion Government surveyors in 1871, and for twenty-five years was engaged on this class of work throughout the whole of Manitoba and the North-West. About fifteen years ago he retired from the service of the Dominion Government to enter upon a private practice which he continued with energy almost up to the hour of his death. The late Mr. Doupe was born at Napanee, Ont., in 1837, and was educated at McGill University, taking his degree of C.E. there. The deceased was out on an important survey at Calgary, Alta., only two weeks ago.

PERSONAL.

The Williamson Construction Company have moved into larger offices at 705 Builders' Exchange, corner Portage Ave. and Hargrave Street, Winnipeg, Man.

Mr. W. C. C. Mehan has been appointed general superintendent of the Mountain division of the G. T. P. Railway, with headquarters at Prince Rupert, B.C. Mr. Mehan is at present located at Melville, Sask.

Mr. W. H. Pearson, Jr., who has been connected with the Consumers' Gas Company of Toronto over thirty years has resigned to devote his time to a new process recently patented for the manufacture of gas. During the period of Mr. Pearson's connection with the Gas Company, the works have grown from 500,000 cubic feet capacity per diem to over 9,000,000 cubic feet. Mr. Pearson had entire charge of all construction and has designed and erected nearly all of the company's plants.

Mr. Pearson is vice-president of the Economical Gas Apparatus Construction Company, and one of the patentees of the Merrifield-Westcott Pearson Water Gas System. The new firm will start operations at once, and expect to have their system installed in one of the Canadian cities.

Mr. F. S. Darling, M. Can. Soc. C. E., until recently engineer in charge of construction on the eastern lines of the C.P.R. has been appointed engineer in charge of construction on the Alberta and Great Waterways Railways, a line



Mr. F. S. Darling, M. Can. Soc. C. E.

which will shortly be built from Edmonton to Fort McMurray, a distance of 350 miles.

Mr. Darling has been engaged in railway construction since 1886 when he joined the staff of the Great Northern. In 1902 he joined the staff of the C.P.R. as Division Engineer of Construction on eastern lines, and in this connection perhaps his heaviest work was the construction of the Toronto-Sudbury branch, the 220-mile cut off to the West.

NEW INCORPORATIONS.

Powassan, Ont.—Arthurs Co. \$20,000; J. Arthurs, J. N. Arthurs, W. F. Duncan. **Collingwood, Ont.**—Manson Bros., \$50,000; D. A. Manson, T. M. Manson, O. L. Hobbs. **Windsor Ont.**—Masonic Temple Association of Windsor, \$50,000; G. English, J. H. Carson, E. B. Winter. **Sandwich, East Township, Ont.**—Regal Motor Car Co., of Canada, \$50,000; J. E. Lambert, C. R. Lambert, B. Lambert. **Sault Ste. Marie, Ont.**—Sault Builders' Supply & Cartage Co., \$50,000; C. B. Sexsmith, D. P. McPhail, K. M. Wright. **Fort William, Ont.**—Enterprise Publishing Co. of Fort William, \$40,000; R. S. Piper, J. Garrity, M. Ferguson. City Cartage & Dray Co., \$40,000; A. H. Dowler, A. G. McAlpine, A. D. Stewart. **Pembroke, Ont.**—Joshua Brown Co., \$45,000; W. L. Hunter, J. C. Hunter, E. A. Dunlop. Silver Nugget Mines, \$1,000,000. S. Arnovitz, M. Landes, J. E. Bergeron. **Haileybury, Ont.**—Haileybury Construction Co., \$40,000; T. Shannon, W. A. Caddie, R. J. Shannon. **Ottawa, Ont.**—Fleming-Dupuis Supply Co., \$60,000; F. W. Bedard, T. Fleming, E. McMahon. Geo. W. Bailey, Ltd., \$40,000; G. W. Bailey, A. J. Moulds, A. T. Bailey. H. N. Bate Realty Corporation, \$1,000,000; H. N. Bate, H. G. Bate, H. A. Bate. Mackey Specialty Co., \$100,000; C. A. Parker, E. A. Larmonth, A. S. Mackey.

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Such selection means waste circulation reduced to a minimum. Is it worth anything to you?

ORDERS OF THE RAILWAY COMMISSIONERS

(Continued from Page 135.)

- 9265—January 12—Authorizing the C.P.R. to construct spur for Messrs. A. & F. Fraser, Pembroke Township, Renfrew County, Ont.
- 9266—January 13—Approving location G.T.P. Railway, Prince Rupert, easterly, mileage 299.15 to mileage 359.00, R. 5, Fort Fraser, District British Columbia.
- 9267—January 4—Dismissing application of city of Montreal for Order directing the C.P.R. to bear and pay cost of construction of sidewalks and pavement under subway where its railway crosses Iberville St.
- 9268—January 10—Directing the C.N.R. to erect and maintain fences on each side of its right-of-way where the same passes through lots 124, 125, 126 and 127, in Parish of Portage la Prairie, Manitoba.
- 9269 January 14—Approving steel pipe line of Messrs. Smith, Kerry & Chace over track of the C.P.R., for construction purposes in connection with construction of new concrete dam on the Illecillewaet River near Revelstoke, B.C.
- 9270—January 14—Authorizing the G.T.R. to construct several branch lines in the 1st Con. Tay Tp., near Midland, Ontario.
- 9271—January 12—Directing the M.C.R.R., the C.P.R., and the T. H. & B. Railway to publish and file not later than March 1st, 1910, a joint rate not exceeding two dollars and sixty cents per ton, in carloads of the customary minimum weights, from Black Rock, New York, and Suspension Bridge, New York, to Sudbury, Ontario, on coal.
- 9272—January 14—Extending until 1st March, 1910, the time within which additional protection may be provided at Crossing of G.T.R. and the Galt, Preston, & Hespeler Railway at Hespeler, Waterloo County, Ont.
- 9273—January 14—Authorizing the Corporation, city of Winnipeg, Man., at its expense, to construct bridge over tracks of C.P.R. connecting Brown Street, on the north, and Brant Street on the south of the yards of said railway company.
- 9274—January 13—Authorizing the Nipissing Power Company, Limited, to place its wires across wires of the Bell Telephone Company five miles south of Callandar, Ontario.
- 9275—January 14—Authorizing the Gillies Hill Telephone Association to place its wires across track of the G.T.R. at mile post 140, 7th concession, Elderslie Township, Bruce County, Ontario.
- 9276—January 14—Authorizing the Rural Municipality of Pipestone, Man., to place its wires across C.N.R. at public crossing 1½ miles north-west of Bellevue Siding, Man.
- 9277—January 14—Authorizing the Shawinigan Cotton Company to lay water pipe under tracks of the C.N.Q. Railway at a point one-fourth of a mile north of the town of Shawinigan Falls, P.Q.
- 9278—January 14—Approving location of the C.P.R. branch line known as the Kipp to Aldersyde Branch from mileage 50 to 84.45, Sec. 6, Tp. 29, R. 28, west 4th Meridian, Alberta.
- 9279—January 15—Authorizing the G.T.R. to construct five bridges on the 20th Dist. of its line of railway.
- 9280—January 14—Authorizing the G.T.R. to construct branch line on Walnut Street, Collingwood, Ontario.

MARKET CONDITIONS.

Following the quotations of the various articles listed in the markets will be found in brackets numbers, thus (10). These numbers refer to the list number of advertisers on page 3 of this issue and will assist the reader to quickly find the name and address of a firm handling any particular article. Buyers not able to secure articles from these firms at the prices mentioned will confer a favor by letting us know.

Montreal, February 9th, 1910.

Prospective legislation in the United States is exerting an influence on the general market in the United States, particularly upon the action of the railway companies. The general feeling is that, sooner or later, some sort of action for the exercise of greater control over the railways, by the Government, will take place, although it would hardly seem that President Taft is specially anxious to bring it about. This may be causing a little nervousness, although, according to reports, there has been a little better buying during the past few days. It would seem that there have been concessions in price by some of the Virginia furnaces, for shipment to Atlantic Coast points, but the central and western furnaces are apparently holding their prices steady. These continue to ask firm figures and are apparently looking forward to further advances, as soon as the present nervousness has passed. Most furnaces throughout the country are sold ahead, and, in view of a pretty good outlook for the future, are not disposed to accept lower prices just now. The general impression is that as soon as demand starts in again there will be an advance on present prices. Meantime, things are in a waiting condition and not a great deal of new trade is being put through. At the same time, furnaces are nearly all fully occupied with orders which were taken some time ago, so that there is no uneasiness.

The situation in Great Britain is unchanged. Scotch and English markets are fairly steady and a moderate amount of trade is passing. As for the export trade, the situation is decidedly better than it was last

year. Canada has been a good customer, having purchased very large quantities of pig-iron—larger probably, than ever before at the same time of year. The continent, also, has been buying more freely than it has during the past few years. On the whole, the situation in Great Britain is hopeful.

Locally, buyers are not holding off for the opening of navigation, as yet, this showing that the stock is needed for prompt use. Apparently the impression that the present is a good time to buy is more or less prevalent among those who are users of pig-iron.

Users of bar iron and steel, steel plates and sheets and similar lines are practically all convinced that prices will advance very shortly. Some say that before the end of the month there will be higher prices while others place the date somewhere before the end of March.

There are very few changes in the remainder of the market. Pipe, both galvanized and wrought, is firm, and dealers are looking for a good demand this season. Cast-iron pipe is firmer than it was last season, and prices are about \$1 higher all round, while dealers claim that the situation is quite encouraging. The market is quoted as follows:—

Antimony.—The market is steady at 8 to 8½c. (111).

Bar Iron and Steel.—The market promises to advance shortly. Bar iron, \$1.85 per 100 pounds; best refined horseshoe, \$2.10; forged iron, \$2; mild steel, \$1.85; sleigh shoe steel, \$1.85 for 1 x ¾-base; tire steel, \$1.00 for 1 x ¾-base; toe calk steel, \$2.35; machine steel, iron finish, \$1.90; imported, \$2.20. (111, 119).

Building Paper.—Tar paper, 7, 10, or 16 ounces, \$1.80 per 100 pounds; felt paper, \$2.75 per 100 pounds; tar sheathing, 40c. per roll of 400 square feet; dry sheathing, No. 1, 30 to 40c. per roll of 400 square feet; tarred fibre, 55c. per roll; dry fibre, 45c. (See Roofing; also Tar and Pitch). (164).

Cement.—Canadian cement is quotable, as follows, in car lots, f.o.b. Montreal:—\$1.30 to \$1.40 per 350-lb. bbl. in 4 cotton bags, adding 10c. for each bag. Good bags re-purchased at 10c. each. Paper bags cost 2½ cents extra, or 10c. per bbl. weight. (26, 86, 164).

Chain.—Prices are as follows per 100 lbs.:—¼-inch, \$4.90; 5-16-inch, \$4.40; ¾-inch, \$3.70; 7-16-inch, \$3.50; ½-inch, \$3.25; 9-16-inch, \$3.20; ¾-inch, \$3.15; ¾-inch, \$3.10; ¾-inch, \$3.05; 1-inch, \$3.05.

Coal and Coke.—Anthracite, egg, stove or chestnut coal, \$6.75 per ton net; furnace coal, \$6.50, net. Bituminous or soft coal: Run of mine, Nova Scotia coal, carload lots, basis, Montreal, \$3.85 to \$4 per ton; cannel coal, \$9 per ton; coke, single ton, \$5; large lots, special rates, approximately \$4 f.o.b., cars, Montreal.

Copper.—Prices are strong at 14 to 14½c.

Explosives and Accessories.—Dynamite, 50-lb. cases, 40 per cent. profit, 15c. in single case lots, Montreal. Blasting powder, 25-lb. kegs, \$2.25 per keg. Special quotations on large lots of dynamite and powder. Detonator caps, case lots, containing 10,000, 75c. per 100; broken lots, \$1; electric blasting apparatus:—Batteries, 1 to 10 holes, \$15; 1 to 20 holes, \$25; 1 to 30 holes, \$35; 1 to 40 holes, \$50. Wire, leading, 1c. per foot; connecting, 50c. per lb. Fuses, platinum, single strength, per 100 fuses:—4-ft. wires, \$3; 6-ft. wires, \$3.54; 8-ft. wires, \$4.08; 10-ft. wires, \$5.

Galvanized Iron.—The market is steady. Prices, basis, 28-gauge, are:—Queen's Head, \$4.10; Colborne Crown, \$3.85; Apollo, 10¾ oz., \$4.05. Add 25c. to above figures for less than case lots; 26-gauge is 25c. less than 28-gauge, American 28-gauge and English 26 are equivalents, as are American 10¾ oz., and English 28-gauge. (111).

Galvanized Pipe.—(See Pipe, Wrought and Galvanized). **Iron.**—The outlook is strong. The following prices are for carload quantities and over, ex-store, Montreal, prompt delivery; No. 1 Summerlee, \$21.50 to \$22 per ton; selected Summerlee, \$21 to \$21.50; soft Summerlee, \$20.50 to \$21; Clarence, \$19.50 to \$20; Carron, No. 1, \$21.50 to \$22, and Carron special, \$21 to \$21.50. (111).

Laths.—See Lumber, etc.

Lead.—Prices are about steady at \$3.55 to \$3.65.

Lead Wool.—\$10.50 per hundred, \$200 per ton, f.o.b., factory.

Lumber, Etc.—Prices on lumber are for car lots, to contractors, at mill points, carrying a freight of \$1.50. Red pine, mill culls out, \$18 to \$22 per 1,000 feet; white pine, mill culls, \$16 to \$17. Spruce, 1-in. by 4-in. and up, \$15 to \$17 per 1,000 ft.; mill culls, \$12 to \$14. Hemlock, log run, culls out, \$13 to \$15. Railway Ties; Standard Railway Ties, hemlock of cedar, 35 to 45c. each, on a 5c. rate to Montreal. Telegraph poles: Seven-inch top, cedar poles, 25-ft. poles, \$1.35 to \$1.50 each; 30-ft. poles, \$1.75 to \$2; 35-ft., \$2.75 to \$3.25 each, at manufacturers' points, with 5c. freight rate to Montreal. Laths: Quotations per 1,000 laths, at points carrying \$1.50 freight rate to Montreal, \$2 to \$3. Shingles: Cedar shingles, same conditions as laths, X, \$1.50; XX, 2.50; XXX, \$3. (112)

Nails.—Demand for nails is better and prices are firmer, \$2.40 per keg for cut, and \$2.75 for wire, base prices. Wire roofing nails, 5c. lb.

Paints.—Roof, barn and fence paint, 90c. per gallon; girder, bridge, and structural paint for steel or iron—shop or field—\$1.20 per gallon, in barrels; liquid red lead in gallon cans, \$1.75 per gallon.

Pipe, Cast Iron.—The market shows a steady tone although demand is on the dull side. Prices are firm, and approximately as follows:—\$32 for 6 and 8-inch pipe and larger; \$33 for 3-inch and 4-inch at the foundry. Pipe, specials, \$3 per 100 pounds. Gas pipe is quoted at about \$1 more than the above. (74, 188).

Pipe, Wrought and Galvanized.—Demand is about the same, and the tone is firm, though prices are steady, moderate-sized lots being: ¼-inch, \$5.50 with 63 per cent. off for black, and 48 per cent. off for galvanized; ¾-inch, \$5.50, with 59 per cent. off for black and 44 per cent. off for galvanized; ½-inch, \$8.50, with 60 per cent. off for black, and 59 per cent. off for galvanized. The discount on the following is 7½ per cent. off for black, and 6½ per cent. off for galvanized; ¾-inch, \$11.50; 1-inch, \$16.50; 1¼-inch, \$22.50; 1½-inch, \$27; 2-inch, \$36; 2½-inch, \$57.50; 3-inch, \$75.50; 3½-inch \$95; 4-inch, \$108.

Plates and Sheets.—Steel.—The market is steady. Quotations are: \$2.20 for 1-16; \$2.30 for ¼, and \$2.10 for ½ and thicker; 12-gauge being \$2.30; 14-gauge, \$2.15; and 16-gauge, \$2.10. (111).

Rails.—Quotations on steel rails are necessarily only approximate and depend upon specification, quantity and delivery required. A range of \$10.50 to \$11 is given for 60-lb. and 70-lb.; 80-lb. and heavier, being \$10.50 per gross ton of 2,240 lbs., f.o.b. mill. Re-laying rails are quoted at \$27 to \$29 per ton, according to condition of rail and location. (73).

Railway Ties.—See Lumber, etc.

Roofing.—Ready roofing, two-ply, 70c. per roll; three-ply, 90c. per roll of 100 square feet. Roofing tin caps, 6c. lb.; wire roofing nails, 5c. lb. (See Building Paper; Tar and Pitch; Nails, Roofing). (164).

Rope.—Prices are steady, at 9c. per lb. for sisal, and 10½c. for Manila. Wire rope, crucible steel, six-strands, nineteen wires; ¼-in., \$2.75; 5-16, \$3.75; ¾, \$4.75; 1, \$5.25; 1½, \$6.25; 2, \$8; 2½, \$10; 3-in., \$12 per 100 feet. (132).

Spikes.—Railway spikes are firmer at \$2.45 per 100 pounds, base of 5¼ x 9-16. Ship spikes are steady at \$2.85 per 100 pounds, base of ¾ x 10-inch, and ¾ x 12-inch. (132).

Steel Shafting.—Prices are steady at the list, less 25 per cent. Demand is on the dull side.

Telegraph Poles.—See lumber, etc.

Tar and Pitch.—Coal tar, \$3.50 per barrel of 40 gallons, weighing about 500 pounds; roofing pitch, No. 1, 70c. per 100 pounds; and No. 2, 55c. per 100 pounds; pine tar, \$8.50 per barrel of 40 gallons, and \$4.75 per half-barrel; refined coal tar, \$4.50 per barrel; pine pitch, \$4 per barrel of 180 to 200 pounds. (See building paper; also roofing).

Tin.—Prices are unchanged, at 32½ to 33c.

Zinc.—The tone is steady, at 6 to 6½c.

CAMP SUPPLIES.

Beans.—Prime pea beans, \$1.85 per bushel. (38).

Butter.—September and October creamery, 26c.; dairy, 22 to 23c.

Canned Goods.—Per Dozen.—Corn, 80 to 85; peas, \$1.05 to \$1.15; beans, 75 to 80c.; tomatoes, 82½ to 90c.; peaches, 25, \$1.65, and 35, \$2.65; pears, 25, \$1.60, and 35, \$2.30; salmon, best brands, 1-lb. talls, \$1.87½, and flats, \$2.02½; cheaper grades, 95c. to \$1.65.

Cheese.—Late makes, 11¼ to 11¾c.; finest makes, ¾c. more.

Coffee.—Mocha, 20 to 25c.; Santos, 15 to 18c.; Rio, 10 to 12c. (38).

Dried Fruits.—Currants, Filiatras, 5¼ to 6¼c.; choice, 8 to 9c.; dates, 4 to 5c.; raisins, Valentias, 5 to 6c.; California, seeded, 7½ to 9c.; Sultana, 8 to 10c. Evaporated apples, prime, 9½ to 9¾c.

Eggs.—No. 1 candled, 26c.; selects, 29 to 30c.; new laid, 35c.

Flour.—Manitoba, 1st patents, \$5.70 per barrel; 2nd patents, \$5.20; strong bakers, \$5.

Molasses and Syrup.—Molasses, New Orleans, 27 to 28c.; Barbadoes, 40 to 50c.; Porto Rico, 40 to 45c.; syrup, barrels, 3¼c.; 2-lb. tins, 2 dozen to case, \$2.50 per case.

Potatoes.—Per 90 lbs., good quality, 50 to 60c.

Rice and Tapioca.—Rice, grade B, in 100-lb. bags, \$2.95 to \$3; C.C., \$2.90. Tapioca, medium pearl, 4½ to 4¾c.

Rolled Oats.—Oatmeal, \$2.45 per bag; rolled oats, \$2.20, bags.

Tea.—Japans, 20 to 38c.; Ceylons, 20 to 40c.; Ceylon, greens, 19 to 25c.; China, greens, 25 to 50c.; low-grades, down to 15c.

Provisions.—Salt Pork.—\$30 to \$32 per bbl.; beef, \$15 per bbl.; smoked hams and bacon, 15 to 18c. per lb.; lard, 17c. for pure and 12c. for compound. (38).

Fish.—Salted.—Medium cod, \$7 per bbl.; herring, \$5.25 per bbl.; salmon, \$15.50 per bbl., for red, and \$14 for pink. Smoked fish.—Bloaters, \$1.10 per large box; haddies, 7½c. per lb.; kippered herring, per box, \$1.20 to \$1.25.

* * * *

Toronto, February 10th, 1910.

The markets appear to be everywhere steady, and we have not found a single feature in any of them that calls for special comment. Prices of metals are maintained, and there is a fair but not active movement.

As to other structural materials, bricks are steady; cement unchanged, the only circumstance worth mention being the contract made with the Davis contracting firm for something near 100,000 barrels for use in the Quebec bridge. Lumber continues to move steadily.

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

Antimony.—Demand quiet at 9c. per 100 lbs. (111).

Axes.—Standard makes, double bitted, \$8 to \$10; single bitted, per dozen, \$7 to \$9.

Bar Iron.—\$2.00 to \$2.10, base, per 100 lbs., from stock to wholesale dealer. Market supply limited. (111).

Bar Mild Steel.—Per 100 lbs., \$2.10 to \$2.20.

Boiler Plates.—¼-inch and heavier, \$2.20. Boiler heads 25c. per 100 pounds advance on plate. Tank plate, 3-16-inch, \$2.40 per 100 lbs.

Boiler Tubes.—Orders continue active. Lap-welded, steel, 1¼-inch, 10c.; 1½-inch, 9c. per 100 feet; 2-inch, \$8.50; 2½-inch, \$10; 3-inch, \$11 to \$11.50; 3½-inch, \$18 to \$18.50 per 100 feet.

Building Paper.—Plain, 30c. per roll; tarred, 40c. per roll. Demand is good for spring requirements.

Bricks.—A very active season has closed, and prices are as below. Prospects excellent for business in 1910. Price at some yards \$9 to \$9.50, at others, \$9.50 to \$10 for common. Don Valley pressed brick move also freely. Red and buff pressed are worth \$18 delivered and \$17 at works per 1,000.

Broken Stone.—Lime stone, good hard, for roadways or concrete, f.o.b., Schaw station, C.P.R., 75c. until further notice, per ton of 2,000 lbs., 1-inch, 2-inch, or larger, price all the same. Not much doing. Broken granite is selling at \$3 per ton for good Oshawa. (164).

Cement.—The figure of \$1.60 may still be quoted at Toronto in car lots per barrel without bags. A large contract recently closed by the city was at \$1.57. In smaller parcels \$1.70 is asked by city dealers, plus bags, (26, 86, 160).

Coal.—Retail price for Pennsylvania hard, \$7.25 net, steady. This price applies to grate, eggs, stove, and chestnut; only pea coal is cheaper, namely, \$6.00. These are all cash, and the quantity purchased does not affect the price. Soft coal is in good supply, American brokers have been covering the ground very fully. In the United States there is an open market for bituminous coal and a great number of qualities exist. We quote. Youghiogheny lump coal on cars here, \$3.70 to \$3.80; mine run, \$3.60 to \$3.75; slack, 2.05 to \$2.85; lump coal from other districts, \$3.40 to \$3.70; mine run 10c. less; slack, 2.50 to \$2.70; cannel coal plentiful at \$7.50 per ton; coking, Solvey foundry, which is largely used here, quotes at from \$5.75 to \$6.00; Reynoldsville, \$4.90 to \$5.00; Connelville, 72-hour coke, \$5.50.

Copper Ingot.—The speculative movement has been very great and it is not easy to forecast the future. The price here is higher at 14½c. per lb., and the demand active.

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

Dynamite, per pound, 21 to 25c., as to quantity. (83.)

Roofing Felt.—A good prospect for spring trade at an unchanged price, which is \$1.80 per 100 lbs.

Fire Bricks.—English and Scotch, \$30 to \$35; American, \$25 to \$35 per 1,000. Fire clay, \$8 to \$12 per ton.

Fuses.—Electric Blasting.—Double strength 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, per 100 count. Bennett's double tape fuse, \$6 per 1,000 feet.

Iron Chain.—1/4-inch, \$5.75; 5/16-inch, \$5.15; 3/8-inch, \$4.15; 7/16-inch, \$3.95; 1/2-inch, \$3.75; 9/16-inch, \$3.70; 5/8-inch, \$3.55; 3/4-inch, \$3.45; 7/8-inch, \$3.40; 1-inch, \$3.40, per 100 lbs.

Iron Pipe.—A steady request at former prices:—Black, 3/4-inch, \$2.03; 1-inch, \$2.25; 1 1/4-inch, \$2.63; 1 1/2-inch, \$3.28; 1-inch, \$4.70; 1 1/4-inch, \$6.41; 1 1/2-inch, \$7.70; 2-inch, \$10.26; 2 1/2-inch, \$16.39; 3-inch, \$21.52; 3 1/2-inch, 27.08; 4-inch, \$30.78; 4 1/2-inch, \$35.75; 5-inch, \$39.85; 6-inch, \$51.70. Galvanized, 3/4-inch, \$2.86; 1-inch, \$3.08; 1 1/4-inch, \$3.48; 1 1/2-inch, \$4.43; 1-inch, \$6.35; 1 1/4-inch, \$8.66; 1 1/2-inch, \$10.40; 2-inch, \$13.86, per 100 feet. (74, 188)

Lead.—An active demand at firm prices, say \$3.75 to \$3.85 per 100 lbs.

Lime.—Retail price in city 35c. per 100 lbs. f.o.b. car; in large lots at kilns outside city 22c. per 100 lbs. f.o.b. car without freight. Demand is moderate.

Lumber.—Prices continue steady, and city demand moderate. We quote dressing pine \$32.00 to \$35.00 per M; common stock boards, \$26 to \$30; cull stocks, \$20; cut sidings, \$17.50; Southern pine dimension timber from \$30 to \$45, according to size and grade; finished Southern pine according to thickness and width, \$30 to \$40. Hemlock in car lots, \$16.50 to \$17; spruce flooring in car lots, \$22 to \$24; shingles, British Columbia, are higher, we quote \$3.10; lath growing scarce and stiffening, No. 1, \$4.40, white pine, 48-inch; No. 2, \$3.75; for 32-inch, \$1.60.

Nails.—Wire, \$2.35 base; cut, \$2.00; spikes, \$2.85 per keg of 100 lbs.

Pitch and Tar.—Pitch, unchanged at 70c. per 100 lbs. Coal tar dull at \$3.50 per barrel. This is the dead season.

Putty.—In bladders, strictly pure, per 100 lbs., \$2.25; in barrel lots, \$2.10. Plasterer's, \$2.15 per barrel of three bushels.

Ready Roofing.—Little doing; prices are as per catalogue.

Roofing Slate.—Most of the slate used in Canada comes now from Pennsylvania or Maine, the Canadian supply being slender and mostly from the Rockland quarries of the Eastern Townships in Quebec. There is a great variety of sizes and qualities, so that it is difficult to indicate prices. But No. 1 Bangor slate 10 x 16 may be quoted at \$7 per square of 100 square feet, f.o.b., cars, Toronto; seconds, 50c. less. Mottled, \$7.25; green, \$7.

Pig Iron.—There is great activity and prices are maintained. Clarence quotes at \$21 for No. 3; Cleveland, \$20.50 to \$21, Summerlee, for winter delivery, \$22.50 in Canadian pig, Hamilton quotes \$19.50 to \$20 per ton. Producing plants are everywhere busy, and there is considerable business in prospect for 1910.

Plaster of Paris.—Calcined, New Brunswick, hammer brand, car lots, \$1.95; retail, \$2.15 per barrel of 100 lbs.

Rope.—Sisal, 9/16c. per lb.; pure Manila, 10/16c. per lb., Base.

Sewer Pipe.—

	4-in.	6-in.	9-in.	10-in.	12-in.	24-in.
Straight pipe per foot	\$0.20	\$0.30	\$0.65	\$0.75	\$1.00	\$3.25
Single junction, 1 or 2 ft. long	.90	1.35	2.70	3.40	4.50	14.65
Double junctions	1.50	2.50	5.00	....	8.50	....
Increases and reducers	....	1.50	2.50	....	4.00	....
P. traps	2.00	3.50	7.50	....	15.00	....
H. H. traps	2.50	4.00	8.00	....	15.00	....

Business quieter; price, 73 per cent. off list at factory for car-load lots; 65 per cent. off list retail. Small lots subject to advance. (52, 84, 138).

Steel Beams and Channels.—Quiet.—We quote:—\$2.50 to \$2.75 per 100 lbs., according to size and quantity; if cut, \$2.75 to \$3 per 100 lbs.; angles, 1 1/4 by 3-16 and larger, \$2.50; tees, \$2.80 to \$3 per 100 pounds. Extra for smaller sizes of angles and tees. (30, 41, 50, 4, 176, 127, 132, 145, 118, 119).

Steel Rails.—80-lb., \$35 to \$36 per ton. The following are prices per gross ton, for 500 tons or over; Montreal, 12-lb. \$45, 16-lb. \$44, 25 and 30-lb. \$43.

Sheet Steel.—The market continues steady; American Bessemer, 10-gauge, \$2.50; 12-gauge, \$2.55; 14-gauge, \$2.35; 17, 18, and 20-gauge, \$2.45; 22 and 24-gauge, \$2.50; 26-gauge, \$2.65; 28-gauge, \$2.85. Quite a good demand exists, and there is prospect of higher prices.

Sheets Galvanized.—Apollo Brand.—Sheets 6 or 8 feet long, 30 or 36 inches wide; 10-gauge, \$2.90; 12-14-gauge, \$3.00; 16, 18, 20, \$3.10; 22-24, \$3.25; 26, \$3.40; 28, \$3.85; 29, \$4.15; 10 3/4, \$4.15 per 100 lbs. Fleur de Lis—28-gauge, \$4; 26, \$3.80 per 100 lbs. A very large tonnage of all sorts has been booked. The feeling is toward an advance. (111).

Tank Plate.—3-16-inch, \$2.40 per 100 lbs.

Tool Steel.—Jowett's special pink label, 10 1/2c. Cammel-Laird, 16c. "H.R.D." high speed tool steel, 6c. (4).

Tin.—The price is now steady at 7 1/4 to 35c.

Wheelbarrows.—Navy, steel wheel, Jewel pattern, knocked down, \$21.60 per dozen; set up, \$22.60. Pan Canadian, navy, steel tray, steel wheel, \$3.30 each; Pan American, steel tray, steel wheel, \$4.25 each. (132).

Zinc Spelter.—A very active movement continues, and a large business is being done. Price very firm at \$5.75 to \$6 per 100 lbs.

CAMP SUPPLIES

Beans.—Hand picked, \$2.25; prime, \$2.15. (38).

Beets.—8c. a bag.

Butter.—Dairy prints, 23 to 24c.; creamery rolls, 29c. per lb.

Canned Goods.—Peas, \$1.10 to \$1.50; tomatoes, 38, 85c. to 95c.; pumpkins, 38, 80 to 85c.; corn, 80 to 85c.; peaches, 28, white, \$1.50 to \$1.60; yellow, \$1.00 to \$1.05; strawberries, 28, heavy syrup, \$1.50 to \$1.95; raspberries, 28, \$1.00 to \$1.05. (38).

Carrots.—6c. and 6 1/2c. a bag.

Cheese.—Large, 12 1/4c.; twins, 13c.

Coffee.—Rio, green, 11 to 12 1/2c.; Mocha, 21 to 23c.; Java, 20 to 31c.; Santos, 11 to 12c.

Dried Fruits.—Raisins, Valencia, 6 to 6 1/2c.; seeded, 1-lb. packets, fancy, 7 1/2 to 8c.; 16-oz. packets, choice 7 to 7 1/2c.; 12-oz. packets, choice 7 to 8c.; Sultanah, good, 6 to 6 1/2c.; fine, 6 to 7c.; choice, 7 to 8c.; fancy, 8 to 9c.; Filippas currants 6 1/2 to 7c.; Nostizzas, 8 1/2 to 9c.; uncleaned currants, 1/2 lower than cleaned. California Dried Fruits.—Evaporated apricots, 15 to 16c. per lb.; prunes, 60s to 70s, 7 to 7 1/2c.; 90s to 100s, 6 1/2c.; evaporated apples, 8c. (38).

All Ingot Metals IN STOCK A. C. LESLIE & CO., Limited, MONTREAL

Eggs.—Cold storage, 28c.; new laid, 37c. per dozen, in case lots.

Flour.—Manitoba Flour.—Quotations at Toronto are:—First patents, \$5.60; second patents, \$5.10; strong bakers', \$4.90; 90 per cents., Glasgow freights, 28s. 6d. Ontario Flour.—Winter wheat patents, for export, \$4.20 to \$4.25, in buyers' sacks outside.

Lard.—Tierces, 16 1/4c.; tub, 16 1/4 to 16 1/2c.; pails, 16 1/2 to 16 3/4c. per lb., market firm.

Molasses.—Barbadoes, barrels, 37 to 45c.; Porto Rico, 45 to 60c.; New Orleans, 30 to 33c. for medium.

Onions.—\$1.25 a bag.

Potatoes.—Best, 65 and 70c. a bag.

Turnips.—45c. the bag.

Pork.—Market uncertain. Short cut, \$29 per barrel; mess, \$27.

Rice.—B. grade, 3 1/2c. per lb.; Patna, 5 to 5 1/4c.; Japan, 5 to 6c.

Salmon.—Fraser River, talls, \$2; flats, \$2; River Inlet, \$1.55 to \$1.75.

Smoked and Dry Salt Meats.—Long clear bacon, 14 1/2c. per lb., tons and cases; hams, large, 14 to 14 1/2c.; small, 16c.; rolls, 14 1/2 to 14 3/4c.; breakfast bacon, 18c.; backs (plain), 18 1/2 to 19c.; backs (peameal), 18c. to 19c.; shoulder hams, 13c.; green meats out of pickle, 1c. less than smoked. Market steady.

Spices.—Allspice, 16 to 19c.; nutmegs, 30 to 75c.; cream tartar, 22 to 25c.; compound, 15 to 20c.; pepper, black, pure Singapore, 14 to 17c.; pepper, white, 20 to 30c.

Sugar.—Granulated, \$4.95 per 100 lbs. in barrels; Acadia, 4.85; yellow, \$4.55; bags, 5c. lower.

Syrup.—Corn syrup, special bright, 3 1/2c. per lb.

Teas.—Japans, 20 to 35c. per lb.; Young Hysons, 16 to 35c.; Ceylons, medium, 16 to 45c.

TORONTO HORSE MARKET.

There has been a good demand at the Union Stock Yards for horses, during the past week. Prices are standing at about last week's figures, with some extra heavy drafters going a little higher, for better quality.

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Winnipeg, February 8th, 1910.

The demand in Winnipeg for all lines of building material is growing very rapidly, as many contractors are placing large orders for material for the coming season's work. There is a slight advance recorded in the price of lumber, more particularly in dimension materials, although there are slight increases, also, in boards and timber. Brick manufacturers report an excellent demand for brick for the coming season's work, one manufacturer stating that he was receiving more orders than they could possibly turn out. These indications point to a very busy season in Winnipeg and Western Canada during the present year, and together with the railroad work and other public works to be done dealers in railway supplies and other lines are looking forward with confidence to a very successful season. Shipments of steel are coming forward for a number of large structures, and by April 1st a large amount of steel will have been shipped into the West.

There is nothing new in the cement market and little is known as to what the prices will be during the coming season. The city of Winnipeg are already calling for tenders for a supply of 25,000 barrels.

Other quotations in Winnipeg are unchanged and are as follows:—

Anvils.—Per pound, 10 to 12 1/2c.; Buckworth anvils, 80 lbs., and up, 10 1/2c.; anvil and vice combined, each, \$5.50 (111, 132).

Axes.—Chopping axes, per dozen, \$6 to \$9; double bits \$12.10 per dozen.

Barbed Wire.—4 point and 2 point, common, \$3.15 per cwt.; Baker, \$3.20; Waukegan, \$3.30.

Bar Iron.—\$2.50 to \$2.60.

Bars.—Crow, \$4 per 100 pounds. (119).

Beams and Channels.—\$3 to \$3.10 per 100 up to 15-inch. (4, 30, 41, 50, 118, 119, 127, 132, 145, 176.)

Boards.—No. 1 Common Pine, 8 in. to 12 in., \$8 to \$45; siding, No. 2 White Pine, 6 in., \$55; cull red or white pine or spruce, \$24.50; No. 1 Clear Cedar, 6 in., 8 to 16 ft., \$60; Nos. 1 and 2 British Columbia spruce, 4 to 6 in., \$55; No. 3, \$45.

Bricks.—\$10, \$11, \$12 per M, three grades.

Building Paper.—4 1/2 to 7c. per pound. No. 1 tarred, 84c. per roll; plain, 60c.; No. 2 tarred, 62 1/2c.; plain, 56c.

Coal and Coke.—Anthracite, egg, stove or chestnut coal, \$0.75 large lots to \$1.50 ton lots, net, Alleghany soft coal; carload lots, basis, Winnipeg, f.o.b., cars, \$6 per ton; canal coal, \$10.50 per ton; Galt coal, \$2 f.o.b., carload lots, \$0 single ton; coke, single ton, \$7 at yard; large lots, special rates. American coke \$11 to \$11.50 a ton; Crow's Nest, \$11 a ton.

Copper Wire.—Coopered market wire, No. 7, \$4 per 100 lbs.; No. 6, \$4; No. 10, \$4.06; No. 12, \$4.20; No. 14, \$4.40; No. 16, \$4.70.

Copper.—Tinned, boiler, 30 1/2c.; planished, 20 1/2c.; boiler and T. K. pls. plain, tinned, 45 per cent. discount.

Cement.—\$2.25 to \$2.50 per barrel in cotton bags.

Chain.—Coil, proof, 3/4-inch, \$7; 5/16-inch, \$5.50; 1/2-inch, \$4.00; 7/16-inch, \$4.75; 1/4-inch, \$4.40; 3/8-inch, \$4.20; 1/2-inch, \$4.05; logging chain, 5/16-inch.